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Parent Expectations, Deaf Youth Expectations, and Transition Goals as Predictors of Postsecondary Education Enrollment

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Abstract

This study used the National Longitudinal Transition Study–2 (NLTS2) data set to determine the effects of expectations and transition planning goals on the postsecondary education enrollment of deaf youth. Propensity scoring modeling results indicated that high expectations held by deaf youth and their parents significantly predicted postsecondary education attendance at 2- and 4-year colleges, and career and technical education (CTE) schools. College enrollment as a transition planning goal for deaf youth also significantly predicted enrollment in all three types of postsecondary education institutions. Postsecondary CTE school attendance as a transition plan goal for deaf youth did not make a difference in enrollment outcomes for CTE and 2-year college, and it significantly reduced their odds of attending 4-year college. Implications regarding expectations and transition plan goals are discussed.

Keywords

postsecondary education enrollment, deaf youth, expectatons, transition planning goals, propensity scoring modeling

Higher education or training has great significance for deaf[1] individuals in closing historical employment gaps with hearing peers (Garberoglio et al., 2019b; Walter & Dirmyer, 2013). Even deaf individuals who enrolled but did not complete their postsecondary education reap greater advantages than those who have never attended postsecondary education (Palmer et al., 2020). Overall, postsecondary education enrollment is more common among deaf individuals than individuals with other disabilities (Newman et al., 2011). However, deaf individuals are less likely to attend 4-year colleges than their hearing peers (34% and 40%, respectively) and more likely to attend 2-year colleges (52% vs. 21%) and career and technical education (CTE) training (45% vs. 20%; Newman et al., 2011). Furthermore, deaf individuals are less than half as likely to be currently enrolled in postsecondary education and training compared with their hearing peers (5% and 11%, respectively; Garberoglio, Palmer, & Cawthon, 2019). These disparities bear implications for later employment and income attainment for deaf individuals (Garberoglio et al., 2019b).

Parent expectations and youth expectations for their future are consistently important factors contributing to postsecondary education enrollment rates (Crosnoe et al., 2002; Doren et al., 2012; Glick & White, 2004; Mello, 2008; Wood et al., 2011). Transition planning goals have also emerged as an important factor in postsecondary education enrollment for students with disabilities (Balcazar et al., 2012; Chiang et al., 2012; Wei et al., 2016). Transition planning from high school to postsecondary education is a legally mandated process for students served under the Individuals with Disabilities Education Improvement Act (IDEIA, 2004), including those who are deaf.

This study examines youth expectations, parent expectations, and transition plan goals as predictors of postsecondary enrollment for deaf individuals. To date, few quantitative studies have examined the role of parent and youth expectations as predictors of postecondary education enrollment for deaf individuals (e.g., Cawthon et al., 2015; Garberoglio et al., 2014). In addition to expanding predictors to include transition planning goals, this study extends previous correlational analysis studies by using quasi-experimental propensity score modeling (PSM), a rigorous approach that is

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designed to determine causal relationships between predictors and outcomes (Austin, 2011).

Postsecondary transition planning is a key strategy for successful navigation of the significant barriers that deaf people face in education and in the workplace (National Deaf Center on Postsecondary Outcomes [NDC], 2019). Inaccessible learning environments, reduced social opportunities, negative attitudes about deaf people and their capacity to be successful, siloed services, and professionals who are unaware of how to support deaf people are but a few systemic barriers to equity in education and employment (NDC, 2018). These barriers may also contribute to inadequate opportunities for rigorous coursework given to deaf youth, leading them to leave high school academically underprepared (Nagle et al., 2016; Newman et al., 2017). While deaf people share experiences with other peers with disabilities, there are also factors that set them apart, which warrant specific consideration and research. For example, there is large variability in the types of language and communication modalities that deaf people use, in the quality of education received, and in their diverse cultural identity and intersectionality, including factors that affect postsecondary readiness (Foster & Kinuthia, 2003; Spencer & Marschark, 2010).

There are specific characteristics found to predict postsecondary enrollment in either the deaf or disability population. These characteristics include gender, race/ethnicity, additional disabilities, household income, type of secondary school attended, and parental educational attainment (Garberoglio et al., 2019a; Newman et al., 2011; Rawlings, 1994). Although postsecondary outcomes of deaf youth have not been linked to other characteristics, such as speech clarity, communication modality, and level of hearing loss, these characteristics have been found to either vary or be associated with other predictor variables (e.g., race/ethnicity, household income; Wagner et al., 2003).

This study draws from both the social cognitive theory (SCT; Bandura, 1986) and the expectancy value theory (Eccles et al., 1983) to explain the role of expectations in postsecondary outcomes. For example, the more parents believe they can contribute to the development of their children's academic skills, the higher expectations they hold for their child's postsecondary enrollment in the future (Bandura, 2006). Therefore, parents with high perceived parental efficacy, who *both* value postsecondary education and expect their child to attend such an institution, may be more likely to engage in promotive behaviors that lead to enrollment. These behaviors that promote self-efficacy development in youth may include (a) discussing potential colleges or postsecondary educational programs with their child, known as verbal persuasion (Bandura, 1977); (b) learning about postsecondary education and financial aid options (Kim & Schneider, 2005); and (c) placing youth in rigorous educational environments (Crosnoe et al., 2002).

Children may perceive and internalize their parents' expectations and values about their future educational pursuits (e.g., Parsons et al., 1982; Wood et al., 2011). This internalization may manifest as stronger commitment to high school academics (e.g., higher grade point average [GPA]), which then continues to boost their own expectations as well as their parents' about attending postsecondary education (Masino & Hodapp, 1996). However, youth themselves become key agents in their future pursuits when transitioning from adolescence to adulthood. Thus, strengthening self-determination, self-determined learning, and personal agency in students throughout this transition period is of utmost importance (Wehmeyer et al., 2019). The National Longitudinal Transition Study–2 (NLTS2) data indicated that expectations held by deaf youth regarding future postsecondary enrollment were significantly higher than those of their parents (80% and 65%, respectively; Wagner et al., 2005, 2007). Yet nearly 75% of deaf youth attended postsecondary school within 8 years of leaving high school (Newman et al., 2011). It is possible that parents and their deaf youth share the same values of attending postsecondary education, but parents may be less confident in their ability to meaningfully support their deaf youth in the transition process (Bandura, 2006).

While both parent and youth expectations were significantly related to postsecondary education attendance for deaf youth (Cawthon et al., 2015; Garberoglio et al., 2014), the likelihood of this outcome depends on the nature of those expectations. Postsecondary education enrollment odds for deaf youth were only significantly higher when their parents expected that they would be employed outside of the home (Cawthon et al., 2015). Furthermore, attendance only became significantly likely when deaf youth expected that they would obtain a bachelor's degree, be employed, or live independently (Garberoglio et al., 2014).

Transition goals, which are operationalized expectations set in a collaborative planning process, are the third predictor included in this study. Transition planning goals also represent the *collective* expectations (Bandura, 2000) of parents, students, and school staff. Early analyses of the impact of transition goals on postsecondary outcomes for students with disabilities, in general, indicated that students with a postsecondary education enrollment goal were significantly more likely—by 21 percentage points—to enroll than those without such a goal (Wagner et al., 1993). Although 80% of deaf students had a transition planning goal to attend postsecondary education, with 43% to enroll at a CTE school and 75% to attend a 2- or 4-year college (Wagner et al., 2005), research has not determined the relationship between goal setting and program enrollment for deaf students.

Overall, the literature indicates the theoretical and practical significance of youth and parent expectations as well as transition planning goals in predicting postsecondary

education enrollment for deaf youth. However, much of the prior research exploring the relationship between expectations and postsecondary education were based on correlational analyses. This study aims to strengthen the literature by utilizing PSM, a robust statistical analysis, to estimate the predictive power of self-expectations, parent expectations, and transition planning goals in deaf youth enrollment in CTE, 2-year, and 4-year postsecondary settings (Austin, 2011). Based on the hypothesis that expectations and goals improve postsecondary enrollment, this study addressed the following research questions using quasi-experimental PSM methodology:

Research Question 1 (RQ1): What are the effects of parent expectations on enrollment in CTE, 2-year, and 4-year postsecondary settings?
Research Question 2 (RQ2): What are the effects of youth self-beliefs on enrollment in CTE, 2-year, and 4-year postsecondary settings?
Research Question 3 (RQ3): What are the effects of postsecondary transition planning goals on enrollment in CTE, 2-year, and 4-year postsecondary settings?

Method

Sample/Data Sources

Data are from the NLTS2, funded by the Institute of Education Sciences' (IES) National Center for Special Education Research of the U.S. Department of Education. NLTS2 is the only large-scale national data set that includes information on the high school and post–high school outcomes and experiences of students with disabilities. In-depth information about sample selection, attrition, and representativeness are found in Cameto et al. (2000) and Javitz and Wagner (2005).

Sample members were required to have at least one wave of data from a parent or youth interview after the youth had left high school so that measures of postsecondary enrollment were available. The analysis sample includes approximately 580 students who received special education services in secondary school under the hearing impairment federal disability category. All reported unweighted sample size numbers are rounded to the nearest 10, as required by the restricted data use agreement with the U.S. Department of Education. Results are weighted so that findings are nationally representative of deaf youth in the NLTS2 age range and time frame, using a cross-wave, cross-instrument weight (Valdes et al., 2013). Data were drawn from parent and youth interviews, and surveys conducted across five waves of data collection performed every other year, beginning in 2001 and ending in 2009. By the final year, youth were 21 to 25 years old. Interviews were conducted in English and Spanish by phone, unless the parent or youth indicated that they were not able to participate by phone; in that case, they were mailed a survey and teletype (TTY) options. Note that a videophone protocol had not been developed for this study, as videophones were not released until the final years of data collection (i.e., about 2007). If the parent indicated that the youth was not able to participate in the interview or the survey, or if the youth could not be reached, parents were asked to answer questions about the youth. Data on transition plan goals came from school program surveys. High school transcripts provided information on students' academic course taking and performance. For details on data sources, see Newman et al. (2011).

Propensity Score Methodology (PSM)

PSM was used to address the hypothesis that expectations and goals during high school improve postsecondary school enrollment for deaf students. Observational studies, such as NLTS2, introduce selection bias and confounders when comparing treatment and control groups. PSM minimizes this by creating "statistical twins"—students who are similar on the specified variables (known as covariates) included in the models—to simulate, to the extent possible, characteristics of a randomized control trial (Rosenbaum & Rubin, 1983, 1985 as cited in Newman et al., 2021).

The treatment group in these analyses were students who definitely expected/were expected to attend postsecondary school and/or had a transition planning goal to attend postsecondary school (treatment measures described more fully in the following). The control group in all models consisted of students who did not have these expectations or goals. Propensity scores were then used to adjust the weights of the control students so that these students were similar to the treatment group on the characteristics included in the analyses. (Please review Newman et al. [2021] for more details on the PSM approach used in this study). Separate logistic regressions on multiply imputed data were run for each of the 20 implicates, where the dependent variable was the postsecondary enrollment outcome, and the independent variable was one of the expectation and goal treatment variables. These models included the propensity weights and all covariates. Regression results were combined across implicates that generated odds ratios (ORs). These ORs can be interpreted as measures of relative odds of postsecondary enrollment, controlling for the estimated 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: Expectations and goals. Four measures—parent postsecondary education expectations for the student, the

student's postsecondary expectations, transition planning goal of attending a 2- or 4-year college, and transition planning goal of attending a CTE school—were the focus of this analysis. The data source for expectations were interview/surveys conducted when students were in high school. Parents were asked whether they expected their child to attend school after high school, and youth were asked whether they expected to attend school after high school with four Likert-type response categories, ranging from 1 (*definitely will*) to 4 (*definitely will not*). This variable in the propensity analysis was dichotomously coded, with response Category 1 coded as 1 and response Categories 2 to 4 coded as 0. The Wave 1 school program survey, infilled with information from the Wave 2 school program survey for those missing the Wave 1 survey, was the source for transition planning goals. School staff were asked to indicate the primary goals on the student's transition plan, with separate response options for attending a 2- or 4-year college or a postsecondary CTE program. Each variable was coded dichotomously.

Outcome: Enrollment in postsecondary school. The outcome measures in the analysis were enrollment in each of three types of postsecondary schools: 2-year college, 4-year college, and CTE schools. Enrollment data came from the Waves 2 through 5 post–high school parent/youth telephone interviews and mail surveys. A dichotomous variable (1 = *yes*, 0 = *no*) was created for enrollment in each of three types of postsecondary schools. Youth were coded as 1 = *yes* if they were reported ever to have enrolled in that type of school since leaving high school. Those who had never enrolled in any postsecondary school were coded as 0 = *no*.

Covariates. Covariate selection is critical to the propensity modeling approach, a primary purpose of which is to achieve the optimal balance between comparison groups on specified covariates that influence outcomes (Caliendo & Kopeing, 2008). Covariate selection was informed by the NLTS2 conceptual framework (Wagner & Marder, 2003). The NLTS2 conceptual framework posits that secondary school and postschool outcomes are influenced by individual and household characteristics; youth's level of functioning in several domains; and the youth's experiences, including course taking and performance in secondary school. The specific factors within the framework's larger constructs included in our analysis were selected on the basis of prior research on factors related to student expectations, transition planning goals, and postsecondary enrollment. Criteria for selecting covariates included factors identified in research on deaf youth and youth in the general population as predictors of expectations and goals, as well as postsecondary enrollment. These covariates, shown in Table 1, are described in the following.

Demographic covariates came from the Wave 1 parent interview/survey and were the following dichotomous variables: youth's sex (1 = *male*, 0 = *female*), race/ethnicity (1 = *other than White*, 0 = *White*), household income (1 = *<US$50,000*, 0 = *≥US$50,000*), and mother's education (1 = *high school graduate/General Educational Development* [*GED*] *or less*, 0 = *all other education categories*).

Indicators of the nature and severity of youth's disabilities included level of hearing loss, whether the student had an additional disability, speech clarity, use of sign language, and number of affected functional domains (e.g., hearing, speaking). Level of hearing loss was reported in the Wave 1 and Wave 2 school program surveys, and for those missing both school surveys, level of loss was based on parent report. This variable was dichotomously coded (1 = *deaf*, 0 = *hard of hearing*). Wave 1 parent interviews, infilled with information from the Wave 2 interviews, provided the remaining severity indicators. To determine clarity of speech, parents were asked to indicate how clearly the youth spoke, on a scale ranging from 1 (*has no trouble speaking clearly*) to 4 (*does not speak at all*). Use of sign language and whether youth had any additional disabilities, were each included as dichotomous variables. Parents also reported whether youth had any problems with seeing, speaking, conversing, understanding language, appendage use, or health. The number of problem domains was included as a dichotomous variable (1 = *1 or fewer domains*; 0 = *more than 1 domain*). Type of school attended was characterized based on the parent survey. Students were identified as having attended general secondary schools (those that serve a wide variety of students), special schools that serve only students with disabilities, or a mix of both types of schools. The type of secondary school covariate was then dichotomized as 1 (*regular secondary schools only*) and 0 (*special schools or a mix of secondary school types*). Academic performance and preparation were measured on the basis of students' high school transcript GPA in academic coursework in Grades 9 and 10 and the percentage of overall ninth- and 10th-grade credits earned in academic courses.

Handling Missing Data

Missing data rates for most variables ranged from 0% to 4%, other than course taking and performance variables, which had a missingness rate of 12% to 19%. Missing data were imputed 20 times using an Imputation by Chained Equations procedure (Royston et al., 2009) to avoid bias associated with listwise deletion and capture the information contained in the correlation between covariates and the outcome and treatment variables. However, as recommended, the analysis did not use imputed values for the outcome or treatment variables (White et al., 2011).

Table 1. Treatment and Control Balance Statistics on Covariates Before and After PSW for Parents Who Expect Youth Will Attend Postsecondary School.

Covariates	Treatment *M*[a]%	SMD[b]	
		Pre-PSW	Post-PSW
Gender: Male	46.64	−0.23	−0.09
Race/ethnicity—not White	31.99	−0.28[c]	−0.04
Household income <US$50,000	52.06	−0.35[c]	−0.01
Mother's education (% ≤ high school graduate)	36.19	−0.56[c]	−0.09
Deaf vs. hard of hearing	43.86	−0.07	0.05
Has additional disability	39.57	−0.48[c]	−0.11
Clarity of speech	45.54	0.47[c]	0.16
Uses sign language	52.10	−0.32[c]	−0.02
Number of functional domains impaired	75.76	0.51[c]	0.04
Attended a regular secondary school only	85.72	0.32[c]	0.07
% credits in academic courses in ninth and 10th grade	65.36	0.31[c]	0.11
GPA in academic courses in ninth and 10th grade	2.74	0.64[c]	0.12
Sample size	540		

Note. Tables reporting treatment and control balance statistics on covariates of other models 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 data sets. GPA = grade point average; PSW = propensity score weighting.

Source: U.S. Department of Education, National Center for Special Education Research, National Longitudinal Transition Study–2 (NLTS2), "Parent/Youth Interview, 2001 and 2003" and "High School Transcripts, 2001–2009."

[a]Post-PSW treatment mean. [b]Pre-PSW standardized mean difference (SMD) is calculated as the treatment 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 treatment mean (calculated using survey weights) minus the control mean (calculated using PSW-adjusted 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.

Balanced Groups

To ensure that PSM created balanced treatment and comparison groups, standardized mean differences (SMDs) between the two groups on each covariate were compared before and after propensity score weighting. The SMD is the difference in means between the groups divided by their pooled standard deviation. The What Works Clearinghouse (WWC, 2020) established a 0.25 cutoff for baseline equivalence for quasi-experimental studies. Before PSM, 10 covariates in the parent expectations model were above this cutoff (see Table 1), as were seven covariates in the youth expectations model. The 11 covariates in the model focused on the transition planning goal to attend a 2- or 4-year college, and seven covariates in the model focused on the transition goal to attend a CTE school (tables available on request). After propensity score weighting, all SMDs were below the WWC cutoff for all models, indicating that treatment and comparison groups were balanced on the covariates in almost all of the other models, and propensity modeling was warranted. In addition, we included all covariates in subsequent models to further account for any possible differences between treatment and comparison groups.

Sensitivity Analysis

A sensitivity analysis (Lin et al., 1988) was conducted to assess the robustness of the propensity analysis findings in the 12 sets of analyses examining the effect of expectations and goals on the three types of postsecondary schools. These analyses demonstrated that the findings are robust to the presence of a single binary unobserved confounder associated with both the outcome and treatment. An unmeasured variable in each of the 12 sets of analyses would need to have an OR ranging from 5.6 to 43.0 (varying by analysis) to make the effect of the parent or youth expectations or transition planning goals on postsecondary enrollment be statistically nonsignificant. This suggests that an unobserved confounder would need to be very powerful (increasing the enrollment probability in the control group by a factor of 5.3 to 42.3) before it would render the treatment not statistically significant.

Results

Nearly half (47%) of the parents of deaf youth expected that their children definitely would attend postsecondary education, whereas three out of four (75%) deaf youth expected that they definitely would attend postsecondary education. More than two out of three (70%) deaf youth had a transition planning goal of attending either a 2- or 4-year college, and close to one in three (30%) deaf students had a transition planning goal of attending a CTE school.

Effect of Parent Expectations

Findings from the propensity-adjusted analyses indicated that expectations of postsecondary education enrollment held by deaf youth or their parents had a significant effect on actual attendance for all three types of postsecondary education institutions (CTE school, 2-, and 4-year colleges; see Table 2). Propensity-adjusted results indicated that, compared with deaf youth whose parents did not expect them to enroll in postsecondary education institutions, deaf youth with parents who expected that they would attend postsecondary school had significantly higher odds of attending a 2-year college (OR = 4.89, $p < .001$), 4-year college (OR = 8.50, $p < .001$), or CTE school (OR = 4.22, $p < .001$). In terms of interpreting the OR, more than half (55.4%) of deaf youth whose parents expected them to attend postsecondary education later enrolled at a 2-year college as compared with a propensity-adjusted attendance rate of one in five (20.2%) deaf youth whose parents did not have the same expectations. Similarly, deaf youth whose parents expected postsecondary enrollment attended a 4-year college (52.2%). In comparison, when parents did not hold those expectations, a smaller PSM-adjusted proportion (11.4%) of deaf youth enrolled in 4-year college. Finally, slightly more than one in three (34.6%) deaf youth whose parents expected postsecondary education enrollment attended CTE school, as compared with a PSM-adjusted rate of 11% for deaf youth whose parents did not hold expectations for postsecondary attendance that enrolled in CTE programs.

Effect of Youth Expectations

Deaf youth who expected that they would definitely attend a postsecondary education institution were significantly more likely than deaf youth without the same future expectation to attend a 2-year college (OR = 14.23, $p < .001$), 4-year college (OR = 379.13, $p < .01$), or CTE school (OR = 54.60, $p < .001$). Fifty-eight percent of deaf youth who expected to attend postsecondary education enrolled in a 4-year college as compared with a PSM-adjusted enrollment rate of less than 1% for those who did not hold this expectation for themselves. About half (50.53%) of deaf youth who expected that they would enroll at a postsecondary education institution attended a 2-year college compared with deaf youth without the same expectations who had a PSM-adjusted attendance rate of less than one in 10 (6.7%).

Effect of Transition Planning Goals

Positive effects of transition planning goals were found for 2- or 4-year college but were nonexistent or had the opposite effect when transition planning goals were for CTE. More specifically, deaf youth with a transition planning goal of attending a 2-year or a 4-year college had significantly higher odds than those without this goal to enroll at any type of postsecondary education institution: 2-year college (OR = 18.59, $p < .001$), 4-year college (OR = 90.36, $p < .001$), or CTE school (OR = 17.15, $p < .001$). Attendance outcomes for 2- and 4-year colleges were similar among deaf youth who had a transition planning goal to attend either one of those postsecondary education institutions (50.7% and 52.4%, respectively), as well as those who did not have these institutions listed as their transition planning goal (PSM-adjusted >1% and >1%). More than a quarter (29.1%) of deaf youth with attendance at a 2- or 4-year college listed as their transition planning goal attended CTE school compared with a <1% PSM-adjusted rate for those who did not have this transition goal. Deaf youth with a transition planning goal of CTE attendance did not have significantly greater odds of enrollment in a 2-year college (OR = 1.81, $p > .05$) or a CTE program (OR = 2.46, $p > .05$) than those who did not have this goal. In addition, those with a CTE transition planning goal were less likely to attend a 4-year college (OR = 0.29, $p < .05$).

Discussion

Postsecondary education and training are key to successful transition into adulthood for deaf individuals who often face systemic barriers (Garberoglio et al., 2019a). Postsecondary education offers multiple benefits for deaf individuals, even if they do not complete their programs (Palmer et al., 2020). Yet, there are significant disparities between deaf individuals and their hearing peers when it comes to postsecondary education outcomes (Newman et al., 2011). This study's findings, derived through the use of PSM, indicated that postsecondary education enrollment expectations held by deaf youth and their parents significantly predicted actual enrollment for all three types of postsecondary education institutions. Transition planning goals, on the contrary, had mixed impact on deaf youth's postsecondary education trajectories, with CTE goals not related to positive postsecondary education outcomes. Research that specifically examines the relationship between CTE as a transition planning goal and enrollment is limited and has not addressed deaf youth (e.g., Chiang et al., 2012; Wagner et al.,1993; Wei et al., 2016). Improved understanding of CTE as a postsecondary pathway for deaf youth is highly relevant, especially as deaf individuals historically represent the highest CTE enrollment rates compared with students with other disabilities (Newman et al., 2011).

The finding that CTE school as a postsecondary transition planning goal did not increase deaf youth's odds of attending CTE school or 2-year college and significantly decreased their odds of enrolling in a 4-year college was surprising. One potential contextual factor is a cohort effect

Table 2. PATT Effect of Expectations and Transition Planning Goals on Postsecondary Education Enrollment for Deaf Students, by Type of Postsecondary School.

	Youth enrolled in a . . .											
	2-year college				4-year college				Career/technical education school			
Predictors	*N*	Treatment group[a] (%)	Adjusted control group[b] (%)	Propensity-adjusted OR[c] [95% CI]	*N*	Treatment group[a] (%)	Adjusted control group[b] (%)	Propensity-adjusted OR[c] [95% CI]	*N*	Treatment group[a] (%)	Adjusted control group[b] (%)	Propensity-adjusted OR[c] [95% CI]
Parent expects youth definitely will attend postsecondary school (all covars <.25)	430	55.4	20.2	4.89*** [2.36, 10.13]	360	52.2	11.4	8.50*** [3.42, 21.16]	340	34.6	11.1	4.22*** [1.93, 9.21]
Youth expect they definitely will attend postsecondary school (all covars <.25)	170	50.53	6.7	14.23*** [2.65, 68.80]	140	58.7	>1	379.13** [4.141, 3470.88]	120	31.4	>1	54.60*** [9.676, 308.06]
Transition plan goal of attending 2- or 4-year college (all covars <.25)	270	50.7	>1	18.59*** [4.33, 79.82]	240	52.4	>1	90.36*** [17.02, 479.57]	220	29.1	>1	17.15*** [4.39, 66.94]
Transition plan goal of attending CTE school (all covars <.25)	280	46.2	32.2	1.81 [0.69, 4.71]	260	13.9	35.7	0.29* [0.10, 0.85]	230	42.0	22.7	2.46 [0.77, 7.84]

Note. PATT = population average treatment effect on the treated; OR = odds ratio; CI = confidence interval; CTE = career and technical education.
Source: U.S. Department of Education, National Center for Special Education Research, National Longitudinal Transition Study–2 (NLTS2), "Parent/Youth Interview, 2001 and 2003" and "School Program Survey, 2002 and 2004."
[a]Treatment group percentage, using survey weights. [b]Percentage positive for a control group that would yield the propensity-adjusted OR if it matched the treatment group on all covariate means; calculated 100 * Pt/(OR [1 − Pt] + Pt), where Pt is the survey-weighted percentage of the treatment 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; Cox (1970).
*$p < .05$. **$p < .01$. ***$p < .001$.

inherent in the NLTS2 data. The timing of the NLTS2 data collection, 2001–2009, overlaps with the Carl Perkins Career and Technical Education Improvement Act of 2006 (Perkins). The Perkins Act was designed to better prepare secondary students for postsecondary education or careers by robustly promoting the development of academic skills alongside the teaching of technical and career skills (Dortch, 2012), creating expectations of both academic and career-focused goals in transition planning. However, although the academic rigor gap between CTE and other courses in high school is narrowing (Holzer & Baum, 2017), as with any educational changes mandated by law, it takes time before the data will reflect the implications of such changes. The intersection of initiatives such as the Perkins Act with disability-focused supports of IDEIA (2004) may also take time to align and optimize. Therefore, it is difficult to determine whether findings regarding CTE goals in transition planning on deaf student postsecondary attendance patterns from this study would have been different if collected more recently.

In addition to inadequate academic preparation, poor career-development programming and a lack of guidance in high school, more generally, may explain the enrollment outcomes associated with having CTE listed as a postsecondary transition planning goal in this study. A majority of high school students report limited career guidance (Hurley & Thorp, 2002) and knowledge (Pisarik et al., 2017). School counselors are also under-equipped to provide this type of guidance due to an extremely high student caseload (Woods & Domina, 2014) insufficient protected time for career counseling (Finlayson, 2009) and lack of appropriate training needed to supply accurate and updated career information to students (Morgan et al., 2014). When this issue is considered in combination with deaf students being disproportionately skewed in the direction of heading for postsecondary CTE (Newman et al., 2011) where career knowledge is important, this becomes a more complex issue that needs to be addressed.

Limitations

Despite both contributing to the literature on predictors of postsecondary education enrollment among deaf youth and identifying potential directions for future research for students with other disabilities, this study is not without its limitations, particularly as it relates to making inferences about deaf students. These limitations include sample characteristics, data collection procedures, relevancy of the data set, and interpretation of findings.

There are several sample characteristics that were not optimally included in this analysis which may have an impact on study results. First, although the proportion of deaf youth with an additional disability in our sample is comparable to that in other research (Gallaudet Research Institute, 2011), the majority (76%) of them had one or more impaired functional domains (e.g., health, communication, mobility). Statistically accounting only for the total number of impaired functional domains rather than independently accounting for each domain as separate variables assumes an equal impact of each domain on study outcomes. Finally, the literature on the hearing population has consistently shown race and ethnic disparities in postsecondary outcomes, suggesting the phenomenon of academic profiling (Ochoa, 2013), and, although race/ethnicity was included as a variable in the analysis, no inferences can be made from these findings about the roles that expectations and transition planning goals play into race and ethnic groups due to insufficient sample size for subgroup analyses.

As a secondary analysis, this study was limited to the items included in NLTS2. Despite attempts to capture unique communication variables relevant to the deaf population, these variables are parent or school reported and, as a result, may not reflect an accurate representation of communication ability. The "clarity of speech" and "sign language use" variables do not reveal important communication characteristic information that may be more relevant to this study, and they thus may not be the best covariate variables (Cawthon & Garberoglio, 2017). For example, greater clarity of speech does not equate to sophistication of language use or ability to pragmatically communicate with others, skills that are more directly related to the outcome variables in the NLTS2.

While it is necessary to acknowledge that the NLTS2 data set is based on data collected more than 10 to 20 years ago (2001–2009), posing the relevancy of findings from this study into question and the limitations of making future-based inferences, no other data exist on post-school outcomes in relation to predictors such as parent and youth expectations and transition planning goals for deaf individuals at this scale. More importantly, findings from this study have inspired further questions to explore in future research as well as implications for practice and policy, thereby extending their relevance beyond the specific time period of data collection.

Implications for Future Research

As the results of this study stress the importance of high expectations being held by parents and deaf youth themselves, future research needs to further explore factors that contribute to those high expectations and trajectories toward successful enrollment into postsecondary education. Those factors may include the presence of role models for deaf youth (Cawthon et al., 2016), messages that deaf youth receive from their parents and school about their potential to pursue higher education or training, and personal experiences that lead them to believe in their ability to attend postsecondary education (Garberoglio et al., 2014). It would be vital to purposefully include those who had high expectations but did not manage to enroll in higher education. This

type of research could also extend to inquiring into those with CTE listed as a transition planning goal but who did not attend CTE or 2- or 4-year college. Adopting a mixed-methods approach would provide greater insight on factors inhibiting postsecondary education enrollment given that deaf students have barriers that are rather unique compared with other disability types.

Although the above findings suggest that transition planning goals can be effective, they do not indicate what makes these goals work or for whom. In addition, little is known about the high school preparation of deaf students with postsecondary CTE as a transition planning goal. Additional research is needed on whether there is a greater focus on preparing the student for employment after graduation, rather than successfully transitioning to postsecondary CTE. Given the possibility of the lingering stigma of CTE (Boughton, 2019; Jordan et al., 2016; Kidwai, 2011), a deaf student with a postsecondary CTE goal may experience and internalize lower collective expectations held by parents and school personnel regarding the student's ability to pursue postsecondary education. Future studies supporting generalization may suggest issues inherent to the transition planning process and/or with the quality of CTE curriculums at the secondary level, whereas contradictory findings in comparison with students with other disabilities may point to systemic barriers uniquely experienced by deaf youth with postsecondary CTE listed as their transition planning goal.

Implications for Practice

Results from this study stress the importance of deaf youth and their parents holding high expectations that are specific to postsecondary education enrollment. As postsecondary education *enrollment* is a necessary first step in postsecondary retention and degree or credential completion, as well as increasing the odds of employment and even living independently, parent and deaf youth expectations surrounding postsecondary education attendance may signify the importance of having both short-term and long-term aspirations. In other words, short-term expectations or goals help individuals increase the odds of achieving their long-term goals (Bandura, 1989).

Although parent expectations and transition planning goals do play a role in predicting postsecondary education enrollment for deaf youth, findings suggest that deaf youth's expectations of their own future educational pursuits may play a larger role in determining such an outcome than the other predictors in this analysis. This finding is expected, as students starting the transition process are at the age where they have already—or at least have begun to—develop independence. As supported by both social cognitive and expectancy-value theories (Bandura, 1986; Eccles et al., 1983), aspirations and expectations to attend and enroll in a postsecondary institution comes down to personal motivation and the extent of value youth place on pursuing higher education. However, individual agency does not diminish the power of expectations held by parents and school personnel, as those expectations both influence the extent to which they adequately prepare deaf students for postsecondary education and shape the messages that deaf students internalize from early childhood to early adulthood. This positive environment is critical, even from early childhood, to instill self-efficacy and values related to postsecondary education expectations (e.g., Bandura, 1994; Wigfield & Eccles, 2002) and to offset the negative messages deaf individuals also receive from the broader society. Therefore, frequent, deliberate discussions about different types of career choices and relevant postsecondary education options may be a great way for parents to explicitly share their high expectations for their deaf youth to internalize about their educational future. High parental expectations could also be emphasized with the deaf youth's school and teachers. In addition, parents and schools could take it a step further to seek out deaf role models who work in a variety of careers to provide deaf youth some insight on their career journey and any advice they would share with deaf youth contemplating similar careers.

Finally, this study examined transition planning goals as a predictor of postsecondary program enrollment, but even more critical to strengthening postsecondary pathways may be the high school coursework and programming support that aligns with those goals (Holzer & Baum, 2017). Therefore, ensuring that deaf students who are aiming for postsecondary education are enrolled in a curriculum that is both rigorous and emphasizes academic preparation—even with CTE as a postsecondary transition planning goal—is essential (Newman et al., 2017). Raising expectations (Cawthon et al., 2015; Garberoglio et al., 2014), providing rigorous academic preparation (Nagle et al., 2016; Newman et al., 2017), allowing deaf youth to make informed choices by explicitly sharing comprehensive information about various postsecondary education and career options, promoting self-determination (Wehmeyer et al., 2019), and ensuring that students have role models for learning how to navigate the complex hearing postsecondary environment (Cawthon et al., 2016) are all malleable factors that may strengthen the transition experience for deaf youth.

Conclusion

Postsecondary education program enrollment is a crucial first step to completing postsecondary education and training, a valuable factor for employment success in adulthood. Previous evidence on expectations held by deaf youth and their parents and transition planning goals of postsecondary education enrollment have been limited for deaf youth. By adding a study that utilizes propensity score methodology, findings allow for even greater confidence in the value of high postsecondary education expectations to be held by

deaf youth and parents than in previous research that utilized regression models. This study also offers a first nuanced look at the role of transition planning goals for deaf youth, including CTE as a transition plan goal. Given the importance of postsecondary education for all students with disabilities, the differential impact of transition planning goals found in this study poses the question of whether this effect is limited to deaf youth or can be generalized to students with other disabilities.

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Note

1. In this article, we use the term "deaf" in an all-encompassing manner, including individuals who may identify as deaf, hard of hearing, hearing impaired, late deafened, or deafdisabled. Terminology from specific research studies is maintained where known. We also use "deaf" preceding adjacent nouns (e.g., individual, student) to reflect an identity first orientation to language use.

References

Austin, P. C. (2011). An introduction to propensity score methods for reducing the effects of confounding in observational studies. *Multivariate Behavioral Research*, *46*(3), 399–424. https://doi.org/10.1080/00273171.2011.568786

Balcazar, F. E., Taylor-Ritzler, T., Dimpfl, S., Portillo-Peña, N., Guzman, A., Schiff, R., & Murvay, M. (2012). Improving the transition outcomes of low-income minority youth with disabilities. *Exceptionality*, *20*(2), 114–132. https://doi.org/10.1080/09362835.2012.670599

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191–215. https://doi.org/10.1037/0033-295X.84.2.191

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice Hall.

Bandura, A. (1989). Social cognitive theory. In R. Vasta (Ed.), *Annals of child development. Vol. 6. Six theories of child development* (pp. 1–60). JAI Press.

Bandura, A. (1994). Regulative function of perceived self-efficacy. In M. G. Rumsey, C. B. Walker, & J. H. Harris (Eds.), *Personnel selection and classification* (pp. 261–271). Lawrence Erlbaum.

Bandura, A. (2000). Cultivate self-efficacy for personal and organizational effectiveness. In E. A. Locke (Ed.), *Handbook of principles of organization behavior* (pp. 120–136). Blackwell.

Bandura, A. (2006). Guide for constructing self-efficacy scales. In T. Urdan & F. Pajares (Eds.), *Self-efficacy beliefs of adolescents* (*Vol. 5*, pp. 307–337). Information Age.

Boughton, P. (2019). *CTE stigma: A barrier to advancing access*. Association for Career & Technical Education. https://www.acteonline.org/cte-stigma-a-barrier-to-advancing-access/

Caliendo, M., & Kopeing, S. (2008). Some practical guidance for the implementation of propensity score matching. *Journal of Economic Surveys*, *22*(1), 31–72. https://doi.org/10.1111/j.1467-6419.2007.00527.x

Cameto, R., Wagner, M., Newman, L., Blackorby, J., & Javitz, H. (2000). *National Longitudinal Transition Study–2 (NLTS2): Sampling plan*. SRI International.

Cawthon, S., & Garberoglio, C. L. (Eds.). (2017). *Research in deaf education: Contexts, challenges, and considerations*. Oxford University Press.

Cawthon, S., Garberoglio, C. L., Caemmerer, J., Bond, M., & Wendel, E. (2015). Effects of parent expectations and parent involvement on postschool outcomes for individuals who are deaf or hard of hearing. *Exceptionality*, *23*(2), 73–99. https://doi.org/10.1080/09362835.2013.865537

Cawthon, S. W., Johnson, P. M., Garberoglio, C. L., & Schoffstall, S. J. (2016). Role models as facilitators of social capital for deaf individuals: A research synthesis. *American Annals of the Deaf*, *161*(2), 115–127. https://doi.org/10.1353/aad.2016.0021

Chiang, H. M., Cheung, Y. K., Hickson, L., Xiang, R., & Tsai, L. Y. (2012). Predictive factors of participation in postsecondary education for high school leavers with autism. *Journal of Autism and Developmental Disorders*, *42*(5), 685–696. https://doi.org/10.1007/s10803-011-1297-7

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

Crosnoe, R., Mistry, R. S., & Elder, G. H., Jr. (2002). Economic disadvantage, family dynamics, and adolescent enrollment in higher education. *Journal of Marriage and Family*, *64*(3), 690–702. https://doi.org/10.1111/j.1741-3737.2002.00690.x

Doren, B., Gau, J. M., & Lindstrom, L. E. (2012). The relationship between parent expectations and postschool outcomes of adolescents with disabilities. *Exceptional Children*, *79*(1), 7–23. https://doi.org/10.1177/001440291207900101

Dortch, C. (2012). *Carl D. Perkins Career and Technical Education Act of 2006: Background and performance*. Congressional Research Service. https://sgp.fas.org/crs/misc/R42863.pdf

Eccles, J., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J., & Midgley, C. (1983). Expectancies, values and academic behaviors. In J. T. Spence (Ed.), *Achievement and achievement motives*. W.H. Freeman.

Finlayson, K. J. (2009). *Perceptions of career technical education by middle school and high school counselors and the effect of these perceptions on student choice of career and education planning*. Union University.

Foster, S., & Kinuthia, W. (2003). Deaf persons of Asian American, Hispanic American, and African American backgrounds: A study of intraindividual diversity and identity. *Journal of Deaf Studies and Deaf Education*, *8*(3), 271–290. https://doi.org/10.1093/deafed/eng015

Gallaudet Research Institute. (2011, April). *Regional and national summary report of data from the 2009-10 annual survey of deaf and hard of hearing children and youth*. Gallaudet Research Institute, Gallaudet University.

Garberoglio, C. L., Palmer, J. L., & Cawthon, S. (2019). *Undergraduate enrollment of deaf students in the United States*. National Deaf Center on Postsecondary Outcomes, Office of Special Education Programs, U.S. Department of Education. https://www.nationaldeafcenter.org/sites/default/files/Undergraduate%20Enrollment%20%20of%20Deaf%20Students%20in%20the%20United%20States.pdf

Garberoglio, C. L., Palmer, J. L., Cawthon, S., & Sales, A. (2019a). *Deaf people and educational attainment in the United States: 2019*. National Deaf Center on Postsecondary Outcomes, Office of Special Education Programs, U.S. Department of Education. https://www.nationaldeafcenter.org/sites/default/files/Deaf%20People%20and%20Educational%20Attainment%20in%20the%20United%20States_%202019.pdf

Garberoglio, C. L., Palmer, J. L., Cawthon, S., & Sales, A. (2019b). *Deaf people and employment in the United States: 2019*. National Deaf Center on Postsecondary Outcomes, Office of Special Education Programs, U.S. Department of Education. https://www.nationaldeafcenter.org/sites/default/files/Deaf%20People%20and%20Employment%20in%20the%20United%20States_%202019%20(7.26.19)(ENGLISH)(WEB).pdf

Garberoglio, C. L., Schoffstall, S., Cawthon, S., Bond, M., & Ge, J. (2014). The role of self-beliefs in predicting postschool outcomes for deaf young adults. *Journal of Developmental and Physical Disabilities*, *26*(6), 667–688. https://doi.org/10.1007/s10882-014-9388-y

Glick, J. E., & White, M. J. (2004). Post-secondary school participation of immigrant and native youth: The role of familial resources and educational expectations. *Social Science Research*, *33*(2), 272–299. https://doi.org/10.1016/j.ssresearch.2003.06.001

Holzer, H. J., & Baum, S. (2017). *Making college work: Pathways to success for disadvantaged students*. Brookings Institution Press.

Hurley, D., & Thorp, J. (2002). *Decisions without direction: Career guidance and decision-making among American youth*. National Association of Manufacturers. https://files.eric.ed.gov/fulltext/ED465895.pdf

Individuals with Disabilities Education Improvement Act of 2004, 20 U.S.C. § 1400 *et seq*. (2004). http://www.p12.nysed.gov/specialed/idea/108-446.pdf

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.

Jordan, J., Dechert, K., Seymour, D., & Hierholzer, A. (2016). *Confronting the CTE stigma: Perceptions of CTE among Mississippi public and educators*. Mississippi State University Research & Curriculum Unit. https://www.rcu.msstate.edu/Portals/0/Reports/CTE%20Perceptions%20Brief.pdf

Kidwai, S. (2011). Changing the image of CTE. *Techniques: Connecting Education and Careers (J1)*, *86*(4), 16–19. https://files.eric.ed.gov/fulltext/EJ926082.pdf

Kim, D. H., & Schneider, B. (2005). Social capital in action: Alignment of parental support in adolescents' transition to postsecondary education. *Social Forces*, *84*(2), 1181–1206. https://doi.org/10.1353/sof.2006.0012

Lin, D., Psaty, B., & Kronmal, R. (1988). Assessing the sensitivity of regression results to unmeasured confounders in observational studies. *Biometrics*, *54*, 948–963. https://doi.org/10.2307/2533848

Masino, L. L., & Hodapp, R. M. (1996). Parental educational expectations for adolescents with disabilities. *Exceptional Children*, *62*(6), 515–523. https://doi.org/10.1177/001440299606200603

Mello, Z. R. (2008). Gender variation in developmental trajectories of educational and occupational expectations and attainment from adolescence to adulthood. *Developmental Psychology*, *44*(4), 1069–1080. https://doi.org/10.1037/0012-1649.44.4.1069

Morgan, L. W., Greenwaldt, M. E., & Gosselin, K. P. (2014). School counselors' perceptions of competency in career counseling. *Professional Counselor*, *4*(5), 481–496. https://doi.org/10.15241/lwm.4.5.481

Nagle, K., Newman, L. A., Shaver, D. M., & Marschark, M. (2016). College and career readiness: Course taking of deaf and hard of hearing secondary school students. *American Annals of the Deaf*, *160*(5), 467–482. https://doi.org/10.1353/aad.2016.0000

National Deaf Center on Postsecondary Outcomes. (2018). *Root causes of gaps in postsecondary outcomes for deaf individuals*. https://www.nationaldeafcenter.org/sites/default/files/Root%20Causes%20of%20Gaps%20in%20Postsecondary%20Outcomes%20of%20Deaf%20Individuals.pdf

National Deaf Center on Postsecondary Outcomes. (2019). *Transition planning tip sheet*. https://www.nationaldeafcenter.org/sites/default/files/asset/document/Transition%20Planning.pdf

Newman, L. A., Madaus, J. W., Lalor, A. R., & Javitz, H. S. (2021). Effect of accessing supports on higher education persistence of students with disabilities. *Journal of Diversity in Higher Education*, *14*(3), 353–363. https://doi.org/10.1037/dhe0000170

Newman, L. A., Marschark, M., Shaver, D. M., & Javitz, H. (2017). Course-taking effect on postsecondary enrollment of deaf and hard of hearing students. *Exceptionality*, *25*(3), 170–185. https://doi.org/10.1080/09362835.2016.1196445

Newman, L. A., Wagner, M., Knokey, A. M., 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 the National Longitudinal Transition Study–2 (NLTS2)* [NCSER 2011-3005]. SRI International.

Ochoa, G. L. (2013). *Academic profiling: Latinos, Asian Americans, and the achievement gap*. University of Minnesota Press.

Palmer, J. L., Newman, L., Davidson, S., & Cawthon, S. W. (2020). Life after college: Employment and social-community outcomes for young deaf adults. *American Annals of the Deaf*, *165*(4), 401–417. https://doi.org/10.1353/aad.2020.0027

Parsons, J. E., Adler, T. F., & Kaczala, C. M. (1982). Socialization of achievement attitudes and beliefs: Parental

influences. *Child Development*, *53*(2), 310–321. https://doi.org/10.2307/1128973

Pisarik, C. T., Rowell, P. C., & Thompson, L. K. (2017). A phenomenological study of career anxiety among college students. *The Career Development Quarterly*, *65*(4), 339–352. https://doi.org/10.1002/cdq.12112

Rawlings, B. W. (1994). Postsecondary education: Its impact and outcomes. In T. E. Allen, K. H. Lam, B. W. Rawlings, D. E. Rose, & A. N. Schildroth (Eds.), *Young deaf adults and the transition from high school to postsecondary careers* (Gallaudet Research Institute Occasional Paper No. 94-1, pp. 17–31). Gallaudet Research Institute.

Rosenbaum, P., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika*, *70*(1), 41–55. https://doi.org/10.1093/biomet/70.1.41

Rosenbaum, P., & Rubin, D. B. (1985). Constructing a control group using multivariate matched sampling methods that incorporate the propensity score. *American Statistician*, *39*(1), 33–38. https://doi.org/10.2307/2683903

Royston, P., Carlin, J. B., & White, I. R. (2009). Multiple imputation of missing values: New features for mim. *Stata Journal*, *9*(2), 252–264. https://doi.org/10.1177/1536867X0900900205

Spencer, P. E., & Marschark, M. (2010). *Evidence-based practice in educating deaf and hard-of-hearing students*. Oxford University Press.

Valdes, K., Godard, P., Williamson, C., Van Campen, J., McCracken, M., & Jones, R. (2013). *National Longitudinal Transition Study–2 (NLTS2). Waves 1, 2, 3, 4 & 5 data documentation and dictionary*. SRI International.

Wagner, M., Blackorby, J., Cameto, R., & Newman, L. (1993). *What makes a difference? Influences on postschool outcomes of youth with disabilities. The third comprehensive report from the National Longitudinal Transition Study of Special Education Students*. SRI International.

Wagner, M., Blackorby, J., Marder, C., & Levine, P. (2003). The functional abilities of youth. In M. Wagner, C. Marder, P. Levine, R. Cameto, T. W. Cadwallader, & J. Blackorby (Eds.), *The individual and household characteristics of youth with disabilities: A report from the National Longitudinal Transition Study–2 (NLTS2)*. SRI International.

Wagner, M., & Marder, C. (2003). Introduction. In M. Wagner, C. Marder, P. Levine, R. Cameto, T. W. Cadwallader, & J. Blackorby (Eds.), *The individual and household characteristics of youth with disabilities: A report from the National Longitudinal Transition Study–2 (NLTS2)*. SRI International.

Wagner, M., Newman, L., Cameto, R., Garza, N., & Levine, P. (2005). *After high school: A first look at the postschool experiences of youth with disabilities. A report from the National Longitudinal Transition Study–2 (NLTS2)*. 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 (NLTS2)* [NCSER 2007-3006]. National Center for Special Education Research.

Walter, G. G., & Dirmyer, R. (2013). The effect of education on the occupational status of deaf and hard of hearing 26- to 64-year-olds. *American Annals of the Deaf*, *158*(1), 41–49. https://doi.org/10.1353/aad.2013.0014

Wehmeyer, M. L., Nota, L., Soresi, S., Shogren, K. A., Morningstar, M. E., Ferrari, L., Sgaramella, T. M., & DiMaggio, I. (2019). A crisis in career development: Life designing and implications for transition. *Career Development and Transition for Exceptional Individuals*, *42*(3), 179–187. https://doi.org/10.1177/2165143417750092

Wei, X., Wagner, M., Hudson, L., Yu, J. W., & Javitz, H. (2016). The effect of transition planning participation and goal-setting on college enrollment among youth with autism spectrum disorders. *Remedial and Special Education*, *37*(1), 3–14. https://doi.org/10.1177/0741932515581495

What Works Clearinghouse. (2020). *What works clearinghouse procedures and standards handbook* (Version 4.1). U.S. Department of Education. https://ies.ed.gov/ncee/wwc/Docs/referenceresources/WWC-Standards-Handbook-v4-1-508.pdf

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. https://doi.org/10.1002/sim.4067

Wigfield, A., & Eccles, J. S. (2002). The development of competence beliefs, expectancies for success, and achievement values from childhood through adolescence. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 91–120). Academic Press. https://doi.org/10.1016/B978-012750053-9/50006-1

Wood, D., Kurtz-Costes, B., & Copping, K. E. (2011). Gender differences in motivational pathways to college for middle class African American youths. *Developmental Psychology*, *47*(4), 961–968. https://doi.org/10.1037/a0023745

Woods, C. S., & Domina, T. (2014). The school counselor caseload and the high school-to-college pipeline. *Teachers College Record*, *116*(10), 1–30. https://www.tcrecord.org