

## Predictors of Self-Determination in Postsecondary Education for Students with Intellectual and Developmental Disabilities

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*Abstract: Given the increasing enrollment of students with intellectual and developmental disabilities in postsecondary education and the potential impact of self-determination on postsecondary outcomes, this study analyzed data on the self-determination status of students with intellectual and developmental disabilities completing their first year of a postsecondary education program. Secondary school (e.g., inclusion in high school and participation in state assessments) and postsecondary education experiences (e.g., advocacy for accommodations, participation in social activities, and living arrangements) that predicted self-determination status were examined. Directions for future research and practice are discussed.*

Researchers have consistently identified self-determination as a key factor to success in postsecondary education for students with disabilities (Field, Sarver, & Shaw, 2003; Shogren & Shaw, 2016; Test et al., 2009; Thoma & Getzel, 2005). In a systematic review of the literature on evidence-based predictors of postschool outcomes, Test et al. (2009) identified self-determination and self-advocacy interventions in secondary school as predictor of more positive postsecondary education outcomes for students with disabilities. Shogren and Shaw (2016), analyzing data from the National Longitudinal Transition Study-2, found that students' level of autonomy, an essential characteristic of self-determination, predicted access and progress in postsecondary education for students with high incidence disabilities. Thoma and Getzel (2005), in interviews with students with disabilities in college, found that students identified skills associated with self-determination, including problem-solving, self-realization, goal-

setting, and self-management, as critical to their success.

Much of the aforementioned research has focused on students with disabilities generally or students with high incidence disabilities specifically. More limited research has focused on students with intellectual and developmental disabilities, which is perhaps because this group of students has had one of the lowest rates of attendance at a 2- or 4-year college (Grigal, Hart, & Migliore, 2011). However, there has been increased focus on creating postsecondary education options for students with intellectual and developmental disabilities in recent years (Hart, Grigal, & Weir, 2010). For example, grant funding allocated through the Office of Postsecondary Education expanded postsecondary programs for people with intellectual disability via the establishment of model demonstration projects called Transition and Postsecondary Programs for Students with Intellectual Disabilities (TPSID) at colleges and universities throughout the US. The institutions of higher education that hosted TPSID projects provided a focus on academic enrichment, socialization, independent living skills, including self-advocacy skills; and integrated work experiences

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and career skills leading to gainful employment.

Current guidance regarding inclusive higher education emphasizes self-determination as an important issue for enrolled students (Grigal, Hart, & Weir, 2012a) and promotes student involvement in and control over the establishment of personal goals related to college course selection, employment and social experiences, and the level and form of family involvement. A recent report to the Secretary of Education also reflected the critical nature of self-advocacy in postsecondary education and the importance of creating accessible grievance procedures for students with intellectual disability (National Coordinating Center Accreditation Workgroup, 2016). To date, TPSID model demonstration projects have supported implementation or expansion of programs on over 52 college or university campuses in 23 states, impacting 2,245 students with intellectual and developmental disabilities (Grigal, Hart, Smith, Domin, & Weir, 2016).

Colleges and universities implementing TPSID projects were charged with integrating person-centered planning in the development of the course of study for each student with an intellectual disability participating in the model program. This refers to form of planning that focuses on the individual and his/her interests, strengths, and needs and is purposefully manifested in these programs via the use of various planning formats (e.g., Whole Life Planning, MAPS, Essential Lifestyles Planning, COACH) to determine the students' course of study in conjunction with other types of academic advising. Over 90% of the institutions of higher education that hosted TPSID programs implemented some form of person-centered planning with enrolled students with intellectual and developmental disabilities (Grigal et al., 2016).

While some emerging research reflects student involvement in self-determined planning activities in college (Grigal et al., 2016), hardly any research has examined the self-determination status of students with intellectual and developmental disabilities in postsecondary education, or the secondary-school and postsecondary program characteristics that impact self-determination status for students with intellectual and developmental disabilities in

postsecondary education. Such information could be used to inform supports provided (a) to prepare secondary students for the transition to postsecondary education, and (b) to promote self-determination in postsecondary programs. The purpose of this study was to identify the self-determination status of students with intellectual and developmental disabilities completing their first year of a postsecondary education program and examine the personal, secondary school, and postsecondary program factors that impacted self-determination. Specifically, the following three research questions were addressed.

1. What is the self-determination status of students with intellectual and developmental disability in the first year of postsecondary education programs, and do personal characteristics (i.e., age, gender, race/ethnicity) influence self-determination status?
2. What is the impact of secondary school experiences (i.e., degree of inclusion in secondary school; employment experiences; participation in statewide assessments) on the self-determination status of students with intellectual and developmental disability in their first year of postsecondary education programs?
3. What is the impact of postsecondary education program characteristics (i.e., access to academic accommodations, participation in social activities, living arrangement – with family or in residence hall) on the self-determination status of students with intellectual and developmental disability in the first year of postsecondary education programs?

## Method

### *Sample*

The sample was comprised of a subset of a larger dataset of students with intellectual and developmental disabilities enrolled in colleges and universities hosting TPSIDs. These data included demographic as well as secondary and postsecondary program experience data, compiled by the National Coordinating Center (NCC) for TPSID programs as part of evaluation activities between 2010–2015. The subset sample included 251 students with

**TABLE 1**

**Demographic Characteristics of First Year TPSID Participants by Program Year**

	<i>Program Year</i>				<i>Total</i>
	<i>2011–2012</i>	<i>2012–2013</i>	<i>2013–2014</i>	<i>2014–2015</i>	
First year participants	30	95	60	66	251
Average age	20.53	20.57	20.53	20.62	20.57
Age range	18–28	17–37	18–34	18–42	17–42
Gender					
Male	20	68	40	42	170
Female	10	27	20	24	81
Race and ethnicity					
Caucasian	24	72	39	42	177
African american	2	15	3	11	31
Asian	0	2	6	2	10
American indian or alaska native	0	1	0	0	1
Native hawaiian or other pacific islander	0	0	2	0	2
Hispanic/latino	3	4	7	10	24
Multiracial	1	1	2	0	4
Missing	0	0	1	1	2

intellectual and developmental disabilities who had also provided information on a self-report measure of self-determination in the first year of their postsecondary program. Students entered the program between 2011 and 2014. On average, when entering the program, these participants were 20.6 years old ( $\sigma = 2.9$ ), with an age range of 17 to 42 years old. Two thirds of the participants were male ( $n = 170$ ; 67%), and 70% ( $n = 177$ ) reported their race/ethnicity as White. The second largest race/ethnicity group was African American (12%), followed by Hispanic/Latino (10%). Table 1 provides further demographic information about the sample, organized by the year in which students entered the program.

*Data Collection and Measures*

Upon entry into the postsecondary education program, program staff collected information about each student’s personal characteristics (e.g., age, gender, race/ethnicity) and prior education and employment history and entered it into the NCC for TPSID programs database. Each year, additional data on program characteristics and experiences (e.g., types of assistance and accommodations re-

ceived, funding sources for tuition, fees, and living expenses, and participation in courses, employment, and social activities) were collected, as were self-report data on student self-determination. Collecting and entering the self-determination data were optional for TPSID programs, while other data were required. Thus explaining why only a subset of students included in programs that chose to collect and enter self-determination data were included in the sample. For more comprehensive summary of the TPSID evaluation, visit <http://www.thinkcollege.net/publications/annual-reports>. In the following sections, we describe the variables selected for our analyses.

*Secondary school experiences.* Based on existing literature on secondary school experiences, self-determination, and postschool outcomes (Shogren, Garnier Villarreal, Lang, & Seo, in press; Test et al., 2009) and available data from the NCC Data Network, we selected three variables for analysis. We examined (1) the level of inclusion in secondary school experienced by students with intellectual and developmental disabilities (included for all or some part of the day versus not included at all); (2) the degree to which students were included in state assessments (regular assessment with or without accommodations, alter-

nate assessment, or waived assessment); and (3) paid employment experiences prior to attending the postsecondary program (yes versus no). Observations in which information about inclusion and participation in statewide assessments were unknown were purposefully removed from the sample.

*Postsecondary education experiences.* We examined three variables reflecting experiences during students' first year of the postsecondary program: (1) access to accommodations (received specialized accommodations provided by the program, received accommodations provided by the university disability services office, or received accommodations from both); (2) the number of social activities that each student participated in; and (3) each student's living arrangement (with family, in university housing either provided by the university or the postsecondary program for people with intellectual and developmental disabilities, or other).

*Self-Determination.* The *Arc's Self-Determination Scale – Postsecondary Version* (SDS-PV; Wehmeyer, Little, Lopez, & Shogren, 2014) was used to assess the self-determination of students in the postsecondary programs. The SDS-PV is a modified version of the short form of *The Arc's Self-Determination Scale* (Wehmeyer & Kelchner, 1995), originally developed for adults with intellectual disability. The SDS-PV items were modified to be appropriate in the post-secondary context. The SDS-PV includes 28 items and subscale scores that can be calculated for the four essential characteristics of self-determination (autonomy, self-regulation, psychological empowerment, and self-realization) and an overall self-determination score. Questions on the autonomy section include: "I plan my weekend activities that I like to do and I go to restaurants that I like," with response options ranging from 0 to 3 or "I do not even if I have the chance" to "I do every time I have the chance." The self-regulation section presents means-ends problem solving questions, where students are required to generate responses which are scored on a 0 to 2 scale, and questions about students' plans for the future and possible action steps, which are scored on a 0 to 3 scale. For the psychological empowerment subscale, respondents select one of two responses that is most like them (e.g., "I don't know how to make friends" or "I

know how to make friends"). For the self-realization subscale, respondents respond "yes" or "no" to questions (e.g., "I am confident in my abilities").

#### *Analytic Procedures*

*Missing data.* The sample size was reduced from 576 in the NCC dataset to 251 as this was the subsample that provided data on self-determination. Of the 251 remaining, data were examined for item-level missingness. The number of cases missing for a given item ranged from 0 to 77 with only 26% (10 of 41) of items in the dataset actually missing information. To address the item-level missing, following recommendations by Enders (2010), we included predictors of missingness in imputation models, which included the degree of inclusion in general education and the number of social activities. Because many of the variables in the dataset were categorical, multiple imputation with chained equations (MICE) was selected as the imputation method because it does not make any assumptions about multivariate normality of the dataset. As such, the 'mice' package (van Buuren & Groothuis-Oudshoorn, 2011) in R (R Core Team, 2015) was used to generate 100 imputed datasets.

*Structural equation modeling.* Following imputation, categorical predictors (e.g., race/ethnicity, previous employment experience or no previous employment experience) were recoded as dummy variables, and the imputed datasets were exported for use with Mplus 7.31 (Muthén & Muthén, 1998–2012). In order to account for non-independence of observations due to students being clustered within various postsecondary education programs, a site identifier was used as a clustering variable with analysis type complex and the robust diagonal weighted least squares (WLSMV) estimator. All models were identified with fixed factor scaling, resulting in the latent variables having a mean of 0 and variance of 1.

The first step was to specify a latent variable model for self-determination. We chose to complete the analyses at the subscale level (autonomy, self-regulation, psychological empowerment, and self-realization) as well as overall self-determination level. The first model contained four latent variables, one for each subscale representing the essential char-

acteristics of self-determination (autonomy, self-regulation, psychological empowerment, and self-realization) on the SDS-PV. The second model contained a single-factor representing the overall SDS-PV score. These models were then examined for model fit based on root mean error square of approximation (RMSEA), the comparative fit index (CFI), and the weighted root mean square residual (WRMR). Indicators that had a standardized factor loading of .40 or lower were dropped, a common cut-off for size of standardized factor loadings in applied confirmatory factor analysis research (Brown, 2006).

The second step involved adding personal characteristics (i.e., age, gender, race/ethnicity) to the models as covariates, to address Research Question 1. An  $\alpha = .05$  was set a priori for the parameter estimates in order to determine which predictors in the model were statistically significant predictors of subscale and overall self-determination scores. To address Research Question 2, we retained the covariates in the model and added secondary school experience variables as predictors. To address Research Question 3, the postsecondary school experiences were added to the model and although the personal covariates were retained in the model, the secondary school experiences were dropped because 10% of the imputed models failed to converge when all predictors were retained. As recommended by Kline (2011), the models used to address Research Questions 2 and 3 were evaluated using absolute and comparative fit indices along with standardized residual output.

## Results

### *Descriptive Statistics*

Student secondary and postsecondary experiences are summarized in Table 2, by program year entry. Over 70% of the sample was included in general education for some portion of the school day during secondary school, approximately half of participants participated in regular state assessments with or without accommodations, and 36% of the sample had a paid job experience prior to entering the postsecondary program.

Once in postsecondary education, more

than half (55%) of the sample primarily received accommodations from the program, only 6% received accommodations from the disability services office at the college or university, and only 8% received accommodations from both. In terms of living arrangement, 55% reported living with family and 37% reported living in university or postsecondary program-specific housing. The number of social activities students participated in was 2.86 ( $SD = 1.14$ ) with a range from 0 to 5. These activities included going out with friends, attending organized events or sport events, participating with a student or community organization, such as the Greek system or Best Buddies.

Means and standard deviations for SDS-PV subscale and SDS-PV overall scores are provided in Table 3. These descriptive statistics were computed after imputation, consequently, the numbers are averaged across 100 data sets. For first year TPSID students who entered their program between 2011–2014, the average autonomy score was 12.20 ( $SD = 4.29$ ). Self-regulation averaged 7.02 ( $SD = 2.83$ ), psychological empowerment averaged 6.20 ( $SD = 1.02$ ), and self-realization averaged 6.31 ( $SD = 1.07$ ). The mean overall self-determination score was 31.72 ( $SD = 6.02$ ).

### *Research Question 1: Self-Determination Status and Personal Characteristics*

Model fit statistics for the self-determination subscale (autonomy, self-regulation, psychological empowerment, and self-realization) models and the overall self-determination model are provided in Table 4. The root mean square error of approximation (RMSEA) values were very good in all models while comparative fit index (CFI) and the non-normed fit index (NNFI) ranged from poor to acceptable, an expected result because both CFI and NNFI are influenced by the degree of correlation amongst all variables in the model (Taylor, 2008). Model fit for the four-factor subscale model was better than the single-factor SDS-PV model at every step of the analysis, but both were retained in order to understand how the predictors related to both the subscales and the total scale. Overall, however, the model fit indices suggest that the SDS-PV can be meaningfully used to assess self-deter-

**TABLE 2**

**Number of Participants, across Program Entry Years, for Each Secondary and Postsecondary Variable**

	<i>Program Year</i>				<i>Total</i>
	<i>2011–2012</i>	<i>2012–2013</i>	<i>2013–2014</i>	<i>2014–2015</i>	
<i>Secondary school experiences</i>					
Level of inclusion					
Included for some portion of the day in general education	14	73	48	39	174
Not included in general education	16	22	12	27	77
Participation in state assessment					
Regular with or without accommodations	11	47	38	27	123
Alternate	19	38	11	25	93
Waived	0	7	10	7	24
Missing	0	3	1	7	11
Employed at or above minimum wage prior to TPSID					
Yes	10	33	24	24	91
No	15	62	36	42	155
Missing	5	0	0	0	5
<i>TPSID experiences</i>					
Academic accommodations					
DSO	1	0	13	1	15
IDD program specific	16	45	29	48	138
Both	6	10	1	4	21
Missing	7	40	17	13	77
Average of social activity participation					
Range	3.50	2.58	2.88	2.88	2.84
	1–5	0–5	0–5	0–5	0–5
Where does the student live?					
With family	25	53	24	36	138
In residence provided by IHE/IDD program	0	36	34	23	93
Other	5	6	2	7	20

mination status and its predictors in this population. Further, these findings suggest that as

predictors were added to the models, model fit improved.

**TABLE 3**

**Mean and Standard Deviation (SD) of SDS Subscales and SDS Overall Scores**

	<i>2011–2012</i>		<i>2012–2013</i>		<i>2013–2014</i>		<i>2014–2015</i>		<i>Overall</i>	
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
<i>Subscales</i>										
Autonomy	13.37	4.36	12.79	3.63	11.32	4.72	11.62	4.46	12.20	4.29
Self-regulation	6.50	2.64	6.71	2.81	7.78	2.80	7.01	2.81	7.02	2.83
Psychological empowerment	6.32	1.17	6.25	0.92	6.22	1.11	6.03	0.98	6.20	1.02
Self-realization	6.53	0.88	6.26	1.05	6.33	1.12	6.24	1.10	6.31	1.07
SDS overall	32.72	5.59	32.01	5.27	31.65	6.52	31.09	6.62	31.72	6.02

*Note:* These numbers are based on the average from 100 imputed data sets.

**TABLE 4**

**Average Model Fit over 100 Imputations for the Subscale and Overall SDS-PV Models**

	$\chi^2$		RMSEA		CFI		WRMR	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Confirmatory factor models								
SDS subscales	325.83	2.21	0.029	0.001	0.87	0.004	1.13	0.011
SDS overall	172.81	1.53	0.051	0.001	0.84	0.003	1.31	0.009
Covariates – age, gender, race/ethnicity								
SDS subscales	490.48	10.86	0.022	0.002	0.90	0.011	1.02	0.041
SDS overall	301.80	19.12	0.037	0.004	0.81	0.019	1.23	0.081
Pre-TPSID experiences and covariates								
SDS subscales	598.47	24.20	0.024	0.004	0.94	0.048	1.10	0.086
SDS overall	356.91	5.038	0.032	0.001	0.89	0.084	1.19	0.023
TPSID experiences and covariates								
SDS subscales	637.80	54.81	0.026	0.006	0.93	0.050	1.16	0.168
SDS overall	397.84	44.09	0.036	0.007	0.84	0.067	1.32	0.181

*Impact of personal characteristics.* Next, the impact of age, gender, and race/ethnicity were examined, with males serving as the gender reference group and Caucasian participants serving as the reference group for race/ethnicity. The only statistically significant finding for autonomy, self-regulation, psychological empowerment, and self-realization or overall self-determination was that participants who identified as Hispanic/Latino scored half a standard deviation lower ( $\beta = -0.52$ , S.E. = 0.22) on the self-regulation domain than participants who identified as Caucasian ( $t = -2.38$ ,  $p < .05$ ).

*Research Question 2: Secondary School Experiences*

Inclusion in general education curriculum, employment prior to postsecondary education, and participation in school-wide state assessments were added to the model as predictors to examine the impact of these variables on the subscales (autonomy, self-regulation, psychological empowerment, and self-realization) and overall self-determination. Students who were not included in the general education curriculum and students who had no prior employment experiences were the reference groups. Participation in school-wide state assessments resulted in the largest identified differences in self-determination. Participants

who took alternate assessments scored higher on autonomy,  $\beta = 0.34$ , S.E. = 0.15;  $t = 2.21$ ,  $p < .05$ , but lower on self-regulation,  $\beta = -0.57$ , S.E. = 0.22;  $t = -2.58$ ,  $p < .05$ , when compared to students who took part in regular state assessments with or without accommodations. Similarly, participants for whom state assessments were waived also scored 0.45 standard deviations higher (S.E. = 0.21;  $t = 2.21$ ,  $p < .05$ ) on autonomy and 0.821 standard deviations lower (S.E. = 0.14;  $t = -6.30$ ,  $p < .001$ ) on self-regulation. When secondary school experiences were added to the model, additional findings related to race/ethnicity and gender emerged with participants who identified as Multi-Racial having significantly lower scores on self-regulation ( $\beta = -1.09$ , S.E. = 0.37;  $t = -2.95$ ,  $p < .01$ ) when compared to Caucasian participants. Females scored significantly higher than males on overall self-determination, by almost a third of a standard deviation ( $\beta = 0.34$ , S.E. = 0.15;  $t = 2.20$ ,  $p < .05$ ).

*Research Question 3: Experiences in Postsecondary Education*

Students who received academic accommodations from the TPSID program were compared to students who received accommodations from the university or college disability services offices or accommodations from both.

**TABLE 5**

**Regression Results for Statistically Significant Predictors and Covariates**

	$\beta$	SE	<i>t</i>
Covariate model			
Self-regulation			
Hispanic	-0.52	0.22	-2.38*
Secondary school experiences and covariates			
Autonomy			
Alternate assessment	0.34	0.15	2.21*
Waived assessment	0.45	0.21	2.21*
Self-regulation			
multi-racial	-1.09	0.37	-2.95**
Alternate assessment	-0.57	0.22	-2.58*
Waived assessment	-0.82	0.14	-6.03***
Overall self-determination			
Female	0.34	0.15	2.20*
Postsecondary experiences and covariates			
Autonomy			
African american	0.38	0.17	2.17*
Multi-racial	-0.47	0.23	-2.03*
Count of social activities	0.23	0.07	3.58***
Self-regulation			
Hispanic	-0.49	0.22	-2.24*
Multi-racial	-0.86	0.44	-1.97*
Self-realization			
Count of social activities	0.32	0.15	2.11*
Overall self-determination			
Count of social activities	0.24	0.09	2.70**

Note. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

Students living at home were compared to students living in housing provided by the program or university and to students in some other living arrangement. No significant differences were found for autonomy, self-regulation, psychological empowerment, and self-realization or overall self-determination. Differences were found, however, based on the number of social activities students participated in. One additional social activity added 0.234 standard deviations (S.E. = 0.07;  $t = 3.58, p < .001$ ) to scores on autonomy, 0.316 standard deviations (S.E. = 0.15;  $t = 2.11, p < .05$ ) to scores on self-realization, and 0.241 standard deviations (S.E. = 0.09;  $t = 2.70, p < .05$ ) to overall self-determination. Similar to previous results, when examining findings related to race/ethnicity, gender, and age in the models that included postsecondary education predictors, significant differences were found based on racial/ethnic group. Partici-

pations who identified as Hispanic/Latino scored 0.49 standard deviations lower on self-regulation (S.E. = 0.22;  $t = -2.24, p < .05$ ) than Caucasian participants, and participants who identified as Multi-Racial scored close to one standard deviation lower than Caucasian participants ( $\beta = -0.86, S.E. = 0.44; t = -1.97, p < .05$ ). All significant predictors, across models are provided in Table 5.

**Discussion**

Students with intellectual and developmental disabilities are accessing postsecondary education in greater numbers than ever before. Given that self-determination is a key factor, and in some cases, a predictor of success in postsecondary education for students with disabilities (Field et al., 2003; Shogren & Shaw, 2016; Test et al., 2009; Thoma & Getzel, 2005) research is needed to assess the self-determi-

nation skills of youth and young adults with intellectual and developmental disabilities accessing postsecondary education. The current study offers an initial assessment of self-determination in first-year college students with intellectual and developmental disabilities, and identifies potential student characteristics, as well as secondary and postsecondary experiences that predicted this status. In the following sections, we discuss the findings as well as implications for future practice and research and the limitations of the study.

This study is one of the first attempts to capture the self-determination of people with intellectual and developmental disabilities who are attending college. This emerging educational context provides a unique background for the assessment of predictors of self-determination skills. While college options for individuals with intellectual and developmental disabilities are beginning to grow, the only existing network of programs for which there are student and program data are the model demonstration projects known as TPSIDs hosted at institutions of higher education. The present study used a convenience sample of students who were enrolled in TPSID program that worked with the National Coordinating Center to gather and report student and program data annually as part of their project work. These programs were not explicitly charged with targeting self-determination as a goal, but were tasked to create and expand high-quality, inclusive model comprehensive transition and postsecondary programs for students with intellectual disability. These programs provided individual supports and services for the academic and social inclusion of students with intellectual disabilities in academic courses, extracurricular activities, and other aspects of the institution of higher education's regular postsecondary program. The findings of this study focus on a small subset of the full population of the TPSID students whose programs collected and entered data on self-determination.

### *Secondary Experiences*

While this study looked at only 11% of the students who attended a TPSID program at a college or university who completed self-re-

port assessments of self-determination, it does offer some insight about the students that were able to access these postsecondary education opportunities. Over 70% of the sample was included in general education for some portion of the school day during secondary school and approximately half of participants participated in regular state assessments with or without accommodations. This may reflect that students that are included in general education or who participate in state assessments are more likely to offered or seek out the opportunity to access PSE than those who are not participating in general education. Access to the general curriculum, in particular access to core curricular grade level subjects (English, Algebra, Science, History) in high school, are cited as predictors of postsecondary success (Conley, 2007; Hein, Smerdon, & Lebow, 2013; Hein, Smerdon, Lebow, & Agus, 2012). Therefore, it is possible that those students who access the general curriculum more likely to be encouraged to seek postsecondary education, providing implications for increasing transition to postsecondary education for students with intellectual and developmental disabilities.

### *Provision of Accommodations*

While the provision of accommodations did not appear to impact student self-determination scores, the finding that so few students received supports from disability services offices is worthy of note. Accommodations are supports and services that allow students with disabilities to access content and complete academic tasks. In a college setting, academic accommodations are authorized and implemented by the disability services office. According to Grigal et al., (2016) the most common accommodations received by TPSID students were academic supports (e.g., note-takers, readers) and academic accommodations (e.g., access to professors' notes, advance access to materials, alternative test formats). However, more than half (55%) of the students received accommodations primarily from TPSID program staff, only 6% received accommodations from the disability services office at the college or university, and only 8% receiving accommodations from both. The low percentage of students who received ac-

accommodations from the disability services office has implications related to self-determination. Typically, in order to receive an accommodation in college, students with disabilities are required to “self-identify” at the disability services office and provide documentation supporting their needs for academic accommodations (Madaus, 2010). This process involves self-knowledge (knowing that you need accommodations) and self-advocacy (being able to articulate that need), as well as goal-setting, problem-solving, and autonomy. Each step in this process includes a signifier of self-determined behavior. If students with intellectual and developmental disabilities are receiving accommodations and supports directly from TPSID program personnel instead of from the university’s office of disability services, they are systematically removed from an opportunity to better understand and articulate their support needs. Subsequently, the lack of opportunities could result in reduced opportunities to practice or advance skills that support self-determined behavior.

#### *Student Self-Determination Status*

The self-determination of students with intellectual and developmental disabilities was measured with the *The Arc’s Self-Determination Scale – Postsecondary Version* (SDS-PV; Wehmeyer et al., 2014) in this study. The SDS-PV is a modified version of the short form of *The Arc’s Self-Determination Scale* (Wehmeyer & Kelchner, 1995), originally developed for adults with intellectual disability. The mean scores of the present sample were around the midpoint of scores obtained with young adults with intellectual and developmental disabilities when the SDS-PV was developed (Wehmeyer et al., 2014), suggesting that this sample was scoring around the average of students with intellectual and developmental disabilities in postsecondary programs. Perhaps because the present sample was comprised of students during the first year of their postsecondary program, this suggests that this sample has potential to grow and develop in their self-determination, if opportunities are provided throughout the postsecondary education program. The SDS-PV can be utilized as a baseline and growth measurement tool when administered to students at the beginning and

end of the year, over the course of the program. Such information could be utilized to individualize instruction and evaluate program or instructional components. Using the SDS-PV as part of data collection would enable postsecondary education programs could assess student gains within the specific subscales of and overall self-determination following implementation of an intervention intended to enhance student self-determination, and over the course of a PSE program.

To engage in specific instruction to enhance self-determination skills in the postsecondary setting, including autonomy, self-regulation, psychological empowerment and self-regulation, The Self-Determined Learning Model of Instruction (SDLMI; Wehmeyer, Palmer, Agran, Mithaug, & Martin, 2000) can be utilized. The SDLMI is a multi-component intervention, that can be used by a facilitator (e.g., teacher, direct support staff, disability support staff) to teach students to self-direct learning by engaging in a self-regulated problem-solving process. The SDLMI focuses on teaching young people to (a) set goals, (b) develop action plans to achieve those goals, and (c) evaluate progress toward the identified goals (Lee, Wehmeyer, & Shogren, 2015). Researchers have established the efficacy of the SDLMI in the secondary school context, enhancing student self-determination, goal attainment, and postsecondary outcomes (Shogren, Palmer, Wehmeyer, Williams-Diehm, & Little, 2012; Shogren, Wehmeyer, Palmer, Rifenburg, & Little, 2015; Wehmeyer et al., 2012). And, preliminary evidence exists on the benefits of the SDLMI in the college context, with researchers finding that when students with disabilities were taught to use the SDLMI they were able to make progress on self-selected postsecondary education program goals (Finn, Getzel, & McManus, 2008). Explicitly teaching goal setting and problem solving skills has the potential to enable students with intellectual and developmental disabilities in the college context to build self-determination and promote engagement in learning in the college context.

#### *Implications for Future Practice*

This study suggests that self-determination can be assessed and used to understand the

impact of personal and program characteristics in postsecondary education programs for students with intellectual and developmental disabilities. One of the issues in assessing self-determination in a college setting is translating the assessment data into practices and language within the higher education context. In some cases, this may involve translating the concepts and constructs of self-determination and how it is manifested for people with disabilities into concepts and constructs used by and for typical college students. One potential framework that could assist in making self-determination assessment data more relevant in postsecondary education practice is that of social and emotional learning (SEL).

According to Dymnicki, Sanbolt, and Kidron (2013), SEL involves the processes through which students and adults apply the knowledge, attitudes, and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions. Five core competencies including self-awareness, self-management, social awareness, relationships skills, and responsible decision-making (Collaborative for Academic Social and Emotional Learning [CASEL], n.d.). While there is not a one-to-one correspondence between the subscales of autonomy, self-regulation, psychological empowerment, and self-realization in *The Arc's Self-Determination Scale – Postsecondary Version*, and Dymnicki et al. (2013) five competencies, it is worth exploring how they relate to each other and their potential to assist in communicating practical strategies from assessment data into language and practices that reflect the college context.

A positive and very affirming finding from this study was that number of social activities students participated in predicted their scores on autonomy, self-realization, and overall self-determination. With the addition of one activity and its significant increase on self-determination score, it may be valid to assert that participating in social activities not only enhances the knowledge that students hold of themselves (self-awareness) and what they enjoy (self-realization) but also helps to enhance choice and access to preferred activities (autonomy).

The Think College Standards for Inclusive Higher Education (Grigal, Hart, & Weir, 2012b) provide some guidance related to expanding campus engagement. The standards suggest that to facilitate campus membership for students with intellectual disabilities, programs should provide access to and support for participation in existing social organizations, facilities, and technology, including:

- Campus programs, such as clubs and organizations, community service, religious life, student government, Greek system, co-curricular experiences, service learning, study abroad, student sports and entertainment events, recreational facilities and programs, etc.
- Residence life facilities and activities, including, when desired, the off-campus housing office.
- Technology for social communication, including email, texting, cell phone, Facebook, Twitter, Skype.
- Social activities facilitated by students without disabilities, who serve as natural supports.

Further research is needed on effective strategies to create inclusive social activities on college campuses (Westling, Kelley, Cain, & Prohn, 2013) and necessary supports for reciprocal relationship development (Eisenman, Farley-Ripple, Culnane, & Freedman, 2013; Nasr & Cranston-Gingras, 2015). Given the impact of social engagement on students' self-determination status, college and university professionals supporting inclusive higher education programs should continually assess how to create or expand these types of campus membership activities for students with intellectual and developmental disabilities.

#### *Implications for Future Research*

As mentioned previously, future research is needed that more fully explores the experiences of students with intellectual and developmental disabilities in postsecondary education programs and the factors that influence those experiences (Grigal et al., 2012a). For example, a slight majority of the sample received accommodations to support program participation that were specialized and deliv-

ered by the program. A much smaller group of students received accommodations from broader resources on the college or university campus, such as offices for students with disabilities, or accommodations from both the program and college or university resources. However, where accommodations were received from did not predict self-determination status (although the low numbers that received accommodations from sources other than the program may have influenced our ability to detect differences); however, this suggests, in combination with findings that the majority of students lived at home and participated in a relatively limited number of social interactions, that ongoing research is needed to evaluate strategies that enhance the degree to which students with intellectual and developmental disabilities are viewed as members of the campus community, who access and participate in campus resources and activities as all other students do (Grigal et al., 2012b).

Additionally, although differences were not found in self-determination based on accommodations received or living arrangements, the number of social activities predicted autonomy, self-realization, and overall self-determination. Given these results, it is incumbent on researchers to further examine effective strategies to create inclusive social activities on college campuses (Westling et al., 2013) and the necessary supports in promoting reciprocal relationship development (Eisenman et al., 2013; Nasr & Cranston-Gingras, 2015). These findings are consistent with research that suggests there is a strong and positive impact of social activities and relationship on self-determination and quality of life outcomes in adolescents and young adults with disabilities (Nota, Ferrari, Soresi, & Wehmeyer, 2007; Walker et al., 2011).

Research is also needed on the personal characteristics that influence self-determination and how to create supports that are sensitive to the influences of cultural identity (Shogren, 2011), as well as the secondary school experiences that influence self-determination in postsecondary education environments. Research has typically explored self-determination status in secondary school and its impact on outcomes, not the impact of secondary school experiences on self-determi-

nation when students are completing their first year of a postsecondary education program. In this study, the participation and type of participation in state-wide assessments in secondary school had the most significant relationship with self-determination in a student's first year of postsecondary education. Participants who took the alternative assessment scored higher on autonomy, but lower in self-regulation than students who took the regular state assessment with or without accommodations. And, when the participation in state-wide assessments was waived, the same pattern emerged.

Decisions regarding participation in state assessments are made by Individualized Education Program (IEP) teams, and are likely related to disability-specific characteristics, although other factors likely influence decisions as well. However, the differential results for autonomy and self-regulation suggest the need for more research. There has been limited work examining the self-regulation subscale that is included on the SDS-PV as well as the adolescent version of the SDS as other large scale studies, such as the National Longitudinal Transition Study-2, excluded these items from data collection as they require open-ended responses made by students to be scored (Shogren, Kennedy, Dowsett, & Little, 2014). Therefore, these findings provide important insight into potential differences associated with self-regulation that should be further examined, particularly as differences in self-regulation scores were also found based on personal characteristics with students identified as Hispanic/Latino reporting lower self-regulation scores.

#### *Limitations*

The present analyses drew on a subset of the secondary data collected by the NCC to document the experiences of students with intellectual and developmental disabilities in TPSID programs. However, the dataset is not representative of all postsecondary education programs or all students with intellectual and developmental disabilities enrolled in postsecondary education, and provides access to a small sample of programs who have opted to participate in data collection on self-determination and who have been awarded a TPSID

model demonstration project. Further, the large amount of blocks of missing data (e.g., complete missingness on secondary or postsecondary experience variables) limits the sample size, as well as suggests that there may be systematic issues encountered in collecting data within programs that must be considered when interpreting the findings and characteristics of the sample for which there is complete data. Relatedly, the data were not independently verified for accuracy or for adherence to administration protocols for the SDS-PV, and because of the limited use of the SDS-PV in previous research, average scores to compare the scores from the present sample do not exist. Further, the limitations of the data (e.g., data only available for analysis on students who were included for some part of the day in general education or not included at all), limit the ability to develop a more nuanced understanding of the factors that influence outcomes. Finally, the small sample size precluded more complex analyses, including analyses of the interactive effects of secondary and postsecondary experiences. However, despite these limitations, the findings provide insights that have implications for future research and practice related to supporting self-determination in students with intellectual and developmental disabilities in postsecondary education.

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