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Perceptions of Students with Autism and Their Parents: The College Experience

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Abstract

Students with autism spectrum disorder (ASD) are attending postsecondary programs at unprecedented rates. Transitions are especially challenging for students with ASD, yet little is known about critical transitions during the college experience. Using the College Adjustment Program Evaluation Scales (CAPES), we examined student and parent perspectives across five dimensions: Student Life, Emotional Adjustment, Independent Living Skills, Interpersonal Relationships, and Self-Advocacy. Sixteen participants—eight students and eight parents, completed the CAPES at the end of fall semester of year one and the end of spring semester year two. Student and parent CAPES ratings were uniformly positive with some differences. We found large effect sizes across dimensions and significant differences in Student Life, Independent Living, and Interpersonal Relationships with parent ratings higher than student ratings. An item analysis revealed specific challenges and skills salient to the results. Implications for supports for students with ASD, higher education practices, and transition research are discussed.

Keywords: autism spectrum disorder, transition, college, postsecondary education

The purpose of postsecondary education (PSE) and the pathways to it are multifaceted. Postsecondary/higher education in the U.S. has evolved across time (Renn & Reason, 2013), and institutions of

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higher education have developed empirically-based strategies to serve an increasingly diverse student population and improve the first year experience of students (Pascarella & Terenzini, 2005). Whether or not a student has a disability, the value of PSE to the student and to society are pivotal issues in the current debate over the goal of PSE. Mayhew and colleagues (2016) synthesized over 1,800 studies related to student development during college and report positive long-term effects on cognitive development, critical thinking, academic self-concept, locus of control, independence, self-efficacy, and psychological well-being to name a few. The effects of college on students with disabilities, however, is seldom addressed in the higher education and student affairs literature (Hendrickson, Therrien, Weeden, Pascarella, & Hosp, 2015).

Although research is scant, the studies that are available indicate that PSE opportunities appear to significantly improve the transition to adulthood and long-term life outcomes (e.g., academic skills, employment, quality of life) of youth with disabilities (Hart, Grigal, & Weir, 2010; Neubert & Redd, 2008). Preliminary psychological well-being data indicate that students with ASD and cognitive disabilities and their typical college counterparts are similarly affected by college (Hendrickson, Vander Busard, Rodgers, & Scheidecker, 2013). Hendrickson et al. (2015) compared a national sample of first year college students with and without cognitive disabilities on student engagement and their perceptions of academic challenge, active and collaborative learning, student-faculty interaction, the campus environment, and educationally enriching experiences. They found that students with intellectual disabilities who attended a structured, inclusive, campus-based program did not differ significantly from typical college students in their responses to the National Survey of Student Engagement (NSSE; Pascarella, Seifert, & Blaich, 2010). McGregor and colleagues (2016) report that college students with learning disabilities (LD) were less satisfied with their college experience than other students, had more obstacles caused by nonacademic responsibilities, and felt that there was a bias against individuals with disabilities. McGregor and colleagues' data showed that students with LD who sought and received accommodations were in more frequent contact with faculty and experienced less difficulty with assignments than peers with LD who did not.

In the transition from high school to college, students with ASD encounter many of the same challenges as typical students (e.g., navigating campus, adjusting to a roommate, developing study routines, making new friends, homesickness; Hewitt, 2011). However, students with ASD also face unique and complex adjustment challenges as a

result of: (a) an increased demand on higher order, independent problem-solving, and executive functioning skills (Dipeoli, Storlie, & Johnson, 2015; Hewitt, 2011); (b) social communication deficits (Wehman et al., 2014; Wolf, 2001); (c) the need for individualized academic and nonacademic supports (Cullen, 2015; Mitchell & Beresford, 2014); (d) limited family involvement (Gelbar, Smith, & Reichow, 2014; Hewitt, 2011); and (e) the need for a PSE services/supports coordinator or administrator (Mitchell & Beresford, 2014). The literature indicates that students with so-called hidden disabilities (Wolf, 2001), including many students with ASD, often have co-morbid psychiatric disorders such as depression, attention deficit disorder, and anxiety disorder (Hewitt, 2011; VanBergeijk, Klin, & Volkmar, 2008). The behavioral and emotional manifestations associated with these disorders can further exacerbate student transition difficulties.

Without doubt, college life makes unprecedented demands on students' social-emotional, cognitive, independent living, and self-advocacy skills, and the array and complexity of these demands can forestall a successful transition (Geller & Greenberg, 2010). The prospect of college raises concerns for educators as well as students with disabilities and their families. These constituencies are apprehensive about academic skills needed, residential living, social relationships, institutional academic and nonacademic supports, time management, leisure and recreation, and employment (Camarena & Sarigiani, 2009; Chambers, Hughes, & Carter, 2004; Cullen, 2015; Gelbar et al., 2014; Longin, 2014; Wehman et al., 2014). Wehman and colleagues (2014) report that secondary students with ASD participate in transition planning meetings at a lower rate than students with other disabilities and identify PSE goals at a significantly lower rate than students with other disabilities. This decreased involvement suggests that many students with ASD are likely to be ill-prepared for college. If there is a lack of preparation at the secondary level, a key question becomes how can preventive approaches (Hewitt, 2011) be implemented in the PSE setting to manage complex college adjustment issues.

Families experience significant emotional, financial, and physiological stress from parenting a child with ASD, and the stresses of parenting can be especially high during adolescence (Smith & Anderson, 2014). Smith and Anderson (2014) note that parents play critical roles (e.g., caregiver, advocate, career counselor) in the lives of adolescents with ASD in the post-high school transition and beyond. Bidirectional influences (e.g., behavioral response cycles, emotional reactions) affect the parents and child with ASD well into adolescence. Furthermore, parental expectations are positively associated with adolescents with ASD seeking a PSE option (Doren, Gau, & Lindstrom,

2012). Both parent and student stress levels increase prior to enrollment in college. In fact, student stress levels appear to be linked to their adjustment after six months of college (Pancer & Hunsberger, 2000). Billstedt, Gillbery, and Gillberg (2011) suggested that an "autism-friendly" school environment may positively impact the mental health and other adult outcomes of individuals with ASD. Currently, there are limited data to show whether or not students and parents view the college environment as "autism friendly." That is, an environment where students are supported in a person-centered manner that addresses each student's academic and nonacademic needs and aspirations.

Despite concerns, students with ASD and other cognitive disabilities are attending college in unprecedented numbers (Longtin, 2014; www.thinkcollege.net), and these students are particularly vulnerable to the risk of dropping out (Wolf, 2001). Traditional college accommodations appear to be insufficient to meet the needs of students with disabilities (Longtin, 2014). Institutional and family supports provided during the student's k-12 education (IDEA, 2004) no longer apply (Longtin, 2014), and the student with ASD is expected to adjust and self-advocate within a complex, novel environment. Direct, day-to-day family support is relatively limited, even if the student allows parents access to his or her college records (Hewitt, 2011).

It is critical to improve the educational processes and outcomes for students with ASD. Yet there is currently a dearth of feedback on PSE experiences from key stakeholders, the students with ASD. Even less is known about the perceptions of students with ASD at two critical college transition points: the end of the entry and exit semesters of college. Student feedback gathered at these critical points would likely be valuable to understanding student adjustment and potential factors that impact student success. In addition to student feedback, the perceptions of parents would arguably expand our understanding of factors that affect student adjustment and college retention.

Parents generally provide the financial support needed for the student to attend college. Parents also may view the interface between the reality and demands of college and the student's adjustment to college differently than students. The perceptions of both of these stakeholders (students and parents) have the potential to improve student outcomes, alter higher education services and supports for students with ASD and other disabilities, and impact the rate at which students with ASD participate in PSE programs. Finally, there is evidence that the views of parents and students with disabilities attending postsecondary programs do not always align (Griffin, McMillan, & Hodapp, 2010). Understanding differences in the perspectives of

parents and PSE students with ASD has the potential to inform practice at both the secondary and postsecondary education levels.

The purpose of this study was to address three questions: (a) How do students with ASD experience their entry and exit semesters of college? (b) How do parents of students with ASD perceive their students' entry and exit semesters of college? (c) How do student and parent perceptions of the college experience compare? We investigated the perceptions of students with ASD and their parents on the five dimensions (i.e., Student Life, Emotional Adjustment, Independent Living Skills, Interpersonal Relationships, Self-Advocacy) of the College Adjustment and Program Evaluation Scale (CAPES; Hendrickson, Carson, Woods-Groves, Mendenhall, & Scheidecker, 2013). We examined these five dimensions in relation to the initial transition to college (i.e., the end of fall semester of year one) and the transition from college (i.e., the end of spring semester of year two).

Method

Participants

Eight young adults with ASD and their parents participated in this study for a total of 16 participants. Students graduated between spring 2010 and spring 2015. The students ranged in age from 18 to 22 years old ($M = 19.38$, $SD = 1.51$). The student participants began their postsecondary/college program with the diagnostic labels provided during the application process: three (37.5%) with Asperger's Syndrome, and five (62.5%) with ASD. (We did not round percentages so that total percentages are equal to 100.) All students received special education services in elementary and/or high school. All of the students were Caucasian, and six (75%) were males. The students were assessed with the Woodcock Johnson Tests of Achievement III (WJIII; Woodcock, McGrew, & Mather, 2001) upon enrollment. Student WJIII total score standard scores ($M = 100$, $SD = 15$) ranged from 50 to 83 ($Mdn = 81$). Student participants exhibited the range of characteristics associated with ASD (see Hendrickson, Carson et al., 2013).

Seven of eight (87.5%) families included two parents; parents of one student (12.5%) were divorced. Students of three families (37.5%) received a need-based scholarship. One (12.5%) student was an in-state resident, and seven (87.5%) students were nonresidents (i.e., from CA, IL, MN, MO, PA, TX). Of the eight students and their families, one (12.5%) family was from a rural community, and seven (87.5%) families lived in suburban or urban communities. Of the 16 parent surveys

completed (i.e., eight in fall of year one; eight in spring of year two), seven (43.8%) were completed by a female parent; three (18.8%) were completed by a male parent; and six (37.4%) were completed by two parents together.

Setting

The students with ASD were enrolled in a full-time, two-year certificate program for students with intellectual and developmental disabilities located at a large Midwestern university. In any given year, 40 to 60% of students in the program are out-of-state residents. Thirty-two percent of all students (approximately 150 students) attending the program between 2008 and 2015 received a need-based scholarship.

The program was designed in accordance with guidelines in the Higher Education Opportunity Act (2008) which provided funding for the development of PSE for students with intellectual disabilities. Specifically, the program included several pillars of an inclusive educational postsecondary program: (a) on-campus residence hall living with traditional students, (b) 50 percent of semester hour course work with students without disabilities, (c) inclusive work/internship environments, (d) full participation in university student life, student organizations, and campus activities, and (e) person-centered planning.

The program was designed to provide structures and supports recommended in the literature for serving students with disabilities in PSE settings. These program components included such elements as preparation for college (Ciccantelli, 2011; Hewitt, 2011); social skills training, counseling, and support (Wenzel & Rowley, 2010); language and communication skill building (Geller & Greenberg, 2009); self-advocacy and self-determination skill training (Roberts, 2010); organization, time management, and problem-solving training (Dipeolu et al., 2015); life skills training (e.g., laundry, medication management, transportation; Adreon & Durocher, 2007; Smith, Maenner, & Seltzer, 2012); workplace expectations and supports (Geller & Greenberg, 2009); and, collaboration and utilization of resources across university departments, adult agencies, and families (Longtin, 2014; Roberts, 2010). Program staff and educational and career advisors received annual and on-going professional development (Mull, Sitlington, & Alper, 2001). They coordinated and implemented various activities to ensure a person-centered approach was employed with each student. For a more detailed description of academic, nonacademic, and counseling supports, see Hendrickson, Carson et al. (2013).

Instrument

The CAPES (Hendrickson, Carson et al., 2013; Hendrickson & Woods-Groves, 2010) was developed to iteratively gather feedback from students, families, and staff and faculty for formative assessment of the program. The CAPES was selected because it contains items related to five areas associated with the adjustment challenges of students with ASD (Geller & Greenberg, 2010; McCall, 2014; VanBergeijk et al., 2008). The CAPES has 37 items with four Likert-type response possibilities (i.e., 1 = *strongly disagree*, 2 = *disagree*, 3 = *agree*, and 4 = *strongly agree*). Respondents other than students (e.g., parents) mark items in relation to a given student (e.g., "*Insert name of student* was often sad." versus "I was often sad."). Scores between 1 and 2 indicate a negative response; scores between 3 and 4 indicate a positive response. An average score < 2.5 was considered a negative perception; an average score ≥ 2.5 was considered a positive perception.

Table 1 shows the CAPES items in relation to each of five dimensions: Student Life (SL), Emotional Adjustment (EA), Independent Living Skills (ILS), Interpersonal Relationships (IR), and Self-Advocacy (SA). The SL dimension consists of nine items that appraise the respondent's perspective related to academic and other learning experiences (e.g., "The teachers supported my learning."). The EA dimension consists of five items that assess the respondent's affective or emotional response to the college experience (e.g., "I was often sad."). The ILS dimension has 12 items related to autonomy and independence (e.g., "I practiced safe habits."). IR consists of six items to evaluate the respondent's perspective concerning social experiences and opportunities (e.g., "I made new friends."). The SA dimension has five items that pertain to self-management and self-advocacy (e.g., "I was willing to ask for help.").

CAPES psychometric properties. Hendrickson, Carson et al. (2013) report the psychometric properties of the CAPES from student cohorts across two years of enrollment (i.e., 2010 to 2012; $n = 262$ cases). With regard to internal consistency, the authors reported Cronbach's alpha coefficients for each of the five dimensions: SL $\alpha = .79$, EA $\alpha = .50$, ILS $\alpha = .83$, IR $\alpha = .65$, and SA $\alpha = .65$. All of the alpha coefficients except the EA dimension met Salvia, Ysseldyke, and Bolt's (2012) criterion of $\alpha = .60$ coefficient for research instruments. In addition, Hendrickson, Carson et al. (2013) reported that skewness and kurtosis values for the 37 CAPES items met Curran, West, and Finch's (1996) recommended standard of ± 2.0 for acceptable skewness and ± 7.0 for acceptable kurtosis values.

Table 1
The Five CAPES Dimensions and Respective Items

Dimension and Items	Dimension and Items
Student Life (9 items)	Interpersonal Relationships (6 items)
1. I had many new experiences at the university.	3. I learned to solve problems of my own.
2. Living in the residence hall was a learning experience.	5. I made new friends.
4. I liked being part of the university experience.	16. Study tables helped me get homework completed on time.
8. Advising meetings were helpful to me.	17. My parents were supportive.
9. The teachers supported my learning.	29. I felt respected by the other students.
10. Most classes were interesting.	34. I got along with others.
15. The RAs were helpful to me.	Self-Advocacy (5 items)
31. I learned new things in my classes.	7. I used the 'buddy system' to go places.
37. Having a roommate was a good thing.	12. I enjoyed group activities in the community.
Emotional Adjustment (5 items)	19. I tried to improve my health habits.
11. I was often [happy] sad.	27. I was willing to ask for help.
14. I emailed or called home often.	30. I know how to use the buses.
22. I [did not] spend too much money.	
24. I was [not] homesick most of the time.	
28. I was often [happy] unhappy.	
Independent Living Skills (12 items)	
6. I became more independent.	
13. I learned to communicate better.	
18. I learned more about my personal challenges.	
20. I practice safe habits.	
21. I cleaned my room & did my own laundry.	
23. I learned about correct public behavior.	
25. My organization skills improved.	
26. I learned my job interests.	
32. I used hall and community resources.	
33. I did my best to succeed.	
35. I met my semester goals.	
36. I better understand my disability.	

With regard to construct validity, Hendrickson, Carson et al. (2013) note that a principal components factor analysis employing an orthogonal varimax rotation recovered 42.20% of the variance and revealed a five-factor structure. Factor loadings were reported for each of the five dimensions. Factor loading ranges by dimension were SL = .42 to .64; IR = .40 to .63; SA = .31 to .55; ILS = .33 to .62; and EA = .43 to .83.

Procedures

Procedures approved by the university Institutional Review Board were utilized. Participation was voluntary; informed consent procedures were followed; participant data were de-identified; and each participant was assigned a research numeric code.

Administration of the CAPES. Students with ASD and their parents completed the CAPES at the end of the fall semester of year one and the end of the spring semester of year two. The CAPES was usually completed within 50 to 65 min. The CAPES was administered to students in a group of 15 to 20 students, most of whom did not have an autism diagnosis. Three to five trained support staff and volunteers were present to assist individual students. The most used accommodations included reading items aloud to students, scribing student answers, and taking short breaks. Parents completed the CAPES at home and returned the survey via U.S. mail or electronically. Program staff routinely administered the CAPES since the program's inception in 2008. Two authors were staff members. Only one author participated in data collection. His tasks involved assisting students in getting to the classroom, observing the administration process, checking surveys for completion, and distributing and collecting parent surveys in a timely fashion at the end of each semester.

Data Analysis

Data were analyzed using IBM SPSS 23 (2016). A series of one-way Analysis of Variance (ANOVAs) were conducted to examine the relation between student and parent ratings for each of the five dimensions (i.e., SL, EA, ILS, IR, SA) at the end of the fall semester of year one and at the end of the spring semester of year two. The student and parent groups were considered to be the independent variables, and the dependent variables were the five CAPES dimensions. When there was a significant difference between student and parent ratings in the CAPES dimensions, we further examined the dimensions at the item level with a series of one-way ANOVAs. The strength of the comparisons was evaluated through the use of Cohen's *d* effect sizes wherein effect sizes $\leq .2$ are considered small; an effect size of .5 is considered medium; and effect sizes of $\geq .8$ are considered large (Cohen, 1988).

Power Analysis

We conducted a power analysis to determine if the sample size for this study was adequate to minimize Type I and II errors in the ANOVA estimations (Cohen, Cohen, West, & Aiken, 2003). A post-hoc power analysis was conducted with G*Power 3.1 as described by Faul, Erdfelder, Lang, and Buchner (2007) for a one-way ANOVA with an approximate effect size of .80, an alpha level of .05, and power of .80 for two groups. The post-hoc power analysis computes the achieved power given a determined alpha, sample size, and effect size (Gillette, 1994). The given sample size for the study ($n = 16$) had 0.84 power to detect a large effect size.

Results

We posed three questions: (a) How do students with ASD experience their entry and exit semesters of college? (b) How do parents of students with ASD perceive their students' entry and exit semesters of college? (c) How do student and parent perceptions of the college experience compare? Results revealed that student rating averages were on the upper end of the 4-point Likert scale (i.e., ≥ 2.5) on each of the five dimensions of the CAPES (i.e., SL, EA, ILS, IR, SA). Results revealed that parent rating averages also were on the upper end of the Likert scale for each of the five dimensions.

The third question examined how student and parent perceptions compared. Table 2 shows mean values, standard deviations, *p* values, effect sizes, and one-way ANOVA results for student and parent item ratings for each CAPES dimension. Tables 3, 4, and 5 present item analysis data for dimensions which showed significant differences between students and parents (i.e., SL items, ILS items, and IR items, respectively).

Comparison results of student and parent perceptions by dimension at two points in time are presented below. Next, item analyses of the dimensions with a significant difference between student and parent ratings are presented.

Perceptions of Students and Parents by Dimension

The transition to college: End of fall semester year one results. A series of one-way ANOVAs were conducted to examine student and parent CAPES ratings at the end of the first semester of college (see Table 2). A significant difference with a large effect size was found between students and parents on the dimension of Student Life with

Table 2

Student (N = 8) and Parent (N = 8) CAPES Dimensions One-way ANOVA Results by Semester

	CAPES Dimensions				
Semester	Student Life *M* (*SD*)	Emotional Adjustment *M* (*SD*)	Independent Living Skills *M* (*SD*)	Interpersonal Relationships *M* (*SD*)	Self-Advocacy *M* (*SD*)
Fall year 1					
Students	27.00 (5.55)	15.50 (2.98)	39.00 (5.42)	19.38 (3.16)	15.75 (2.71)
Parents	33.75 (5.55)	17.50 (2.07)	41.88 (3.83)	21.50 (2.60)	17.00 (2.39)
ES (*d*)	1.22	.78	.61	.73	.49
ANOVA	$F(1, 15) = 9.33$ $P = .009^{**}$	$F(1, 15) = 2.44$ $p = .141$	$F(1, 15) = 1.50$ $p = .241$	$F(1, 15) = .216$ $p = .168$	$F(1, 15) = .956$ $p = .345$
Spring year 2					
Students	29.75 (3.62)	16.00 (2.00)	38.88 (4.94)	19.38 (1.77)	15.50 (2.62)
Parents	34.38 (3.02)	*M* 17.13 (1.36)	45.13 (4.36)	22.13 (2.59)	18.00 (2.45)
ES (*d*)	1.39	.66	1.34	1.24	.99
ANOVA	$F(1, 15) = 7.71$ $p = .015^{*}$	$F(1, 15) = 1.73$ $p = .20$	$F(1, 15) = 7.20$ $p = .018^{*}$	$F(1, 15) = 6.16$ $p = .026^{*}$	$F(1, 15) = 3.89$ $p = .069$

Note. $^{*}p \leq .05$, $^{**}p \leq .01$, ES = Effect size, Cohen's *d*.

higher/more positive parent ratings, $p = .009$, $d = 1.22$. No significant results were found for the CAPES dimensions of EA, ILS, IR, or SA.

The transition from college: End of spring semester year two results. A series of one-way ANOVAs were conducted to examine student and parent CAPES ratings at the end of the postsecondary program. The analyses yielded large effect sizes and significant differences for three dimensions: SL, $p = .015$, $d = 1.39$, ILS, $p = .018$, $d = 1.34$, and IR, $p = .026$, $d = 1.14$. Family ratings were consistently higher than student ratings on these dimensions. No significant results were found for EA or SA.

Student and Parent Perceptions by Items within Significant CAPES Dimensions

We further examined the CAPES dimensions in which we found significant differences when conducting a series of one-way ANOVAs with CAPES item ratings. Data related to both the transition to and the transition from college (i.e., the end of fall semester year one and the end of spring semester year two) are presented.

Student Life dimension. For the end of fall semester year one, we found significant differences with large effect sizes for four Student Life items. Parent ratings were consistently higher than student ratings for the following: (a) I had many new experiences at the university, $p = .002$, $d = 1.91$, (b) I liked being part of the university experience, $p = .026$, $d = 1.24$, (c) The RAs (residence hall assistants) were helpful to me, $p = .003$, $d = 1.91$, and (d) Having a roommate was a good thing, $p = .001$ $d = 2.16$. For the end of the spring semester year two, we found six significant differences. Parent ratings were higher than student ratings on these items: (a) I had many new experiences at the university, $p = .009$, $d = 1.54$, (b) Living in the residence hall was a learning experience, $p = .001$, $d = 2.31$, (c) I liked being part of the university experience, $p = .031$, $d = 1.19$, (d) The RAs were helpful to me, $p = .010$, $d = 1.49$, (e) Having a roommate was a good thing, $p = .004$, $d = 1.86$, and (f) The teachers supported my learning, $p = .002$, $d = 1.96$.

Independent Living dimension. For the end of fall semester year one, significant differences with large effect sizes were found with parents rating higher than students for one item: I used hall and community resources, $p = .010$, $d = 1.63$. For the end of spring semester year two, significant differences were found with parents rating higher than student ratings for seven items: (a) I learned more about my personal challenges, $p = .009$, $d = 1.50$, (b) I cleaned my room and did my own laundry, $p = .041$, $d = 1.15$, (c) I learned about correct public behavior, $p = .019$, $d = 1.33$, (d) My organization skills improved, $p = .014$, $d = 1.40$, (e) I learned my job interests, $p = .001$, $d = 2.31$, (f) I met my semester goals, $p = .010$, $d = 1.54$, and (g) I better understand my disability, $p = .017$, $d = 1.35$.

Table 3

Significant and Non-Significant Student and Parent Student Life Item Ratings by Semester

	Student Life Items								
Semester	1 *M* (*SD*)	2 *M* (*SD*)	4 *M* (*SD*)	8 *M* (*SD*)	9 *M* (*SD*)	10 *M* (*SD*)	15 *M* (*SD*)	31 *M* (*SD*)	37 *M* (*SD*)
Fall year 1									
S	3.00 (.53)	3.13 (.99)	3.13 (.99)	2.75 (.89)	2.63 (1.06)	2.75 (.71)	2.75 (.89)	3.00 (.53)	2.63 (.74)
P	3.88 (.35)	3.88 (.35)	4.00 (.00)	3.63 (.74)	3.50 (.76)	3.29 (.76)	4.00[a] (.00)	3.63 (.74)	3.88 (.35)
ES (*d*)	1.91	1.01	1.24	1.06	.94	.73	1.99	.99	2.16
A	*F*(1, 15) = 14.913 *p* =.002**	*F*(1, 15) = 4.065 *p* =.063	*F*(1, 15) = 6.236 *p* =.026*	*F*(1, 15) = 4.573 *p* =.051	*F*(1, 15)= 3.611 *p* =.078	*F*(1, 15) = 2.010 *p* =.180	*F*(1, 14) = 13.788 *p* =.003**	*F*(1, 15) = 3.723 *p* =.074	*F*(1, 15) = 18.421 *p* =.001**
Spring year 2									
S	3.25 (.46)	3.25 (.46)	3.25 (.89)	3.13 (.64)	3.00 (.76)	2.75 (.89)	2.88 (.64)	3.13 (.64)	3.00 (.53)
P	3.88 (.35)	4.00 (.00)	4.00 (.00)	3.63 (.74)	3.88 (.35)	3.25 (.89)	3.86[a] (.38)	3.63 (.74)	3.88 (.35)
ES (*d*)	1.54	2.31	1.19	.72	1.49	.56	1.86	.72	1.96
A	*F*(1, 15) = 9.211 *p* =.009**	*F*(1, 15) = 21.00 *p* =.001**	*F*(1, 15) = 5.727 *p* =.031*	*F*(1, 15) = 2.074 *p* =.172	*F*(1, 15)= 8.795 *p* =.010**	*F*(1, 15) = 1.273 *p* =.278	*F*(1, 14) = 12.544 *p* =.004**	*F*(1, 15) = 2.074 *p* =.172	*F*(1, 15) = 14.913 *p* =.002**

Note. *$p \leq .05$, **$p \leq .01$, S = Students, P = Parents. ES = Effect size, Cohen's *d*, A = ANOVA results. [a] = 7 ratings. ITEMS: 1. I had many new experiences at the university; 2. Living in the residence hall was a learning experience; 4. I liked being part of the university experience; 8. Advising meetings were helpful to me; 9. The teachers supported my learning; 10. Most classes were interesting; 15. The RAs (residence hall assistants) were helpful to me; 31. I learned new things in my classes; 37. Having a roommate was a good thing.

Table 4

Significant and Non-Significant Student and Parent Independent Living Skills Item Ratings by Semester

	Independent Living Skills Items											
	6 *M* (*SD*)	13 *M* (*SD*)	18 *M* (*SD*)	20 *M* (*SD*)	21 *M* (*SD*)	23 *M* (*SD*)	25 *M* (*SD*)	26 *M* (*SD*)	32 *M* (*SD*)	33 *M* (*SD*)	35 *M* (*SD*)	36 *M* (*SD*)
Fall year 1												
S	3.25 (1.04)	3.13 (.64)	3.25 (.71)	3.63 (.52)	3.50 (.53)	2.88 (.99)	2.88 (.64)	3.25 (.71)	3.00 (.53)	3.75 (.46)	3.00 (.76)	3.00 (1.07)
P	3.43[a] (.53)	3.13 (.64)	3.63 (.52)	3.88 (.35)	3.88 (.35)	3.00 [a] (.58)	3.13 (.35)	3.43 [a] (.53)	3.75 (.46)	3.75 (.46)	3.63 (.74)	3.50 (.53)
ES	.22	.00	.61	.56	.85	.15	.48	.29	1.63	.00	.84	.59
A	*F*(1, 14) =.168 *p*=.689	*F*(1, 15) =.000 *p*=1.00	*F*(1, 15) =1.465 *p* =.246	*F*(1, 15) =1.273 *p* =.278	*F*(1, 15) =2.739 *p* =.120	*F*(1, 14) =.085 *p* .775	*F*(1, 15) =.933 *p* =.350	*F*(1, 14) =.297 *p* =.595	*F*(1, 15) =9.000 *p* =.010*	*F*(1, 15) =.000 *p*=1.00	*F*(1, 15) =2.778 *p*=.118	*F*(1, 15) =1.400 *p*=.256
Spring year 2												
S	3.00 (1.07)	3.13 (.83)	3.13 (.36)	3.38 (.52)	3.38 (.52)	3.00 (.00)	2.38 (.52)	3.00 (.00)	3.63 (.52)	3.38 (.52)	2.88 (.35)	2.63 (.74)
P	3.75 (.46)	3.63 (.52)	3.75 (.46)	3.63 (.52)	3.89 (.35)	3.50 (.53)	3.25 (.71)	3.75 (.46)	3.88 (.35)	3.75 (.46)	3.57[a] (.53)	3.50 (.53)
ES	.91	.72	1.50	.48	1.15	1.33	1.40	2.31	.56	.75	1.54	1.35
A	*F*(1, 15) =3.316 *p*=.090	*F*(1, 15) =2.074 *p*=.172	*F*(1, 15) =9.211 *p* =.009**	*F*(1, 15) =.933 *p*=.350	*F*(1,15) =5.091 *p*=.041*	*F*(1, 15) =7.000 *p*=.019*	*F*(1, 15) =7.977 *p* =.014*	*F*(1, 15) =21.000 *p* =.001**	*F*(1, 15) =1.273 *p*=.278	*F*(1, 15) =2.333 *p*=.149	*F*(1, 14) =9.091 *p* =.01**	*F*(1, 15) =7.298 *p* =.017*

Note. *$p \leq .05$, **$p \leq .01$, S = students, P = parents. ES = Effect size, Cohen's *d*, A = ANOVA results. [a] = 7 ratings. ITEMS: 6. I became more independent; 13. I learned to communicate better; 18. I learned more about my personal challenges; 20. I practice safe habits; 21. I cleaned my room & did my own laundry; 23. I learned about correct public behavior; 25. My organization skills improved; 26. I learned my job interests; 32. I used hall & community resources; 33. I did my best to succeed; 35. I met my semester goals; 36. I better understand my disability.

Interpersonal Relationships dimension. For the end of fall semester of year one, no significant differences were found between student and parent ratings for the CAPES Interpersonal Relationships items. For the spring semester of year two, significant differences with large effect sizes were found with parent ratings higher than student ratings for two items: (a) I felt respected by the other students, $p = .018$, $d = 1.35$, and (b) I got along with others, $p = .012$, $d = 1.45$.

Table 5
Significant and Non-Significant Student and Parent CAPES Interpersonal Relationships Item Ratings by Semester

	Interpersonal Relationships Items					
	3 *M* (*SD*)	5 *M* (*SD*)	16 *M* (*SD*)	17 *M* (*SD*)	29 *M* (*SD*)	34 *M* (*SD*)
Fall year 1						
S	2.88 (.99)	3.13 (.99)	3.25 (.89)	3.50 (.76)	2.88 (.64)	3.00 (.00)
P	3.25 (.46)	3.57[a] (.79)	3.88 (.35)	3.71[a] (.49)	3.43[a] (.53)	3.25 (.70)
ES	.48	.49	.93	.33	.94	.51
A	*F*(1, 15)	*F*(1, 14)	*F*(1, 15)	*F*(1, 14)	*F*(1, 14)	*F*(1, 15)
	= .940	= .913	= 3.431	= .411	= .3.241	= 1.000
	p = .349	*p* = .357	*p* = .085	*p* = .533	*p* = .095	*p* = .334
Spring year 2						
S	3.13 (.35)	3.38 (.52)	3.25 (1.04)	3.25 (.46)	2.63 (.74)	3.13 (.64)
P	3.50 (.53)	3.38 (1.06)	3.63 (.52)	3.50 (.53)	3.63 (.74)	3.88 (.35)
ES	.82	.00	.46	.50	1.35	1.45
A	*F*(1, 15)	*F*(1, 15)	*F*(1, 15)	*F*(1, 15)	*F*(1, 15)	*F*(1, 15)
	= 2.739	= .000	= .840	= 1.000	= 7.226	= 8.400
	p = .120	*p* = 1.00	*p* = .375	*p* = .334	*p* = .018*	*p* = .012*

Note. *$p \leq .05$, **$p \leq .01$, S = students, P = parents, ES = Effect size, Cohen's *d*, A = ANOVA results. [a] = 7 ratings. ITEMS: 3. I learned to solve problems on my own; 5. I made new friends; 16. Study tables helped me get homework completed on time; 17. My parents were supportive; 29. I felt respected by the other students; 34. I got along with others.

Discussion

A decade ago Barnhill's (2007) future directions for research on behalf of individuals with ASD recommended obtaining information directly from students with ASD and families so that appropriate educational and vocational supports could be provided. In this study we examined and compared the perceptions of college age students with ASD and their parents regarding the transition to and exit from a two-year university-based PSE program. Student ratings of items on the five dimensions of CAPES, Student Life, Emotional Adjustment, Independent Living Skills, Interpersonal Relationships, and Self-Advocacy, were positive. Parent ratings on the CAPES aligned with student perceptions and indicated that students were having positive experiences related to SL, EA, ILS, IR, and SA. These results suggest that a coordinated, individualized system of supports (Cullen, 2015; Longin, 2014; Mitchell & Beresford, 2014) at the postsecondary level holds promise for promoting student adjustment and attainment in academic and nonacademic areas of concern (Adreon & Durocher, 2007; Hewitt, 2011; McCall, 2014).

In spite of the fact that the transition to adulthood may be an especially stressful time for students with ASD and their families (Taylor & Seltzer, 2011), both the students and parents in this study perceived the transition to and exit from college positively. The fit of the institution of higher education to the individual student is a recognized factor in transition success (Adreon & Durocher, 2007; VanBergeijk et al., 2008). Billstedt and colleagues (2011) suggest that an autism friendly environment should also contribute to positive student outcomes. For example, although there was a slight discrepancy between perceptions of students and parents, both indicated that the program resulted in positive student life experiences. Student life outcomes included such experiences as learning new things, having a roommate, and being supported by teachers. Other positive outcomes related to improved organizational skills, making new friends, and developing a willingness to ask for help. The program was likely a good fit for the individual students and parents in the current study. Although small campuses are advocated for some students with ASD (VanBergeijk et al., 2008), the participants in this study found a large university to be autism friendly. Several students expressed that they did not want to be perceived as different, and it is likely that the large and diverse student population provided opportunity for them to have anonymity or find others with similar interests.

There is limited research on 16 to 21 year-old youth with ASD and intellectual disabilities, and the path to a PSE option and program

outcomes vary (Hart, Grigal, & Weir, 2010). Students and parents self-selected to enroll in the PSE program of this study, so it is likely that the program afforded the type of college experience they sought. It is also likely that the program addressed the goals (e.g., residence hall living, structured academic and nonacademic supports, communication channels for families and staff) that these constituents viewed as priorities. Many families commented that the knowledgeable staff, success of past students, and emergency procedures and call numbers helped them to feel that their students would be safe and thrive.

As in prior research, the perceptions of parents do not always align with those of the students and other stakeholders (Chambers et al., 2004). We found a significant difference between student and parent ratings at the end of the first semester of college on the dimensions of Student Life (with large effect sizes for four items) and Independent Living (with a large effect size for one item). Parents rated Student Life items: how many new experiences the student had, how much he or she liked being part of the university experience, the helpfulness of residence hall assistant (RA), and having a roommate, higher than the students rated these items. Parents did not witness the day-to-day challenges of the student, fully understand the reporting role of the RAs—especially related to disturbances in which the student might be involved—and did not have to mediate frequent roommate disagreements. Therefore, it is not unexpected that parents would feel more positively than the students themselves about new experiences, the RAs, and having a roommate.

Student success may have positively influenced parental ratings. It is likely that most, if not all of the parents, were relieved to know that their student had successfully completed the first semester. Several parents reported that their students contacted them very infrequently and that they did not know much about the specifics of the student's daily challenges and experiences. Staff noted that several students considered themselves to be independent adults. Advisors reported that these students actively chose to not communicate with their parents. At the end of fall semester of year one, parents also rated the Independent Living item: I used hall and community resources, significantly higher than students did. Some students did not have the communication skills to fully express themselves nor effectively self-advocate. Others did not wish to be perceived as needy nor draw attention to themselves. Yet, parents recognized growth in their students, and they may have assumed that students were fully utilizing these resources.

Significant differences between students and parents were also found at the end of the spring semester of year two as students,

families, and agencies were collaboratively planning for the student's transition to their home communities. Parent ratings were significantly higher on six Student Life items, seven Independent Living items, and two Interpersonal Relationship items. To program staff, the transition semester of preparing to return to their home communities appeared to be equally or more stressful than the transition to college for the students. Students were concerned about the need to live independently, to be gainfully employed, to maintain friendships they had made in college, and to succeed in the adult world. Students were acutely aware that they were going to be in charge of their lives in ways that they had not been previously.

To offset some of the student's transition concerns in the final semester of college, program staff and advisors emphasized interdependence (vs. independence; Kim & Turnbull, 2004) and the student's self-identified circle of support. Each student's circle included a number of people he or she selected who would be available in the future to provide assistance, emotional support, and problem-solve.

The significantly higher parent ratings at the end of the exit semester may in part be due to the fact that parents have deep knowledge of the student's challenges, talents, and interests. Parents may be more likely to recognize the magnitude of the student's development, skill acquisition, and accomplishments than the student himself or herself. Parents felt significantly more strongly than students that the student had learned more about personal challenges, cleaned their rooms and did their laundry, learned about appropriate behavior in public, showed improved organizational skills, learned about job interests, met their semester goals, and better understood their disability during the exit transition period than students did. Parents also felt that their student was respected by other students and got along with others significantly more than the students themselves. Again, parents were likely to recognize student growth across time, but were not always aware of the magnitude of student stress during the spring semester of year two. Students needed to achieve academically, vocationally, and interpersonally to graduate. They also needed to prepare for returning to their home communities. Each student had spent considerable time developing goals for the future, evaluating their skills and interests in relation to work opportunities, applying for jobs, and planning how to stay in touch with friends. Together these pressures heightened students' anxiety and concerns for the future.

Limitations and Future Research

Several limitations of the current study suggest directions for future research. This study examined the perceptions of a small

sample of students with ASD and their parents ($N = 16$). Students from across the U.S. participated, but the sample was comprised of students attending one large university program. Approximately one-third of the participants received a need-based scholarship, however, parents were predominantly of middle class to higher socio-economic status with postsecondary educations. Results cannot be generalized to PSE programs across the country. Replication studies are needed to determine the level of satisfaction of students and parents, the alignment of their views, and the relationship of the results to program models.

Survey data have a range of limitations such as the "inability to determine cause and effect" (Underhill, 2005, p. 294). The survey data herein were collected as part of the program's formative evaluation process. Staff and volunteers received training related to survey administration. When researchers also function as service providers, there exists a possibility of impacting the study (e.g., participant responses, interpretation of results). Future investigations of the transition to and from college should make efforts to minimize staff/researcher impacts, include a substantial number of participants, and procure input from participants attending different program models in different regions of the U.S. Future research participants should be representative of the diversity of the population of students with ASD.

This is the first study known to examine the perceptions of students with ASD and parents at two critical junctures in the college experience (i.e., the transition to and from college). A multi-modal approach to examining PSE transitions, including direct observations, interviews, and/or input from peers, faculty, and advisors, would strengthen the results and provide data that could be triangulated for a better understanding of the transition process and the supports and resources that might improve student outcomes.

Because this is not an experimental study, one cannot determine causal relationships. Investigations of factors that prepare students with ASD for college, support their transition to college, and affect the transition from college into adult life are needed. It is well established that students with ASD are a heterogeneous population (e.g., Taylor & Seltzer, 2011), and the investigation of student and program characteristics that enhance the probability of a good fit for the individual student are needed to maximize educational outcomes. Questions pertaining to the differential impact of on-campus residential living, inclusive internships, the frequency and quality of advising, family involvement, academic supports, faculty-student engagement opportunities, disability and counseling services, and the like remain to be answered.

Any scaled up research also should examine questions related to the reciprocal impact that students with ASD have on one another and on their peers. Questions related to how colleges, education agencies, and the community can best support postsecondary students with ASD in rural and urban communities will need to be addressed. Finally, longitudinal studies that compare experiences and outcomes of students with and without ASD (and other disabilities) are needed to contextualize results and evaluate long-range outcomes.

Implications for Practice

The recommendation for PSE institutions to provide proactive, individualized supports has been proffered in the past (e.g., Wolf, 2001), but research on effective implementation models is lacking (Cullen, 2015). Institutions of higher education (IHEs) are in the early stages of developing comprehensive, integrated support services for students with ASD and other disabilities (Hart et al., 2010; Longtin, 2014), and it will be important for IHEs to partner with government and community agencies on behalf of students with disabilities. Included in this partnership should be secondary educators and administrators who (a) must become knowledgeable about PSE education options, (b) take an active role in developing family expectations and advocacy skills, (c) prepare high school students academically and socially, (d) encourage students to take advantage of PSE opportunities, and (e) work with IHEs to facilitate the transition of students with ASD to college through utilization of formal and informal supports (McCall, 2015; VanBergeijk et al., 2008).

Institutions of higher education can enhance their effectiveness for all college students, including students with ASD, by ensuring accessibility, employing universal design for learning, and providing professional development for faculty and staff on disability issues and 21st century pedagogy. Longtin (2014) argues that the infrastructure and an array of support services beyond the disabilities office (e.g., counseling and career centers, speech and language clinics, academic support programs) are currently available and can be utilized at a relatively low cost. Many IHEs have residence hall living-learning communities. These programs have documented positive effects on first year students' academic and social transitions (Inkelas, Daver, Vogt, & Leonard, 2007). Selective placement in campus-based living-learning communities may also facilitate transitions for students with ASD. Accommodations appropriate for students with other disabilities may not suffice for students with ASD. The

menu of accommodations and the manner in which they are implemented need to be expanded. For students with ASD, structured, individualized supports related to their specific challenges are required (Cullen, 2015). University staff and faculty are insufficiently prepared to serve students with ASD. It is likely that IHEs have staff and faculty who could provide college-wide professional development. Processes and incentives should be put in place to employ these human resources.

Strategies that afford the proactive (Ciccantelli, 2011) and continued involvement of families in the student's PSE experience are also needed. Families may be ill-informed about or intimidated by the prospect of their student attending college (Griffin et al., 2010). Pre-enrollment orientation visits that acquaint families and students with the IHE and the range of IHE services are important. Such orientations would allow parents to better identify a program that fits the student's needs and aspirations. A student-family-institution feedback loop would potentially provide IHEs with a better understanding of the needs of students with ASD and which services are the most instrumental in improving retention and graduation rates.

Conclusion

In summary, students with ASD and cognitive disabilities are attending PSE programs across the U. S. in unprecedented numbers. It will be essential for IHEs to develop models for serving students with ASD that maximize the institution's resources. Program models and outcomes will necessarily differ. The ultimate goal is for students and parents to identify an IHE of good fit. Improving the college experience of students with ASD and cognitive disabilities benefits students, families, and society.

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