Social Capital and Career Preparation: Postsecondary Students with Mobility or Sensory Disabilities

Pamela Luft[1]
Collin Meyer[1]

Abstract

This study examined the social networks of 26 postsecondary students with mobility and sensory disabilities regarding their perceptions of career preparation and career choice confidence. Social networks have been shown to contribute to postsecondary students' academic success and establishing a successful career for those with and without disabilities. This study examined the social capital resulting from social networks consisting of parents, family, friends, acquaintances (e.g., teachers, counselors, advisors), and interest groups or hobbies. Participants rated their perceptions of career preparation and career choice confidence twice during the study: once in the early weeks of a summer employment internship and after a career-focused presentation and internship completion. Measures of career preparation included self-rated abilities in (a) finding a job, (b) interviewing successfully, (c) keeping a job, and (d) resolving career accommodation challenges. Results showed that social capital contributed significantly to perceptions of career preparation. Career choice confidence remained stable suggesting satisfaction with their choice. A path analysis examined both career variables in conjunction with demographic factors, finding that social capital increased with age. Analyses suggested a number of other relationships between social capital, career perceptions, and demographic variables indicating complexities that warrant additional research.

Keywords: mobility disabilities, sensory disabilities, career preparation, social networks, social capital

Individuals with disabilities are less likely to be fully employed, earn salaries commensurate with their training, or have equal opportunities for career advancement. This disparity begins after high school graduation with reduced levels of postschool success compared with their peers without disabilities (Mazzotti et al., 2021; Newman et al., 2011). They neither enroll in higher education nor attain a bachelor's degree at similar rates; even after achieving this degree, they are three times less likely to be employed (Bureau of Labor Statistics, 2019, 2021, 2022; National Center for Educational Statistics, 2019; U.S. Census Bureau, 2016).

Transition programming to address these disparities has resulted from federal legislation, beginning with IDEA (1997, 2004) and the Workforce Innovation and Opportunity Act (2014). Important strategies to further empower students with disabilities in achieving their postsecondary and employment goals are in developing strong and broad social networks, which contribute to their becoming more fully engaged and completing their postsecondary degrees, and to obtaining and succeeding in their later careers (Alemán et al., 2012; Behtoui & Neergaard, 2016; Dokuka et al., 2020; Dufur et al., 2013; Fleming et al., 2017; Punch & Duncan, 2022; Stadtfeld et al., 2019). However, the ways in which social capital contributes to the future successes of individuals with disabilities are not well understood (Langford et al., 2013).

Social Networks and Social Capital

Social networks consist of the different personal relationships an individual may have, and social capital is the benefits derived from these relationships (Duncan et al., 2021). Putnam (2000) conceptualized social capital as consisting of close and strong networks among family and friends that can provide emotional and other support. More distant and weaker networks extend across a broader range of people and offer new perspectives, supports, and knowledge.

[1] *Kent State University*

This model posits that young adults with both broad and strong social networks are better positioned to bring a range of resources to the tasks of entering and completing postsecondary training, securing employment and succeeding in their careers. For example, job seekers typically use multiple methods and networks to identify and obtain employment. They contact employers and use internet resources, professional organizations, friends, family members, acquaintances, teachers and others among their networks (Langford et al., 2013).

Strong social capital and networks have been shown to improve individual academic achievement (Behtoui & Neergaard, 2016; Dufur et al., 2013), life aspirations, and career planning (Ellison et al., 2014). Those with multiple avenues of social capital have resources that contribute more broadly to their quality of life. These networks positively influence students' postsecondary aspirations, increase their academic performance, and support their transitions to higher education and employment (Dokuka et al., 2020; Punch & Duncan, 2022; Stadtfeld et al., 2019). The positive influence is not limited to face-to-face networks: online social networks can contribute to more equitable postsecondary outcomes, especially for underserved and marginalized groups (Alemán et al., 2012).

Social networks affect employment success as well. Effects can occur during the initial assessment of job candidates; for later performance evaluations, promotions, and reward distributions; and with an individual's job satisfaction and opportunities for socialization and integration (Castilla et al., 2013b). Employment networks typically exchange four types of interpersonal resources: information, learning, influence, and support (Castilla et al., 2013a). Employees who use their social connections to engage in these functions can improve their employment outcomes and signal to others regarding their ability, legitimacy, and status.

Aime et al. (2011) proposed a model for improving employee satisfaction and productivity using both close and distant networking relationships, which have the potential to become especially important to the long-term success and satisfaction of workers with disabilities. Expanding and strengthening these relationships contributes to employees' influence in their workgroups and incorporates external employment information that enhances their careers (Aime et al., 2011). In sum, these studies emphasize the importance of future workers building and utilizing networks for long-term career success, and that this process should begin during their postsecondary years.

Networking Effects for Persons with Disabilities

Disability research has largely overlooked the contributions of personal and professional relationships in creating effective social networks. Little is known about these individuals' successes or limitations in leveraging their networks (Langford et al., 2013). The influence of social dynamics on overall satisfaction and success can differ for individuals with disabilities. They often face increased challenges in preparing for, securing, and succeeding in their careers, with some studies suggesting that their accrued social capital may be less than that of their peers.

In fact, Kulkarni (2012) suggested that workers with disabilities may be disadvantaged overall in terms of relational inclusion. She recommended structured socialization programs and focused training to promote their more active engagement in social networking. Tough et al. (2017) found that social relationships played an important role in mental health and overall wellbeing in persons with disabilities. Integrating into social networks seemed to be insufficient and these authors also recommended some type of focused intervention or support.

Several studies indicate that the success of postsecondary students with disabilities can be improved through social networks. Punch and Duncan (2022) reported that students' success was influenced by community, school, and family networks as well as their individual characteristics. Lindsay et al. (2021) interviewed students with physical disabilities regarding their career aspirations and social networks. Half identified family and other social networks in fostering career aspirations and job preparation. Fleming et al. (2017) reported that social networking interventions could provide a beneficial buffer for students who experienced disability-related bias from faculty/staff or peers. These networks also increased students' sense of belonging and satisfaction with their postsecondary programs, supporting higher rates of completion.

Philp and Gill (2022) examined characteristics of social networks including size (total contacts), social status (average prestige of occupations), network orientations, and social resource mobilization (brokering) for youths with disabilities. Only the total number of contacts was significantly related to resource mobilization, suggesting the importance of both close and distant relationships. Langford et al.'s (2013) research similarly suggested that individuals who had many weak ties such as acquaintance relationships, might gain more dispersed and non-redundant job information that subsequently facilitated their job search process. Broad networks that include both close and distant relationships may therefore be

more beneficial than a strong network of close relationships. A focus on mostly strong relationships may ultimately reduce network effectiveness for workers with disabilities (Langford et al., 2013).

Other studies have examined predictors of employment for students with disabilities that included elements of social capital. Test et al. (2009) identified parental involvement as a potential transition practice with small to medium effects on employment. Student support through self-family-friend networks had medium effects on increased engagement in postschool employment. Landmark et al. (2010) identified parental involvement as a recognized best practice, with employment opportunities often obtained through contacts from family members and friends. Family also contributed to students' career decisions by providing ongoing supports for successful employment outcomes. Mazzotti et al. (2016) identified parental participation and parental expectations as potential predictors for employment, limited by a lack of research studies. Mazzotti et al. (2021) reported that parental involvement remained a promising predictor with additional studies supporting the effects of parental expectations, leading it to become a research-based predictor of employment. Berry and Domene (2015) studied Canadian postsecondary students with mobility and sensory disabilities, similarly reporting positive effects on employment outcomes from interactions with family members, friends, educational staff, employers, and community organizations.

These studies emphasize that networks contribute positively to the employment of individuals with disabilities; yet this area remains under-researched (Langford et al., 2013) and, therefore, potentially underutilized. In order to address the lack of research regarding social capital effects on careers of individuals with disabilities, the present study examined the effects of social networks on the career perceptions of postsecondary students with mobility and sensory disabilities. These individuals participated in a paid summer employment internship that aligned with their career majors. The analysis examined the contributions of four social network groups consisting of family, friends, acquaintances, and interest groups, to self-ratings of their career preparation and career choice confidence. Career confidence contributes as an aspect of self-efficacy with links to positive employment outcomes and abilities to thrive in the workplace (Nota et al., 2010; Zhu et al., 2019). The overall hypothesis was that social capital accrued from these interns' social networks contributed differentially to their career preparation and career choice confidence. The research questions were as follows:

1. Which aspects of social networks contributed to interns' perceptions of their career preparation?
2. Which aspects of social networks contributed to interns' confidence in their current career choice?
3. What were the contributions of social networks and demographic factors to interns' perceptions of career preparation in conjunction with career choice?

Materials and Methods

Participants

Study subjects participated in a summer 2021 employment internship program hosted by the Gregory S. Fehribach Center (Markle et al., in press). Interns had mobility or sensory disabilities, were recruited in Fall 2020, and accepted into the program February 2021. Over the past 10 years of operation, the Center has partnered with 39 employers, hosting 195 interns from 40 different colleges and universities, offering 396 internship opportunities. All interns are placed individually in positions related to their career majors. Internship work is scheduled from early June to early August with specific dates depending upon the organization. The 2021 internships used a mix of face-to-face and virtual work experiences due to the COVID-19 pandemic in accordance with the requirements and needs of each worksite.

Instrument

Career content was assessed based on a career success presentation delivered July 14, 2021 by the first author. It addressed two theories relevant to the career trajectories of individuals with disabilities. The first was based on Brolin and Lloyd's (2004) four career development stages: career awareness, career exploration, career preparation, and career assimilation (see also Thoresen et al., 2004). The presentation focused on the final stage that included successful career entry, maintenance/retention, retraining, advancement into fully developed careers, and successful exit from work. These topics were integrated with work adjustment theory which examines factors that promote person-environment fit including workers' satisfaction with their positions and their satisfactoriness to their employers (Bayl-Smith & Griffin, 2015; Dawis, 2004; Swanson & Schneider, 2013; Szymanski & Hershenson, 2005), which addresses effects due to disability, environmental perceptions, and behaviors that extend beyond securing appropriate accommodations. The strategies to enhance person-environment fit support successful career assimilation (Brolin &

Lloyd, 2004; Thoresen et al., 2004) and the alignment of these theories can better prepare individuals with disabilities for successful career trajectories.

The presentation occurred using Cisco WebEx and PowerPoint, followed by a question-and-answer session (contact the first author for presentation content). The survey instrument assessed presentation content using a pre/post strategy. It asked interns to self-rate across four career elements: (a) finding a job in a chosen career, (b) interviewing successfully, (c) keeping the job, and (d) resolving career accommodation challenges. Interns also rated their career choice confidence. All ratings used a 6-point Likert scale ranging from strongly disagree (1) to strongly agree (6) with higher scores representing stronger agreement. Surveys were developed March through May 2021 and approved by internship program staff in June 2021.

The duration of the internship was approximately eight weeks, providing reduced opportunities for developing peer or workplace relationships, also due to COVID-19 restrictions. As a result, social capital was measured only in Survey 1, as were demographic variables. Several career content ratings were added to Survey 2 to evaluate presentation effectiveness. The two surveys were entered into Qualtrics. Survey 1 was sent in early June. Survey 2 was to be sent during the last week of internship; however, the Center's email was hacked and nonfunctional for five weeks, delaying this until the end of September. Surveys were sent by the program staff to maintain confidentiality, with an email link to Qualtrics followed by two general reminders.

Analyses

Social capital was measured through participants' ratings of family, friends, acquaintances, and interest group contributions to their careers. Perceptions of career preparedness and career confidence were measured using the 6-point rating scale described earlier. Analysis used a pre/post comparison (Surveys 1 and 2) of ratings with an ANOVA procedure that compared these across the four career preparation items. Preliminary correlation analyses examined relationships between social network elements for Research Question 1 (family, friends, acquaintances, and interest group components of social network ratings), and these career preparation elements. Research Question 2 used correlation analysis to examine the effects of social networks on participants' confidence in having chosen the right career.

Research Question 3 examined interrelationships among demographic variables, the social networks, and the Survey 1 and 2 career preparation and career confidence self-ratings. The four social network elements and four career preparedness item ratings were converted into two composite variables using Rasch rating scale modeling, an item response theory approach to factor analysis. The Winsteps software package (Linacre, 2023) was used to affirm Rasch model assumptions (Bond, et al. 2021), for item refinement, and to generate reliability estimates.

Variables were then entered into a path analysis model (Schumacker & Lomax, 2010). Path models enable a sophisticated multi-variable correlational analysis through a series of simultaneous regressions that can account for interrelated predictors. Analyses were conducted in R version 4.0.2 using the mirt (Chalmers, 2012) and lavaan (Rosseel, 2012) packages, and a path diagram was generated using lavaanPlot (Lishinski, 2021).

Results

Descriptive Statistics

Across the total pool of 52 interns, 42 (80%) completed Survey 1 and 36 (69%) completed Survey 2; of these, 26 (50%) had matching survey responses. These 26 formed the basis for the subsequent comparative analyses. The 26 interns ranged in age from 19-43 with a mean age of 22.7 years. The majority (62%) were female, and the rest identified as male with no other gender identifications. All respondents were sophomores or above, with graduate students comprising the largest plurality and juniors the smallest (see Table 1). Ethnic and racial diversity was limited with the majority being white (78.6%) and remaining groups each consisting of less than 5% (n = 1-2). Other questions asked for age and mean number of prior work experiences. One senior intern had 10 prior work experiences which increased what otherwise would have been a more typical mean of 1.9 for that group. Those who had graduated or were engaged in further education had the least number of mean prior work experiences.

Interns had a mix of mobility and sensory disabilities as shown in Table 2. Those with low vision were the largest group followed by wheelchair users and those who were hard of hearing. The category of "other disabilities" included speech, cerebral palsy, and Type 1 diabetes, with 11 (42%) who reported having additional disabilities.

Item Correlations and ANOVA comparisons

Analyses for Research Question 1 examined relationships between the social network elements (family, friends, acquaintances, and interest groups) and interns' perceptions of the four career preparation

Table 1

Year in School

Year	*n*	%	Mean Work Experiences
Sophomore (Year 2)	7	26.9	1.7
Junior (Year 3)	4	15.4	2.5
Senior (Year 4)	7	26.9	2.9
Graduated/further education	8	30.8	1.4

Table 2

Primary Disability

Disability	*n*	%
Hard of hearing	5	19.2
Deaf	3	11.5
Mobility: non-wheelchair user	1	3.8
Mobility: wheelchair user	5	19.2
Low vision	7	26.9
Blind	2	7.7
Other disability	3	11.5

items. Between Surveys 1 and 2, interns' perceptions of overall career preparedness grew markedly from an average of 1.98 (SD = 2.35) to 4.85 (SD = 2.49). A repeated measures ANOVA confirmed this change as large and statistically significant ($F_{1,25}$ = 35.016, p < .001), further supported by findings of a large effect size ($\eta^2_{partial}$ = .583).

Results also evidenced effects for both close and distant social network relationships that differed across the four career preparation items. Initial inter-item correlations showed that interns' perceptions of their skills in finding a job was significantly associated with interest groups (r = .666, p < .001). Perceptions of their interview preparedness was associated with interest groups (r = .631, p < .001), family members (r = .460, p = .021), friends (r = .485, p = .014), and acquaintances (r = .418, p = .037). Those who felt better prepared to keep a job reported strong influences from interest groups (r = .723, p < .001). Perceived ability to resolve career accommodation challenges was associated with influences from interest groups (r = .715, p < .001), friends (r = .425, p = .034), and acquaintances (r = .436, p = .029). In summary, the four types of relationships (family members, friends, acquaintances, and interest groups) each contributed to different elements of interns' perceptions of their career preparation with only interview preparedness significantly influenced by all four social networks.

Investigations for Research Question 2 began with bivariate correlations among the four social networks and interns' confidence in their chosen career path. Interns' confidence at Survey 1 had a mean of 5.16 increasing to 5.38 at Survey 2, though this increase was nonsignificant ($F_{1,24}$ = 2.000, p = .170, η^2partial = .077). Other analyses showed that career choice confidence correlated positively but non-significantly with all four social capital items for Survey 1: interest groups (r = .297, p = .169), family (r = .386, p = .069), friends (r = .036, p = .872), and acquaintances (r = .350, p = .102). Similar patterns occurred with Survey 2. Overall, the positive relationships among the social network relationships (family members, friends, acquaintances, and interest groups) and interns' career choice confidence suggest that these networks all contribute to overall career confidence, despite not reaching significance.

Path Analysis

For Research Question 3, multi-item scales were converted into single variables using Rasch modeling; scores were generated this way for social capital and career preparation. The social capital scale demonstrated adequate reliability with Cronbach's alpha of .70. Reliability was stronger for the perceived career preparedness scale with alphas of .80 and .86 for Surveys 1 and 2, respectively. Based on this, relationships between demographics, social capital, perceived career preparation, and career confidence were explored using path analysis.

The path model was successfully identified after a single iteration, and global fit statistics indicated good model fit ($\chi^2 = 1.13$, $df = 6$, $p = .98$; CFI = 1.00; TLI = 1.00; RMSEA < .001; SRMR = .04). On Survey 1, after controlling for significant covariates, positive paths were identified between the number of work experiences and perceptions of career preparedness ($p = .04$), career preparedness and career choice confidence ($p < .01$), and between age and social capital ($p = .04$). The path between perceptions of career preparedness from Survey 1 to Survey 2 was significant ($p < .01$), as was the path between career choice confidence ($p < .001$).

Relationships among career preparedness and social capital items all were nonsignificant and the correlation between Survey 1 career preparedness and overall social capital also was not significant ($p = .053$). However, bivariate correlations of the social networks showed significant correlations with family ($p = .03$) and acquaintances ($p = .02$), suggesting further patterns to examine. Regression coefficients are shown in Table 3 and a diagram of the path model shows standardized coefficients in Figure 1.

Although disability type and other demographic variables were uncorrelated with the above variables, age was a significant predictor of social capital. Despite age having a generally positive association with career preparedness, this relationship fell short of significance after controlling for the number of prior work experiences and social capital: older interns reported significantly more social capital when the number of work experiences was held constant.

There also was a positive bivariate association between age and perceived career preparedness, but this relationship was no longer statistically significant after controlling for previous work experiences and social capital. Interns reporting more prior work experiences also tended to report higher levels of career preparedness on Survey 1 after controlling for age and social capital; but age and social capital were not themselves significant predictors of career preparedness after controlling for previous work experiences. Early career preparedness ratings (Survey 1) were also positively and significantly associated with early career choice confidence as well as later (Survey 2) career preparedness. Early career choice confidence was positively and significantly associated with later career choice confidence.

In summary, although interns' perceptions of their career preparedness initially improved their career choice confidence, this effect disappeared when perceived preparedness increased in the second survey. Interns' number of work experiences also had a direct positive impact on career preparedness in Survey 1 ($B = .38$, $p = .04$). However, by Survey 2 and intern's increased overall career preparedness, there was no longer a direct association between prior work experiences and preparedness ($B = -.01$, $p = .97$).

A repeated measures ANOVA demonstrated no change in the mean levels of interns' career confidence between surveys ($F_{1,24} = 2.00$, $p = .17$). The path analysis indicated that over half of the variance in career confidence on Survey 2 was associated with initial confidence levels at Survey 1 ($B = .75$, $p < .001$). This stability contrasts with interns' overall increase in career preparedness, which was significant and showed a large effect size, described previously.

In terms of social networks, although older interns reported higher levels of social capital on average ($B = .40$, $p = .04$), social capital did not in turn, show a direct path to increased levels of career preparedness after adjusting for age and number of work experiences. Social capital also did not have a significant path to career choice confidence when controlling for career preparedness. The path analysis confirmed several interrelationships among social networks, career preparation, and career choice confidence, but also suggests complex patterns of direct and indirect effects on career measures, with some variables acting as confounds on others.

Discussion

This study examined social capital accrued through the social networks of postsecondary students with mobility and sensory disabilities engaged in a summer employment internship. This was an effort to increase the research-derived understandings of social networks' effects on the careers of individuals with disabilities. Participants were presented with career content from career development and work adjustment theories as strategies to improve their trajectories toward successful careers. They were assessed on this career content with analyses that examined the influences of social networks on perceptions regarding their careers.

Table 3

Path Analysis Regression Coefficients

Outcome Variable	Predictor	*b*	*B*	*SE*	*Z*	*p*
Career Preparedness, Survey 1						
	Age	.16	.35	.09	1.76	.08
	Social Capital	.23	.11	.40	.57	.57
	Number of Work Experiences	.35	.38	.17	2.02	.04*
Career Preparedness, Survey 2						
	Career Preparedness, Survey 1	.59	.53	.22	2.75	.01**
	Social Capital	-.02	-.01	.42	-.05	.96
	Number of Work Experiences	-.01	-.01	.20	-.03	.97
Confidence, Survey 1						
	Social Capital	.11	.14	.14	.79	.43
	Career Preparedness, Survey 1	.20	.51	.07	2.84	.01**
Confidence, Survey 2						
	Confidence, Survey 1	.85	.75	.20	4.24	.00***
	Social Capital	.02	.02	.14	.16	.87
	Career Preparedness, Survey 1	-.01	-.03	.09	-.15	.88
	Career Preparedness, Survey 2	-.10	-.24	.07	-1.40	.16
Social Capital, Survey 1						
	Age	.09	.40	.04	2.02	.04*
	Number of Work Experiences	.06	.13	.09	.68	.50
Number of Work Experiences						
	Age	-.11	-.22	.10	-1.07	.28

Note. b = unstandardized coefficient; B = standardized coefficient; * $p < .05$; ** $p < .01$; *** $p < .001$

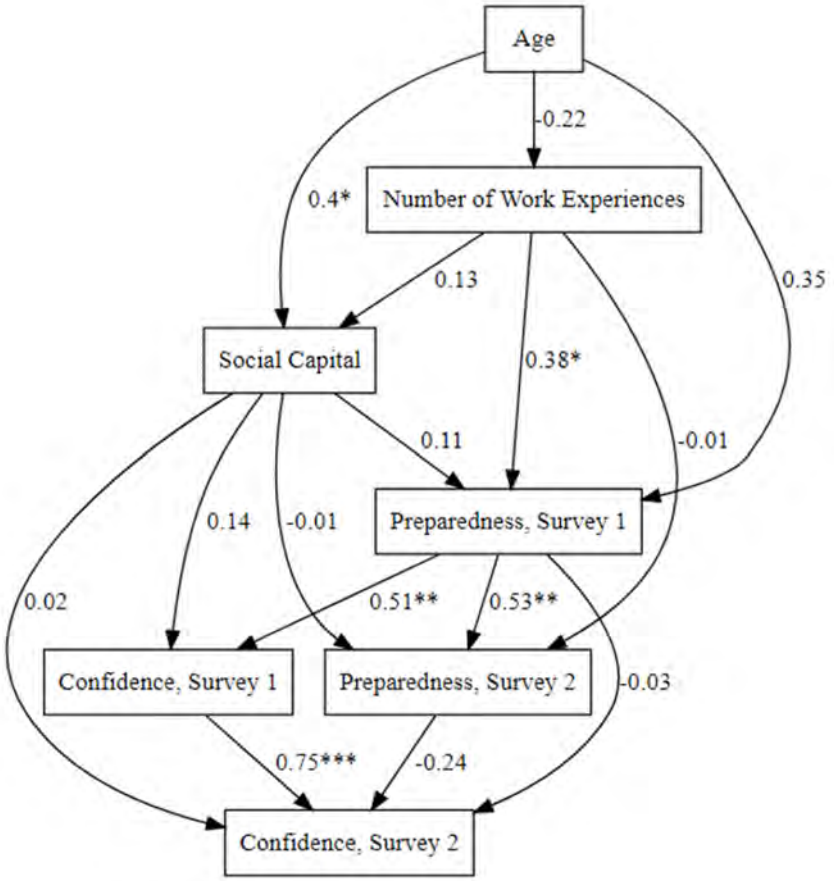
Research Question 1 examined the contributions of social network relationships (family, friends, acquaintances, and interest groups) to interns' perceptions of their career preparation. These four career elements showed significant improvement between Surveys 1 and 2 with a large effect size. They also showed varying relationships with the family, friends, acquaintances, and interest groups with no single social capital factor showing significant bivariate correlations across all four career elements. This finding supported the hypothesis of differential relationships between career preparation and the social capital factors: each contributed uniquely. This finding also aligns with research on the importance of having a range of close and distant network relationships (Aime et al., 2011; Langford et al., 2013; Philp & Gill, 2022; Putnam, 2000).

Several social network elements were significantly correlated with each other, supporting a theoretical connection between these, the four career preparation elements and social capital. Further analysis of the differential nature of these relationships suggests interns used all four network groups to support their interview skills, but they believed network relationships other than families as more helpful for resolving accommodation-related issues after obtaining a job. Interns may perceive more distant relationships as providing more experience and expertise that would vary by disability and setting-specific characteristics. This finding reinforces the importance of developing broad and diverse social networks, and which increased with age.

Results for Research Question 2 showed an overall lack of bivariate significance, suggesting that

Figure 1

Path Diagram with Standardized Coefficients



interns' career choice confidence remained stable, perhaps from satisfaction with their choices. Analyses found positive correlations that suggested relationships between career choice confidence and the social capital factor of family, with further contributions from interest groups and acquaintances; but overall, these remained shy of significance. Whether in whole or in part, network factors may still affect career choice confidence with additional research needed to explore these effects, with a larger sample that may strengthen these observed relationships.

Research Question 3 used path analysis to examine interrelationships suggested by the bivariate correlations from Questions 1 and 2. These relationships were seen in interns' perceptions of career preparedness that initially increased their career choice confidence; however, this effect disappeared by Survey 2 as perceived levels of preparedness grew and career confidence remained stable. This disappearance possibly occurred because change was unequally distributed. Interns with higher initial levels of career preparedness showed lower average increases in their career choice confidence; those with early and high levels had reduced occasion for measurable change.

Social capital also showed a relationship with age: older interns exhibited higher levels of social capital. However, there was no direct path to increasing levels of career preparedness after adjusting for age and number of work experiences, nor to career choice confidence when controlling for career preparedness. This finding suggests that programs seeking to foster social capital should implement strategies that foster and build upon age-based improvements.

Analyses also showed that interns who rated their career preparation and career confidence higher on Survey 1 tended to rate themselves higher on Survey 2, although the correlation for career preparation was smaller due to its overall growth. The number of work experiences also contributed to perceptions of career preparedness. This finding aligns with career development theory (Brolin & Lloyd, 2004; Thoresen et al., 2004) in suggesting that multiple work experienc-

es support/promote/encourage progressive narrowing and confirming career choices.

The path analysis also showed generally positive although nonsignificant relationships, suggesting that social network factors contribute initially to career choice confidence and perceptions of preparedness prior to work-based experiences: path coefficients were larger for Survey 1 than Survey 2. This could mean that early perceptions of career preparation and confidence are based largely on interactions with social network members. However, work experiences may equalize or reduce these effects as the individual's involvement in work settings affirms or modifies his/her perceptions. Further research could help confirm these relationships.

Overall study results indicate that a range of close (family and friends) and distant (acquaintances and interest groups) relationships contribute variously and significantly to perceptions of career preparation for postsecondary students with mobility and sensory disabilities. These social networks also contributed to their career choice confidence, although not significantly: confidence ratings were relatively stable and interns were apparently satisfied with their career choices. The examination of career preparation and choice with demographic characteristics also indicated multiple relationships and interrelationships that were influenced by age and numbers of prior work experiences. This again reaffirms the complex and differential contributions of social capital to one's career that also change with age and over time.

These varying relationships align with previous research regarding the importance of developing a broad range of social network relationships. Programs should take every opportunity to expand students' range of relationships in order to prepare them for the varying challenges they will face, and to address their potentially lower levels of social and networking inclusion (Kulkarni, 2012; Tough et al., 2017). A useful strategy is seen in undergraduate students' use of social media leading to increased social capital (Martínez-Alemán & Wartman, 2008). Shoham and Heber (2012) studied 2050 online postings in a deaf and hard-of-hearing forum, finding a range of *informational support, tangible assistance, emotional support, social network support,* and *esteem support* requests. This finding suggests the use of online platforms for expanding postsecondary students' networking opportunities as increasing their access to resources.

University-based disability and equity programs also could utilize social networking to facilitate increased disability inclusion and address intersectionality issues due to gender and culture (Alemán et al., 2012; Berry & Domene, 2015). Other research confirms that online social networks can function similarly to face-to-face networks with connections that vary across looser and more distant, or close and emotional relationships (Ellison et al., 2007; Katz & Rice, 2002). Peer and mentor networking groups can further expand and support these efforts. Peer network contacts can be additionally increased through course-based and institutional activities, using virtual and online interactions for study groups and long-term group projects (Alemán et al., 2012; Dokuka et al., 2020; Philp & Gill, 2022; Stadtfeld et al., 2019).

In fact, these activities can benefit all students in that increased social engagement with programs and universities can improve program satisfaction and retention (Fleming et al., 2017; Kuh et al., 2006). Retention and completion rates are increasingly scrutinized as measures of postsecondary program quality (Ohio Department of Education, 2022). Such efforts could use campus services that encourage faculty to assign long-term, interactive, course-based projects and study groups as means to improve student networking, integration, and overall engagement.

Another means for engaging and retaining students is through internships or work experiences. Study findings suggested that social networks contributed initially to career confidence and perceptions of career preparation, but that this influence was lessened after internship completion. Social capital may contribute to students' choice of a major, but work experiences would seem to result in interns' own evaluations to confirm or modify these choices. Social networks then regain importance as individuals search for and interview for jobs, address accommodation and work-site challenges, and integrate and succeed in their careers (Aime et al., 2011; Castilla et al., 2013a, 2013b). Programs working with these students can help them build and expand networks that often start with family and friends, and expand with age. A further benefit to colleges is that work experiences can be a strategy to address declining enrollments and that further enhance their reputations (Sasser, 2009; Tu, 2022).

Limitations

A major limitation was the small sample, with only 26 of the 52 total interns that used matching self-identifiers. The significant relationships reported/detected, however, suggest these as robust patterns. Several coefficients approached significance suggesting effects that could have been stronger with greater numbers; other important relationships likely remained undetected. Correlations for Question 2 showed positive relationships among the social networks and with interns' career choice confidence, but

not at significant levels. Path analysis showed initial contributions to social capital from age, but subsequent effects were mitigated by other factors. A larger sample might have clarified the relationships that did not reach significance.

This study also occurred over a truncated timeline with the internship lasting approximately eight weeks. This timeframe limited interns' potential opportunities for social networking growth or change. Many interns were in online or hybrid internship placements due to the COVID-19 restrictions, further constraining opportunities for peer and workplace relationships. Some participants described supervisors who encouraged interviews with organizational administrators (Luft, 2022) but generally, social networking was restricted. The substantial delay in Survey 2 also likely reduced their recall of these effects on their careers.

Despite these concerns, analyses showed several patterns that should be further investigated with larger populations. Research could examine social networking effects and opportunities through longitudinal tracking extending into subsequent employment. Such studies could more clearly identify the nature and extent of social network relationships on career success across career trajectories, including factors that support successful resolution of potential worksite challenges. Analyses should include a range of demographic and career-related experiences to better understand how multiple factors contribute to career success.

Recommendations

The interns in this study were approaching graduation and workplace entry. Businesses and postsecondary programs could prioritize disability as part of their diversity and inclusion efforts, which has not yet occurred although such efforts are likely to increase (Gould et al., 2020). Barriers will likely remain until full equity and inclusion are established and become routine. Postsecondary students' experiences with forming and participating in social networking and use of social media, as well as engaging in work experiences, can provide important foundations as they move into and assume employment roles. These should include developing or contributing to disability networks and affinity groups in their employment settings (Disability:IN, 2020).

Study results and extant research suggest a number of strategies that can be implemented in programs working with postsecondary students, across internships or work experiences offered by degree majors and through disability services programs. Outcomes data suggest the contributions of employment internships, work experiences, or apprenticeship opportunities as part of postsecondary programs (Hora et al., 2021; Tu, 2022). Activities that increase academic outcomes, engagement, and inclusion (Fleming et al., 2017; Kuh et al., 2006) also are increasingly important evidence of program quality. Reporting of these data is required by the Higher Education Act of 2008 (Integrated Postsecondary Education System, n.d.) and may be used as indicators of program quality. Several of these strategies are described below.

Internship and Apprenticeship Programs

1. Explain to students the contributions of social capital for their postsecondary and job success; promote development of various close and distant network relationships; build on and expand new work relationships (Langford et al., 2013; Philp & Gill, 2022).
2. Build on age-based network growth: provide access to, or develop online disability, career, and interest or affinity groups; encourage face-to-face and online interactions with other interns, co-workers, supervisors, and mentors (Fleming et al., 2017).
3. Establish cohort-based networks that further expand existing relationships; increase networking by using prior graduates or returning students as mentors; find those who can provide examples of successful network use across career stages and challenges.

Postsecondary Disability Services Programs

1. Encourage faculty to facilitate network connections through long-term group projects and problem-solving or study groups (Dokuka et al., 2020; Stadtfeld et al., 2019) when providing faculty accessibility and accommodation trainings; explain peer networking as supporting student retention and engagement, and aligning with many fields that are becoming increasingly collaborative in nature (Turner et al., 2020).
2. Develop online resources and use returning or graduate students as mentors to increase current students' close and distant network relationships; use these to increase program participation and engagement to support long-term persistence in achieving their goals and graduating (Fleming et al., 2017; Kuh et al., 2006).
3. Provide information and resources to students about disability and diverse online opportunities and social media; use this to support more equitable outcomes, especially for un-

derserved or marginalized individuals and disability-specific groups (Alemán et al., 2012; Disability:IN, 2020); encourage students to form support groups and to network in ways that address barriers they experience with integrating into existing program or career networks (Philp & Gill, 2022; Tough et al., 2017).

Conclusions

Little is known about the networking access, successes, or limitations of individuals with disabilities in building and leveraging their social networks for career success (Langford et al., 2013). The present study was undertaken to better understand the nature and importance of social networks regarding early career paths of postsecondary students with mobility and sensory disabilities. The postsecondary stage of career preparation is an important point for beginning to effectively build and utilize these networks (Aime et al., 2011) and to increase resources for meeting and succeeding with future workplace challenges.

This study adds to extant research by showing that social networks contribute to the career development of individuals with disabilities; in this case, it was with postsecondary students with mobility and sensory disabilities. Correlation results between social networks and career preparation were positive and significant. Social capital also increased with age, with several other factors influencing the nature and extent of social network relationships, including prior work experiences.

The differing correlations between the four social networks, career preparation, and career confidence indicate that contributions vary across the range of close and distant connections. This aligns with previous research regarding the importance of broad sets of relationships in supporting both postsecondary and employment success (Fleming et al., 2017; Kuh et al., 2006). This research also suggests that beginning network development during postsecondary programs is important, in that concerns remain for later career success and needs to compensate for potential network exclusion (Kulkarni, 2012; Tough et al., 2017).

The interns in this study were selected based on their current postsecondary excellence; but not all such students will have such positive experiences or academic records. Programs working with postsecondary students who have disabilities should consider using and creating opportunities to expand their face-to-face and online networks to encompass a range of close and distant relationships. Another important avenue is to increase both work experiences and networking opportunities, and encourage programs to provide internships or apprenticeships related to students' academic programs. This approach will serve to support current program engagement and promote future career success. In this way, students with a range of disabilities will be better prepared to access and create opportunities that contribute to futures commensurate with their abilities and life goals, and provide them with needed resources to address the challenges they may face.

References

Aime, F., Dyne, L. V., & Petrenko, O. V. (2011). Role innovation through employee social networks: The embedded nature of roles and their effect on job satisfaction and career success. *Organizational Psychology Review, 1*(4), 339–361. doi: 10.1177/2041386611411230

Alemán, A. M. M., Rowan-Kenyon, H. T., Savitz-Romer, M., & Way, A. (2012). *Social networking and first-generation college student success: A conceptual framework for "critical" engagement and persistence efforts*. kdp0l43vw6z2dlw631ififc5-wpengine.netdna-ssl.com/wp-content/uploads/large/2015/04/Social-Networking-and-Student-Success-Romer-Martinez.pdf

Bayl-Smith, P. H., & Griffin, B. (2015). Measuring work styles: Towards an understanding of the dynamic components of the theory of work adjustment. *Journal of Vocational Behavior, 90*, 132–144.

Behtoui, A., & Neergaard, A. (2016). Social capital and the educational achievement of young people in Sweden. *British Journal of Sociology of Education, 37*(7), 947–969. doi: 10.1080/01425692.2015.1013086

Berry, S. J., & Domene, J. F. (2015). Supporting postsecondary students with sensory or mobility impairments in reaching their career aspirations. *Career Development and Transition for Exceptional Individuals, 38*(2), 78–88. doi: 10.1177/2165143413490792

Bond, T. G., Yan, Z., & Heene, M. (2021). *Applying the Rasch model: Fundamental measurement in the human sciences* (4th ed.). Routledge.

Brolin, D., & Lloyd, R. (2004). *Career development and transition services: A functional life skills approach*. Merrill Educational.

Bureau of Labor Statistics. (2019). *Persons with a disability, 2018. Current population survey.* Division of Labor Force Statistics. U.S. Department of Labor.

Bureau of Labor Statistics. (2021). *News release: Persons with a disability: Labor force characteristics—2020*. U.S. Department of Labor. http://www.advancingstates.org/sites/nasuad/files/labor%20forcc.pdf

Bureau of Labor Statistics. (2022). *News release: Persons with a disability: Labor force characteristics—2021*. U.S. Department of Labor. https://www.bls.gov/news.release/pdf/disabl.pdf

Castilla, E. J., Lan, G. J., & Rissing, B. A. (2013a). Social networks and employment: Mechanisms (part 1). *Sociology Compass, 7*(12), 999–1012. doi: 10.1111/soc4.12096

Castilla, E. J., Lan, G. J., & Rissing, B. A. (2013b). Social networks and employment: Outcomes (part 2). *Sociology Compass, 7*(12), 1013–1026. doi: 10.1111/soc4.12095

Chalmers, R. P. (2012). mirt: A multidimensional item response theory package for the R environment. *Journal of Statistical Software, 48*(6), 1–29. doi: 10.18637/jss.v048.i06

Dawis, R. V. (2004). Job satisfaction. In J. C. Thomas (Ed.), *Comprehensive handbook of psychological assessment, Vol. 4. Industrial and organizational assessment* (pp. 470–481). John Wiley & Sons, Inc.

Disability:IN (2020). *Employee resource group/ business resource group resources*. disabilityin.org/resource/erg-brg-resources/

Dokuka S, Valeeva D, Yudkevich M. (2020) How academic achievement spreads: The role of distinct social networks in academic performance diffusion. *PLoS ONE 15*(7): e0236737. https://doi.org/10.1371/journal.pone.0236737

Duncan, J., Colyvas, K., & Punch, R. (2021). Social capital, loneliness, and peer relationships of adolescents who are deaf or hard of hearing. *Journal of Deaf Studies and Deaf Education, 26*(2), 223–229. doi: 10.1093/deafed/enaa037

Dufur, M. J., Parcel, T. L., & Troutman, K. P. (2013). Does capital at home matter more than capital at school? Social capital effects on academic achievement. *Research in Social Stratification and Mobility, 31*, 1–21. doi: 10.1016/j.rssm.2012.08.002

Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "friends:" Social capital and college students' use of online social network sites. *Journal of Computer-Mediated Communication*, 12(4), 1143–1168. http://dx.doi.org/10.1111/j.1083-6101.2007.00367.x

Ellison, N. B., Wohn, D. Y., & Greenhow, C. M. (2014). Adolescents' visions of their future careers, educational plans, and life pathways: The role of bridging and bonding social capital experiences. *Journal of Social and Personal Relationships, 31*(4), 516–534. http://dx.doi.org/10.1177/0265407514523546

Fleming, A. R., Oertle, K. M., Plotner, A. J., & Hakun, J. G. (2017). Influence of social factors on student satisfaction among college students with disabilities. *Journal of College Student Development, 58*(2), 215–228. doi: https://doi.org/l0.1353/csd.2017.0016

Gould, R., Harris, S. P., Mullin, C., & Jones, R. (2020). Disability, diversity, and corporate social responsibility: Learning from recognized leaders in inclusion. *Journal of Vocational Rehabilitation, 52*(1), 29–42. doi:10.3233/JVR-191058

Hora, M. T., Colston, J., Chen, Z., & Pasqualone, A. (2021). Insights into the prevalence, quality, and equitable access to internships in higher education: Summary findings from the pilot phase of the NSCI at 17 colleges and universities. *National Survey of College Internships (NSCI) 2021 Report*. ccwt.wisc.edu/wp-content/uploads/2022/04/CCWT_NSCI-2021-Report.pdf

Individuals with Disabilities Education Act Amendments of 1997. Pub. L. 105-17, 20 U.S.C. § 1400 et seq.

Individuals with Disabilities Education Act Amendments of 2004. Pub. L. 108-446, 20 U.S.C. § 1400 et seq.

Integrated Postsecondary Education Data System. (n.d.). *Graduation rates*. Institute for Educational Sciences, National Center for Educational Statistics. nces.ed.gov/ipeds/survey-components/9

Katz, J. E., & Rice, R. E. (2002). Social consequences of Internet use: Access, involvement, and interaction. *MIT press*. http://dx.doi.org/10.7551/mitpress/6292.001.0001

Kuh, G. D., Kinzie, J. L., Buckley, J. A., Bridges, B. K., & Hayek, J. C. (2006). *What matters to student success: A review of the literature (Vol. 8)*. National Postsecondary Education Cooperative.

Kulkarni, M. (2012). Social networks and career advancement of people with disabilities. *Human Resource Development Review, 11*(2), 138–155. http://dx.doi.org/10.1177/1534484312438216

Langford, C. R., Lengnick-Hall, M. L., & Kulkarni, M. (2013). How do social networks influence the employment prospects of people with disabilities? *Employee Responsibilities and Rights Journal, 25*(4), 295–310. doi: 10.1007/s10672-012-9194-6

Landmark, L. J., Ju, S., & Zhang, D. (2010). Substantiated best practices in transition: Fifteen plus years later. *Career Development for Exceptional Individuals, 33*(3), 165–176. doi: 10.1177/0885728810376410

Linacre, J. M. (2023). *Winsteps*® (Version 5.2.0) [Computer Software]. www.winsteps.com

Lindsay, S., Cagliostro, E., Leek, J., & Stinson, J. (2021). Career aspirations and workplace expectations among youth with physical disabilities. *Disability and Rehabilitation, 43*(12), 1657–1668. doi: 10.1080/09638288.2019.1671505

Lishinki, A. (2021). *Path diagrams for 'lavaan' models via 'DiagrammeR'*. github.com/alishinski/lavaanPlot

Luft, P. (2022, July 21). *Career preparation and accommodation experiences of deaf and hard-of-hearing postsecondary students in a summer employment internship*. Presentation at the annual conference of the Association on Higher Education and Disability, Cleveland, OH, United States.

Markle, L., Wessel, R., & Parker, D.R. (in press). The Gregory S. Fehribach Center: An evidence-based internship program for students with physical disabilities. *Journal of Postsecondary Education and Disability*.

Martínez-Alemán, A. M., & Wartman, K. L. (2008). *Online social networking on campus: Understanding what matters in student culture.* Routledge.

Mazzotti, V. L., Rowe, D. A., Sinclair, J., Poppen, M., Woods, W. E., & Shearer, M. L. (2016). Predictors of post-school success: A systematic review of NLTS2 secondary analyses. *Career Development and Transition for Exceptional Individuals, 39*(4), 196–215. doi: 10.1177/2165143415588047

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

National Center for Education Statistics. (2019). *Students with disabilities.* https://nces.ed.gov/fastfacts/display.asp?id=60

Newman, L. A, Wagner, M., Knokey, A., Marder, C., Nagle, K., Shaver, D., Wei, X., Cameto, R., Contreras, E., Ferguson, K., Greenes, S., & Schwarting, M. (2011). *The post-high school outcomes of young adults with disabilities up to 8 years after high school. A report from the National Longitudinal Transition Study-2* (NLTS2) (NCSER 2011–3005). U. S. Department of Education. https://fdes.eric.ed.gov/fulltext/ED524044.pdf

Nota, L., Ginevra, M. C., & Carrieri, L. (2010). Career interests and self-efficacy beliefs among young adults with an intellectual disability. *Journal of Policy and Practice in Intellectual Disabilities, 7*(4), 250–260. https://doi.org/10.1111/j.1741-1130.2010.00274.x

Ohio Department of Education. (2022). *Ohio attainment: 2022 annual report.* https://www.lsc.ohio.gov/assets/organizations/legislative-service-commission/monthly-agency-reports/agency-reports/files/attainmentreport2022.pdf

Philp, K. D., & Gill, M. G. (2022). Brokering youth learning opportunities in after-school settings: The role of adult social networks and network orientations. *Translational Issues in Psychological Science, 8*(2), 257. https://doi.org/10.1037/tps0000311

Punch, R., & Duncan, J. (2022). The role of social capital in the transition to postsecondary education of students who are deaf or hard of hearing. *American Annals of the Deaf, 767*(3), 334–354. doi: 10.1353/aad.2022.0031

Putnam, R. D. (2000). *Bowling alone: The collapse and revival of american community*. Simon & Schuster.

Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software, 48*(2), 1–36. doi: 10.18637/jss.v048.i02.

Sasser, A. (2009). Lasting connections: Using internships to retain recent college graduates in New England. Policy Brief 09-3. *Federal Reserve Bank of Boston*. https://files.eric.ed.gov/fulltext/ED505611.pdf

Schumacker, R. E., & Lomax, R. G. (2010). *A beginner's guide to structural equation modeling* (3rd ed). Routledge.

Shoham, S., & Heber, M. (2012). Characteristics of a virtual community for individuals who are d/Deaf and hard of hearing. *American Annals of the Deaf, 157*(5), 251–263. doi: 10.1353/aad.2012.1625

Stadtfeld, C., Vörös, A., Elmer, T., Boda, Z., & Raabe, I. J. (2019). Integration in emerging social networks explains academic failure and success. *Proceedings of the National Academy of Sciences, 116*(3), 792–797. http://dx.doi.org/10.1073/pnas.1811388115

Swanson, J. L., & Schneider, M. (2013). Minnesota theory of work adjustment. In R. W. Lent & S. D. Brown (Eds.) *Career development and counseling: Putting theory and research to work* (pp. 29–53). Wiley.

Szymanski, E. M., & Hershenson, D. B. (2005). An ecological approach to vocational behavior and career development of people with disabilities. In R. M. Parker, E. M. Szymanski, & J. B. Patterson (Eds.), *Rehabilitation counseling: Basics and beyond*, (4th ed., pp. 225–280). Pro-Ed.

Test, D. W., Mazzotti, V. L., Mustian, A. L., Fowler, C. H., Kortering, L., & Kohler, P. (2009). Evidence-based secondary transition predictors for improving postschool outcomes for students with disabilities. *Career Development for*

Exceptional Individuals, 32(3), 160–181. doi: 10.1177/0885728809346960

Thoresen, C. J., Bradley, J. C., Bliese, P. D., & Thoresen, J. D. (2004). The big five personality traits and individual job performance growth trajectories in maintenance and transitional job stages. *Journal of Applied Psychology, 89*(5), 835. http://dx.doi.org/10.1037/0021-9010.89.5.835

Tough, H., Siegrist, J., & Fekete, C. (2017). Social relationships, mental health and wellbeing in physical disability: a systematic review. *BMC public health, 17*(1), 1–18. doi: 10.1186/s12889-017-4308-6

Tu, F. (2022). What can we learn from longitudinal studies on the impacts of college internships. *Literature Review, 5*. Center for College Workforce Transitions, University of Wisconsin Madison. ccwt.wisc.edu/wp-content/uploads/2022/04/Final_CCWT_report_LR-What-can-we-learn-from-longitudinal-studies-on-the-impacts-of-college-internships.pdf

Turner, J. R., & Baker, R. (2020). Collaborative Research: Techniques for Conducting Collaborative Research From the Science of Team Science (SciTS). *Advances in Developing Human Resources, 22*(1), 72-86. doi.org/10.1177/1523422319886300

U.S. Census Bureau. (2016). *Educational attainment in the United States: Population characteristics.* https://www.census.gov/content/dam/Census/library/publications/2016/demo/p20-578.pdf

Workforce Innovation and Opportunity Act of 2014. Pub. L. 113-128.

Zhu, X., Law, K. S., Sun, C., & Yang, D. (2019). Thriving of employees with disabilities: The roles of job self-efficacy, inclusion, and team-learning climate. *Human Resource Management, 58*(1), 21-34. doi: 10.1002/hrm.21920

About the Authors

Pamela Luft received her M.Ed. in Deaf Education from McDaniel College, her M.S. in Education Technology for Persons with Disabilities, and her Ph.D. from the University of Illinois at Urbana-Champaign in Special Education-Transition Services. She worked in public, special day, and residential schools as a teacher, behavior specialist, career coordinator, and program administrator before getting her doctorate. She is a past president and current secretary of the Council on Education of the Deaf and a professor emerita at Kent State University. Her research and grant projects have focused on transition services and rehabilitation services for the deaf and she has published on issues related to transition, technology employment of persons with disabilities, literacy, special education policy, and instructional practices. She can be reached by email at pluft@kent.edu.

Collin Meyer received his M.A. in Teaching English as a Second Language and is currently a Ph.D. candidate in Research, Measurement, and Statistics at Kent State University. He previously worked in program evaluation and student assessment at the Creighton University School of Medicine and currently works as a psychometrician for the National Board for Certification in Occupational Therapy. His research interests include measurement and psychometrics, statistics for education, and cross-cultural competence. He can be reached by email at cmeyer3@kent.edu.