Using Ego Network Analysis to Determine the Effectiveness of Postsecondary Education Programs in Building Independence and Self-Determination Skills Among Young Adults with Intellectual Disabilities (ID)

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Abstract
Postsecondary education programs for individuals with Intellectual Disabilities (ID) strive to help provide students with ID independent living skills. One important element of independent living is the social interaction and support of a network of friends, acquaintances. Ego network analysis from both student and parent perspectives provides a way to formatively and summaratively evaluate the social world of students with ID. Here, we present two representative network diagrams from two cohorts (n=6) in a 2-year postsecondary certificate program that were analyzed at three times. Baseline data (T1) confirmed existing research that students begin with limited networks that expand considerably in the first year (T2), and stabilizes by the last year (T3), to reflect significant relationships. The data suggests that the program provided a context to increase the size of students' networks. However, whether students continue to maintain these networks once they leave the program and its supports is still an open question.

Methods
With the provision of funding through the Department of Education, there are presently 48 programs receiving a TPSSD Transition and Postsecondary Programs for Students with Intellectual Disability funding. These model demonstration programs focus on academic enrichment, socialization, independent living skills, self-advocacy, and integrated work experiences and career skills for future gainful employment, all through person-centered planning curriculum, to help these young adults achieve their goals. Supports in the form of peer mentors who model appropriate social skills help them negotiate relationships within integrated settings, build new relationships of quality, and expand their social networks.

In our study, networks of students were mapped from both their perspective and their parent's perspective in an effort to observe consistencies, as network representations in an ego network analysis, a branch of social network analysis, are only from the ego's perspective and may not necessarily be reciprocated. Network data were obtained at three time points: baseline (T1), at the end of the first year (T2), and at the end of the second/last year (T3). Our TPSSD funded program graduated its first and only student from Cohort 1 at the end of Fall 2018, and its Cohort 2 of five students in Spring 2019. The data presented here on size, density, and network composition, as well as the tie churn analysis, are from all three time points for these students (n=6). Two representative network diagrams were selected to be presented here from both the students' and parents' perspective across the three time points.

Data at T1 confirms existing research that young adults with ID have limited networks because of exposure only to family members, caregivers, and close friends. Data at T2 showed changes in network characteristics and size with the identification of fewer familiar ties from T1 and an increase in peer ties, owing in large part to participation in the program. Data at T3, however, differ in both size and characteristics on a case to case basis with the identification of alters from T1 and fewer alters from T2, indicating only significant relationships. Observation of size, density, and composition of the network representations at both Time 1 and Time 2 were used to form a network representation at Time 3 and compared to the respective data. The tie churn analysis on the ego's ego network of Student C at T1 (Student Perspective) and Parent Perspective Network Diagrams of Student A and C from both students' perspective as well as their parent's perspective across Time 1 (prior to PSE), Time 2 (the end of the first year) and Time 3 (in the second year/last year of the PSE) and Time 3 are presented in Table 2 below. The averages of students' network size and density across Time 1, Time 2 and Time 3 from the perspective of students and parents are presented in Table 1 below. Size is simply the number of ties an ego identifies in their network. Density is number of ties an ego has in a network, expressed as a proportion of the number of people. A density closer to 1 indicates a dense network where the ego might engage in an activity with some alters, and in other activities with a few of the same alters as well as new ones (Borgatti, Everett, & Johnson, 2011).

Network Diagrams of Student A and C from both students' perspective as well as their parent's perspective across Time 1 (prior to PSE), Time 2 (the end of the first year) and Time 3 (in the second year/last year of the PSE) and Time 3 are presented in Table 2 below. The averages of students' network composition from the students' perspective across Time 1, Time 2 and Time 3 are presented in Table 3 below. The averages of students' network composition from the parents' perspective are presented in Table 4 below. Size is simply the number of ties an ego identifies in their network. Density is number of ties an ego has in a network, expressed as a proportion of the number of people. A density closer to 1 indicates a dense network where the ego might engage in an activity with some alters, and in other activities with a few of the same alters as well as new ones (Borgatti, Everett, & Johnson, 2011).

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Examples of the Eric Voice of Students and Parents in a PSE as Revealed Through SNA
Some PSE students at T1, on why they considered PSE:

"It's been a home away from home and the social skills that I gained, the best thing about them [friends] except for the fact that you get to know the church. Hopefully, you [will] be able to be there. Then you can say that you went to this one day that.

Student of T2, on her experience from being in the program a year:

"I know one girl named MM [PSE peer]. She is very smart... and every time I say, 'Bye,' she will say, 'Call me, text me! Ms. Wetter, I love you. I want to go to college!'

Parent at T3, on her observation of her daughter:

"She was always outgoing... and probably had her book more from every but her language skills have just exploded like she's got this. She's using these words and it is expressive and it is one of the right context and context to go... and to her independence. You know she's always been the kind of person that will say, 'Hey, one cannot help so big of a task that I do it all by myself.' Her work ethic, she really tried to do her very best but now she's really in, 'Oh, I think I do better than that.'

Discussion
The purpose of this longitudinal study was to better understand the social network of young adults with ID in a PSE. Students with ID have limited networks because of the lack of opportunities to socialize with people outside circles that are familiar to them. This is debilitating in terms of social capital. McCarty et al. (2015) explain that, the resources embedded in an individual's personal embeddedness is of critical importance to the development of independence and self-determination skills. Their findings are in congruence with previous research (e.g., Wehmeyer, 2004; Wehmeyer & Metzler, 1995; Wehmeyer, Kelchner, & Richards, 1996) that indicate the program will have the best of intentions but who may end up controlling outcomes (Frielink, Schuengel, & Embregts, 2017)


While our SNA study showed an expansion of networks through the formation of new relationships and involvement in new activities as students learned essential self-determination skills and independence by choosing to form closer relationships with certain people, selecting activities of their choice, and exhibiting a change in behavior in terms of how they engaged in new opportunities and took on responsibilities, it is uncertain if students will continue to flourish in these skills in the absence of program intervention.

Extensive research has been done on the concept of self-determination, independence, and its importance to individuals with disabilities, intellectual and otherwise. Wehmeyer and Metzler (1995) argue that the exploration of self-determination and independence in individuals with ID could offer new opportunities to make decisions and choices and assume control in their lives. An individual with ID displays the ability to make decisions and choices, in addition to providing an understanding of their social capital. McCarty et al. (2015) explain that the resources embedded in an individual's personal embeddedness is of critical importance to the development of independence and self-determination skills. Their findings are in congruence with previous research (e.g., Wehmeyer, 2004; Wehmeyer & Metzler, 1995; Wehmeyer, Kelchner, & Richards, 1996). Autonomy or independence in a person with disabilities is evident when the individual can act according to his or her own preferences, interests and/or abilities, and independent of external influence or interference. Most individuals with ID struggle with autonomy because of their dependence on the people around them, especially family members who may have the best of intentions but who may end up controlling outcomes (Krilov, Schuangel, & Embregts, 2017).

Conclusion
Social Network Analysis (SNA) as an evaluation method in the context of postsecondary education for individuals with ID provides rich data for both formative and summative evaluation. In terms of formative evaluation, SNA data provides program staff with information on possible areas required intervention. For example, more engaging activities may be needed for students who are not engaged; students may need to be paired with peer mentors who are better suited to their personality, etc. Visual representation of an individual's network as presented here, allows for an immediate understanding of that network in terms of valued relationships, and if these relationships are in a closed or open network. Visual representations can aid in generating dialogue between the program and families on the importance of networks in terms of gainful employment, and how to help individuals grow their network. In terms of summative evaluation, SNA could be used to provide information on how to involve family members in helping students develop the skills they learn in the PSE in a way that will be evident in their network growth. SNA as a mixed methods form of evaluation also provides for the collection of rich, qualitative information that reveal participant's own voice. The expectations of a PSE, the challenges faced by families with a student with ID, and the realizations that both families and students come into having a PSE experience, can help influence policy decisions on the importance of such programs and the need to grow these programs so they are accessible to more people.

Given the uncertainties of network growth beyond our PSE program, and the ability of students to assert self-determination and independence, especially in terms of employment choices, we propose expanding this SNA study to a year post program to make these observations, as well as continuing to study the growth of students' networks. We propose modifying the existing protocol and data collection instruments to include questions related to the assessment of introduction to activities and alters identified, to ascertain if new ties are independent of influences from a student's bonded network. We therefore hope to use SNA as a predictor of the growth of self-determination and independence in young adults with ID in relation to how growth in these areas affect their employment opportunities, in addition to providing an understanding of their social network, and possibly including families as program partners in helping students develop autonomy.