

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 and acquaintances. Ego network analysis from both student and parent perspectives provides a way to formatively and summatively 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 TPSID or Transition and Postsecondary Programs for Students with Intellectual Disability funding. These model demonstration programs focus on academic enrichment, socialization, independent living skills, self-advocacy skills, and integrated work experiences and career skills for future gainful employment, all through person-centered planning curricular, 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 timepoints - baseline (T1), at the end of the first-year (T2), and at the end of the second/last year (T3). Our TPSID 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 networks generated using ENet, UCINET, and NetDraw, at all three timepoints, are presented here from both perspectives and insights gained including the need for post-program observations to determine the transfer of independence and self-determination skills, are discussed.

The first important post-program question that will be addressed is whether the loss of regular opportunities of engagement within the university community leads to a shrinking of networks or changes in networks depending upon the new contexts that students find themselves in post-program. The students in the program we have been evaluating are, for the most part, local to our region. So there is the potential for networks to be maintained and new relationships formed as students become engaged in the community at large. Hence, the analysis of the networks post-program will have to explore the outcomes in relation to the ecologies each student finds him or herself in post-program. The second important question is whether we can use social network analysis (SNA) to predict the development of independence and self-determination skills among students who graduate from a post-secondary program through their network representations.

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, 2017).

	Students' Perspective		Parents' Perspective	
	Size (M)	Density (M)	Size (M)	Density (M)
Time 1	4.67	.3	6.5	.25
Time 2	16.5	.23	13.3	.24
Time 3	18	.17	14	.25

Table 1 Size and Density of Students' Ego Network (Student's and Parents' Perspective)

The averages of students' network composition from the students' perspective across Time 1, Time 2 and Time 3 are presented in Table 2 below.

	Family Mean (%)	Peer Mean (%)	Authority Mean (%)	Incidental/Group Mean (%)
Time 1	26.17	60.7	4.17	8.97
Time 2	9.3	77.42	11.62	1.67
Time 3	19.8	63.2	14.33	0.72

Table 2 Students' Network Composition from Students' Perspective

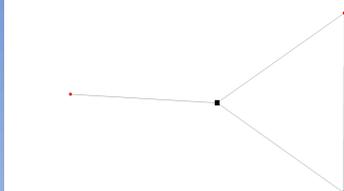
The averages of students' network composition from the parents' perspective across Time 1, Time 2 and Time 3 are presented in Table 3 below.

	Family Mean (%)	Peer Mean (%)	Authority Mean (%)	Caregiver Mean (%)	Incidental/Group Mean (%)
Time 1	51.38	19.07	5.55	6.02	17.9
Time 2	29.02	58.1	10.18	0	2.8
Time 3	28.9	51.9	15.08	0	4.2

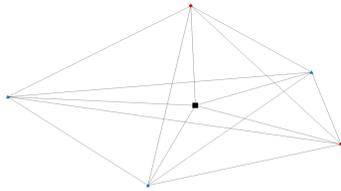
Table 3 Students' Network Composition from Parents' Perspective

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)

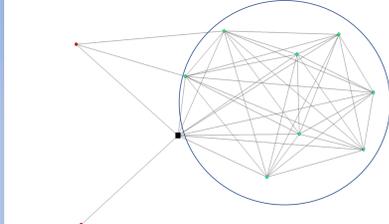
Ego Network of Student A at T1 (Student Perspective)



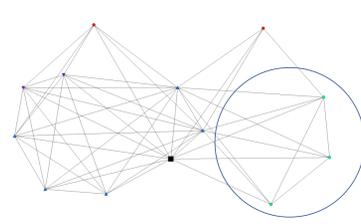
Ego Network of Student A at T1 (Parent Perspective)



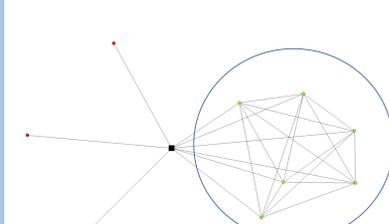
Ego Network of Student A at T2 (Student Perspective)



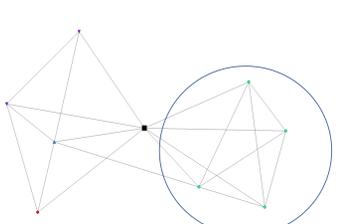
Ego Network of Student A at T2 (Parent Perspective)



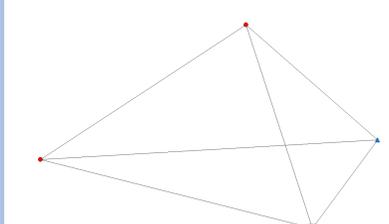
Ego Network of Student A at T3 (Student Perspective)



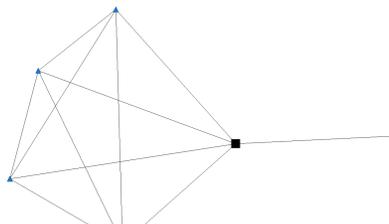
Ego Network of Student A at T3 (Parent Perspective)



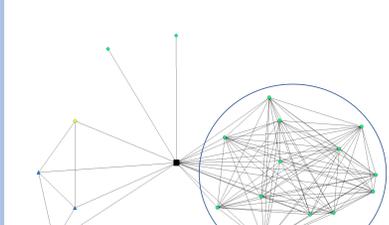
Ego Network of Student C at T1 (Student Perspective)



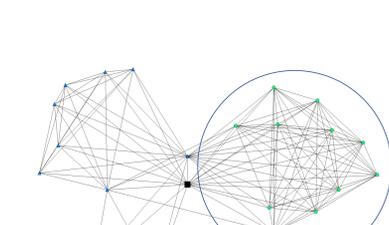
Ego Network of Student C at T1 (Parent Perspective)



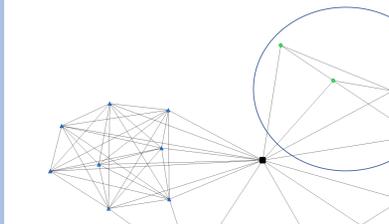
Ego Network of Student C at T2 (Student Perspective)



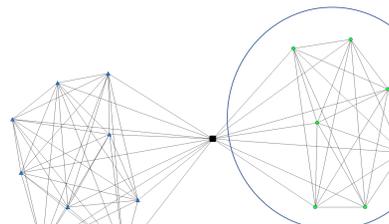
Ego Network of Student C at T2 (Parent Perspective)



Ego Network of Student C at T3 (Student Perspective)



Ego Network of Student C at T3 (Parent Perspective)



NOTE: Circles around clusters indicate networks formed while in the postsecondary program.

Tie Churn Analysis – An Average of New Ties, Lost Ties and Kept Ties Across Time 1, Time 2 and Time 3 from Students' Perspective ($n=6$) and Parents' Perspective ($n=6$) are presented in Table 4 and Table 5.

	Time 1 – Time 2	Time 2 – Time 3	Time 1 – Time 3
New Ties	14.6	12.3	15.2
Lost Ties	3	11.3	2.5
Kept Ties	1.6	5	2.2

Table 4 Tie Churn Analysis – (Students' Perspective)

	Time 1 – Time 2	Time 2 – Time 3	Time 1 – Time 3
New Ties	11.5	8.6	11.3
Lost Ties	4.6	8.3	5.2
Kept Ties	1.8	5	2.5

Table 5 Tie Churn Analysis – (Parents' Perspective)

Examples of the Emic Voice of Students and Parents in a PSE as Revealed Through SNA

Parent of Student D at T1, on why they considered a PSE,

"She's [K] been at home but she is very social. With her being out of school so long [7 years], she's lost touch with them [friends] except for the ones that she goes to church with. Hopefully, [next year] it [her circle] will be broader. Then she can say that she went for this and that."

Student D at 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. P [PSE staff], she is also my friend. I am very close to her. She helps me a lot. She motivates me. Some days when I am very, very tired, she'll say, 'Wake up.' J [PSE peer], he helps me and sometimes I help him."

Parent D at T3, on her observation of her student's growth,

"... she was always pretty outgoing ... and I probably held her back myself from worry, but her language skills have just evolved like she, she's got this. She's using these words and it is expressive and it is in the right context and content so yeah ... and her independence you know, she's always been pretty independent but she's now like, "Mom, you cannot help me do that. I will do it by myself." Her work ethics, she really tried to do her very best but now she's really like, "Oh, I know I can do better than that."

Parent E at T1, on why they considered a PSE,

"He's only been with me ... K doesn't go out or do anything without me. I do want to break that and that's what I am hoping this would do. That's what I am hoping that this would do, that someone would call and say, "Hey, you want to go do this, you want to go do that?" Give him something... He just doesn't want to leave me. He was going to camp every year and then all of a sudden he just quit. He was terrified. Cried. Didn't want to leave me... I'm sort of hoping that he will make some more friends... get out more... I hope he makes friends here and gets out a little bit, start getting out more. I think what he is going to learn here is what he needs."

Student E at T3, on graduating from the PSE,

"[In the PSE, I...] do homework, wording, [and] hangout [and] play. I feel sad and happy. I feel sad I will miss P [PSE]. I am happy for my mom ... I saw her eyes. Her eyes crying. She loves me so much ... I am gonna graduate."

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 connect with people outside circles that are familiar to them. This is debilitating in terms of social capital. McCarty et al. (2019) explain that the resources embedded in an individual's personal network can be used for expressive and instrumental purposes. In the case of those with ID, having connections that are outside their usual boundaries are essential in helping them access information to opportunities such as employment, a major goal of postsecondary education. Coleman (1988) makes a distinction between bonding ties and bridging ties that describe bonding ties as those that offer social and emotional support to an ego and is made up of family members and close friends, in contrast to bridging ties that offer connections to other groups with different characteristics and access to new resources.

Participants in our PSE exhibit strong bonding ties at T1, T2 and T3 evidenced by the clusters that are formed. While the expansion of networks in terms of size is obvious, students remain in clusters that are closed with either family and close friends, or the connections made in the PSE. At T2, there appears to be a replacement of family ties ($M=9.3\%$), with peer ties mostly formed in the PSE ($M=77.4\%$), from the students' perspective. Parents confirm this by reporting a similar trend with fewer family ties ($M=29\%$) compared to peer ties ($M=58\%$) at T2. While there appears to be a small reduction in the number of peer ties at T3 compared to T2 from both perspectives, these continue to outnumber family ties at T3 from both students' ($M=63\%$) and parents' perspective ($M=52\%$). The tie churn analysis from both perspectives show that students, on average, gained in the number of new ties formed across all three time points.

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 and independence, and its importance to individuals with disabilities, intellectual and otherwise. Wehmeyer and Metzler (1995) argue for the need to focus on self-determination in individuals with ID precisely because of their limited opportunities to make decisions and choices and assume control in their lives. An individual with ID displays self-determination through choice and decision making, problem-solving, goal-setting, and attainment of skills; internal locus of control orientations; positive self-efficacy and outcome efficacy; and self-knowledge and understanding (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 preference, 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 (Frielink, Schuengel, & 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 requiring intervention. For example, more engaging activities may be needed for students who are reserved; 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 participants' emic voice. The expectations of a PSE, the challenges faced by families with a student with ID, and the realization that both families and students come into from 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 regarding the source 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.

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