

College Preparation Program for High School Youth Who Are Blind: The Summer Academy

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Abstract

Students with disabilities have significantly lower graduation rates in four-year postsecondary institutions than students without disabilities. Although there are many barriers associated with persistence and graduation, for students with vision loss, additional accessibility challenges exist. This paper describes a pilot study that examined the impact of a training program designed to enhance functional skills (e.g., white cane use, public transportation use, money management) that may aid in the transition to postsecondary settings. Differences in pre-/posttest results indicate statistically significant gains in functional skills reported by students and their parents, as measured by an experimental scale developed from the curriculum. Using the Snyder et al. (1991) Trait Hope Scale, *there was no statistical difference in measured pre-/posttest overall hope scores. Statistically significant relationships were found between hope scores and differences in pre/posttest student functioning, however.* Given preliminary findings, this program shows promise for enhancing college readiness among high school students with vision loss.

Keywords: Blind, vision loss, college preparation

There has been an increasing number of students with disabilities who pursue postsecondary education (Wagner, Newman, Cameto, & Levine, 2005). Estimates indicate that about one in 10 students enrolled in four-year institutions are persons with disabilities (Horn & Nevill, 2006; Newman, Wagner, Cameto & Knokey, 2009) and of those who pursue college, their graduation rate is much lower than that of college students without disabilities. For example, Newman and colleagues (2011) reported that graduation rates for students without disabilities in the United States is about 51% yet only 34% for students with disabilities, and even with the increase in enrolled students with disabilities over the past two decades, the graduation rate for students with disabilities over that time has remained constant. In accounting for the disparity of these graduation rates, several reasons have been articulated in the literature including: (a) insufficient academic preparation (Test et al., 2009); (b) lack of understanding of academic accommodations needed to succeed in college (Newman et al., 2009); (c) difficulty coping with higher education demands

(Hong, Ivy, Humberto, & Ehrensberger, 2007) as evident in reading/writing, listening comprehension, and organization deficiencies (Reaser, Prevatt, Petscher, & Practor, 2007); (d) poor self-advocacy skills (Brinkerhoff, McGuire, & Shaw, 2002); (e) negative faculty and staff attitudes towards persons with disabilities (Mamiseishvili & Koch, 2010); (f) lack of environmental, financial, psychological, and social support systems (Seidman, 2007); and (g) insufficient programming and services to assist students with disabilities (Tagayuna, Stodden, Chang, Zeleznik, & Whelley, 2005).

Students with Vision Loss

Included in the larger population of students with disabilities attending college are those with vision loss. Within the United States, it is estimated that there are 21 million adults or 9% of the population with varying degrees of vision loss (Centers for Disease Control, 2014) and, of these, about 14% of persons with visual disabilities have attained baccalaureate degrees (National Federation of the Blind, 2015).

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As advances in technology that promote accessibility and independence are available to persons with vision loss, there is an increasing opportunity among persons who are blind or have visual impairments to pursue postsecondary education but they must have necessary accommodations available to them; otherwise, it results in being excluded from educational opportunities (Bell, 2012). For these students, the benefits of having a college degree not only results in obtaining higher salaries (Bell & Mino, 2013) and better employment outcomes (Capella-McDonnall, 2011; Grigal, Hart, & Migliore, 2011) but also provides other positive outcomes including opportunities to make friends, explore avocational interests and participate in community activities (Newman et al., 2011; Wehman, 2013).

In a review of the literature, Giesen and Cavanaugh (2012) concluded that postsecondary transition interventions are efficacious for students with visual impairments when they address career awareness and career development, job seeking skills, and social skills training, involve parents as part of the transition process, and provide direct work experience. When these interventions are introduced in school settings beginning by age 16, they may be particularly effective in postsecondary transition (Crudden, 2012). Although these recommendations may be appropriate for immediate employment strategies, as applied to the successful transition to college, they may have less applicability particularly as they pertain to the first year of matriculation. Cobb and Alwell (2009) in their review of 31 studies on transition planning and coordinating interventions for transition age youth with disabilities identified eight empirically based student-focused studies but only one study by Grenwelge and Zhang (2013) examined a transition intervention specifically for youth planning to attend college. The intervention involved a youth leadership summer training to enhance self-advocacy (knowledge of self and disability rights, communication and leadership skills) for high school juniors and seniors with disabilities. The program consisted of a five-day on-campus program that involved mentoring and classroom activities designed to enhance student self-advocacy and self-determination skills. Results indicated that the summer program enhanced both areas.

Hope

Individuals with higher hope have been found to have better coping skills, better recovery from physical injury, and better overall well-being and adjustment (Snyder, 1995, 2002; Snyder et al., 1991). Previous research has also shown hope predicts successful academic achievement in high school and college students (Snyder et al., 1991). As a construct associated with generalized behavioral persistence, hope has been more recently studied as a promising predictor of persistence (Holder, 2007). Based on Snyder's conceptualization (Snyder et al., 1991), hope reflects individuals' "perceptions regarding their capacities to (1) clearly conceptualize goals, (2) develop the specific strategies to reach those goals (pathway thinking), and (3) initiate and sustain the motivation for using those strategies (agency thinking)" (Snyder, Lopez, Shorey, Rand, & Feldman, 2003, p. 122).

Hope has been studied with multiple populations, in various situations, and outcomes associated with better overall well-being and adjustment (Snyder, 1995, 2002). At the same time, the evidence is mixed depending on situational contexts. For example, although hope has been associated with greater likelihood of completing on-line college coursework (Kemp, 2002), it has also been found to have no predictive influence (Holder, 2007).

Although limited research on hope and vision loss exists, a study by Jackson, Taylor, Palmatier, Elliott, and Elliott (1998) investigated the relationship of hope to self-reported functional ability of 63 American veterans with acquired visual impairments entering a rehabilitation program. The study revealed higher hope was not only correlated to higher self-reported abilities, but also "more sociable, proactive coping styles" (p. 182). Because hope is a dispositional construct that can change over time and is amenable with counseling and predictive of goal achievement (Snyder, 1995), it offers promise as a variable worth studying for professional practice. Since hope can be taught and fostered, service providers working with at risk populations such as students with vision loss should consider incorporating interventions to promote hope as part of their programs.

Given this review, the purpose of this study was to investigate the impact of a three-week on-campus training program specifically designed for high school students who are blind or have vision loss and considering attending college. The basic goal of the program is to improve participant functional skills

needed to successfully apply and graduate from college. To analyze the major questions of interest, we used descriptive statistics to address the first question, paired samples t-tests as it pertained to the second and third questions and a Pearson product-moment correlation to address the last research question which are stated accordingly:

1. What specific functional skill changes are reported by students and their parents over the course of the training program?
2. Do student perceptions of functional competence and parent perceptions of their child's functional competence change over the course of the training program?
3. Do student hope scores change over the course of the training program?
4. How are hope and self-perceptions of functionality related to one another?

Method

Summer Academy Program

The designed training program is intended for high school students with blindness or visual loss to enhance independent living skills that facilitate transition to postsecondary education. Sponsored by the Pennsylvania Bureau of Blindness and Visual Services (BBVS) through the partnership between the state Office of Vocational Rehabilitation (OVR), Bureau of Special Education Training and Technical Assistance Network, and The Pennsylvania State University, the training curriculum includes daily living activities such as orientation and mobility, self-advocacy and networking, career/vocational planning, social interaction, and technology skills (a full description of the curriculum is available upon request).

High school students throughout the state applied and then screened by their vocational rehabilitation counselors before being accepted into the program. Once accepted, students and parents received an orientation packet that explained program schedule, policy and procedures, and logistics. The program lasted three weeks where students lived on-campus throughout the duration of the program and, on occasion, participated in local recreational and social outings. Each student was also assigned an individual peer mentor (residential assistant) who was also pre-screened before acceptance into the program. Peer mentors were students from various academic majors from local

universities who, prior to their appointment as a peer mentor, completed a one-week training program on their roles and responsibilities.

The campus program included a variety of classroom and community-based activities. Students learned about on/off campus travel and how to access the local bus system, strategies to enhance orientation and mobility (e.g., cane use, global positioning systems), money management (use of an automated teller machine, maintaining a bank account), access to university learning platform systems (e.g., *Angel*, *Canvas*), classroom technology (e.g., *Kurzweill scanning software*, *iPad*, and *Victor systems*), career exploration (i.e., career inventories), residence living (e.g., food preparation, cooking, nutrition, cleaning, labeling, laundry, self-defense), and effective classroom practices (e.g., note-taking, hiring readers). As part of this program, students received information related to the "Voc Act Now" curriculum which is an interactive program designed to enhance postsecondary transition by learning about reasonable accommodations and skills needed in postsecondary education settings (e.g., gaining access to an office for disability services, how to ask for a classroom accommodation). Students also attended two class sessions as part of the regular summer course schedule to audit college level classes and participate in class discussions. This activity provided students with some sense for what a "real college classroom experience" may be like. Students chose course lectures from a selection of 10 courses from various academic disciplines. During weekends and weeknights, they participated in recreational and social activities that include a team-building program involving a high-ropes course as well as attended other social activities such as swimming, dancing, listening to music, visiting state parks, and/or attending a movie. Finally, students also participated in social work sessions that allowed them to discuss any concerns or issues they wanted to address with staff and other participants. These experiences, in combination, were intended to provide students with a clear understanding of what college life may be like so that if they intended to apply and attend college, they may have developed experiences that could help with the transition from high school to college.

Participants

High school students with visual impairments or blindness registered with the Pennsylvania Office of Vocational Rehabilitation (OVR) were recruited to

participate in the Summer Academy Program. Approximately six months prior to participation, students and their parents were sent a letter explaining the purpose and requirements of the study. Participation in the study was voluntary and had no impact on admission to the program. Each participant received an individualized identity code known only to the primary investigators. After completion of the program (last day), students completed the same outcome measure as the pretest. A similar posttest outcome measure was forwarded via mail to the parent or legal guardian of the student approximately four weeks later. This time period was used in order to provide sufficient time for the parent to observe any changes as a result of the program, if perceived. If there was no immediate response from the parent, a follow-up mailing was conducted two weeks later. No further contact was made after this subsequent effort.

The student sample consisted of 23 students who had various degrees of vision loss and two students reporting total blindness. About half (48%) also reported having a secondary disability (e.g., asthma, attention deficit disorder, bipolar disorder, diabetes, hearing impairment, multiple sclerosis). Functionally, about one-third of students used Braille and/or a cane. In terms of other assistive technology, the majority (92%) of students used one or more other kinds of assistive technology including GPS devices, magnifiers, optical character recognition readers, scanners, and smart phones. As it pertains to software and hardware applications, 60% of students reported using one or more of those specifically to assist with reading text (*BrailleNote*, Digital reader/talking book player JAWS [screen reader], *Google Maps*, *Open Book* [allows printed documents or graphics into an electronic text format using optical character recognition technology], Zoom Text [screen magnifier/reader software]) as well as technology designed for general use (*iPad*, *iPod*, *iPhone*).

Demographically, the average age of students was 17.6 years old, ranging from 15.11 to 19.30 years old. In terms of ethnicity/race, 68% were White, 16% African American, 12% Hispanic and 4% multiracial. Distribution across grade levels was fairly consistent with 32% of students enrolled in the 12th grade, 28% in the 11th grade, 24% in the 10th grade and 8% in the 9th grade.

Assessments and Measures

In order to evaluate the impact of the Summer Academy, two outcome measures were used. The first measure was an experimental scale directly tied to the curriculum; the second measure was an established scale, the *Trait Hope Scale* (Snyder et al., 1991). Pretest measures for students were completed by paper format and sent to their home address. Given the possibility of needing assistance in order to complete the pretest, a question was asked as to whether the student required assistance completing the surveys and, if so, who assisted them. Data indicated that one-third of students completed pretest measures independently, one-third required assistance from a parent or legal guardian, and the remaining third by “other” (e.g., teacher, rehabilitation counselor). It should be noted that we conducted a comparison of means as a function of who completed the scale and, at pretest administration, found no statistical differences in total score. Posttest measures were completed on-line independently (i.e., by each student) on the last day of the training program. Parent forms at both pretest and posttest administrations were completed through a mail survey, and included only the experimental functional assessment survey since we were also interested in parent perception of perceived changes in their child’s functional assessment.

Functional assessment. An experimental scale was developed by the investigators and instructors who taught in the Summer Academy. Each instructor who was associated with one of the six domains described in next section was asked to construct a list of behavioral outcome statements. Working collectively, there was an initial pool of 68 items but after subsequent reviews, this list was reduced to 24 items. Items were eliminated primarily because of redundancy or not being directly tied to the curriculum that focused on one of the six domains: (a) assistive technology, (b) activities of daily living, (c) career planning, (d) orientation and mobility, (e) recreation and (f) social interaction and stress management. Because we were interested in perceptual changes reported by students as well as their parents, parallel forms of the functional assessment were developed. For example, a question on the student form asked, “I know how to use a washer and dryer to do laundry” whereas the parent form asked, “I believe that my child knows how to use a washer and dryer to do laundry.” For each question, the respondent was asked to evaluate the level of agreement (ranging from 1 = “Strongly Agree” to 5 =

“Strongly Disagree”). Internal consistency estimates at pretest indicated levels considered “good” based on psychometric interpretation described by George and Mallery (2003) for both child (Cronbach estimate $p = .79$) and parent forms (Cronbach estimate $p = .88$).

Trait Hope Scale. This scale is a measure of a person’s general or characteristic level of hope for persons 15 years or older. When administered, the scale is referred to as *The Future Scale* so as not to sensitize respondents to the fact that hope is being measured, thus inadvertently impacting responses. The self-report scale developed by Snyder et al. (1991) consists of 12 items that is divided into two subscales, each with four items: *Agency* which reflects goal-directed (motivation) energy to achieve goals whereas *Pathways* refers to one’s plans or routes needed to accomplish goals. There are also four items considered as “filler items.” Each item is scored between an eight-point scale ranging from “1=definitely false” to “8=definitely true” with higher scores indicative of higher hope. An example of an item is: “There are lots of ways around any problem.” Although the scale has two subscales, for the purpose of this study, we were interested in overall hope (total) score. In the current study, the observed internal consistency reliability estimate was .89 indicating “good” reliability (George & Mallery, 2003). This estimate in our study was actually somewhat higher than reported overall reliability estimates that have ranged between .74 to .88 for the *Trait Hope Scale* (Snyder, Lehman, Kluck & Monsson, 2006).

Results

Perceptions of Functional Competence

As noted in Table 1 that lists specific aspects of functionality, student perception of pretest functioning of activities of daily living and related skills indicated that, in general, students believed that they demonstrate an ability or have knowledge to do almost all of the 24 task statements described (i.e., items where respondents indicated either “agree” or “strongly agree”). Noted exceptions (means greater than 2.5) were knowing how to use an Automated Teller Machine (ATM) to get money from a bank account ($M = 4.52$ or rating between “slightly disagree” and “disagree”), how to use a “Pen Friend” to label personal items ($M = 4.08$ or “slightly disagree”), asking for correct information from a public bus driver ($M = 3.44$ or approximating a rating of “slightly

disagree”), knowing how to ask and apply for disability-related accommodations needed at college or at work ($M = 3.36$ or between a rating of “slightly agree” and “slightly disagree”). On the other hand, parent perceptions of their children’s functionality were more conservative and, in fact, over 70% of items were at levels between slight disagreement or disagreement (i.e., means > 3.5). Among these items, the highest rated items included how to use a “Pen Friend” to label personal items ($M = 4.56$), knowing how to use an Automated Teller Machine to get money from a bank account ($M = 4.45$), knowing how to ask and apply for disability-related accommodations needed at college or at work ($M = 4.50$), knowing what disability-related accommodations needed for work ($M = 3.92$), and asking correct information from a public bus driver ($M = 3.84$).

With respect to posttest assessments of functionality, student perceptions were consistently rated at the highest level of agreement regarding one’s capability or knowledge in performing a specific task. The lowest rated level of agreement had to do with knowing how to use a “Pen Friend” to label personal items ($M = 2.27$); all other items approximated a level of “strong agreement.” A similar trend was also evident among parents who generally rated all levels of functionality as being either in “agreement” (about 33% of items) or “strong agreement” (about 66% of items) regarding their child’s ability or knowledge on how to perform them. Thus, on the basis of descriptive data results of self-report functionality, student perception of their overall functionality at both pretest and, to a lesser extent, posttest assessments were higher than parent perceptions. This difference was pronounced at the pretest level as students rated their functional skills at a level 3.5 times higher than that of their parents. A descriptive summary breakdown of pretest and posttest functioning is provided in Table 3.

Two paired-samples t-tests were used to determine whether there was a difference in perceived functionality as reported by students and their parents. Prior to conducting the paired t-tests, data were inspected for outliers and normal distribution assumptions. An inspection of box plots was conducted and all values were retained in the analysis (i.e., none detected more than 1.5 box-lengths from the edge of the box in both boxplots). The assumption of normality was not violated, as assessed by Shapiro-Wilk’s test for students ($p = .31$) and parents ($p = .87$) data groups. As a result, no normality violations were assumed when conduct-

ing the paired samples *t*-tests. Results indicated that student perception of functionality increased, on average by 21.44 points (lower scores indicate higher levels of perceived functionality), 95% CI [14.91, 27.97] (see Table 4). Participation in the Summer Academy resulted in a statistically significant increase compared to pretest assessment, $t(15) = 6.99$, $p < .001$, $d = 1.75$. Similarly, parent perception of functionality indicated a mean difference of 28.21 points, 95% CI [20.70, 35.73] which also resulted in a statistically significant increase (lower scores indicate higher levels of perceived functionality), as compared to pretest assessment, $t(13) = 8.11$, $p < .001$, $d = 2.16$. As noted in effect size estimates (*d*), results from both groups were considered “large” using Cohen’s (1988) guidelines.

With regard to the third research question pertaining to whether changes in self-reported hope scores occurred, prior to conducting the paired *t*-test, we first examined the data for outliers and two were detected that were more than 1.5 box-lengths from the edge of the box in the boxplot and, as expected, the assumption regarding the normality of the distribution was also violated (Shapiro-Wilk, $p = .001$; data significantly deviated from a normal distribution). After verifying that outliers did not occur because of data entry error, we decided to run the paired *t*-test under two conditions, one that included the two outliers and one where they were removed (see Table 4). When including the two outliers, results indicated that there was no statistical difference between pretest and posttest administrations of hope. When excluding these outliers, results indicated that change scores on the *Trait Hope Scale* resulted in a statistically significant increase with a mean difference of 2.30 points, 95% CI [4.54, .06], $t(16) = -2.16$, $p = .05$, $d = .53$ (moderate effect). In terms of hope scores, it is important to note that student’s mean scores at both pretest ($M = 53.48$, $SD = 6.20$) and posttest ($M = 53.58$, $SD = 11.33$) assessments were considered high given maximum value of 64 points (see Table 3). With respect to high hope scores in our sample, the overall average score at each administration was almost identical; students perceived high levels of hope prior to and immediately following the program intervention.

When examining the last research question regarding the relationship between hope and student perception of functionality, a statistically significant relationship indicative of a medium effect was found between pretest hope scores and pretest perception

of student functioning, $r(25) = -.44$, $p = .03$. Posttest hope scores and the difference between pretest and posttest scores pertaining to student perception of functionality also revealed a statistically significant relationship indicative of a large effect $r(19) = .50$, $p = .03$. Thus, hope scores shared a moderate to large level of variance with pretest perception of student functioning and overall changes in perceived functionality.

In sum, descriptive and inferential analysis concludes that both students and parents perceived an increase of functional skill attainment; for students, the difference between pretest and posttest administrations seemed more pronounced. As applied to hope scores, there was no change over the course of the Summer Academy as initial high hope scores persisted throughout the training program. If one were to exclude two outliers, however, a difference between administrations was observed. Finally, it also appears that changes in perceived functionality reported by students is associated with higher hope scores and initial pretest hope scores correlate with student perceived functioning.

Discussion

Students with vision loss reported at pretest levels that they “agreed” or “strongly agreed” with their ability to function on almost all of the 24 tasks, which was much higher than parental perceptions of students’ abilities. By the time at posttest, however, parental perception of their children’s functionality increased to nearly the same level as that reported by their children. Given the importance of how parental perceptions influence a child’s decision whether to pursue college (e.g., Nauert, 2015), it would seem that interventions that enhance perceptual functioning in the areas addressed in the Summer Academy (i.e., assistive technology, activities of daily living, career planning, orientation and mobility, recreation and social interaction and stress management) could be an important influence in having more high school students with disabilities pursue postsecondary education. Although we did not directly assess if perceptual changes in parent beliefs regarding their children’s capacity to apply, pursue and graduate from college occurred before and after the intervention, there is some interesting anecdotal evidence. A follow-up contact completed almost one-year post intervention indicates that of the eight high school seniors

who completed the program, each of these students applied, were admitted and are currently enrolled in college. We will continue to monitor whether other students in earlier grades apply, attend and, if relevant, persist in college.

Understanding perceived functioning from both student and parental perspectives is important in identifying areas where students may feel less competent in skills needed to progress after high school and onto college. Although research studies are limited, there are indications that, as it pertains to youth with visual impairments, successful postsecondary transition has been linked to having competent independent living skills, accessible transportation and related travel skills and effective social skills (Capella-McDonnall, 2011; Cmar, 2015). Regarding research and students with any type of disability, not limited to just visual, Getzel (2008) reported specific factors offered by colleges that support students with disabilities including self-management skills, exposure to technology, and exposure to career experiences. A review of transition best practices, conducted by Landmark, Ju and Zhang (2010) identified strategies including career planning, social skills preparation, and daily living skills training. It should be noted that all of the factors identified above are addressed in the Summer Academy.

In terms of the relationship between hope and functionality, findings from the current study support the positive relationship found in the earlier investigation by Jackson et al. (1998). As it pertains to disability-related aspects needed to succeed in college (i.e., activities of daily living, assistive technology and orientation and mobility) as well as generic aspects for any college student (i.e., career planning, social interaction and stress management), it seems that hope has a positive influence in perceived competence. Since hope can be taught and given its relationship to perceptions of functional competence that contribute to academic achievement, intervention programs may want to consider how this aspect could be infused in a curriculum. Following earlier suggestions by Snyder (2002), program staff could use agency (motivation) techniques such as examining goals important to the individual and pathway (route) techniques of sub-goals that are necessary to achieve them. Understanding the role of hope at different stages of an individual's life is important in understanding hope for individuals with significant life challenges (e.g., persons with disabilities; Coduti & Schoen, 2014).

One unintended finding from this study was that students with varying degrees of vision loss had higher hope scores when compared to that found among the general population of young adults. For example, mean scores among college and non-college students was 49 (Snyder, 2002) and 48, respectively (Snyder, 1995). When thinking about students with vision loss and the goals that they must set and achieve in order to function in a visual world on a day-to-day basis, perhaps elevated scores found at both pretest and sustained through posttest administrations should not be thought of as being that unusual. Earlier commentary by McDermott and Snyder (1999) noted, "Hope is not dependent upon constant success, but rather the experience of some success" (pp. 15-16). Knowing that students with vision loss set and achieve goals based on functional challenges that most persons without visual disabilities cannot appreciate, it may be that having experiences of successfully overcoming obstacles contributes to one's overall perception of hope. As participants in this study already had high hope perceptions, changes as a result of the intervention did not contribute to enhancing these perceptions. Further, changing hope perceptions may not occur unless there are learning activities such as the agency and pathway suggestions noted by McDermott and Snyder that are introduced in the training curriculum. At the same time, however, we noted that when two outliers from the data set were eliminated, there was a statistically significant increase of moderate effect. Thus, the extent to which hope may be enhanced in a program designed to enhance functionality pertaining to prepare postsecondary success is unclear without replication and including additional student samples.

Implications for Further Research

Future research comparing this program to other college preparatory programs for students with vision loss, such as those by National Federation of the Blind ([NFB]; 2015) is needed. Comparing different programs with similar training rubrics and using the same outcome measures will allow us to identify best practices that other educational and state vocational rehabilitation programs may consider in promoting postsecondary outcomes for students with vision loss. Such comparisons will require collaboration so that generalizability can be evaluated. Without a more focused effort that compares multiple interventions, it is difficult to create research-driven interventions that may impact college application, participation, grad-

uation and ultimately employment of persons with vision loss.

Assessment of hope in relation to successful outcomes also needs to be studied further, particularly with students who have vision loss. Hope, as part of rehabilitation practice, offers promise as an important variable as it relates to goal setting and goal achievement (Coduti & Schoen, 2014). Further study of persons with various disabilities is needed to explore in what situations and demographic cohorts are hope perceptions similar or different. Given the varying nature of daily challenges of achieving and navigating goals that persons with various disabilities experience, further studies are needed to better understand the clinical aspects of having different levels of hope and how they impact related rehabilitation outcomes. This work would also allow for the development of cohort norms as a function of disability.

Finally, although this study focused on changes on functionality and hope perceptions, in term of behavioral criteria, longitudinal study is needed to determine whether students actually applied, gained admittance and pursued postsecondary education. As noted earlier, anecdotal evidence indicated that all eight seniors in the Summer Academy were currently enrolled in college. What is not known is to what extent, if any, did the program change one's perception about pursuing college. Further studies should explore this aspect as ultimately it serves as an important behavioral outcome indicator of program success.

Limitations

Students who participated in this study were a convenience sample that was prescreened by the state vocational rehabilitation program team and, as a result, these students may have already been highly motivated from onset. As a quasi-experimental design (no randomization or control group), while we cannot make any inference regarding cause-effect relationships (i.e., changes were due to the program), to some extent, the internal validity limitation concern is mitigated by using multiple observations from two groups. Still, even with rather robust effect sizes that were found in pretest-posttest differences, we must be cautious as to whether findings generalize to other high school students with vision loss.

Another limitation of the study is that we relied on using self-report measures and, as a result, whether perceived change manifests in behavioral change can be questioned. While acknowledging this prob-

lem, as noted earlier, this study used an external validation by soliciting parental input. Also, the manner in which pretest student data was collected, for some students, may have compromised results as there were instances where they required the assistance of a parent, teacher or some other person to help them complete pre-test measures (since they were distributed by mail survey). Although there were no statistical differences at pretest on these measures as a function of whether the student or some other person recorded their answers on the pretest, we did not have sufficient statistical power to evaluate differences at pretest, which may have influenced their responses. For example, student scores may have been inflated at pretest administration based on apprehension of not wanting to seem incompetent or unskilled in certain areas in front of another person.

Six students also dropped out and/or did not complete the final posttest due to leaving the program early (e.g., required earlier transportation on last day when posttest evaluation occurred). When student posttest data were collected on the final day of the program, some students reported being tired and overwhelmed and were eagerly awaiting the graduation ceremony that was scheduled later in the day. Students may have completed the posttest survey in a rushed manner thus not paying sufficient attention to questions being asked or given time to thoroughly reflect on how they perceived their functioning on tasks now that the program had ended. In addition, despite attempts to reach parents, over half did not complete the posttest evaluation and therefore findings may not accurately reflect parent perceptions who had a child in the program.

Finally, given that there were no standardized outcome instruments that we could identify that addressed functional aspects that we were interested in studying and the decision to develop an outcome measure tied to the curriculum, it was necessary to develop an experimental scale of functionality. Although internal consistency estimates for both student and parent forms at pretest administration were acceptable, in terms of validity and the factor structure of the scale, additional research is needed. Continuing research in scale development that could be used in comparative studies would help establish the use of a standardized instrument.

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Table 1

Descriptive Statistics of Functionality Items at Pretest/Posttest Reported by Students

Functionality Test Item	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD
Use washer and dryer to do laundry	2.44	1.41	1.26	0.45
Ask for correct information using public bus	3.44	2.06	1.05	0.22
Use stress management techniques	2.28	1.20	1.47	0.69
Aware of disability-related school/work accommodations	2.44	1.38	1.31	0.58
Comfortable interacting with people	1.64	0.75	1.26	0.56
Use assistive technology in all aspects of life	2.52	1.55	1.63	0.68
Use correct canes/tips for mobility	2.88	1.66	1.78	0.91
Use ATM machine to get money from account	4.52	1.66	1.84	0.60
Identify signs of un/healthy relationships	1.92	0.86	1.47	0.51
Use websites to explore career interests	1.72	0.93	1.36	0.59
Be a good listener	1.76	0.72	1.57	0.60
Know how and where to get technical support for needs	1.88	0.66	1.57	0.60
Use different orientation aids such as large print, GPS	2.56	1.30	1.36	0.42
Comfort asking for assistance from others	2.32	1.46	1.52	0.96
Know how to ask/apply for disability accommodation	3.36	1.62	1.63	0.83
Know enjoyable ways to spend leisure time	1.36	0.48	1.10	0.31
Know what traffic cues to use to cross streets safely	1.92	0.95	1.26	0.45
Know how to use “pen friend” for labeling items	4.08	1.77	2.27	1.17
Know what kind of work want to do after graduation	2.28	0.84	1.42	0.60
Know how to submit class assignment using email	1.48	1.08	1.47	0.84
Use stovetop safely to cook meal	2.44	1.66	1.42	0.60
Identify stress management	2.28	0.97	1.47	0.51
People consider me a “team player”	1.54	0.72	1.31	0.47
Use magnifier and/or screen reader to read text	2.32	1.81	1.31	0.58

Table 2

Descriptive Statistics of Functionality Items at Pretest/Posttest Reported by Parents

Functionality Test Item	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD
Use washer and dryer to do laundry	2.96	1.56	1.26	0.45
Ask for correct information using public bus	3.84	1.95	1.05	0.22
Use stress management techniques	2.80	1.29	1.47	0.69
Aware of disability-related school/work accommodations	3.92	1.82	1.31	0.58
Comfortable interacting with people	1.88	1.09	1.26	0.56
Use assistive technology in all aspects of life	2.36	1.63	1.63	0.68
Use correct canes/tips for mobility	3.80	1.98	1.78	0.91
Use ATM machine to get money from account	4.45	1.82	1.84	0.60
Identify signs of un/healthy relationships	2.56	1.26	1.47	0.51
Use websites to explore career interests	2.70	1.60	1.36	0.59
Be a good listener	1.96	1.20	1.57	0.60
Know how and where to get technical support for needs	3.16	1.71	1.57	0.60
Use different orientation aids such as large print, GPS	3.64	1.84	1.36	0.42
Comfort asking for assistance from others	2.56	1.44	1.52	0.96
Know how to ask/apply for disability accommodation	4.50	1.93	1.63	0.83
Know enjoyable ways to spend leisure time	2.08	1.11	1.10	0.31
Know what traffic cues to use to cross streets safely	2.80	1.35	1.26	0.45
Know how to use "pen friend" for labeling items	4.56	1.70	2.27	1.17
Know what kind of work want to do after graduation	3.68	1.51	1.42	0.60
Know how to submit class assignment using email	1.52	1.19	1.47	0.84
Use stovetop safely to cook meal	3.00	1.95	1.42	0.60
Identify stress management	3.00	1.29	1.47	0.51
People consider me a "team player"	1.84	1.06	1.31	0.47
Use magnifier and/or screen reader to read text	3.44	1.91	1.31	0.58

Table 3

Descriptive Statistics of Outcome Variables

	<i>N</i>	Minimum	Maximum	Mean	<i>SD</i>
Student Pretest Functioning	25	40.00	84.00	57.36	13.10
Parent Pretest Functioning	25	34.00	115.00	72.44	19.91
Student Posttest Functioning	19	24.00	47.00	35.11	6.39
Parent Posttest Functioning	14	28.00	56.00	43.86	10.72
Student Pretest Hope	25	41.00	64.00	53.48	6.20
Parent Pretest Hope	19	10.00	64.00	53.58	11.33

Table 4

Paired t-tests of Differences (Pretest - Posttest) Among Outcome Variables

Variables	Paired Differences		95% CI		<i>t</i>	<i>df</i>	Sig.
	Mean	<i>SD</i>	Lower	Upper			
Student Function Pretest/Posttest	21.44	12.25	14.91	27.97	6.99	15	.005
Parent Function Pretest/Posttest	28.21	13.02	20.70	35.73	8.11	13	.000
Student Pretest/Posttest Hope Outliers Removed	-2.29	4.37	-4.54	-.05	-2.17	16	.046
Student Pretest/Posttest Hope Outliers Retained	-.84	10.95	-6.12	4.44	-.34	18	.741

Note. CI = Confidence interval.