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Assessing the Effectiveness of Structured Social Planning for College Students with Autism Spectrum Disorder in the Context of a Multiple-Baseline Across Participants Design

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Assessing the Effectiveness of Structured Social Planning for College Students with Autism Spectrum Disorder in the Context of a Multiple-Baseline Across Participants Design

A dissertation submitted in partial satisfaction of the requirements for the degree of Doctor of Philosophy in Counseling, Clinical, and School Psychology

by

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ABSTRACT

Assessing the Effectiveness of Structured Social Planning for College Students with Autism Spectrum Disorder in the Context of a Multiple-Baseline Across Participants Design

By

Kristen Elizabeth Ashbaugh

An increasing number of individuals with Autism Spectrum Disorder (ASD) are transitioning into adulthood and entering postsecondary education. For both typical individuals and individuals with ASD, a college education and experience is linked to improved outcomes in employment, personal skill building, integration into a meaningful community, and overall quality of life. However, the majority of research and programming efforts are geared towards school-aged children with autism, and less attention has been given to the needs of young adults as they move beyond high school. Many college students with ASD report feeling lonely, isolated, and not able to engage with their peers and the campus community. These difficulties with socialization have been found to impact students' academic success, involvement within the university, and overall well-being in the college environment. Therefore, the purpose of this current study was to assess within the context of a multiple-baseline across participants design whether a structured social planning intervention produced improvements in measures relating to socialization and collateral areas relating to overall quality of life. Specifically, this study sought to enhance the understanding of socialization in college students with ASD by investigating the impact of a social intervention on the following: (1) Quantity of social activities; (2) Scope of social activities; and (3) Supplemental areas related to socialization (i.e. satisfaction with socialization and social conversation skills). Additionally, this research study examined the effectiveness of the intervention on collateral areas relating to quality of life, specifically the following: (4) Standardized assessments of well-being; and (5) Academic performance. Three students in higher education with a diagnosis of ASD participated in this study. Baseline data were collected with each participant for a period of three, seven, or eleven weeks. Following baseline, a structured social planning intervention was implemented for ten weeks and consisted of the following components: (a) Incorporation of the participant's motivational interests; (b) Participant's choice in social activity from a menu of activities based on their unique interests; (c) Training in organizational skills; (d) Support from a typical peer mentor; and (e) Social skills training related to communication and interaction with peers. Follow-up data were also collected for three weeks upon completion of intervention. Results indicated the following: (1) Two participants increased the overall quantity of social activities attended per week; (2) All participants increased their scope of social activities; and (3) All participants reported increases in supplemental areas related to socialization (i.e. satisfaction with socialization and social conversation). Furthermore, data indicated that increases in social behavior observed during treatment were maintained at follow-up. Results also illustrated that participants either maintained or improved in collateral areas beyond socialization that were not specifically targeted in the intervention. Specifically, data indicated the following: (4) Participants reported relatively consistent levels of well-being throughout the study; and (5) All participants improved in their academic performance following intervention. Results are discussed in regards to assisting college students with ASD to engage in social activities and expand their breadth of socialization. In addition, implications of findings and future directions related to the examination of collateral areas relating to quality of life are explored. Further research would be helpful to continue to develop and examine interventions to assist young adults with ASD to transition into higher education settings.

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Autism Spectrum Disorder is one of the fastest growing disability categories (Cimera & Cowan, 2009). The Center for Disease Control estimates that the disorder currently impacts 1 in 68 children in the United States (CDC, 2013). Additionally, the literature suggests that many individuals with ASD do not outgrow their diagnosis and continue to have difficulties with communication, socialization, and behavioral skills throughout the lifespan (Graetz, 2010; Zager & Alpern, 2010). Without effective interventions and support services, these difficulties can create significant barriers to successful outcomes in the transition phase to adulthood (Howlin, Goode, Hutton & Rutter, 2004). Specifically, social deficits in young adults with ASD can impact participation and success in higher education (Van Bergeijk, Klin & Volkmar, 2008). Developing techniques to assist individuals on the spectrum to succeed in postsecondary education is therefore an important area to examine, as a college education has been linked to higher quality of life, future employment, increased self-confidence, and personal skill building (Zafft, Hart, & Zimbrich, 2004). Although the anticipated wave of individuals with autism who have higher education goals has created some discussion in the field, there is still a paucity of research and services for this population on the spectrum (Cimera & Cowan, 2009; Nevill & White, 2011; Zager & Alpern, 2010). The majority of research and programming efforts are focused on school-aged children with autism, with less attention given to the needs of young adults as they move beyond high school (Zager & Alpern, 2010). This gap in the literature must be addressed as the surge of children diagnosed with ASD in the early 1990s is currently transitioning into adulthood and entering higher education settings (Van Bergeijk et. al., 2008). Adults with autism represent a consistently growing population, and at this time there is a lack of knowledge regarding the most effective methods to successfully serve college students on the spectrum.

Adults with ASD: Symptoms and Outcomes

One of the key diagnostic criteria for Autism Spectrum Disorder (ASD) includes persistent difficulties with social communication and social interaction (American Psychiatric Association, 2013). More specifically, individuals with ASD exhibit social deficits in the following areas: (1) Social-emotional reciprocity (e.g. lack of reciprocal conversations, reduced sharing of interest, and lack of initiation or response to social interaction); (2) Challenges with appropriate nonverbal behaviors used for social interaction (e.g. impairments in eye contact and body language, abnormal affect and prosody, and inappropriate volume and facial expressions); and (3) Difficulties developing, understanding, and maintaining relationships with others (e.g. difficulties making friends, challenges with appropriately engaging in social activities, and reduced display of interest in other people). For college students on the spectrum, these deficits in social communication and social interactions can create challenges in their transition into higher education (Adreon & Durocher, 2007; Van Bergeijk et al., 2008). In a college environment, communication and social skills are important tools for developing relationships with peers, integrating into a university setting, and successfully living independently. Furthermore, these social and communication difficulties may impact students' well-being and overall quality of life.

Although autism is a developmental disorder that is typically diagnosed during childhood, difficulties with socialization often continue to pose challenges as individuals on the spectrum develop into adulthood (Hendricks & Wehman, 2009; Seltzer, Shattuck, Abbeduto & Greenberg, 2004; Zager & Alpern, 2010). Due to the fact that autism was only recently identified in 1943 by Leo Kanner, there is limited research on the course and outcomes associated with the disorder (Seltzer et al., 2004; Zager & Alpern, 2010). However, research does indicate that the core symptoms of autism largely remain as individuals on the spectrum develop through life (Hendricks & Wehman, 2009; Seltzer et al., 2004). While individuals can make improvements in their social communication and behavioral skills, data indicate that few individuals move into the normal range of functioning (Seltzer et al., 2004). More specifically, longitudinal research indicates that that only 22% of adults with ASD have “very good” or “good” outcomes, and most remain dependent on families and support services (Howlin et al., 2004). Therefore, it is important that in addition to efforts aimed towards school-aged children with autism, research and programming are conducted to help serve the adult population with ASD.

In addition to the majority of adults with ASD having poor long-term outcomes overall, most long-term outcomes specifically related to the area of socialization are especially low for adults on the spectrum (Howlin et al., 2004; Zager & Alpern, 2010). Social deficits appear to be a persistent component for individuals with ASD, with severe impairments affecting about half of the population (Seltzer et al., 2004). Even with early intervention, the children who progress well with the acquisition of age-appropriate language structures may continue to have difficulties in social engagement with peers as they grow older, such as challenges participating in social activities, difficulties with social conversation skills, and less interactions with peers (Bauminger & Kasari, 2000; Howlin, 2000; Stewart, Barnard, Pearson, Hasan & O’Brien, 2006; Strain & Schwartz, 2001). Data indicate that symptoms can abate in the social reciprocity domain, but typically the degree of improvement is less prominent than in the communication domain (Seltzer et al., 2004). Research shows that only 26% of adults with autism report having a relationship with at least one other person in their age group that involved participation in social activities (Howlin et al., 2004). Furthermore, Baron-Cohen and Wheelright (2003) found that individuals on the spectrum scored significantly lower than control subjects without autism on a measure of friendship, and concluded that “although many adults with AS/HFA do have friendships, compared with people in the normal population, their friendships are less close, less empathic, less supportive, and less important to the individual” (p. 513). This dearth of friendships for individuals with ASD is distressing, as the literature suggests that individuals with ASD have a longing for social relationships and emotional intimacy, but have difficulty developing meaningful and deep friendships (Muller, Schuler, & Yates, 2008). In addition, long-range follow-up studies indicate that only 9% of children with autism were rated as having good social adjustment in adolescence, and 30% were rated as having very poor social adjustment (Rutter, Greenfield, & Lockyer, 1967). Mesibov, Schopler, Schaffer & Michal (1989) also conducted a longitudinal study with 59 individuals with ASD and found that of the 15 areas assessed in the Childhood Autism Rating Scale, the least improvements occurred in the dimensions capturing the social limitations of autism (as opposed to the other dimensions such as imitation ability and adaptation to environmental changes). It appears that social impairments may be the most intractable core symptom associated with the disorder.

The literature and current research described above suggest that symptoms of autism persist throughout the lifespan, and most long-term outcomes for adults on the spectrum are low (Howlin et al., 2004). It appears that socialization is a main area of deficit that continues to impact individuals with ASD of all ages and development levels (Seltzer et al., 2004). Therefore, evaluating techniques to improve socialization would be beneficial to the field and may improve the long-term outcomes for adults on the spectrum.

College as a Significant Time Period for Students with ASD

Research and the literature indicate that people benefit from a college education and the college experience (Dowrick, Anderson, Heyer & Acosta, 2005; Grigal, Neubart & Moon, 2001; Hart, Grigal, & Weir, 2010; Zafft et al., 2004). Attending college is the desirable outcome for many students that graduate the secondary school system (Grigal et al., 2001). For both students without disabilities and students with autism, college is an environment that promotes academic and personal skill building, future employment, increased self-confidence, and integration into a community (Webb, Patterson, Syverud, & Seabrooks-Blackmore, 2008; Zafft et al., 2006). For students with disabilities, college is a natural and inclusive environment in which they can integrate with students without disabilities, and build self-confidence as they navigate the campus environment and increase independent living skills (Hart et al., 2010). The literature states that individuals with disabilities benefit from the opportunity to participate in valued social roles, and a “college student” is a valued social role that can increase a person’s quality of life and future opportunities (Hart et al., 2010).

College is also an important time period to address because postsecondary education is a predictor of successful employment outcomes for both individuals with and without disabilities (Dowrick et al., 2005; Zafft et al., 2004). Research documents a positive relationship between college attendance and competitive employment outcomes, and data show that a college education offers greater employability and increased earnings for individuals, including individuals on the autism spectrum (Dowrick et al., 2005; Hart et al., 2010; Nevill & White, 2011; Zafft et al., 2004). Students with disabilities that participate in postsecondary education have been shown to have higher rates in competitive employment, utilize less work-related supports (e.g. job coaches), and earn higher wages when compared to individuals with disabilities that did not participate in postsecondary education (Zafft et al., 2004). This suggests that developing techniques to support students with disabilities to successfully participate in postsecondary education may decrease the overall amount of money and resources needed for on-going support and government-assisted income. Additionally, securing meaningful employment is thought to be one of the pillars of successful adult life, and it is important that individuals with autism receive the supports to attend postsecondary education and increase their tools and opportunities for successful employment.

Family members of adolescents with autism have also expressed interest in seeing their young adult with autism participate in postsecondary activities (Stodden & Mruzek, 2010). Although parents typically report that they believe postsecondary education would be beneficial in regards to transition planning for their young adult with autism, they state that most educators did not encourage this option (Griffin, McMillan & Hodapp, 2010). Data indicate that 73% of parents lack information and guidance about planning for postsecondary education, and poor communication between schools and families can be a barrier to an effective transition into adulthood (Griffin et al., 2010). It seems important to develop support programs for higher education students with ASD, and disseminate this information to parents when discussing transition planning for their young adult.

Although there are numerous benefits for an individual on the spectrum to attend college, many young adults with ASD currently believe that they do not have the option to obtain a higher education degree. While 78% of typical high school graduates pursue some type of postsecondary education, only 14% to 37% of individuals with significant disabilities enter postsecondary education (Grigal et al., 2001; Zafft et al., 2004). Students with disabilities frequently remain in special education programs or enter sheltered work environments after high school, while most of their typical peers move to further education or competitive employment (Zafft et al., 2004). Stodden, Whelley, Chang & Harding (2001) note that it is well documented that students with disabilities often experience limited access to and success in higher education, which can then limit future opportunities for employment and independent living.

As of 2007, the United States Department of Education identified 15,443 students between the ages of 18 and 21 years as having autism (U.S. Department of Education, 2006). Despite the increased prevalence of autism and the wave of individuals with ASD transitioning to adulthood, there is limited research on evidence-based interventions and services for postsecondary students with autism (Hart et al., 2010). Higher education offers valuable learning and social opportunities, and can be a natural progression from the inclusive educational environment offered in the K-12 system. Due to the fact that college appears to be an important time period and stepping stone to competitive employment, it seems necessary to develop and assess methods to best serve individuals with ASD in this environment (Hart et al., 2010; White, Ollendick & Bray, 2011).

Current Services for College Students with ASD

Even though college is an important time period for many individuals with ASD, current services do not typically address the unique range of supports needed to assist college students on the spectrum. There is minimal research conducted on the development, implementation, and evaluation of programs to serve the college student population with ASD (Grigal et al., 2001). Unfortunately, services received in elementary through high school may decrease or disappear for college students on the spectrum (Graetz & Spampinato, 2008; National Council on Disability, 2000). The literature suggests that many college students with ASD often do not receive the necessary services and supports to address their unique and complex needs associated with the disorder (Hendricks & Wehman, 2009). Furthermore, postsecondary educational supports for students with disabilities are rarely documented by empirical data or grounded in theory, and little is known about the effectiveness of support programs (Stodden et al., 2001). Many students with ASD that enter postsecondary education end up having limited success due to a lack of available services that effectively address their specific disability (Webb et al., 2008).

At the secondary level, the Individuals with Disabilities Education Improvement Act (IDEA) is a federal law that mandates educational support for students with disabilities (Individuals with Disabilities Education Act, 2004). Under IDEA, students with disabilities should receive services designed to meet their unique learning needs until he or she receives a high school degree, and individuals should be helped to prepare for further education, employment and independent living (IDEA, 2004; Van Bergeijk et al., 2008). As part of this act, an Individualized Education Plan (IEP) is developed for each student with a disability in primary or secondary school (Adreon & Durocher, 2007). The IEP is created by a team of teachers, school staff and parents, and it is uniquely designed to help the student meet their educational needs in the least restrictive environment. The document specifies the services that will be provided, the student’s current level, short and long term goals, and the accommodations and modifications that will be provided. By the time the student is 16 years of age, IDEA requires that transition planning be incorporated into the student’s IEP (Van Bergeijk et al., 2008). During transition planning, the student is involved in the IEP meeting and a transition plan is formed based on the student’s preferences, strengths and interests. The team will develop a personalized plan for each student that coordinates postsecondary education or vocational training, employment, independent living, and community participation. Both the IEP and transition planning assist in accomplishing one of IDEA’s stated objectives to help prepare children with disabilities to lead productive and independent adult lives, to the maximum extent possible (IDEA, 2004).

Once a student with autism graduates from high school, then they are no longer protected under IDEA and services diminish. While IDEA (2004) mandates individualized educational programming for each student with a disability at the secondary level, students in higher education generally do not receive services unique to their disability (Van Bergeijk et al., 2008). At the postsecondary level, the Americans with Disabilities Act (ADA) and the Rehabilitation Act are the primary mandates for provision of services (Americans with Disabilities Act, 1990; Graetz & Spampinato, 2008). The ADA is a federal policy that prohibits discrimination against people with disabilities in employment, transportation, public accommodation, communications, and governmental activities (ADA, 1990). Disability is defined by the ADA as a physical or mental impairment that substantially limits a major life activity (ADA, 1990).

The ADA focuses on providing reasonable accommodations to ensure equal access to learning and work environments; however, accommodations are not unique to the individual and their specific support needs (Stodden & Mruzek, 2010). Under this mandate, universities typically offer a general menu of accommodations, but support services may not be individually tailored to the student's disability (Graetz & Spampinato, 2008). For example, universities may offer "one-size-fits-all" services for all students with disabilities, such as instructional accommodations (e.g. note-takers, tape-recorded lectures, priority seating, course materials available in an alternative format, etc.), academic accommodations (e.g. modified course load, priority registration, academic counseling, etc.), and test accommodations (e.g. separate room for exams, extended time, larger type, breaks during testing, etc.). However, these services may not address the unique deficits and areas of need for the student (e.g. communication and socialization skills) (Graetz & Spampinato, 2008; Hart et al., 2010). Many college students with ASD have challenges that are not covered by the academic accommodations and tutoring services provided through the college. Students with disabilities have discussed in focus groups that postsecondary support services should address each individual's needs rather than a general formula for students with disabilities (Dowrick et al., 2005). Without support to address their unique challenges, particularly socialization and peer interactions, it can be difficult for the student with autism to transition and succeed in the college setting.

In addition to services typically being somewhat limited and general at the college level, students with autism must also self-advocate to receive their assistance (Adreon & Durocher, 2007; Stodden & Mruzek, 2010). At the secondary level, teachers and parents assist in developing the treatment plan, but students in higher education must take the initiative themselves to disclose their disability and self-advocate for accommodations (Dowrick et al., 2005). As Stodden et al., (2001) state, “Students with disabilities graduating from high school move from a protective environment in which school personnel are legally responsible for identifying and providing appropriate services under IDEA to an environment in which the students are expected to self-identify as a person with a disability and request specific accommodations under Section 504 and the Americans with Disabilities Act (ADA)” (p. 189). The ADA shifts the responsibility for making decisions about services from parents and school staff to the student with autism (Stodden & Mruzek, 2010). Most students with ASD have to arrange their own services and accommodations, and it is common for students to have difficulty knowing which services they need to succeed at the university level and how to access the appropriate resources (Adreon & Durocher, 2007). In a literature review on studies that have asked students with disabilities to identify their needs in postsecondary settings, 65% of the articles reviewed commented on the need for self-advocacy skill training for college students with disabilities (Webb et al., 2008). Individuals must know how to initiate contact with the school’s disability office, approach professors to communicate the accommodations that they need to be successful, and follow-through on utilizing the resources. Students with disabilities at postsecondary education settings have reported that they are not always aware of the services available to them, and that they wish the disability office provided more outreach and information to the students (Dowrick et al., 2005). Williams and Palmer (2004) discussed that many students need coaching and support on how to gain and access accommodations, especially because they no longer have the guidance of a long-term teacher or parent. Without the appropriate self-advocacy skills, many students with ASD may have difficulty navigating the university setting (Adreon & Durocher, 2007).

As described above, general services provided by Disabled Students Program currently do not include support for increasing socialization (Adreon & Durocher, 2007; Hart et al., 2010). Students on the spectrum are typically not receiving services to help them participate and engage in the college environment, and many students are not able to independently integrate into this new type of setting. For example, it is common for college students on the spectrum to not know where to look for potential social activities, lack the confidence to independently go to social events, or have challenges with organization skills that prevents them from following through on participating in social activities. Due to the fact that socialization is a key area of deficit for college students with ASD, it appears important that strategies for college students on the spectrum are developed and examined to assist them to engage with peers and integrate into the campus environment.

Increasing Socialization as an Important Goal for College Students with ASD

Current services offered by most universities do not include supports for social skills; however, increasing socialization for students with autism is an important area to target (Nevill & White, 2011). Adjusting to the social pressures of postsecondary education and adult living is one of the most challenging areas for college students with disabilities, and the literature suggests that experiencing success at the undergraduate and graduate level requires an individual to demonstrate advanced social skills (Nevill & White, 2011; Webb et al., 2008). Students with ASD typically struggle with the transition to college not because they lack the cognitive abilities to complete the work, but because they experience challenges with new social interactions in an unfamiliar place (Wenzel & Rowley, 2010).

The literature states that there must be a concentrated effort to include students on the spectrum among their peers without disabilities, as well as efforts to increase community participation of students with ASD on campus (Grigal et al., 2001; Hart et al., 2010; Hendricks & Wehman, 2009). Adults with disabilities are increasingly attending college, but their social participation and integration in the university is still below the level of students without disabilities (Dillon, 2007). Research indicates that providing students with autism the opportunity to interact with same age peers without disabilities should be one of the major premises when creating programs in postsecondary education settings, as productive engagement in activities promotes integration into social networks and relationship development (Grigal et al., 2001; Hendricks & Wehman, 2009).

The literature shows that adults with ASD long for social relationships and have the desire to contribute to their community, but they often experience loneliness due to a lack of involvement and social skill deficits (Adreon & Durocher, 2007; Hendricks & Wehman, 2009; Howlin, 2000; Muller, Schuler, Yates, 2008). Muller et al. (2008) interviewed adults with autism and found six major themes in social experiences: (1) Isolation; (2) Difficulty initiating; (3) Communication challenges; (4) Longing for intimacy; (5) Desire to contribute; and (6) Effort to develop social awareness. Research shows that many adults with ASD report feeling isolated, and discuss that they often resign to their lack of relationships and do not attempt to improve their feelings of loneliness (Muller et al, 2008). For students with ASD, leisure activities are frequently isolated activities such as playing video games and watching television (Hendricks & Wehman, 2009). Additionally, adults on the spectrum indicate that initiating social interactions is a significant challenge, and have stated, “I’m not very outgoing on my own, in terms of taking the initiative” and “Initiating social interactions sounded really good, but I didn’t have the slightest clue how to do it.” (Muller et al., 2008, p. 179). In spite of difficulties with initiating social interactions, most adults with ASD have a desire to contribute and integrate into their community (Adreon & Durocher; 2007; Muller et al., 2008). Due to the discrepancy in experiencing social challenges but longing for integration into the surrounding environment, interventions should be developed to assist adults with ASD to engage in social activities.

Social challenges may be one of the primary reasons that as many as half of individuals with ASD whose symptoms continue into adulthood develop co-morbid disorders such as depression and anxiety (Kring, Greenberg, & Seltzer, 2008). Data indicate that compared to a typical community sample, individuals on the autism spectrum have a higher rate of depression (Hendricks & Wheman, 2009; Stewart et al., 2006). Research shows that students with ASD have difficulty engaging in positive social relationships with peers, which can result in rejection, isolation, and academic failure (Webb et al., 2008). College students on the spectrum often report having few friends and feeling lonely, which can interfere with their intellectual skills to excel in academics (Dillon, 2007). The literature suggests that many individuals with ASD receive poor grades or fail out of college due to feeling isolated and depressed that they are not able to establish and maintain relationships (Dillon, 2007).

Although depression is common in autism, there is little research on this issue (Stewart et al., 2006). The literature does indicate that a depressed mood is the most frequently cited symptom of depression for individuals with ASD, and other symptoms that are common in the autism population include loss of interest in activities, appetite, and sleep (Stewart et al., 2006). However, there are no scales specifically designed to assess for depression in individuals with autism, and researchers typically use measures designed for the general population or individuals with learning disabilities (Stewart et al., 2006). This may be problematic, as the characteristics of autism (e.g. difficulties with social interaction) may affect the expression of depressive symptoms. Additionally, there are few studies to assess the treatment of depression in autism. The majority of treatment studies have been based on pharmacological therapy, with little research on behavioral therapies that can reduce symptoms of depression for individuals on the spectrum (Stewart et al., 2006). There seems to be clear need for both assessment and measurement tools that are specifically designed to assess depressive symptoms for the autism population.

Due to the fact that socialization is a difficult area for college students on the spectrum, but may also be a key area to success in postsecondary education, it is important that strategies be developed to assist students with autism to socially engage with typical peers. Techniques should be researched to increase peer social activities for individuals with ASD in postsecondary settings, and systematically examine the impact of social intervention on measures relating to overall quality of life for college students on the spectrum.

Structured Social Planning as a Promising Intervention

Preliminary research suggests that structured social planning is an effective method in increasing amount of social activities for college students with ASD (Koegel, Ashbaugh, Koegel, Detar & Regester, 2013). Unlike most typically developing individuals, college students with ASD typically have limited experience with peers and less knowledge of appropriate social skills (Webb et al., 2008). This can be particularly challenging in a college setting that includes more unstructured time that most typical students use to spend time with their peers and engage in extracurricular activities. Furthermore, college students are expected to make friends and independently find and engage in social activities, which can be difficult for individuals on the spectrum (Wenzel & Rowley, 2010).

Structured social planning is an intervention aimed to improve socialization for individuals with ASD by increasing the number of social activities they attend with their peers. Structured social planning consists of the following components: (1) Incorporating motivational interests; (2) Choice in social activity; (3) Training in organizational skills; and (4) Incorporation of a peer mentor (Koegel et al., 2013). This intervention procedure is based on previous research findings. First, the literature suggests that adults on the autism spectrum are most successful and typically prefer participating in activities and events that incorporate their preferred interests for social interaction (Koegel, Dyer, & Bell, 1987; Muller et al., 2008; Wenzel & Rowley, 2010). Structured social planning aims to increase the individual's motivation to attend social activities by identifying their preferred interests and incorporating their preferences into possible activities for them to attend. Second, structured social planning also incorporates choice, in that individuals choose which social activity they would like to attend each week (Koegel et al., 2013). This is thought to increase the individual's sense of personal control and independence, in that they are determining which activity they would like to participate in for the week. Third, a common challenge for college students with ASD is difficulty managing tasks, organizing a planner, and scheduling (Hart et al., 2010). According to White, Ollendick & Bray (2011), poor organization and planning may lead to a difficult transition into college and prevent students with ASD from recognizing their potential. Therefore, structured social planning incorporates training in time management and organization skills. Lastly, there is a plethora of data to show that incorporating typical peers can be beneficial in treatment programs for individuals with ASD (Chan et al., 2009; Dillon, 2007; Hart et al., 2010; Koegel et al., 2013). According to Hart et al. (2010), navigating the social environments of a college campus may be the most challenging aspect of college, and peer mentors can be extremely helpful in this regard. Additionally, peer mentors can offer individualized support that is unique to the particular student's needs, and involves flexibility of activity, time and location which has been shown to be beneficial for working with students with ASD (Dillon, 2007). Furthermore, the peer mentor component of structured social planning aims to provide social assistance in the natural environment in a non-stigmatizing manner. Peer mentors attend social activities with individuals with ASD to help model appropriate social behavior, prompt individuals with ASD to engage with peers, and provide feedback on the individual's social behavior following the activity (Koegel et al., 2013).

Preliminary research shows that this intervention is successful in increasing the number of peer social activities for individuals with ASD (Koegel et al., 2013). Data showed that individuals rapidly increased the number of social activities they attended with peers each week after the implementation of structured social planning. Additionally, college students with ASD reported increases in satisfaction with their college experience and interactions with others, as well as increases in confidence with peer conversations after receiving structured social planning (Koegel et al., 2013). This suggests that structured social planning is a promising intervention to increase social activities, as well as improve the level of satisfaction and confidence for college students on the spectrum.

While research has shown that structured social planning is effective in improving the number of social activities for college students with autism, there are limitations to the current research. First, previous research has not examined the effectiveness of structured social planning to improve the scope of social activities for individuals with ASD. While data indicate that the intervention can increase the total quantity of social activities attended each week, details regarding the types of social activities attended have not yet been evaluated. It should be helpful to assess if individuals with ASD increase their ability to participate in more social activities with unfamiliar (i.e. new) peers, if they increase the number of social activities they attend on campus/in the community, and if they have more interactions with different peers each week. Evaluating the impact of structured social planning on the types of social activities and breadth of peer interactions may enhance understanding of techniques to assist students with ASD to integrate into their campus community, meet new peers, and assimilate with a variety of students. Examining the effectiveness of structured social planning to improve the scope of social activities for individuals with ASD seems like a promising next step in this line of research.

Additionally, previous research on structured social planning did not incorporate social skills training and priming related to the social activity. Research shows that instruction and rehearsal of social skills related to participation in social activities (e.g, conversation skills, electronic communication, introductions, etc.) can help improve social behavior for young adults with ASD (Gantman, Kapp, Orenski, & Laugeson, 2012). For example, instruction and priming on conversation skills (e.g. how to introduce oneself, how to ask questions to peers, appropriate topics of conversation), electronic communication (e.g. Facebook, e-mailing, text messaging), and appearance (e.g. hygiene, appropriate clothes) has been shown to benefit individuals with ASD (Laugeson, Frankel, Gantman, Dillon & Mogil, 2011). Additionally, parents have reported that instruction and rehearsal of social skills can improve young adults' overall social skills, social responsiveness, and frequency of get-togethers (Gantman et al., 2012). Therefore, incorporating training and practice in social skills within a structured environment may increase the student's ability to engage in social activities, and may be a helpful addition to the intervention procedure. This study will include social skills training in the intervention package with the aim to further enhance their social engagement with typical peers.

Quality of Life in Adults with ASD

Another reason that socialization is an important area to target is that social inclusion is considered a component to an individual's Quality of Life (QoL) (Graetz, 2010). The term "quality of life" first appeared in the literature in the 1920s, and in 1995 the World Health Organization defined QoL as an "individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (Eapen, Cryncec, Walter, & Tay, 2014, p. 1). Quality of life is a multidimensional construct, and includes a broad set of factors that comprise personal well-being.

Although there are many definitions of quality of life, researchers have generally agreed that the following eight dimensions provide a framework for examining an individual's quality of life: (1) Emotional well-being; (2) Interpersonal relationships; (3) Material well-being; (4) Personal development; (5) Physical well-being; (6) Self-determination; (7) Social inclusion; and (8) Rights (Graetz, 2010). Individuals with autism frequently have struggles with these identified dimensions related to quality of life, specifically in the areas of interpersonal relationships, self-determination, and social inclusion. Therefore, identifying strategies aimed to help individuals improve in these specific areas may in turn improve their overall quality of life.

The majority of research on adults with ASD has been focused on unidimensional outcome domains, with little research assessing more global measures for adults on the spectrum (Renty & Roeyers, 2006). Quality of life is a global construct, and targeting certain areas may potentially produce collateral increases in other domains. There have been few studies to examine for collateral improvements in the supplemental areas relating to general quality of life, which takes into account a more comprehensive and multidimensional approach. Current findings have focused on descriptive information on specific outcome domains for adults with autism, such as living situations, employment outcomes, and so on. There has been minimal research to assess the general quality of life and subjective well being for adults with autism, and few studies have incorporated multiple domains when examining treatment outcomes. Therefore, it seems important to document several outcome measures to assess for possible collateral improvements when examining the effectiveness of an intervention procedure.

The minimal research that has been conducted on the quality of life for adults with ASD has shown that support characteristics are related to increased quality of life (e.g. perceived and received informal support, perceived and received formal support), whereas disability characteristics did not show to influence quality of life (e.g. severity of autism-specific traits) (Renty & Roeyers, 2006). This implies that the available social network and professional supports can be significant factors in achieving a high quality of life for individuals on the spectrum. This is important when considering college students with ASD, as research has shown that they typically do not have a strong social support system and may not receive the necessary support needs from the university to assist with their unique social challenges. Thus, quality of life and subjective well-being for college students on the spectrum may be low due to the lack of support to assist them with social integration and participation in the campus community. Therefore, it may be important to assess if providing increased social support can increase students' overall sense of well-being in a college environment.

Due to the fact that quality of life is a global domain, it may be beneficial for research to examine if improving specific areas of an individual's life will in turn produce global improvements in untargeted areas. Research has found that personal factors, environmental variables, and provider characteristics are significant predictors of quality of life, but it is unknown if improving certain factros will show improvements in other areas related to quality of life (Renty & Roeyers, 2006). It may be possible that focusing on certain domains that comprise quality of life can impact the broad measure of personal well-being. However, because the term "quality of life" refers to a set of factors, targeting one specific construct may not be enough to produce gains in the global measure (Renty & Roeyers, 2006). Individuals may perceive improvements in one area of their life (e.g. interpersonal relationships), but it is possible that other aspects of their personal well-being (e.g. academic achievement and physical well-being) may overshadow any specific gains in regards to overall perception of quality of life and general well-being. It may be valuable to examine the effectiveness of an intervention on the specific targeted area as well as collateral areas to investigate a more global and comprehensive outcome.

Purpose and Aims of the Current Study

Research indicates that current outcomes for adults with ASD are low, particularly in regards to socialization. A college education and college experience have been shown to increase positive outcomes for individuals on the spectrum; however, students with ASD have social deficits that can create barriers to success in higher education settings. Currently, there is little research and programming efforts on the development and examination of intervention techniques to address the unique social challenges for this population.

Due to these issues, the first purpose of this study was to assess within the context of a multiple-baseline experimental design whether a structured social planning intervention produced increases in measures related to socialization for college students on the autism spectrum. This study built upon previous research by examining the effectiveness of structured social planning on multiple measures relating to the quantity of social activities, scope of social activities, and supplemental areas related socialization. Specifically, the following research questions were examined. Does a structured social planning intervention for college students with ASD result in:

1. An increase in the quantity of social activities as measured by the following:
    A. The number and hours of social activities attended per week
    B. The number of independent (non-peer mentor) and supported (peer mentor) social activities per week
2. An increase in the scope of social activities as measured by the following:
    A. The number of community-based social activities attended per week
    B. The number of social activities attended with familiar and unfamiliar peers per week
    C. The number of different peer interactions at social activities per week
3. An increase in supplemental areas related to socialization as measured by the following:
    A. An increase in self-reported satisfaction with socialization
    B. An improvement in social conversation skills

In addition to these primary research questions, the following research questions were explored. These research questions examined the potential impact of structured social planning on collateral areas that relate to the participant's overall quality of life. Specifically, does a structured social planning intervention for college students with ASD result in:

4. An improvement in well-being as measured through standardized self-report assessments of subjective well-being, psychological functioning, and depressive symptoms?
5. An increase in academic performance as measured through Grade Point Average?

Methods

Participants and Setting

Three college students with ASD participated in this study. Each participant met the following criteria: (a) A diagnosis of an Autism Spectrum Disorder by an outside agency according to criteria in the DSM-IV TR or DSM-5 and confirmed through our center from individuals with an expertise in autism (American Psychiatric Association, 2000; American Psychiatric Association, 2013); (b) Current student in a higher education setting; (c) Between 18-25 years of age; (d) Able to speak in full, syntactically correct sentences; (e) No history of violence or aggressive behavior; and (f) Demonstrated social difficulties as seen through a lack of self-reported socialization and direct observation (i.e. reported an average of less than three social activities per week, noted zero to one extracurricular activities with peers, and discussed challenges developing friendships and feeling isolated).

The participants were selected from a pool of approximately 10 college students receiving services because they were the most severe in regard to a low level of social engagement with peers. Participants had not received behavioral intervention for autism in the past five years, and all students had an IQ in the average or above average range. Informed consent was obtained from all participants included in this study and participants were informed that they would receive structured social planning to attempt to improve their socialization. While all participants had a formal diagnosis of Autism Spectrum Disorder, each participant also completed the Adult Autism Spectrum Quotient (AQ) questionnaire and Social Responsiveness Scale - 2 (SRS-2) Adult Self Report measures to provide supplemental information regarding severity of autism traits and level of social impairment associated with ASD (AQ; Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001;

SRS-2; Constantino & Gruber, 2012). Further information on participants can be seen in Table 1.

Participant 1. Nina was 24 years, 0 months at the start of the study and of European origin. Nina was a first-year transfer student at a four-year University and her major was Art Studio. At the start of the study, Nina was on Academic Probation for low Grade Point Average (below a 2.0). She was referred to the Autism Center by a social worker at the University Student Health Center who felt that her social difficulties were interfering with her academic performance. Nina reported that she failed all of her classes during her first quarter at the four-year university, and would like to improve her socialization and academic success at college. She lived at home with her parents and had a part-time job at a local grocery store. In addition to a diagnosis of Autism Spectrum Disorder, Nina also had a diagnosis of Depression and Attention Deficit Hyperactivity Disorder from a local psychiatrist and reported taking antidepressant medication at the start of the study. Nina reported a 64 on the SRS-2 assessment indicating that she has mild deficiencies in social behavior and a 28 on the Autism Quotient. In a clinical interview, Nina discussed having no friends at the university, noted no extracurricular activities, expressed having difficulty initiating to new people, and reported challenges staying connected to previous friends. Furthermore, Nina reported that she would like to get involved in more extracurricular activities on campus and develop more friendships at college.

Participant 2. Hannah was 21 years, 4 months at the start of the study and of Euro-American origin. She was referred to the Autism Center by her parents for difficulties with socialization and academics at the University. At the start of the study, Hannah was a second-year student at a four-year university and her major was Mechanical Engineering.

She was on Academic Probation from the University at the onset of the study due to a low Grade Point Average (below a 2.0). During the study, Hannah took a leave of absence at the four-year university and enrolled at a community college. Hannah received a comprehensive diagnostic evaluation from a local autism agency and she received a diagnosis of Autism Spectrum Disorder. She reported a 51 on the SRS-2 and a 17 on the AQ assessments. In addition to a diagnosis of Autism Spectrum Disorder, Hannah was diagnosed with Depression from a local psychiatrist and reported taking antidepressant medication at the start of the study. She lived at home with her parents and had a part-time job at a local karate studio. Hannah did not engage in extracurricular activities with peers and spent the majority of her free time in her room at home. She noted that she had concerns about building and maintaining friendships, and stated that she did not have many friends at college. In a clinical interview, Hannah stated that her primary reason for services was to improve her academics, but also reported that she would like to develop more friendships at college and get involved in more extracurricular activities.

Participant 3. Aaron was 19 years, 2 months at the start of the study and of Euro-American origin. He was a first-year student a community college and his major was undeclared. He lived at home with his parents and was referred to the Autism Center by his mother. Aaron received a diagnosis of Autism Spectrum Disorder in elementary school, but he did not receive any clinical intervention in the past five years. He reported a 50 on the SRS-2 and a 32 on the AQ assessment, signifying a strong indication of Autism Spectrum Disorder. In a clinical interview, Aaron reported that he did not participate in school activities, had difficulty initiating to peers, and engaged in most activities on his own. He discussed that he was not satisfied with his interactions with other students and the number of social activities that he attends, and that he was not confident in his ability to find social events to attend.

Table 1

Participant Characteristics

	Nina	**Hannah**	**Aaron**
Age	24:0	21:4	19:2
Gender	Female	Female	Male
Postsecondary Setting	Four-year University	Four-year University/ Community College	Community College
Academic Status	Academic Probation	Academic Probation	Good Standing
Residence	Parent's home	Parent's home	Parent's home
Ethnicity	European	European-American	European-American
Diagnosis	ASD	ASD	ASD
Co-morbid Diagnoses	Depression, Attention-Deficit Hyperactivity Disorder	Depression	None
Social Responsiveness Scale-2 (SRS-2) Score	*64	51	50
Autism Quotient (AQ) Score	27	17	*32

*Score met criteria for clinical significance

Autism Quotient (AQ): Higher scores indicate greater indication of autism tendencies. Autism rule-out ≥ 26 and cut-off score ≥ 32

Social-Responsiveness Scale-2 (SRS-2): Higher scores indicate increased deficiencies in reciprocal social behavior. ≤59= Normal Range, 60-65=Mild Range, 65-75=Moderate Range, ≥ 76 = Severe Range.

Settings and Materials

All baseline, intervention, and follow-up sessions were conducted at the Autism Center on the University campus. Intervention was implemented in a clinic room or office that contained a computer and large chairs. All social activities recorded for each student took place with peers in the student's natural environment on the university campus (e.g. dining commons, recreation center, dormitory, student organization events, etc.), the community (e.g. restaurants, local beaches, bowling alley, movie theater, etc.) or the home (e.g. playing games, cooking, etc.).

Experimental Design

The effectiveness of structured social planning for college students with ASD was evaluated using a multiple baseline across participants design. Multiple baseline designs provide a useful means to test the effects of specific therapeutic techniques, and in-depth information can be collected on the use of the intervention technique over time (Heppner, Kivlighan & Wampold, 1999). This design, with each participant serving as their own control, is widely used in the field of autism, where participants with the diagnostic category show considerable heterogeneity (Campbell, 1988; Zhan & Ottenbacher, 2001). There is a staggered introduction of the independent variable at different points in time so that each individual participant provides its own control for purposes of assessing the replication of the effect as well as a comparison to the baseline condition (Barlow, Nock & Hersen, 2009). Baseline sessions were systematically staggered for three, seven and eleven weeks for Nina, Hannah, and Aaron, respectively. Following baseline, structured social planning intervention was then implemented in the clinic for one hour per week for a period of 10 weeks. Follow-up data were also collected for three weeks following the end of intervention with each participant.

Procedure

Baseline. Prior to intervention, a baseline phase was conducted with each participant. During the baseline phase, no instructions were provided concerning social activities. Rather, the participants were asked to continue as they normally would in their everyday lives. In order to control for the fact that a social activity log would be employed later in the intervention condition, each student was instructed to keep a daily social activity log of all social activities attended throughout the week. Participants were instructed that a social activity must involve at least one typical peer and the activity must not be an academic or vocational requirement. Additionally, the clinician provided a minimum of three examples of a social activity (e.g. lunch with a friend, recreational class, studying at the library with a classmate) and three examples of a non-social activity (e.g. exercising on their own, attending class, going to dinner with their family). Examples of social activities and non-social activities that were provided by the clinician can be seen in Appendix A. During each weekly session, the social activity log was reviewed for validity and discussed for the previous week (i.e. the duration, setting, and peers involved were reviewed for all recorded activities). A template of the social activity log can be found in Appendix B.

Intervention. Intervention sessions were conducted one time per week for approximately one hour. The structured social planning intervention consisted of the following components: (1) Incorporation of the participant's motivational interests; (2) Participants' choice in social activity from a menu of activities based on their unique interests; (3) Training in organizational skills related to the social activity; (4) Support from a typical peer mentor; and (5) Social skills training related to communication and interaction with peers.. Intervention sessions were conducted for ten weeks with each participant. A description of each component of the intervention is also presented below. An outline of the intervention procedure can also be found in Appendix C.

Incorporation of motivational interests. During the first intervention session, the clinician met with the participant to discuss the participant's motivational interests. The clinician asked the participant about their interests, likes, dislikes, and other preferences. The clinician also probed for information regarding the participant's hobbies, social activities of interest, extracurricular activities in high school, career path, and goals for the future. When possible, the clinician also discussed with the participant's parents regarding the participant's interests and preferred activities. The clinician used this information and incorporated the participant's motivational interests during each structured social planning intervention session.

Menu of social activities. For each weekly intervention session, the clinician researched community events, university clubs, and extracurricular activities based on the participant's interests gathered in the assessment of motivational activities. Each session, the clinician created a menu of at least three social activities that aligned with the interests of the participant. The options consisted of activities such as school affiliated clubs, one time social events on campus or in town, activities in the community, recreational classes, events in the dormitories, and dining or studying with peers. The participant was prompted to select a minimum of one activity that he or she would attend during the upcoming week. For example, one participant expressed interest in art, dance, and Japanese culture. During an intervention session, the clinician presented her with at least three opportunities of possible social activities to attend that week around her interests, such as an Art Club, dance class, event at the university art museum, yoga class, or Japanese Language Café Club. Once a specific activity was decided upon, the clinician and participant developed an arranged plan to participate in the activity (e.g. looked up location of the activity, arranged transportation, registered for the event, initiated asking a friend, etc.) For example, if a participant selected a recreational class, then the clinician would assist the participant in determining the time and location of the class, how to enroll in the class, any necessary materials needed for class, and identified any potential friends that may also be interested in attending.

Organizational skills. Each weekly session, the clinician also assisted the participant in how to manage the social activity that they selected. The purpose of the instruction in organizational skills was to assist the participants on following through in attending the social activity. Many college students with ASD have reported difficulty engaging in social activities because they forgot about the event, were busy in their room, did not recall the details of the event, and had difficulty time managing their other responsibilities. During intervention, participants were instructed to bring a daily planner or phone calendar to the weekly intervention sessions, and the clinician assisted them in documenting the time, place, and activity for the week. Next, any contact information or directions for the activity were located for the participant. Contact information was put into the participant's cell phone, and a copy of the directions and details of the event was offered for them to keep.

Peer mentors. During intervention, each participant was matched with a neurotypical peer mentor. The peer mentors were similarly-aged undergraduate research assistants that received practicum course units through the university. All peer mentors were upper division undergraduate students that have taken an undergraduate course in autism or received training in the symptoms and treatment of ASD. The clinician helped arrange for the peer mentor to attend the planned social activity with the participant and provide social support for the participant during the event. The peer mentors were instructed to model and assist the participants to appropriately engage and interact with peers at the social activity. This included reminding the participants of the activity, modeling appropriate interactions, prompting the participant to interact with others, providing support to the participant during peer interactions, and providing feedback to the clinician after the activity. Furthermore, peer mentors provided text prompts to participants before the social activities to remind them of the events. Peer mentors attended at least one clinic session each month to discuss the social activities with the clinician and participant (e.g. the participant's follow through on attending social events, appropriateness of social conversation at events, etc.) Additionally, peer mentors attended weekly group supervision meetings with the clinician, in which they were able to discuss feedback from the social activities and assist in planning for subsequent intervention sessions.

Social skills training. During each weekly intervention session, each participant also received training in social skills related to their upcoming social event. Areas discussed included how to meet people by appropriately introducing oneself, how to appropriately exchange contact information with peers (e.g. phone numbers), how to invite peers to attend events, appropriate topics of conversation, how to ask questions to peers, appropriate ways to say "goodbye" when an activity finishes, and so on. Techniques used in social skills training included priming, self-management and practice with feedback. In addition, the social activity from the previous week was discussed and any feedback from the peer mentor was provided by the clinician.

Follow-Up. To assess for maintenance of any gains made during intervention, follow-up data were collected after the completion of intervention. Weekly data were collected for three weeks on all dependent measures to examine if any increases made in the intervention phase maintained after structured social planning was terminated.

Fidelity of Implementation.

The clinician in this study was an advanced doctoral student that attended weekly supervision with a doctoral level psychologist or speech-language pathologist. To ensure consistent implementation of the structured social planning intervention, an observer scored 20% of the sessions and assessed for correct implementation of the following intervention components: (a) Incorporation of the participant's motivational interests; (b) Participant choice from a menu of at least three social activities; (c) Instructing the participant to organize the details of the event in their calendar; (d) Coordination of the peer mentor to attend the social event with the participant; and (e) Providing social skills training for the upcoming event. A score of eighty percent or above was considered to be effective implementation of the intervention procedures. The clinician in this study met fidelity of implementation on all scored sessions, with most sessions at 100%.

Dependent Measures

This study first aimed to assess the impact of a structured social planning intervention on socialization for participants. Data were collected on the quantity of social activities, scope of social activities, and supplemental measures related to socialization for each participant. For quantity of social activities, the following dependent measures were examined: (1) Total quantity (number and hours) of social activities attended per week; and (2) Total quantity of supported social activities and independent social activities. For scope of socialization, the following dependent measures were assessed: (1) Number of college and other community-based social activities per week; (2) Number of social activities per week with familiar peers and unfamiliar peers; and (3) Number of different peers the participant interacted with at social activities per week. Lastly, supplemental measures related to socialization were collected through the following: (1) Self-report satisfaction questionnaire; and (2) Social conversation skills.

The second aim of this study examined the potential impact of structured social planning on collateral areas relating to participants' overall quality of life. Specifically, the following dependent measures were examined: (1) Standardized assessments of well-being as measured through self-reported subjective well-being, psychological functioning, and depressive symptoms; and (2) Academic performance. Each data category is defined below.

Socialization measures. In order to assess the effectiveness of structured social planning intervention on socialization, data were collected on the quantity, scope and supplemental measures related to socialization for each participant.

***Quantity of social activities*.** Data were first collected on measures relating to the participant's overall quantity of social activities attended per week.

Total quantity (number and hours) of social activities. To assess the effects of structured social planning on total quantity of social activities, data were collected on the number and hours of all social activities attended each week by the participant. A social activity was defined as an activity with at least one other typical peer and takes place outside of the academic or vocational requirements for the student (See Appendix A). For this study, a peer is defined as another individual that is of similar age (i.e. 18-25) to the participant.

The number and hours of social activities attended by the participant each week were collected through the social log from the participant. Each participant kept record of a daily social log through the baseline, intervention, and follow-up phases. Through the social log, each participant was instructed to record (1) Each social activity they attended throughout the week; (2) The number of hours they participated in the social activity; and (3) Any peers they interacted with at the social activity (See Appendix B). Each weekly session, the clinician and participant reviewed the participant's social log together, and data were obtained on the activity, duration, location, and peers involved for every social activity attended throughout the previous week. In regards to validity of the participant's social log, the peer mentor confirmed all social activities he or she attended with the participant during intervention. Additionally, the clinician randomly selected one peer social activity attended without the peer mentor each week and asked the participant to provide details of the event to show that they in fact attended the activity recorded on their social log (e.g. what time did you see the movie, who won the game, etc.). The total number and hours of social activities attended per week were calculated by summing the number of activities and summing the hours that were recorded on the social log for each participant.

Supported and independent social activities. Data were collected on the support provided at each social activity to assess the effect of the intervention on participant's participation in planned social activities with the support of a peer mentor, as well as unplanned social activities without the support of their peer mentor. Each social activity on the participant's social log was categorized as a supported social activity (i.e. the peer mentor attended the social activity with the participant) or an independent social activity (i.e. the peer mentor was not at the social activity). The total number of supported social activities and total number of independent social activities was recorded each week for all participants.

Scope of social activities. The following measures were collected to assess the effects of structured social planning on the participant's scope of social activities.

Community-based social activities. Due to participant's reports of feeling disconnected, isolated and wishing to be a part of their campus and community, data were collected on the number of college and other community-based social activities attended each week. A community-based social activity was defined as a social activity that took place in the community or on a college campus (i.e. social activities outside of the home setting). Each social activity recorded on the participant's social log was categorized as a campus social activity (e.g. school club, dorm event), community activity (e.g. bowling alley, fair), or home activity (e.g. baking, playing games). The total number of social activities that the participant attended on campus or in the community was summed and recorded each week for all participants.

Social activities with unfamiliar peers versus familiar peers. The type of social activities that the participant attended each week was analyzed to assess if participants were attending social activities with unfamiliar (i.e. new) peers as well as participating in social activities with familiar (i.e. previously known) peers. Data were collected each week on the number of social activities that the participant attended with familiar peers and the number of social activities that the participant attended with unfamiliar peers. A social activity with familiar peers was defined as a social activity that included only peers that the participant had previously known (e.g. lunch with a friend from high school). A social activity with unfamiliar peers was defined as a social activity that included at least one peer that the participant had not previously met (e.g. dance class that included new peers unknown to the participant). Each social activity on the participant's social log was categorized as a social activity with familiar peers or a social activity with unfamiliar peers. The total number of social activities with familiar peers and total number of social activities with unfamiliar peers that the participant attended each week was recorded for all participants.

Peer interactions. To assess the effects of structured social planning on breadth of peer interactions, data were collected on the number of different peers with whom the participant interacted at social activities each week. The number of different peers that each participant interacted with during social activities was collected each week through the participant's social log. For each social activity on the social log, the participant was instructed to record the names of the peers with whom they interacted at the event (i.e. exchanged at least a short conversation). The total number of different peers that the participant interacted with during social activities each week was recorded for all participants.

Supplemental measures related to socialization. In addition to the dependent measures collected each week relating to quantity and scope of socialization, the following measures were administered pre and post-intervention to include supplemental information on the participant's satisfaction with socialization and social conversation skills.

Satisfaction with socialization. To help assess for social validity, a self-report satisfaction questionnaire was given to each participant at baseline and post-intervention to examine the participant's satisfaction with areas relating to socialization and college experience. Data were collected at baseline and post intervention on perceived satisfaction in the following areas: (1) Overall school/college experience; (2) Overall social experience (3)

Number of social activities attended; (4) Availability of campus social events. Participants were directed to rate their satisfaction level on a 7-point Likert scale ranging from 1 (“Very Unsatisfied”) to 7 (“Very Satisfied”). See Appendix D.

Social conversation skills. To assess the effects of structured social planning on the participant’s interpersonal communication skills, data were collected at baseline and post-intervention on the participants’ social conversation skills. The clinician videotaped a 10-minute conversation probe of the participant and a novel conversational partner that is a typical peer of similar age that the participant has not met before. No instructions were given to the participant regarding the conversation with a novel peer. A naïve observers rated the conversation using a 7-point Likert-type scale ranging from 1 (“Strongly Disagree”) to 7 (“Strongly Agree”) on the following areas: (1) This is an equal, reciprocal conversation; (2) This person asks questions in the conversation; and (3) This person has positive affect during the conversation. See Appendix E.

Collateral measures relating to quality of life. In addition to the behavioral measures described above, collateral assessments were included to examine the effectiveness of the treatment on untargeted areas relating to general quality of life. Data were collected on the following:

Standardized assessments of well-being. In order to assess the potential impact of structured social planning on collateral areas relating to overall well-being, standardized assessments of subjective well-being, psychological functioning, and depressive symptoms were administered to participants. Measures consisted of self-report standardized questionnaires, including the Subjective Well-Being questionnaire (SWB; Diener, Emmons, Larsen, & Griffin, 1985; Watson, Clark & Tellegen, 1988), Outcome Questionnaire- 45 (OQ-

45; Lambert, 2012), and Becks Depression Inventory- II (BDI – II; Beck, Steer, & Brown, 1996).

The Subjective Well-Being (SWB) questionnaire was given to the participants each week during the baseline, intervention, and follow-up phase, and consisted of 25-item self report items to measure general satisfaction with life and a person's experience of positive and negative affect (Crawford & Henry, 2004; Pavot & Diener, 1993). The SWB measure has two parts and consists of both the Satisfaction with Life Scale (SWLS) and the Positive and Negative Affect Schedule (PANAS). The SWLS portion is the cognitive component of subjective well-being, and assessed the participant's satisfaction with their overall life as a whole (Diener et al., 1985). The measure consists of five items designed to assess the global cognitive judgments of one's life satisfaction (e.g. "In most ways my life is close to ideal", "So far I have gotten the important things I want in life", etc.). Participants indicated how much they agreed or disagreed with each of the five items using a 7-point Likert Scale ranging from 1 ("Strongly disagree") to 7 ("Strongly agree"). The SWLS has a reported Cronbach's alpha coefficient of 0.87 and a 2-month test-retest stability coefficient of 0.82 (Pavot & Diener, 1993). The PANAS portion is the affective component of subjective well-being and assessed the participant's experience of positive affect and negative affect each week (Watson et al., 1988). The measure consists of 20 words that describe different feelings and emotions (e.g. interested, distressed, excited, etc.), and the participants indicated the extent they felt that way over the past week on a 5-point Likert scale from 1 ("Not at all") to 5 ("Extremely"). The PANAS has a reported Cronbach's alpha coefficient of 0.88 for Positive Affect and 0.87 for Negative Affect, and the test- retest correlation for an 8-week period ranged from 0.47-0.68 for Positive Affect and 0.39-0.71 for Negative Affect (Watson et al., 1988). See Appendix F.

The Outcome Questionnaire – 45 (OQ-45) and Becks Depression Inventory-II (BDI-II) were given at baseline and upon completion of the intervention to examine for any changes in subjective psychological functioning and depressive symptoms. The OQ-45 is a 45-item self-report assessment that is designed to measure a person's progress in areas of symptom distress, interpersonal relationships and social role performance (Lambert et al.,1996). A total score of 63 or more indicates symptoms of clinical severity, with higher scores suggesting the individual is experiencing more symptoms of distress and difficulties in their general quality of life. The OQ-45 has high internal consistency (0.90), test re-test reliability (0.84 over 3-weeks) and concurrent validity with scales such as the BDI-II have a coefficient in the mid 0.80s. The BDI-II consists of 21 multiple-choice items and was administered to examine if structured social planning had an impact on an individual's self-reported symptoms of depression. Currently there are no scales specifically designed to assess depression in individuals with ASD; however, the BDI-II is one of the most widely used scales to assess the severity of depression and the scale has been used with individuals with Asperger Syndrome (Hare, 1997; Stewart et al., 2006). On the BDI-II, scores of 0-13 represent minimal depression, 14-19 represent mild depression, 20-28 represent moderate depression, and 29-63 represent severe depression. The BDI-II is widely used as an indicator of the severity of depression, and numerous studies provide evidence for its reliability and validity across different populations and cultural groups (Beck et al., 1996; Whisman, Perez & Ramel, 2000).

Academic Performance. In addition to the standardized assessments of well-being, collateral data were collected on participant's academic performance pre and post intervention. Academic performance was evaluated through the participant's Grade Point Average (GPA). Data were recorded on participant's GPA for the term prior to implementation of structured social planning and for the term following the start of intervention.

Reliability

Reliability was obtained by having two observers independently view and code for the number and type of social activities using the same operationalized definitions and coding procedures described above. Reliability was calculated for a random 31% of social logs throughout baseline, intervention, and follow-up for each participant.

Reliability for the continuous measures of quantity of social activities and number of different peers interacted with per week was calculated using percent agreement. Percent agreement was calculated by dividing the number of agreements by the number of agreements plus disagreements, and multiplying by 100 to yield a percentage (Bailey & Burch, 2002). An agreement was defined as each observer coding the same number and hours of social activities per week and the same number of different peers that the participant interacted with at social activities per week. Percent agreement was 100% for both number and hours of social activities per week, and 98% (range = 75%-100%) for number of different peers interacted with per week.

Reliability for the categorical measures of supported/unsupported social activities, community-based social activities, and unfamiliar/familiar peer social activities was calculated using Cohen's weighted kappa coefficient. Because this measure takes into account agreement by chance but allows for incorporation of scaled degrees of disagreement, it is considered a robust measure of interobserver agreement for categorical data (Cohen, 1968). Agreement for these measures was defined as both observers coding the social activity in the same category (e.g. both observers coding a social activity as a social activity with unfamiliar peers, both observers coding a social activity as a community-based social activity, etc.). Cohen's weighted kappa coefficient for supported/unsupported social activities was 1.0, indicating perfect agreement. Cohen's weighted kappa coefficient for community-based social activities was 0.98, indicating very good agreement. Cohen's weighted kappa coefficient for unfamiliar/familiar peer social activities was .91, also indicating very good agreement. Additionally, Cohen's weighed kappa was calculated for the subjective ratings of participant's social conversation skills. Reliability was calculated for 33% of social conversations, and an agreement for this measure was defined as both observers scoring within one point of each other on the seven-point Likert rating scale. Cohen's weighted kappa coefficient for social conversation rating was 0.28, indicating fair agreement.

Results

Results on Socialization

The first research questions asked in his study investigated the impact of structured social planning on quantity of social activities, scope of social activities, and supplemental areas related to socialization for college students with ASD. Results from visual analysis and effect size calculations for the dependent measures suggest that the intervention was effective in improving socialization for participants (Horner et al., 2005). In summary, two participants increased their quantity of social activities while one participated maintained a consistent quantity of social activities each week, all participants increased their scope of social activities, and all participants improved in supplemental areas related to socialization (i.e. satisfaction with socialization and social conversation skills).

Effect size for all dependent measures relating to quantity and scope of social activities was examined by calculating Cohen’s d for each participant (Cohen, 1988; Kromrey & Foster-Johnson, 1996). Cohen’s d was calculated from both baseline to intervention and also from baseline to follow-up, by taking the difference of the means divided by the pooled standard deviations of data points from the two phases (Cohen's $d = M_1 - M_2 / s_{\text{pooled}}$, where $s_{\text{pooled}} = \sqrt{}[(s_1^2 + s_2^2) / 2]$ (Cohen, 1998). For Cohen’s d, values less than 0.2 are considered a small effect, values around 0.5 are considered a medium effect, and values 0.8 or larger are considered a large effect (Cohen, 1988).

Results of the dependent measures relating to socialization are presented below:

Quantity of social activities. Results will first be presented on the effects of structured social planning on participant’s quantity of social activities attended per week. Data indicate that two participants increased the quantity of social activities they attended each week during intervention with gains maintaining at follow-up, and one participant maintained a relatively consistent level of social activities per week throughout the study.

Total quantity (number and hours) of social activities. A first aim of this study was to assess whether participants would demonstrate improvements in their overall quantity of social activity, specifically the number of social activities they attended each week and the number of hours spent at social activities each week. Figure 1 shows the number and hours of social activity per week for each participant during the baseline, intervention, and follow-up phases. The results illustrate that two participants increased their number and hours of social activity per week, and one participant maintained a consistent total quantity of social activity subsequent to structured social planning intervention.

As seen in Figure 1, Hannah and Aaron demonstrated improvements in their overall number and hours of social activity per week during intervention, with follow-up data showing maintenance of treatment gains. During baseline, Hannah spent an average of 1 hour per week (range: 0-6) at social activities and attended an average of .3 social activities per week (range: 0-1). Throughout intervention, Hannah increased her socialization to an average of 8.2 hours per week (range: 0-13.5) and an attended an average of 3.8 social activities each week (range: 0-6). Cohen's effect size value for hours of social activities per week (d = 2.13) and number of social activities each week (d=2.63) indicate a large effect on quantity of social activities during intervention. In follow-up, Hannah's socialization continued to maintain above the baseline level, and she engaged in social activities with peers for 5.2 hours per week (range: 3-8.5), and attended an average of 2.3 social activities per week (range: 1-4). Cohen's effect size value from baseline to follow-up also indicate a large effect on hours of social activities per week (d=1.55) and number of social activities per week (d=1.8) after intervention was complete. Results indicate that Aaron also showed improvements in his overall quantity of social activities. Specifically, during baseline he engaged in social activities with peers for an average of 1.7 hours per week (range: 0-4) and attended an average of 1.4 social activities per week (range: 0-4). During intervention, he increased his engagement in social activities to an average of 8.2 hours per week (range: 4.5-13) and attended an average of 6.2 social activities per week (range: 3-9). Cohen's effect size value for hours of social activities (d=3.05) and number of social activities (d=2.88) suggest a large effect on quantity of social activities from baseline to intervention. He continued to interact with peers an average of 7.2 hours per week (range: 7-7.5) and attended an average of 7.3 social activities per week (range: 7-8) during follow-up. Cohen's effect size value also show a large effect on Aaron's quantity of socialization from baseline to follow-up for hours of social activities per week (*d*= 6.14) and number of social activities per week (*d*=6.69).

Data indicate that Nina attended a relatively consistent level of social activities throughout the study. Specifically, during baseline she attended an average of 2.3 social activities per week (range: 1-4) and interacted with peers for an average of 5.2 hours per week (range: 3-7.5). During intervention, she attended an average of 2.4 social activities per week (range: 1-4) and interacted with peers an average of 4.6 hours per week (range: 1.25-9). Cohen's effect size for hours of social activities per week (*d*=0.05) suggests no effect and the effect size value for number of social activities per week (*d*=-0.27) suggest a small effect in quantity of social activities from baseline to intervention for Nina. Follow-up data illustrate that Nina attended an average of 2 social activities per week (range: 1-3) and interacted with peers for an average of 5 hours per week (range: 1.5-8) after intervention was completed. Similar to Nina's effect sizes from baseline to intervention, Cohen's effect size for hours of social activities per week (*d*=-0.06) suggest no effect and effect size value for number of social activities per week (*d*=-0.26) suggest small effect for change in quantity of social activities from baseline to follow-up for Nina.

Supported and independent social activities. In order to assess the extent to which each participant engaged in planned social activities with their peer mentor as well as independent social activities without support from their peer mentor, the support at each social activity was analyzed. Figure 2 shows the number of supported social activities with the peer mentor and the number of independent social activities without support from the peer mentor each week for all participants. Similar to the previous dependent measure on overall quantity of social activities, the results illustrate that two participants (Hannah and Aaron) increased the number of independent social activities they participated in per week, while one participant (Nina) engaged in a relatively consistent level of independent social activities per week throughout the study.

As seen in Figure 2, Hannah and Aaron demonstrated improvements in their ability to independently attend social activities without support from a peer mentor, with follow-up data showing maintenance of treatment gains. During baseline, Hannah engaged in an average of 0.3 social activities per week without a peer mentor (range 0-1). Throughout intervention, Hannah increased her independent social activities to an average of 2.9 social activities per week (range: 0-5) and also attended an average of 0.8 social activities with her peer mentor each week (range: 0-2). The effect size for this analysis (d = 2.41) was found to exceed Cohen's (1988) convention for a large effect. During follow-up, Hannah's socialization remained above the baseline level and she continued to engage in an average of 2.3 social activities without support from a peer mentor each week (range: 1-4). There was also a large effect size for this analysis from baseline to follow-up (d=1.80). Results indicate that Aaron also showed improvements in the number of social activities he attended independently each week. Specifically, during baseline he engaged in an average of 1.4 social activities per week without having a peer mentor (range: 0-4). During intervention, he increased to engaging in an average of 4.4 social activities without support from his peer mentor each week (range: 1-7) and attended an average of 1.8 social activities per week with his peer mentor (range: 0-2). The effect size value (d =1.7) indicates a large effect from baseline to intervention for Aaron on this measure. He continued to increase the number of social activities he went to independently each week during follow-up, with data indicating he engaged in an average of 7.2 social activities each week without his peer mentor (range: 7-8). The calculated effect size (*d* =6.7) also indicates a large effect from baseline to follow-up. These results suggest that increased engagement in social activities may have generalized, as data show that Hannah and Aaron not only participated in social activities with support of their peer mentor, but they also increased their ability to independently plan and engage in social activities without having support from their peer mentor.

Data indicate that similar to overall quantity of social activities, Nina attended a relatively consistent amount of independent social activities without support from a peer mentor throughout the study. Specifically, during baseline she attended an average of 2.3 social activities per week (range: 1-4). During intervention, she attended an average of 1.5 social activities per week without support from a peer mentor (range: 0-3) and attended an average of 0.9 social activities per week with her peer mentor (range: 0-2). Follow-up data illustrate she independently attended an average of 2 social activities (range: 1-3) without peer mentor support once intervention was complete. Cohen's effect size from baseline to intervention (*d*=0.63) and from baseline to follow-up (*d* =0.26) indicate that there was not a large effect on the number of independent social activities per week for Nina. Although Nina engaged in a relatively consistent amount of overall and independent social activities throughout the study, further results described below indicate that she improved in her scope of social activities and supplemental areas related to socialization.

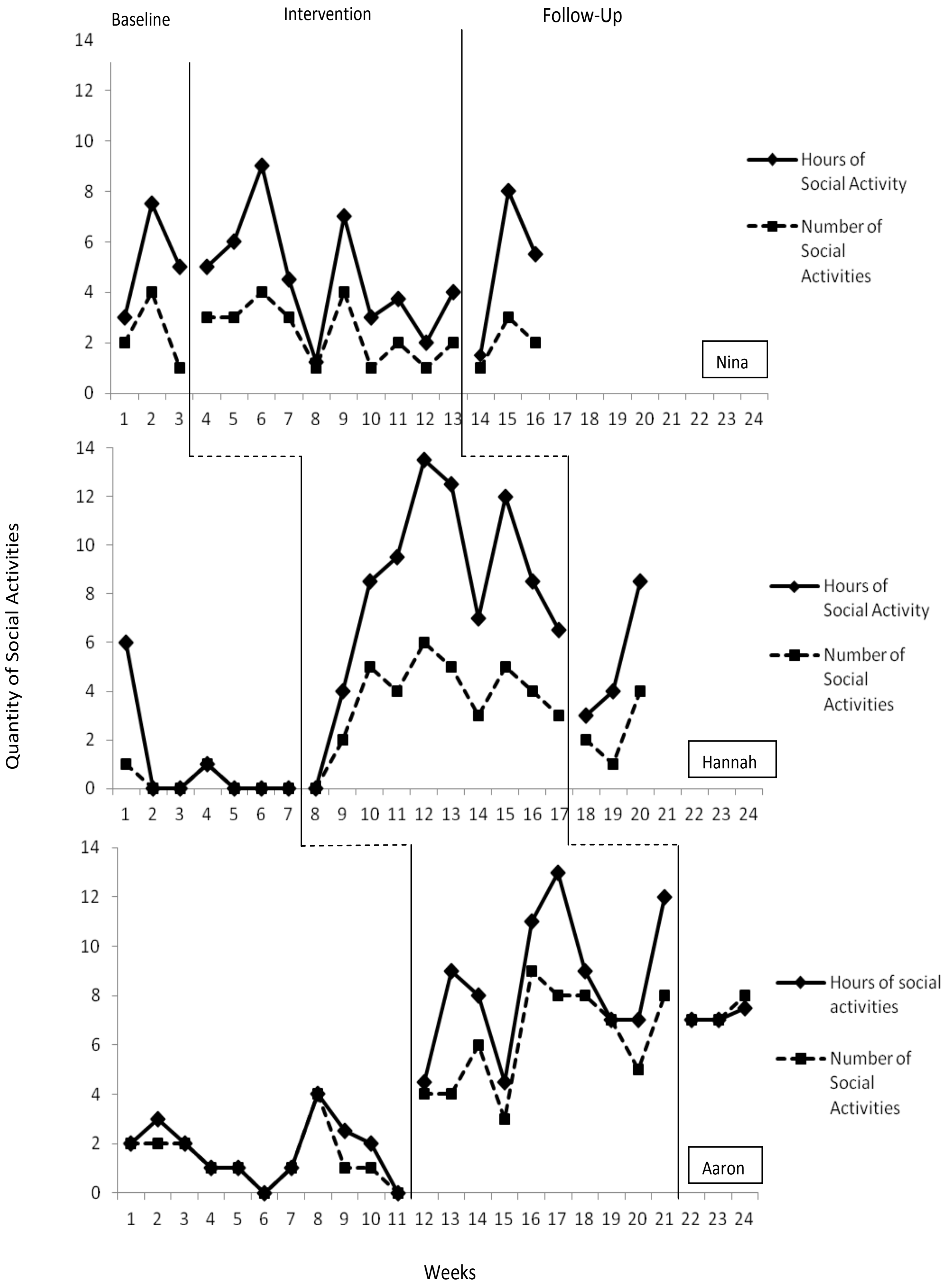

Figure 1. Total quantity (number and hours) of social activities per week

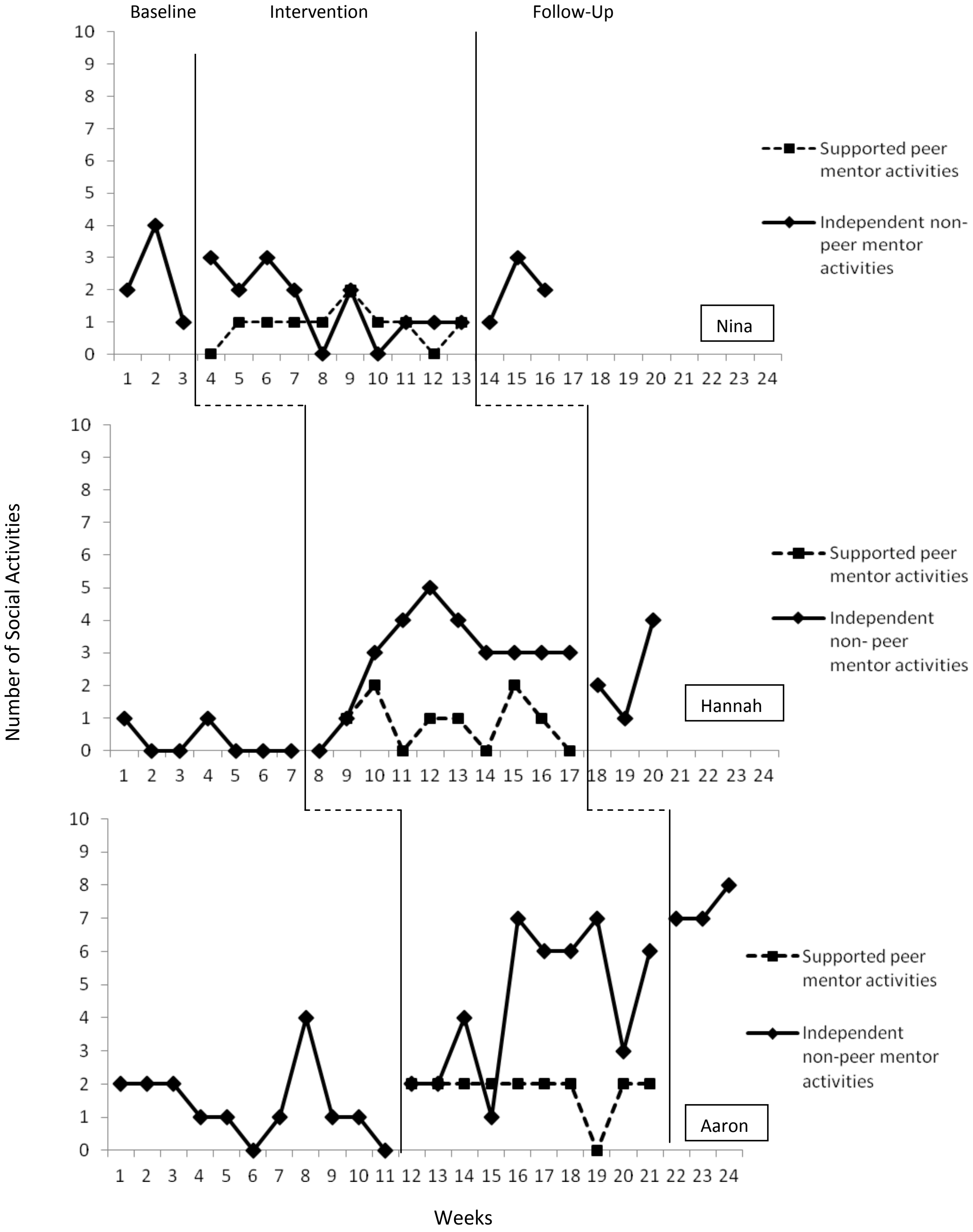

Figure 2. Number of supported (peer mentor) and independent (non-peer mentor) social activities per week

Scope of social activities. In addition to examining the participant's overall quantity of social activity, the following results discuss the impact of structured social planning on the participant's scope of social activities. Specifically, data were examined to assess the impact of the intervention on the following areas: (1) Participant's involvement in community-based social activities; (2) Participant's participation in social activities with new peers and/or familiar peers; and (3) Participant's peer interactions at social activities. Results show that all participants increased their scope of socialization.

Community-based social activities. Data were collected to assess the impact of structured social planning on participant's involvement in college and other community-based social activities (i.e. social activities in the community or on campus). Figure 3 shows the number of community-based social activities that participants attended each week throughout the study. Results indicate that all three participants increased their participation in community-based social activities following the start of intervention.

At baseline, Nina engaged in an average of 0.3 community-based social activities (range: 0-1), Hannah participated in an average of 0.1 (range: 0-1) community-based social activities, and Aaron engaged in an average of 1.3 (range: 0-4) community-based social activities per week. Throughout the ten-week intervention, all three participants engaged in more social activities on campus or in the community each week, with Nina averaging 1 per week (range: 0-2), Hannah averaging 2 per week (range: 0-5*)*, and Aaron averaging 6.2 community-based social activities per week (range: 3-9). Effect size calculations indicate a large effect from baseline to intervention for all three participants, with d=1.07, d=2.46, and d=2.1 for Nina, Hannah, and Aaron, respectively. Follow-up data indicate that both Hannah and Aaron continued to engage in an increased level of social activities on campus or in the community after intervention was complete, with Hannah attending an average of 1.3 community-based social activities each week (range: 0-2) and Aaron participating in an average of 7 community-based social activities each week (range: 7-7). The effect size analysis from baseline to follow-up indicate a large effect for both Hannah (*d*=1.39) and Aaron (*d*=7.12). During follow-up for Nina, she attended the same average number as baseline of 0.3 community-based social activities.

Social activities with unfamiliar peers versus familiar peers. In order to assess the extent to which each participant attended social activities with new peers (i.e. unfamiliar peers) as well as social activities with previously known peers (i.e. familiar peers), the peers involved at each social activity were analyzed. Figure 4 shows the number of social activities each week that included new peers that were unfamiliar to the participant, as well as the number of social activities each week that involved only peers that the participant previously knew (e.g. peers they met at high school). Results show that all participants increased the number of social activities they attended with novel unfamiliar peers, and two participants increased the number of social activities they attended with previously known peers.

Data illustrate that all participants increased their engagement in social activities with unfamiliar peers upon start of the intervention. This suggests that structured social planning was effective in increasing the ability for participants to attend social activities that incorporate new peers. Specifically, Nina engaged in zero social activities with unfamiliar peers during baseline. During the 10-week intervention, she participated in five social activities with unfamiliar peers (range: 0-1 per week), and participated in one social activity with unfamiliar peers in the three-week follow-up (range: 0-1 per week). The effect size calculation showed a moderate effect from baseline to intervention (*d*=0.53) and could not be calculated from baseline to follow-up. For Nina, her events with unfamiliar peers primarily consisted of an extracurricular dance class and the school Art Club. Hannah participated in only one social activity with unfamiliar peers throughout the baseline phase, with an average of 0.1 per week before intervention. During the 10-week intervention, she attended six social activities with unfamiliar peers, with an average of 0.6 per week (range: 0-1). Cohen's effect size (*d*=1) indicate a large effect from baseline to intervention. Hannah's social activities with unfamiliar peers included an extracurricular karate classes on campus and social events at the dorm halls. Aaron did not attend any social activities with unfamiliar peers in the baseline stage. Throughout the 10-week intervention, he attended 10 social activities with unfamiliar peers, with an average of 1 per week (range: 0-2). He continued to engage in an average of one social activity with unfamiliar peers per week during the three-week follow up (range: 1-1). Cohen's effect size (*d*=2.11) shows a large effect on this measure from baseline to intervention, and effect size could not be calculated from baseline to follow-up. For Aaron, his social activities with unfamiliar peers included activities such as the school Videogame Club and group study sessions.

Peer interactions. In order to assess each participant's breadth of peer interactions, data were collected on the number of different peers that the participant interacted with at social activities each week. As seen in Figure 5, two participants (Hannah and Aaron) increased the number of different peers they interacted with each week and one participant (Nina) maintained the number of different peers she interacted with at social activities.

Results show that Hannah and Aaron increased the number of different peers that they interacted with each week following the start of intervention. Specifically, Hannah had one peer interaction during the entire baseline phase, with an average of 0.1 per week (range: 0-1). During intervention, Hannah interacted with an average of 6.5 different peers each week (range: 0-11). She continued to interact with an average of 4.3 different peers each week during following up (range: 3-7). Cohen's *d* calculations indicate a large effect from both baseline to intervention (*d* = 2.76) and baseline to follow-up (*d* = 2.53). Aaron interacted with an average of 1.8 different peers each week during baseline, increased to an average of 5.7 different peers each week during intervention (range: 3-9), and continued to increase to interact with an average of 8.3 different peers each week during follow-up (range: 8-9). Similar to Hannah, Cohen's *d* calculations indicate a large effect from both baseline to intervention (*d* = 2.16) and baseline to follow-up (*d* = 6.68) for Aaron. Results show that Nina interacted with an average of two different peers each week throughout baseline, intervention, and follow-up.

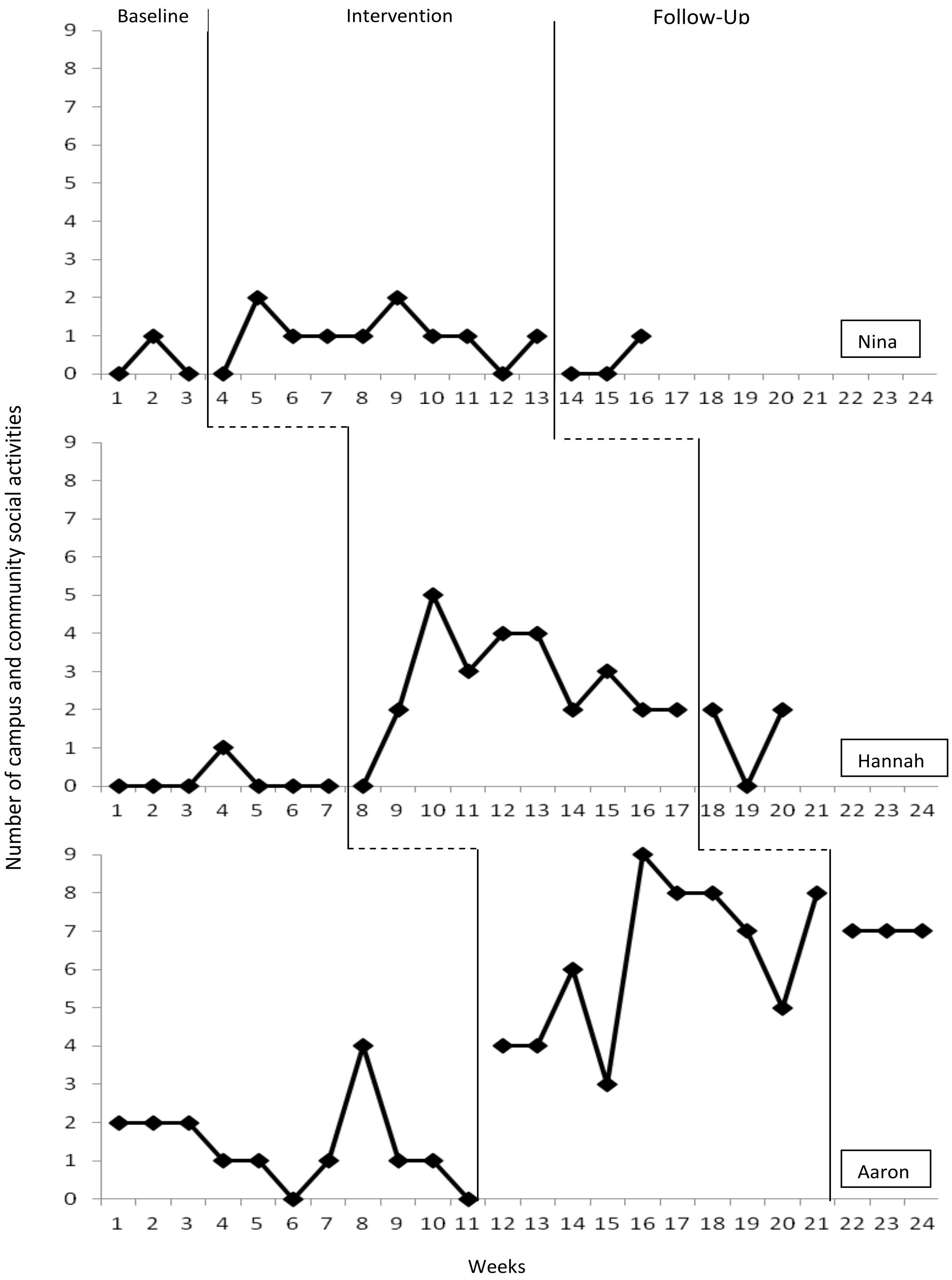

Figure 3. Number of community-based social activities per week

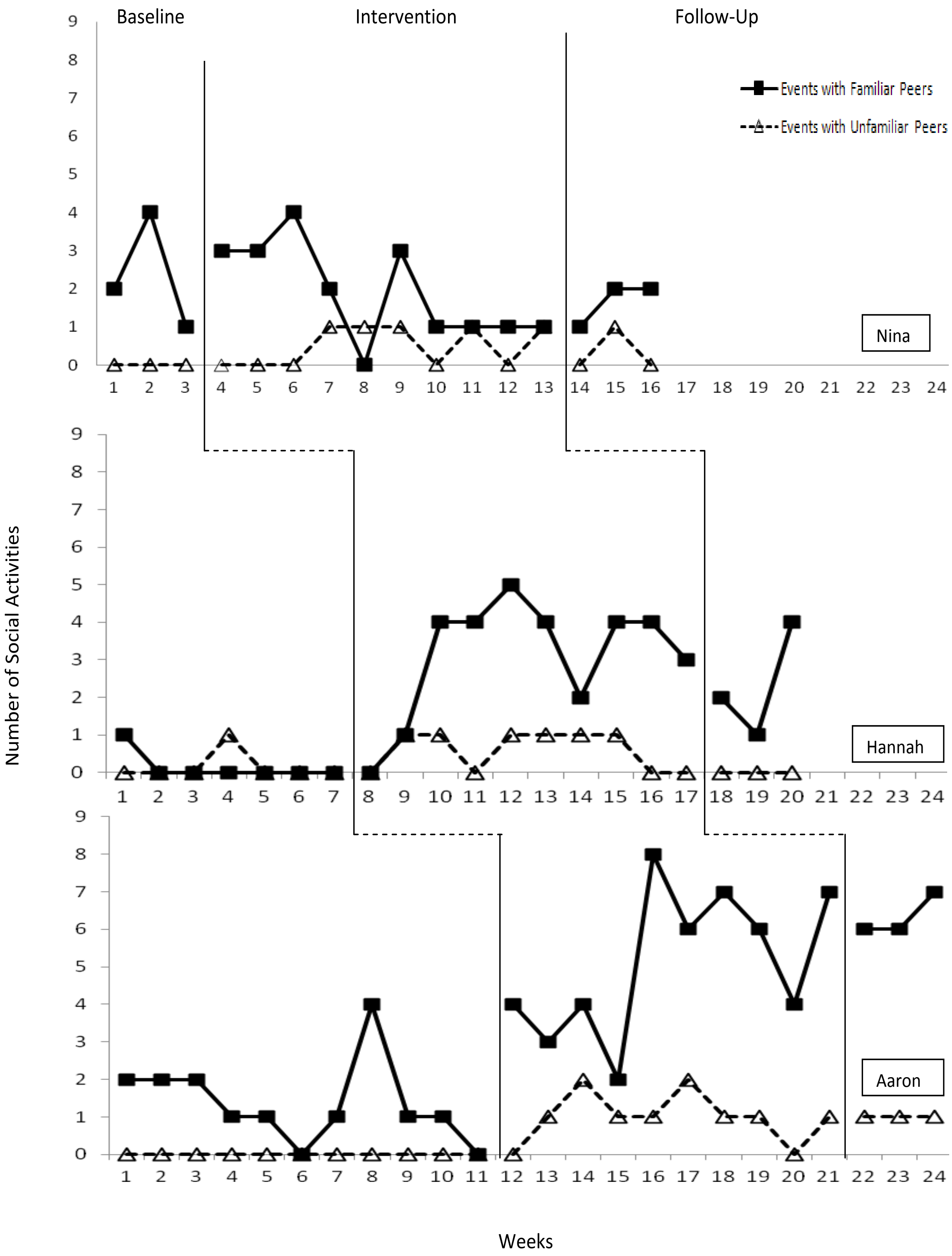

Figure 4. Number of social activities with unfamiliar peers and familiar peers per week

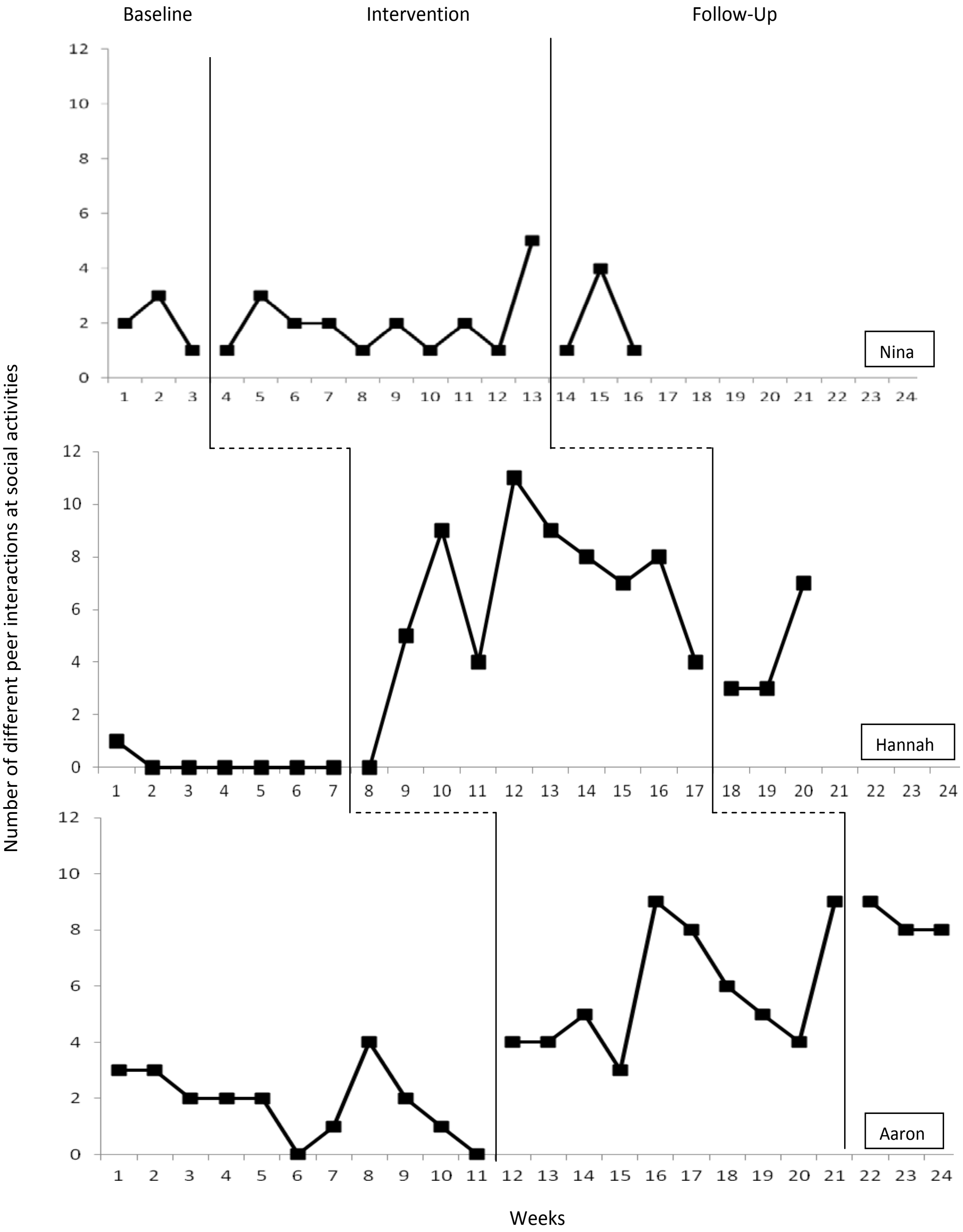

Figure 5. Number of different peer interactions at social activities per week

Table 2

Average Social Activities per Week in Baseline, Intervention, and Follow-Up

	Nina			Hannah			Aaron		
	BL	INT	Follow-Up	BL	INT	Follow-Up	BL	INT	Follow - Up
Number of social activities	2.3	2.4	2	0.3	3.7	2.3	1.4	6.2	7.3
Hours of social activities	5.2	4.6	5	1	8.2	5.2	1.7	8.5	7.2
Number of independent social activities	2.3	1.5	2	0.3	2.9	2.3	1.7	4.4	7.2
Number of social activities with unfamiliar peers	0	0.5	0.3	0.1	0.6	0	0	1	1
Number of social activities with familiar peers	2.3	1.9	1.7	0.1	3.1	2.3	1.4	5.1	6.3
Number of community-based social activities	0.3	1	0.3	0.1	2.6	1.3	1.4	6.3	7.0
Number of different peer interactions	2	2	2	0.1	6.5	4.3	1.8	5.7	8.3

Supplemental measures related to socialization. In addition to the changes in social behavior discussed above, the following findings relate to supplemental information on the participant's satisfaction with socialization and social conversation skills pre and post-intervention. Results from these supplemental measures indicate that all participants reported increases in satisfaction with socialization, and all participants increased in at least one area of social conversation following intervention.

Satisfaction with Socialization. To assess for social validity of the treatment, data were collected on the participant's self-reported satisfaction in areas related to socialization. As seen in Table 3, data indicate that all participants reported increases in satisfaction with their overall college experience, overall social experience, number of social activities they attend, and availability of campus social events. Specifically, Nina reported being somewhat unsatisfied with her college experience and unsatisfied with her socialization at baseline, and following intervention she reported feeling somewhat satisfied with her college experience and neutral with her overall social experience. Hannah reported a neutral college experience and neutral social experience at baseline, and improved to feeling somewhat satisfied with both her college experience and social experience after intervention. Lastly, Aaron reported feeling neutral about his college experience and the number of social activities he attended at the start of the study, and following intervention he improved to being somewhat satisfied with his college experience and satisfied with the number of social activities he attended. These findings suggest that the intervention produced meaningful gains beyond behavioral data for each participant. In addition to all participants feeling more satisfied in regards to their social experience, each participant also reported improvements in their satisfaction with their overall college experience. This indicates that structured social planning may have produced more widespread improvements.

Social conversation skills. To examine for possible gains in interpersonal communication skills, naïve observers rated participant's social conversation skills pre and post intervention. As seen in Table 4, results indicate that observers rated improvements in at least one area of social conversation for all participants. Specifically, at baseline the observer disagreed that Nina engaged in an equal and reciprocal conversation, and strongly disagreed that she asked questions to her conversational partner. Following intervention, the observer agreed that Nina's conversation was equal and reciprocal and also agreed that she initiated questions to her peer. For Hannah, at baseline the observer somewhat disagreed that her conversation was reciprocal and also somewhat disagreed that she asked questions to her conversational partner. Following intervention, Hannah's conversation was rated as very reciprocal and the observer also agreed that she asked questions to her conversational partner. For Aaron, the observer rated improvements in his positive affect during social conversation.

In summary, the results described above suggest that structured social planning was effective for increasing socialization for participants. This study expanded on previous research and incorporated a breadth of dependent measures to assess the impact of structured social planning on multidimensional areas of socialization. Data indicate that two participants increased their quantity of social activities and all participants improved their scope of social activities during intervention, with gains maintaining during follow-up. Specifically, results illustrate that structured social planning increased the ability for all participants to interact with new peers and engage in more social activities on campus/in the community. This indicates that structured social planning may help participant's develop new friendships and integrate into their school environment. Furthermore, social validity data indicate that each participant was more satisfied with their overall social experience and overall college experience after receiving the intervention. The following section will discuss further results regarding the impact of structured social planning on collateral areas beyond socialization that were not targeted through the intervention.

Table 3

Results for Social Satisfaction Questionnaire

	Satisfaction with overall college experience		Satisfaction with overall social experience		Satisfaction with number of social activities attended		Satisfaction with availability of campus social events	
	Baseline	*Post-Intervention*	*Baseline*	*Post-Intervention*	*Baseline*	*Post-Intervention*	*Baseline*	*Post-Intervention*
Nina	3 Somewhat unsatisfied	5 Somewhat satisfied	2 Unsatisfied	4 Neutral	2 Unsatisfied	4 Neutral	3 Somewhat unsatisfied	4 Neutral
Hannah	4 Neutral	5 Somewhat satisfied	4 Neutral	5 Somewhat satisfied	3 Somewhat unsatisfied	4 Neutral	3 Somewhat unsatisfied	4 Neutral
Aaron	4 Neutral	5 Somewhat satisfied	5 Somewhat satisfied	6 Satisfied	4 Neutral	6 Satisfied	4 Neutral	6 Satisfied

Table 4

Results for Social Conversation Ratings

	The participant engages in an equal, reciprocal conversation		The participant asks questions in the conversation		The participant shows positive affect in the conversation	
	Baseline	*Post-Intervention*	*Baseline*	*Post-Intervention*	*Baseline*	*Post-Intervention*
Nina	2 Disagree	6 Agree	1 Strongly Disagree	6 Agree	3 Somewhat Disagree	4 Neutral
Hannah	5 Somewhat Agree	7 Strongly Agree	3 Somewhat Disagree	6 Agree	6 Agree	6 Agree
Aaron	6 Agree	3 Somewhat Disagree	6 Agree	5 Somewhat Agree	2 Disagree	3 Somewhat Disagree

Results on Collateral Areas Relating to Quality of Life

The secondary questions asked in this study regarded the possible impact of structured social planning on collateral areas relating to participants' overall quality of life. In summary, although all participants had a history of low socialization and discussed difficulties interacting with peers, they did not report decreases in subjective well-being and noted increases in academic performance when prompted to participate in social activities during intervention. First, results illustrated that participants reported a relatively consistent level of subjective-well being throughout each phase the study. All participants maintained a fairly consistent level in their reported overall satisfaction with life and two participants reported similar levels of positive and negative affect throughout the study. Additionally, pre and post-intervention data on standardized assessments of depression and psychological functioning indicated one participant, Nina, reduced self-reported symptoms of depression and increased psychological functioning while the other two participants reported little change in these areas. The discussion section will address potential explanations for participants reporting consistent levels of well-being throughout the study. Second, all participants demonstrated an improved academic performance as indicated through an increase in grade point average following intervention.

Results of the dependent measures on collateral areas relating to quality of life are presented below:

Standardized assessments of well-being. Standardized assessments were administered to participants to evaluate for the potential impact of structured social planning on collateral areas related to reported well-being. A summary of these results can be found in Tables 5 and Figures 6-7.

Results for participants' self-reported satisfaction with life as measured through the Satisfaction with Life Scale are presented in Figure 6. All three participants reported a relatively consistent global cognitive judgment of their satisfaction with life throughout the study. For example, Nina's scores were in the satisfied range (26-30 = Satisfied Range) throughout the study. Specially, she reported an average SWLS score of 28 during baseline (range: 26-30), an average of 30 during intervention (range: 30) and maintained an average of 30 during follow-up (range: 30). Hannah's scores were in the slightly dissatisfied range (15-19 = Slightly Dissatisfied Range) throughout the study. Specially, Hannah reported an average SWLS score of 17 during baseline (range: 16-19), and maintained an average of 17 during both intervention (range: 15-20) and follow-up (range: 16-18). Lastly, Aaron reported scores in the satisfied range throughout each phase of the study. He reported an average SWLS score of 27 during baseline (range: 25-29), an average score of 28 during intervention (range: 27-28), and maintained an average SWLS score of 28 during follow-up (range: 28). Overall, all participants reported essentially the same cognitive judgment on their overall satisfaction with life through the study.

Results for participants' reported positive and negative affect each week as measured through the Positive and Negative Affect Schedule are presented in Figure 7. Lower scores indicate low (positive or negative) affect and higher scores indicate high (positive or negative) affect. Watson, Clark and Tellegen (1988) discuss that the normal population will have a mean positive affective score of 29.7 (SD = 7.9) and a mean negative affective score of14.8 (SD = 5.4). Data illustrates that two participants (Hannah and Aaron) maintained a relatively consistent level of self-reported positive and negative affect throughout the study, and one participant (Nina) decreased in both negative and positive affect during intervention and follow-up. Specifically, Hannah reported an average positive affect of 17 during baseline (range: 12-23), and results show she maintained her positive affect with an average of 17.5 during intervention (range: 14-21), and an average of 17 during follow-up (15-18). Her reported negative affect was an average of 16.7 during baseline (range: 14-19), an average of 14.5 during intervention (range: 11-24), and an average of 13.3 during follow-up (range: 12-15). Aaron reported an average positive affect of 17.8 during baseline (range: 12-29), an average of 21 during intervention (range: 17-29), and an average of 19 during follow-up (range: 18-20). His reported negative affect was an average of 14 during baseline (range: 11-20), 14.4 during intervention (range: 12-25), and 14 during follow-up (range: 14-14). Lastly, results indicate Nina reported slightly lower positive and negative affect during intervention and follow up. Specifically, her average positive affect at baseline was 25 (range: 23-27), decreased slightly to an average of 18.8 during intervention (range: 16-21), and maintained with an average of 18.2 during follow-up (range: 17-20). Nina's reports of negative affect also decreased, and data illustrate that she reported an average negative affect score of 18.3 during baseline (range: 15-20), an average of 14.9 during intervention (range: 10-23), and continued to decrease to an average of 11 during follow-up (range: 10-13). Overall, this suggests that two participants maintained a relatively consistent level of positive and negative affect throughout the study, and one participant reported slightly lower levels of both positive and negative affect during intervention and follow-up.

Results for standardized assessments on depression and psychological functioning pre and post-intervention are presented in Table 5. For both the BDI-II and OQ-45, higher scores indicate the participant is reporting a higher level of symptoms (i.e. increased symptoms of depression or distress). For Nina, data indicate that her symptoms of depression reduced from mild depression at baseline (BDI-II=14) to minimal depression following intervention (BDI-II=4). Furthermore, results from the Outcome Questionnaire-45 indicate that during baseline Nina's reports met criteria for clinical significance in regards to overall score and symptom distress (i.e. anxiety, depression, stress) (OQ-45 Total =67, OQ-45 Symptom Distress = 47). Following intervention, Nina reported fewer symptoms and no longer met criteria for clinical significance in her overall score or for the area of symptom distress (OQ-45 Total = 30, OQ-45 Symptom Distress = 19). Hannah exhibited minimal depression in both baseline (BDI-II =9) and following intervention (BDI-II = 10). Furthermore, her reported level of psychological functioning through the OQ-45 was in the typical range in both pre and post-intervention. However, at baseline she reported clinically significant levels of symptom distress (OQ-45 Symptom Distress = 36) and following intervention her reported symptom distress was no longer at a significant level (OQ-45 Symptom Distress = 35). Lastly, Aaron reported the same minimal level of depression at baseline (BDI-II =7) and following intervention (BDI-II=7). Although he reported a relatively consistent overall level of psychological functioning through the OQ-45, his symptoms of distress relating to Interpersonal Relations dropped from a seven to a zero following intervention. This indicates that he had no complaints about loneliness or relationships following intervention.

Academic performance. As seen in Table 6, pre and post data on participants' Grade Point Average (GPA) indicate that each participant improved their academic performance following the start of intervention. Specifically, both Nina and Hannah were on academic probation at baseline. Nina failed all of her classes prior to intervention and received a 0.0 GPA, and Hannah withdrew from her classes before the term was complete due to not being able to earn passing grades. Following intervention, Nina received a 3.3 GPA and Hannah received a 4.0 GPA for the term. Additionally, Aaron improved his GPA from a 1.72 during baseline to a 2.20 for the term following the start of intervention.

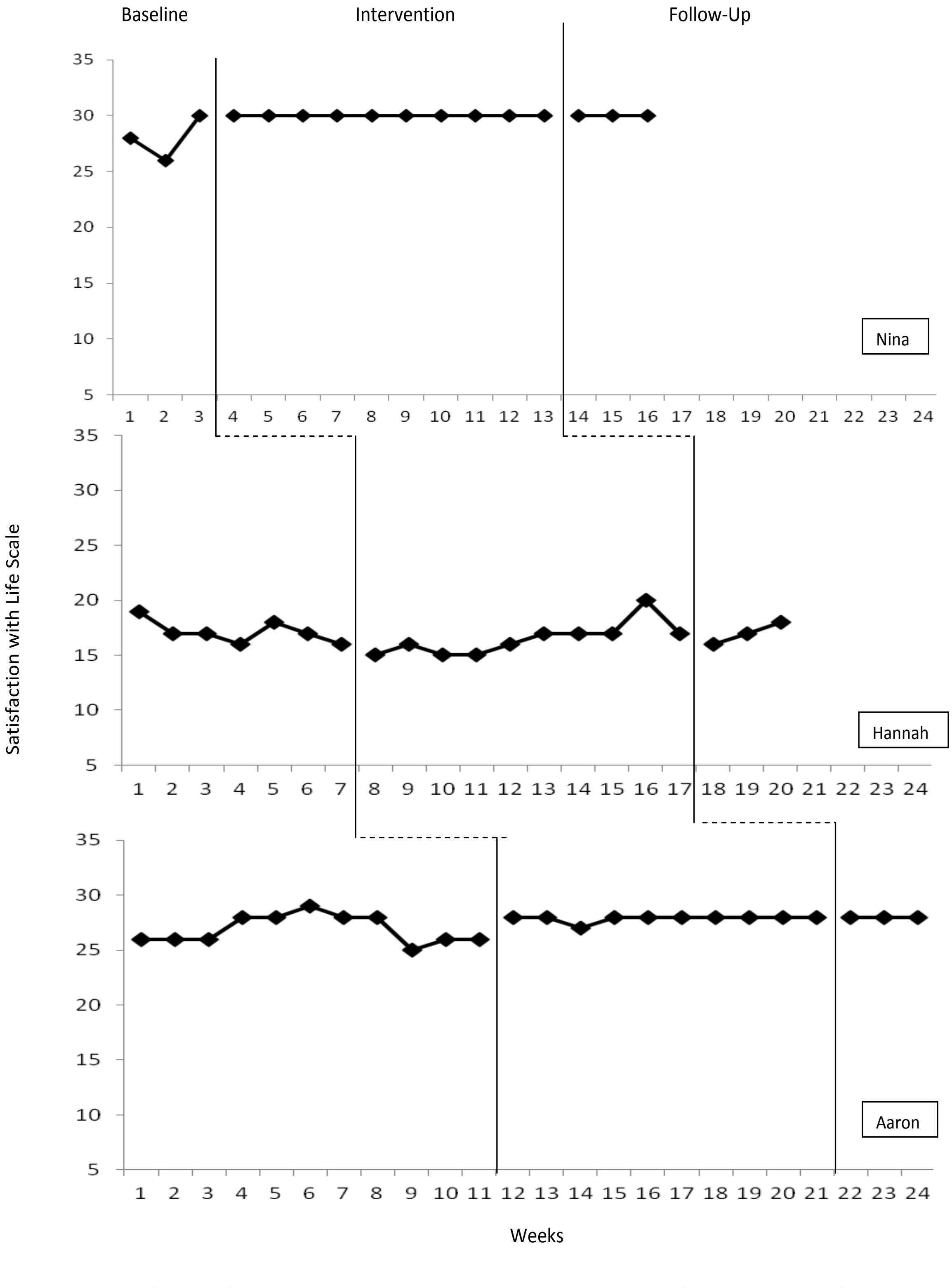

Figure 6. Life satisfaction scores as reported through the Satisfaction with Life Scale (Diener et al., 1985).

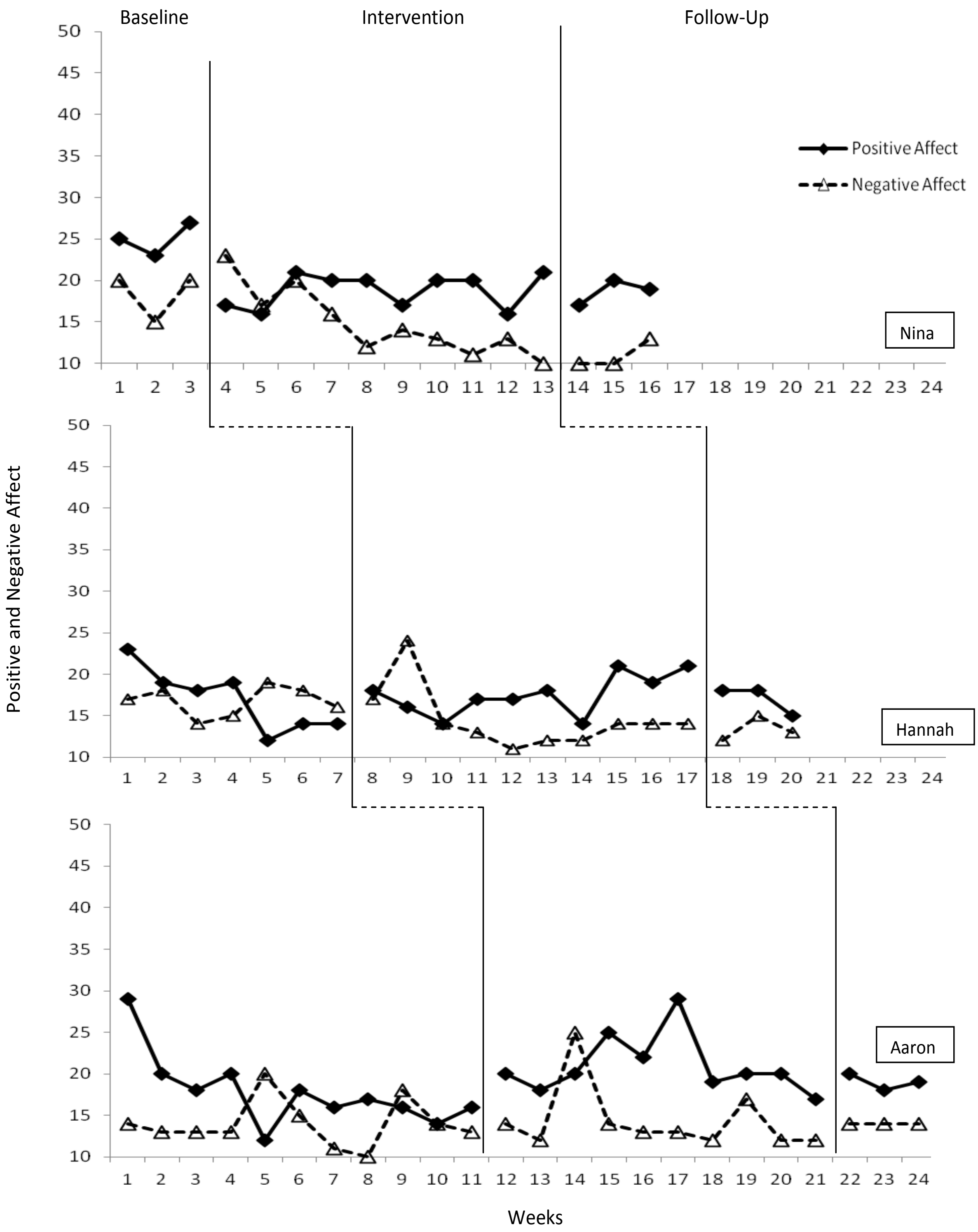

Figure 7. Positive and negative affect as reported through the Positive and Negative Affect Schedule (Watson et al., 1988)

Table 5

Results for Standardized Assessments of Well-Being

	Nina		Hannah		Aaron	
	Pre	*Post*	*Pre*	*Post*	*Pre*	*Post*
BDI-II	14 Mild Depression	4 Minimal Depression	9 Minimal Depression	10 Minimal Depression	7 Minimal Depression	7 Minimal Depression
OQ-45 (Total)	*67	30	54	57	33	37
OQ-45 (Symptom Distress)	*47	19	*36	35	19	26
OQ-45 (Interpersonal Relations)	8	4	5	8	7	0
OQ-45 (Social Role)	11	4	*13	*14	7	11

*Score met criteria for clinical significance
BDI-II: Higher scores indicate higher levels of depression. 0-13=Minimal, 14-19=Mild, 20-28=Moderate, 29-63=Severe
OQ-45: Higher scores indicate a larger number of symptoms. Cut-off scores for OQ-45 Total ≥ 63, OQ-45 Symptom Distress ≥ 36, OQ-45 Interpersonal Relations ≥ 15, OQ-45 Social Role ≥ 12

Table 6

Academic Performance Results

	Nina		Hannah		Aaron	
	Pre	*Post*	*Pre*	*Post*	*Pre*	*Post*
Grade Point Average	0.0	3.3	Withdrew from classes	4.0	1.72	2.20

Discussion

Summary of Findings

The results of this study extend previous research and suggest that intervention can be effective in increasing the quantity, scope and satisfaction with socialization for college students with ASD (Koegel et al., 2013). Specifically, two participants increased their overall quantity of social activities and one participant maintained a consistent level of social activities. All participants increased their scope of socialization in that each participant attended more community-based social activities, engaged in an increased amount of social activities with new/unfamiliar peers, and two participants increased the number of different peers they interacted with at social activities each week. Follow-up data showed maintenance of gains made during treatment and generalization of participating in social activities without support from a peer mentor. In addition to increasing social behavior, all participants also reported increased satisfaction in their socialization and college experience, and naïve observers rated improvement in at least one area of participants' social conversation following intervention.

Findings on the impact of structured social planning on collateral areas relating to quality of life indicate that participants reported a relatively consistent level of well-being throughout the study and improved their academic performance following intervention. Although participants with a history of low socialization with peers were prompted during intervention to participate in social activities, findings suggest that this did not seem to decrease their subjective well-being. All participants reported a consistent level of overall satisfaction with life, and two participants reported similar positive and negative affect throughout the study. Additionally, reported symptoms of depression and psychological functioning improved for one participant and maintained at a similar level for two participants. Furthermore, results on academic performance illustrate that all participants improved their grade point average following the structured social planning intervention.

These findings have several theoretical and applied implications. Additionally, there are limitations to this current study and results lead to future directions in this line of research.

Theoretical Implications

The results of this study have several theoretical implications. First, it is possible that difficulties engaging in social activities with peers may relate to symptoms of learned helplessness. That is, individuals with ASD may not initiate attempts to engage in social activities due to lack of motivation and a history of not experiencing positive reinforcement in their attempts at these activities. According to the theory of learned helplessness, if an individual learns that an attempt at a behavior is independent of reinforcement, then they will initiate fewer attempts due to their expectancy that their attempt will not be reinforced (Klein, Fencil-Morse, & Seligman, 1976; Maier & Seligman, 1976). Many individuals with ASD have difficulties with social interaction that make it challenging to engage and successfully interact with others at social activities, and they may leave a social event feeling discouraged and frustrated with their difficulties in developing the friendships they desire (Adreon & Durocher, 2007; Graetz & Spaminato, 2008; Hendricks & Wehman, 2009; Muller et al., 2008). If they repeatedly attempt to attend social activities but do not experience success, then it is possible that their motivation may decline and they may become less likely to initiate social activities with peers (Abramson, Seligman, & Teasdale, 1978; Klein et al., 1976). Many researchers have found that repeated experiences of failures may depress motivation, impair performance, and increase task avoidance (Koegel & Mentis, 1985). However, structured social planning aimed to target both the participant's motivation and the response-reinforcement contingency around social activities. Motivation may have been targeted by incorporating the individual's preferred interests and involving choice in social activities, and it is possible that the response-reinforcement contingency was strengthened by incorporating support from a peer mentor to assist the individual to appropriately engage in the activity and aid them to successfully interact with their peers (Dillon, 2007; Koegel & Koegel, 2006). Data show that participants generalized improvements in attending social activities with a peer mentor to attending more social activities without support from the peer mentor, and also maintained once intervention was complete. This suggests that it is possible that once participants may have had more motivation to attend social activities and worked with a peer mentor to help increase their likelihood of success at the event, then they independently engaged in more activities on their own. These findings support the idea that under the right conditions, most individuals with ASD do in fact have a desire to interact with their peers and integrate into their campus community (Howlin, 2000; Muller et al., 2008). However, they often experience loneliness and isolation due to challenges with social interactions, disappointing outcomes at social events, and possibly symptoms of learned helplessness (Graetz & Spaminato, 2008; Hendricks & Wehman, 2009; Muller et al., 2008). Results from this study suggest that it may be possible to increase motivation to attend social activities and bolster the response-reinforcer contingency around social activities for individuals with ASD, which may reduce symptoms of learned helplessness and in turn increase participation and satisfaction with socialization.

Findings from this study also suggest that the type of social activities that individuals with ASD attend may be an important area consider. While quantity of social activities attended is an important component of socialization, the scope of socialization and type of social activities seems to be beneficial to examine. Specifically, it appears that specifically targeting social activities that enhance campus and community integration may be important (Hendricks & Wehman, 2009). For example, although Nina's total quantity of social activities was consistent throughout the study, her scope and satisfaction with socialization improved, and she also reported the most improvements in collateral measures related to symptoms of depression and mental health functioning. During baseline, Nina attended the majority of her social activities at home and with the same couple of peers (e.g. had a friend from high school over to her parent's house to watch a movie). With intervention, she began to attend social activities on campus (e.g. participated in art club meetings) and participated in social events taking place in community (e.g. went to club dinners at local restaurants). While the overall number of social activities per week maintained throughout the study, she increased her participation on campus and in turn reported feeling more satisfied with socialization and less depressed than at baseline. This suggests that it may be important to specifically target involvement in community-based social activities (e.g. school clubs, extracurricular activities, community organizations) (Hart et al., 2010). Community-based social activities can enhance integration into an individual's natural environment, improve participation in social groups, and increase involvement in activities that may become a source of potential friends for individuals on the spectrum (Laugeson & Frankel, 2010). Hendricks and Wehman (2009) note that there is little known about the level of community integration experienced by individuals with ASD, and few research studies examine interventions that enhance community participation. This study adds to the literature that campus/community integration may be important to consider for adults with ASD, and structured social planning may be an effective intervention in this area.

Applied Implications

These findings are encouraging for postsecondary education options for the young adult population with ASD. The literature suggests that the number of students on the spectrum entering the realm of postsecondary education is increasing and continues to be on the rise, but current services available on college campuses do not address the array of unique social and behavioral difficulties for this student population (Dillon, 2007; Wenzel & Rowley, 2010). Developing support systems and discussing postsecondary options for students with ASD is a relatively new concept, and many colleges and universities are just beginning to face the issues of assisting students on the spectrum (Hart et al., 2010). This study indicates that structured social planning may be a beneficial technique to implement for individuals with ASD in higher education settings, as results suggest that participants improved their socialization, reported increased satisfaction with their overall college experience, and increased their grade point average following intervention.

Research has found an indirect relationship between stress level for neurotypical peers prior to enrolling in a university and their adjustment 6 months later, but students with ASD report difficulties with the transition from high school to postsecondary settings (Van Berjeijk et al., 2008). Students with disabilities have a lower level of participation in college life compared to students without disabilities, and difficulties establishing relationships with peers has been found to interfere with academic achievement (Dillon, 2007). Findings from this study indicated that structured social planning was effective in improving participation in college life, and all participants improved their grade point average following intervention. Two participants were on academic probation before receiving intervention, and both achieved above a 3.0 for the term following the start of intervention. While it is likely that structured social planning was not the only contributing factor towards the increase in grade point average, results support the notion that participation in social activities and satisfaction with socialization may have a positive impact on academic achievement.

This study also leads to further applied research in the field of social interventions for adults with ASD. The intervention used in this study was a package, and it would be helpful to further examine the individual components to help enhance the impact of the intervention. Specifically, it may be beneficial to continue examining the peer mentor component to better understand specific factors that can enhance the effectiveness of a peer mentor. Peer mentors have been shown to successfully address a wide range of support needs for individuals with ASD, and in this study the peer mentor assisted with the participants' involvement in social activities (Dillon, 2007; Hart et al., 2010). Specifically, the peer mentor helped research potential social activities, attended the social activity with the participant, modeled and prompted appropriate interactions at the social activity, and provided feedback to the clinician following the event. It may be interesting to examine characteristics of the peer mentor as well as the strength of the relationship between the peer mentor and the participant, and assess if these factors may have an impact on the participant's response to the intervention. Previous research on mentoring has indicated that the effects of mentoring are increased by the duration of the relationship (specifically if the match works together for at least a year), the quality of the mentoring relationship, and the frequency of contact between the mentor and mentee (Kaye, 2014). It may be interesting to assess the strength of the relationship with the peer mentor as perceived by the individual with ASD, and examine if the strength of the relationship impacts how successful the intervention will be for the individual. For example, if a peer mentor has similar interests to the participant, takes time to form a bond with the individual, and is reliable about attending social activities with the participant, then it is possible that the participant may be more motivated and enthusiastic about attending social activities with their support. It may be beneficial to better understand what makes an effective peer mentor and examine techniques to strengthen a peer mentor's therapeutic relationship with a young adult with ASD.

In addition to conducting further research on social supports for adults with ASD, it may be helpful to disseminate information regarding structured social planning across college campuses (Dillon, 2007). This is a short-term intervention that may be feasible to implement across campuses, and collaboration with staff members and campus organizations may be advantageous for creating effective support programs (Dillon, 2007). While many higher education programs are increasing their awareness about autism spectrum disorders, few universities are trained to provide specific services to help students with ASD with their unique support needs. Some colleges offer specific seminars for individuals with ASD or the option to live in a separate residential hall, but it is rare that students on the spectrum receive one-on-one support to help increase their socialization with peers (Dillon, 2007; Wenzel & Rowley, 2010). Because this intervention is feasible to implement and can be conducted for just one hour a week, it may be beneficial to train university staff members in structured social planning. Training staff members at Disabled Students Programs, Psychological Counseling Centers, Student Health Centers, and Offices of Residential Life could help students with ASD receive support to increase their socialization with peers. Dillon (2007) indicates that students who get the supports they need have a higher likelihood of success, and individualized supports (e.g. peer mentors) can effectively address the unique kinds of needs for students on the spectrum.

Additionally, research suggests that a potential moderator of academic and social success for college students on the spectrum is the attitudes and beliefs held by their typical peers (Nevill & White, 2011). It may be important to conduct specific outreach programs to the typical student population to increase knowledge, awareness, and inclusion of students with ASD (Wenzel & Rowley, 2010). The primary attention of autism intervention is still geared towards early identification and treatment, so emphasizing awareness and inclusion of students with ASD to typical students, staff, and faculty may improve outcomes in higher education for individuals on the spectrum (Nevill & White, 2011). It could be helpful to include information about autism in freshman orientation programs, new student welcome meetings, and general discussions in the classroom and residential halls (Nevill & White, 2011). Increasing openness and acceptance of typical peers towards students with ASD may make it easier for individuals on the spectrum to feel connected to their peers and be able to successfully integrate into a higher education setting (Nevill & White, 2011). Disseminating the intervention procedures across colleges may help staff increase their knowledge of techniques to assist students with ASD as well as enhance openness and awareness within the typical student population, which in turn may improve the ability of students with ASD to integrate into higher education and participate in social activities with their peers.

Limitations and Future Directions

There are limitations that exist in the measures used for this study, and it may be helpful for future research to incorporate additional measures to assess for collateral changes relating to overall quality of life. This study found that participants mainly reported a consistent level of subjective well-being and mental health functioning throughout the study. This indicates that increasing participation in social activities, which many consider to be a daunting task for adults with ASD, appears not to reduce subjective well-being. Although this is a noteworthy finding, most of the dependent measures assessing for collateral areas relating to quality of life were self-report questionnaires (e.g. Subjective Well-Being assessment, Becks Depression Inventory, Outcome Questonnaire-45). For example, the Subjective Well-Being assessment measured each participant's cognitive and affective evaluations of his or her own life and the Outcome-Questionnaire – 45 evaluated self-reported psychological functioning and symptom distress (Diener, Lucas, & Oishi, 2009, Lambert, 2012). While these self-report questionnaires assess the participants' subjective perspectives in areas relating to overall quality of life, they may not capture a complete picture of changes made throughout intervention (Mazefsky, Kao, & Oswald, 2011; White, Ollendick, Scahill, Oswald, & Albano, 2009). Unlike assessment of typically-developing adults where standardized self-report measures are central for diagnosis, self-report measures have not commonly been incorporated into assessment for ASD (Bishop & Seltzer, 2002). While research has been conducted to develop valid, standardized assessments of children with a suspected diagnosis of ASD, less attention has been given to the development of assessment tools that are valid for use in adults with ASD (Bishop & Seltzer, 2002). The self-report assessments utilized in this study were valid for typically developing individuals, but results may be limited due the little research on the validity of these assessments for adults with ASD.

For these reasons, it may be important to incorporate parent or teacher-reported measures or behavioral measures to fully assess for changes related to overall quality of life (Mazefsky et al., 2011). Previous research studies have shown that participants can indicate no change in their self-reported symptoms related to mental health functioning, even though there are significant changes in parent-reported measures and changes in their diagnostic status (White et al., 2009). Furthermore, it may be particularly important to supplement self-report questionnaires with other assessments such as parent-report or objective measures when working with adults with ASD because the literature indicates that adults on the spectrum are found to be more alexithymic (i.e. they have difficulty identifying and describing emotions in their own self) (Berthoz & Hill, 2005). Research has found that compared to typically-developing adult controls, adults with ASD have difficulty identifying, verbalizing and analyzing their own emotions, which may impact the validity of self-reported questionnaires related to subjective well-being (Berthoz & Hill, 2005). In order to gain a thorough understanding of the effectiveness of structured social planning on areas relating to quality of life, it may be necessary to incorporate a breadth of measures and collaborate with parents and other individuals that are actively involved in the participant's life. Using mainly self-report questionnaires, especially with adults with ASD, may not lead to an accurate portrayal of general quality of life for individuals with ASD (Mazefsky et al., 2011). Incorporating a variety of measures (e.g. self-report measures, parent-report measures, behavioral scales, etc.) can possibly lead to a more comprehensive and complete assessment of the effectiveness of the intervention and would be helpful to include in future research.

It would also be interesting to conduct a long-term follow up to assess if improvements in collateral areas relating to quality of life may further develop over time. It is possible that increasing social activities was a first step in improving participants' subjective well-being and overall satisfaction with life, but it may take time for adults with ASD to improve their engagement in social activities, recognize their gains, and experience and perceive changes in overall well-being. Although this study incorporated a follow-up phase to assess for short-term maintenance, it would be interesting to examine if self-reported collateral gains emerge in the long-term, after the individuals with ASD have more time and opportunities to practice structured social planning on their own. Adults with ASD tend to have a long history of experiencing social challenges and it seems possible that structured social planning may improve symptoms of learned helplessness related to social activities with peers, but it may take time for more global changes to occur. Additionally, it may be that increasing social activities with peers initially increases awareness of social skills deficits for individuals with ASD in that they may become more conscious of their difficulties engaging with peers. It is possible that this may actually cause an initial decrease in perceived well-being that may be followed by an overall increase once the individual experiences more practice and success in engaging in social activities with peers (Rao, Beidel & Murray, 2007). It would be intriguing to administer measures in a long-term follow up to examine long-term collateral gains and assess if the repercussions of increasing social activities may have a latency effect.

Another limitation and area for future research exists in the sample size and background information related to participants in this study. While three participants met the standard criteria for multiple baseline designs, it would be helpful to replicate procedures with a larger sample size to help strengthen the findings (Kratochwill et al, 2010). Additionally, all participants attended a local community college or four-year university, and it would be interesting to implement intervention to students in a different higher education setting (i.e. technical school) to assess if results would be similar. Further, all participants lived at home with parents and it seems possible that this has an impact on their participation in social activities with peers. Students that live on campus or off campus with peers may have more opportunities to engage in social activities, and living at home with parents may be an additional challenge to successfully integrate into the social scene and campus community.

It may also be interesting to conduct a more detailed assessment of the participant's level of motivation to increase their social activities with peers prior to starting intervention to examine if motivation level may impact treatment outcomes. While all participants reported as least some motivation to increase their social activities with peers, some participants, such as Nina, were primarily focused on improving their academics. It may be important to more thoroughly examine individual's motivation to increase social activities before starting intervention to make sure that structured social planning is a good fit for their treatment goals. It seems possible that individuals may need some level of underlying motivation to improve their socialization in order for the intervention to be effective. While the clinician aims to incorporate preferred interests and choice in social activities throughout the intervention, it is possible that individuals need to be motivated to increase their social engagement with peers in order for the structured social planning to be most effective.

Lastly, it may be beneficial to examine the effectiveness of the intervention with individuals of varying severity of autism spectrum disorder and with individuals with diverse cultural backgrounds. While each participant had an official diagnosis of autism spectrum disorder that was confirmed through our center, results from the Social Responsiveness

Scale-Adult Self-Report measure (SRS-2; Constantino & Gruber, 2012) and the Autism Spectrum Quotient questionnaire (AQ; Baron-Cohen et al., 2001) suggest that participants may be in the mild range. Participants did not report severe social impairments according the SRS-2, and only one participant, Aaron, reported on a score on the AQ that suggested clinically significant levels of autistic traits. While this may suggest that participants were in the mild range, research has also suggested that the AQ is not strongly correlated with the ADI-R or Vineland scores (Bishop & Seltzer, 2012). This may be another area in which it is important to incorporate a variety of measures (e.g. observations, parent-report measures) to gain thorough understanding of participant characteristics. Future research may want to rely more on the Autism Diagnostic Observation Schedule and Autism Diagnostic Interview to help determine autism severity for participants. Lastly, the racial/ethnic diversity of the current sample was limited, and is would be important to investigate cultural differences in a sample of more demographically diverse students.

Conclusions

This study was a next step in furthering the area of developing and examining treatment techniques for college students with ASD. The findings of this study suggest that structured social planning is effective in increasing social activities for students with ASD in higher education, and participants also maintained or improved in collateral areas beyond socialization that were not specifically targeted in the intervention. However, it may be helpful for future research to investigate specific components of the intervention package, incorporate a breadth of dependent variables to assess for areas relating to quality of life, and include a long-term follow-up to examine if collateral gains in overall quality of life will further emerge once participants continue to integrate with their peers. A promising next step may also be to disseminate information regarding structured social planning to help train staff and peers across college campuses in treatment strategies to assist students on the spectrum. Providing support services to help postsecondary students with ASD will likely increase their ability to successfully obtain a higher education degree and in turn may improve their long-term outcome in life.

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Appendix A.

Examples of social activities and non-social activities

Social Activities	Non-Social Activities
Videogame club on campus	Dinner with family
Movies with a friend	Bike ride on own
Dinner at a restaurant with a friend	Attending class
Local community event (e.g. fair) with a peer	Playing computer games on-line
Group tutoring on campus	Going to work
Extracurricular class at the Recreation Center	Meeting with a Professor

Appendix B.

Social Activity Log

	Monday	**Tuesday**	**Wednes-day**	**Thursday**	**Friday**	**Saturday**	**Sunday**
12 - 8 am							
8 - 9 am							
9 – 10 am							
10 – 11 am							
11 - 12 pm							
12 - 1pm							
1 - 2 pm							
2 - 3 pm							
3 – 4 pm							
4 - 5 pm							
5 - 6 pm							
6 - 7 pm							
7 - 8 pm							
8 - 9 pm							
9 - 10 pm							
10 - 11 pm							
11 - 12 am							

Appendix C.

Structured Social Planning Intervention Procedures

Component	Description
Incorporation of motivational interests	Participant’s preferred interests and motivational activities are identified and incorporated into social activities
Menu of peer social activities	Clinician develops a menu of at least three possible social activities around participant’s motivational interests. Participant chooses at least one activity
Training in organizational skills	Participant is trained in organization skills surrounding the peer social activity
Peer mentor	Participant is matched with a similar-aged peer mentor for support at the social activity
Social skills training	Participant is trained in social skills surrounding the peer social activity

Appendix D.

Self-Report Satisfaction Questionnaire

Name: ______________________________ Date:______________

1. How satisfied are you with your overall school/college experience?

1	2	3	4	5	6	7
Very Unsatisfied	Unsatisfied	Somewhat Unsatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied

2. How satisfied are you with your overall social experience?

1	2	3	4	5	6	7
Very Unsatisfied	Unsatisfied	Somewhat Unsatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied

3. How satisfied are you with the number of social activities you attend?

1	2	3	4	5	6	7
Very Unsatisfied	Unsatisfied	Somewhat Unsatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied

4. How satisfied are you with the availability of campus social activities?

1	2	3	4	5	6	7
Very Unsatisfied	Unsatisfied	Somewhat Unsatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied

Appendix E.

Social Conversation Rating Scale

Video Clip:
Coder :

1. This is an equal, reciprocal conversation between the conversational partners.

1	2	3	4	5	6	7
Strongly disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly agree

2. This person asks questions in the conversation.

1	2	3	4	5	6	7
Strongly disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly agree

3. This person has positive affect during the social conversation.

1	2	3	4	5	6	7
Strongly disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly agree

Appendix F.

Subjective Well-Being Questionnaire

1. Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number in the line preceding that item. Please be open and honest in your responding.

1 = Strongly Disagree
2 = Disagree
3 = Slightly Disagree
4 = Neither Agree or Disagree
5 = Slightly Agree
6 = Agree
7 = Strongly Agree

______1. In most ways my life is close to my ideal.
______2. The conditions of my life are excellent.
______3. I am satisfied with life.
______4. So far I have gotten the important things I want in life.
______5. If I could live my life over, I would change almost nothing

2. This scale consists of a number of words that describe different feelings and emotions. Read each item and then list the number from the scale below next to each word. Indicate the extent you have felt this way over the past week.

1	2	3	4	5
Very slightly or not at all	A little	Moderately	Quite a bit	Extremely

_____ 1. Interested
_____ 2. Distressed
_____ 3. Excited
_____ 4. Upset
_____ 5. Strong
_____ 6. Guilty
_____ 7. Scared
_____ 8. Hostile
_____ 9. Enthusiastic
_____ 10. Proud
_____ 11. Irritable
_____ 12. Alert
_____ 13. Ashamed
_____ 14. Inspired
_____ 15. Nervous
_____ 16. Determined
_____ 17. Attentive
_____ 18. Jittery
_____ 19. Active
_____ 20. Afraid