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ORIGINAL PAPER

Supporting More Able Students on the Autism Spectrum: College and Beyond

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Abstract In the 1990's a surge of children were diagnosed with autism spectrum disorders (ASDs) and are now approaching college age. Through early diagnosis and intervention many of these children are now able to consider post secondary education. However, these students will need specific interventions and supports in order to be successful. This article reviews the nosology of ASDs, the legal basis for providing accommodations to students on the autism spectrum, and the incidence and prevalence of ASDs. The authors provide specific recommendations regarding the academic, independent living, social, vocational and counseling needs of college students who are on the autism spectrum. With a carefully planned transition, appropriate accommodations, and support, ASD students can be successful academically and socially in college.

Keywords Autism spectrum disorder · Asperger syndrome · College · Young adults

Introduction

In the last 20 years, changes in the diagnostic specification of Autism Spectrum Disorders (ASD) coupled with heightened public awareness has led to increased identification of children and adults with one of these disorders. ASDs are currently estimated to occur in 0.2% of the general population of children (Gillberg 2005). The Center for Disease Control estimates that 1 out of every 166 children in the United States has an ASD (Bertrand et al. 2001). This translates to over 500,000 Americans having an ASD (Fombonne 2003). If one were to examine the segment of the population potentially preparing to enter college, Fombonne (2005) estimated that in 2002 there were between 284,000 and 486,000 individuals with the broader diagnosis of pervasive developmental disorder under the age of 20 years old alone.

The overwhelming majority of individuals with a pervasive developmental disorder have milder forms of ASD. For example, the number of children suffering from Asperger Syndrome is double the number of children suffering from classic autism (VanBergeijk and Shtayermman 2005). The main thrust of the academic literature has focused upon the more severe forms of ASDs. Comparatively little attention has been paid to children and young adults who possess milder forms of the disorder.

Although children and youth with an ASD demonstrate significant and limiting interpersonal deficits, they may possess cognitive abilities similar to neurotypical or gifted individuals (Barnhill et al. 2000). Consequently, while many individuals with an ASD are intellectually capable of university level education, they will require a range of academic and supportive accommodations in order for them to succeed both educationally and in terms of transitioning to greater independence (Glennon 2001). Despite the fact that there is a bourgeoning number of college-bound youth with an ASD, there is relatively little information available about the unique needs of this group. This article seeks to fill this gap by discussing the supportive

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requirements of these young adults with respect to higher education and social development.

Terminology and Overview of Diagnostic Concepts

Autism spectrum disorder (ASD) is a term that is used as an organizing rubric for a series of lifelong neuropsychiatric disorders including autism, Asperger Syndrome, Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS). Autism Spectrum Disorders are characterized by impairments in reciprocal social interaction, communication and the presence of stereotyped behavior, interests or activities. ASD is often used interchangeably with the term Pervasive Developmental Disorder although the latter is the preferred term for this constellation of disorders because of its implication that the disruption in development occurs across multiple areas of functioning and implies a multidisciplinary approach to assessment and intervention.

Autism is the most widely recognized pervasive developmental disorder (APA 1994, p. 66). The hallmark of this disorder is a profound impairment in the social interaction skills of the individual as well as his or her communication skills. One of the distinguishing features of autism as it presents in infancy is the delay or total lack of language development. In terms of IQ testing individuals with autism will have stronger nonverbal or performance skills as compared to their verbal skills. This holds true for both typical autism and what has been described as High Functioning Autism (HFA). Autism is frequently comorbid with mental retardation. In addition to these features, an individual with autism even as an adult typically has a severely restrictive repertoire of activities and interests.

Asperger Syndrome (AS) is characterized by severe and sustained impairment in social interaction, and the development of restricted, patterns of behavior, interests and activities. These two features of the disorder will create a clinically significant impairment in the social, occupational and other areas of functioning. AS has a later onset than autism (Klin et al. 2000) and there is no clinically significant delay in either receptive or expressive language development. Students with AS may have excellent vocabularies, although, their communication is quite impaired. Their difficulties often lie in the semantics and pragmatics of speech. They do not understand the give and take of a conversation. Individuals with AS may dominate a conversation on an esoteric topic that is of little interest to the other person. Their style of speech can be described as pedantic or very formal in its style. Also, in contrast to autism, there are no clinically significant delays in adaptive functioning, and cognitive abilities. Their IQ profile is the reverse of students with autism or HFA, i.e., typically students with AS have a deficit in their nonverbal skills. Their IQ scores on the performance portions of standardized IQ tests are markedly poor as compared to their scores on the verbal portions of these tests (Volkmar and Klin 2001). The seemingly strong verbal skill of the student with AS belies the true nature of their disability. AS is often referred to, albeit incorrectly, as high-functioning autism. This is likely done to highlight the verbal and cognitive strengths of the individual. The term, high functioning autism, is a colloquial one used by clinicians to describe individuals on the autism spectrum who score above a 70 on standardized IQ tests and would be considered in the normal range of intelligence. A debate remains as to whether high functioning autism is a separate and distinct clinical entity from Asperger Syndrome (Volkmar and Klin 2001).

A diagnosis of PDD-NOS is reserved for clinical situations where the individual's presenting symptomatology is either atypical or sub-threshold. The clinical presentation of PDD-NOS does not meet the criteria for autistic disorder nor does the presentation meet the criteria for Schizophrenia, Schizotypal Personality Disorder, or Avoidant Personality Disorder. The impairment in reciprocal social interaction, verbal and nonverbal communication, and stereotyped interests, activities and interests are present but are of late onset. The student may have had normal speech development for a period of time and was not diagnosed with autism until after the age of three

The clinical presentation of Non-Verbal Learning Disability (NLD) (Rourke 1989) is similar in many ways to AS. Individuals with NLD have deficits in social perception, judgment, and interaction skills. In addition, there are bilateral deficits in tactile perception, psychomotor coordination and visual spatial organizational abilities. Adaptation to novel situations, particularly complex social situations, is impaired. An individual with NLD will rely upon rote application of social skills to these situations, which are often incorrect and inappropriate. There are also notable deficits in the individual's ability to incorporate feedback from social interactions, nonverbal problem solving, concept formation, hypothesis formulation, and hypothesis testing (Klin et al. 2000, p. 236).

Co-morbidity

The issue of co-morbidity with Asperger's disorder (and, for that matter, higher functioning autism) has assumed increasing importance in recent years; it is intimately related to issues of syndrome validity and approaches to sub-typing the autism spectrum. Although there are methodological challenges associated with defining and

identifying co-morbid conditions the most common conditions are anxiety and depression in adolescents and young adults (Klin and Volkmar 1996). In many cases, anxiety appears to stem from the individual's difficulties in dealing with the fast-paced world of social information processing and depression may, to some degree, be viewed as a result of recurrent failure experiences (Klin et al. 2005). Seligman (1975) described a resultant state of anxiety and depression after repeated failed attempts to solve a problem as "learned helplessness." The co-morbid anxiety and depression exhibited by the ASD population may be a manifestation of learned helplessness. However, there is some suggestion for the limited available family-genetic work of increased rates of anxiety and depression in immediate relatives—particularly female relatives (Klin et al. 2005). Research suggests that rates of co-morbid anxiety and/or depression in individuals with AS are as high as 65% (Ellis et al. 1994; Fujikawa et al. 1987; Ghaziuddin 2002; Ghaziuddin et al. 2002; Ghaziuddin et al. 1998; Green et al. 2000; Howlin and Goode 1998).

Case studies have suggested potential links to other disorders including Tourette's syndrome (e.g., Gillberg and Rastam 1992; Kerbeshian and Burd 1986; Littlejohns et al. 1990; Marriage et al. 1993), obsessive–compulsive disorder (Thomsen 1994) and psychotic conditions (both psychotic depression and bipolar disorder) (Gillberg 1985). A small, mostly British literature suggests some increased risk for criminality and/or troubles with the law (e.g., Baron-Cohen 1988; Everall and LeCouteur 1990; Mawson et al. 1985; Scragg and Shah 1994; Tantam 1988c; Wing 1981) although often legal troubles seem to stem from poor social judgment and limited empathy rather than malevolent intent (Ghaziuddin et al. 1991; Klin et al. 2004). Individuals with AS often have difficulty secondary to their tendency to rigidity and, somewhat paradoxically, a firm and invariant adherence to 'the rules'.

ASD and Young Adults

The surge of children diagnosed with an ASD beginning in the early 1990s is now adolescent age on the brink of transitioning to adulthood. Existing research suggests that these children will continue to exhibit interpersonal deficits throughout their adulthood. Many will experience improvements in their social and communication skills (Nordin and Gillberg 1998) particularly if they received intervention services earlier in their lives (McGovern and Sigman 2005). In some individuals, the severity of their autistic symptoms may be reduced with intervention to point where they are more behaviorally similar to individuals diagnosed with PDD-NOS (NRC report 2001). The presence or absence of communicative speech by 5–6 years of age and the child's school age IQ score appear to predict functioning at adolescence and beyond (Gillberg and Steffenberg 1987).

The limited research available addressing the psychosocial profiles of these young people suggests that they continue to struggle with the developmental tasks of their age (Billstedt et al. 2005). Howlin et al. (2004) examined the adult outcomes of individuals diagnosed with autism as children. They found that while some of these individuals were able to live independently, the majority was unable to transition fully to an adult life that embraced work, personal relationships and independent living. Most of these individuals remained dependent upon their families and were socially isolated. Sperry and Mesibov (2005) reported similar findings. Based on their sample of adults with autism, they identified a number of interpersonal challenges affecting the quality of life of these individuals. These challenges included forming and maintaining functional work and personal relationships, demonstrating age and interpersonally appropriate behaviors with members of the opposite sex, and developing meaningful personal understanding of ASD.

Overall, the literature suggests that approximately 70%–80% (Billstedt et al. 2005; Fombonne 2003) of individuals diagnosed with an ASD at childhood will continue to demonstrate marked social impairment in adolescence and adulthood. Fombonne's (2005) review of epidemiological studies of autistic samples found a median proportion of subjects without intellectual impairment to be 29.6% (range 0%–60%). The proportion of subjects who possessed mild to moderate intellectual impairment comprised 29.3% of the samples. The level of cognitive impairment in AS and PDD samples is assumed to be less pronounced than in autistic samples. Findings reported by Howlin et al. (2004) and Mawhood et al. (2000) indicate that performance IQ typically declines and the verbal IQ increases as the individual ages. The majority of these individuals will experience difficulty in undertaking adult social roles although they may be cognitively capable of meaningful employment.

Individuals with ASD and Higher Education

The Individuals with Disabilities Education Act (IDEA) was authorized in 1990 providing a federal mandate to educate children with disabilities. This legislation was first enacted in 1975 as P.L. 94-142 and was subsequently reauthorized as IDEA. Prior to 1975, there was no legal requirement on the part of the state to provide educational services to children with a developmental disability. A school district could refuse to educate a child citing either a lack of appropriate educational services or a lack of

funding. At the time P.L. 94-142 was passed there were 8 million handicapped children in the US. An estimated 1.75 million were not provided any educational services. An additional 2.5 million children were inadequately served (Allen-Meares 2004). The law established the legal doctrine known as Free and Appropriate Public Education (FAPE). FAPE guaranteed the right of all children to be educated. The Zero Reject Principle of IDEA forbids the exclusion of any student with a disability from FAPE (Turnbull et al. 2002). As a result of IDEA, children with autism spectrum disorders are entitled to supportive services to enable them to maintain their placement in public schools. It is because a greater number of children with ASDs have been able to receive a high school education and our greater awareness of the importance of early intervention that a greater number of these young people are prepared and interested in attending university.

Section 504 of the Vocational Rehabilitation Act and Americans with Disabilities Act (ADA)

Congress passed the Vocational Rehabilitation Act in 1973. This law pre-dates both IDEA and the Americans with Disabilities Act. It established the precedence that any program receiving federal funding may not discriminate against individuals with disabilities. The law emphasized equal treatment in federally funded programs whereas IDEA emphasized adequate access to a free and appropriate education (FAPE) (Walker 2006). In 1990 Congress re-authorized and re-named the Vocational Rehabilitation Act as the Americans with Disabilities Act. Walker (2006) cogently argues that IDEA and ADA are complimentary laws that should be used in tandem to secure students' educational placements especially since the Supreme Court's decision in the *Shaffer v. Weast*, which reversed the burden of proof. Historically, the burden of proof was placed upon the school districts to demonstrate that the student's placement met his or her educational needs, i.e., the placement was free *and* appropriate. Now it is incumbent upon the party bringing forth the legal action, (typically the parents), to demonstrate that the current educational placement is not meeting the student's needs. The implication is that this Supreme Court decision will make it more difficult for parents to obtain services for their children.

IDEA provides funding for special education services to local educational agencies. This funding covers a student until he or she receives a high school degree. For the students who are unable to earn a high school degree IDEA provides funding for the provision of independent living and vocational skills training until he or she reaches the age of 22. The Americans with Disabilities Act shapes how universities provide services to students with ASDs. The ADA prohibits any public institution from discriminating against individuals with disabilities. The rationale for provision of academic supports appears to be self-evident given that a university's chief mission is the education of its students and the failure to do so would severely limit a major life activity of disabled students. However, according to Glennon (2001), "the overall goals of any university experience include developing skills for adulthood, forming life-long relationships, identifying a vocational pathway, and/or participating in extracurricular activities" (p. 185). The nature of autism spectrum disorders is a social disability and the failure by universities to provide social supports would substantially impair the student's ability to reach these goals. Furthermore, the failure to provide supports in the social realms for students with ASDs would exclude these students from being successful in academic achievement, which is a major life activity and the primary focus of universities. To be in compliance with the ADA universities must learn to address the social and organizational difficulties of this population. Over recent years there has been an increase in the number of self-help resources made available by parents of children with ASD and adults with ASD addressing the university application process and tips for academic and social success. There have been a growing number of reports within the pedagogical literature to develop awareness of this anticipated demand on university education. For example, Taylor (2005) outlines a series of recommendations for teaching, evaluating, and supporting students with ASD within higher education. Glennon (2001) identifies important issues to be addressed by campus support services for university students with Asperger Syndrome. Prince-Hughes (2003) describes ASD-related challenges for students as it related to college life. However, in the helping disciplines there continues to be a dearth of information addressing the needs of this college bound population.

The 2001 report of the National Research Council, *Educating Young Children with Autism*, emphasized that times of transition were critical times in the lives of young children with ASDs. This would include transition from high school to young adulthood as another critical juncture for individuals on the autism spectrum. Among a neurotypical sample of students, Pancer and Hunsberger (2000) found an indirect relationship between students' stress level prior to enrolling in a university and their adjustment 6 months later. Students with ASDs have tremendous difficulties with transitions. Without preparation students with ASDs would predictably fare far worse than neurotypcial students in their transition to university. Preparing young people with an ASD for the

transition to post secondary education is the next logical step.

The Transition to University: Issues of Fit

One of the first most important aspects of the transition to higher education is the fit of the student to the institution. When undertaking this decision process, the student should draw upon the Individualized Education Plan (IEP) developed with school personnel during the high school years. A well-developed IEP may serve as a blue print for the individualization of services at the university level. The IEP should identify the student's areas of relative strength and weaknesses. This "Individualized College Plan" should outline academic modifications, independent living skills, socialization skills and goals, vocational goals, and mental health supports.

IDEA requires school districts to develop a transition plan for students as a part of the IEP. The transition plan must be in place by the time the student reaches the age of 14. The transition plan typically identifies whether or not the student will graduate from high school or continue in a special education placement emphasizing vocational and independent living skills. For the higher functioning students on the autism spectrum the transition plan should include exposure to the college curriculum while the student is still in high school. Matriculating in 1–2 college courses at a local community college exposes the student to the academic and social demands of the college environment. Careful attention should be paid to the selection of these courses to maximize the student's chances of success. The courses should be of the student's choosing that are in his or her areas of strength. Creative school districts in the New York area have designed IEPs for these students that include a "Grade 13." During this year the students take courses at the local community college in the morning. In the afternoon the students return to their high schools for academic and social support. In addition to exposing the higher functioning students to the college curriculum and environment, this intervention decreases the stress the students face by reducing the number of college courses they have to take each semester.

As with neurotypical students, the size of the school will impact the adjustment process of the student with ASD. Small colleges offer familiarity and personalized learning environment. The smaller setting for some students represents less of a transition from high school where the classes range in size from 15 to 30 students. The likelihood that small college will offer smaller class sizes is greater than large state institutions. Smaller colleges may be appropriate for students with ASDs who are easily over stimulated by large groups of people and become increasingly anxious in unpredictable social situations. Smaller schools, however, may not be familiar with the unique educational needs of students on the autism spectrum. They may approach the student as though he or she has a specific learning disability and provide academically based interventions only.

Large universities offer students on the autism spectrum the possibility of finding their niche both socially and vocationally. The student that may have been described as "odd" in high school because of narrow and particular interests has the possibility of finding a community of peers with similar interests. Larger universities also offer a curriculum that is typically more diverse than what is offered at smaller colleges. This gives the student with an ASD the opportunity to excel in an academic area and plays to his or her strengths.

Harris et al. (2005) describe 3 basic models of educational interventions for young children on the autism spectrum. These are home-based, center based, and school based programs. Although there are significant developmental differences between young children and college aged young adults, their tri-modal approach is useful when considering how to implement college-level educational and social supports. Home-based services in college settings would place services in the student's current residence, typically a dormitory. Given the less structured and more socially complex nature of communal living, such home-based services may play a critical role in the student's success at college. Center-based programs in a university setting would assist students in learning requisite classroom social skills in a systematically monitored environment that specializes in providing services to ASD students. Some universities currently have centers that target remediation of academic skills which is analogous in structure. This model may be seen as too insular in its approach in that only students with ASDs would attend the center and the skills are learned within the confines of the program. A school-based program at a university level would contrast with the center-based program in its approach to how and where the services to the students would be offered. In a school based program the services are provided to the student in his or her classroom settings and general education environment. Peer training and support models have been shown to be effective in among college-aged students on campuses (Krohn and Goetz 2005; Tevyaw et al. 2007). The major advantage of this approach is that it allows the student to enjoy the full extent of the college life experience. When selecting a potential university, the student and his or her family should evaluate this "goodness of fit" (Schalock et al. 1989) between the students with an ASD and his or her environment as well as identify the models of intervention

the university uses to assist students on the autism spectrum.

Counseling Supports

Whether the student with an ASD and their parents select a small college or larger university should rest upon their assessment of how supportive the college community is of people with different abilities. A university's commitment to diversity should include their commitment to serving people with varying degrees of disabilities. One way to assess this commitment is to examine their office of student disabilities' statistics regarding not only the number of students they serve with disabilities, but also the types of disabilities served as well as the overall portion of students with disabilities vis-à-vis the total student body. Determining the types of disabilities served is an important distinction. Most colleges and universities are familiar with the leaning needs of students with specific learning disabilities and attention deficit disorder. These students need specific supports and modifications in the academic realm. However, students on the autism spectrum require modifications and supports in social, organizational, and communicative realms in addition to traditional academic supports.

While neurotypical students may benefit from a variety of counseling modalities, students on the autism spectrum require directive, explicit guidance and counseling. Because students on the autism spectrum will have difficulty making inferences, drawing conclusions and making connections social situations, in particular, must be broken down and analyzed. Each step the student is expected to take should be clearly stated and rehearsed prior to the student attempting the behavior. Role-plays with explicit feedback are critical. Because many students on the autism spectrum have difficulty generalizing skills across situations practicing new behaviors should ideally be practiced in vivo.

Modifications in the Classroom

Currently colleges and universities are required to make academic modifications for students with disabilities although there is variability in the extent to which this is implemented. Although approximately 3% of the college student population self-identifies as having some sort of disability (Thomas 2002), research suggests that faculty have limited understanding of the ADA and a student's rights to modifications in a university setting (Dona and Edminster 2001). Therefore it is critical that students with ASD register with the university's office of student disabilities. It is only with the confirmed registration of the individual's disability that the student is eligible for mandated accommodations within the classroom and for evaluation. For example, many students with ASD have fine motor problems. As a result, note taking can be a barrier to learning. Appropriate accommodations would include allowing the use of laptop computers, scribes, and tape recorders. Providing the student with an ASD a copy of lecture notes and/or slides prior to the class is also an appropriate accommodation.

Organizational help is critical to the success of a student on the autism spectrum. Just as in elementary and high school, these college students may continue to need explicit instructions on organizing their classroom and study materials (e.g., developing separate color coded binders for each subject area, sub-dividing binders into areas for notes, assignments, syllabi etc.). This organizational help requires more than simple verbal instruction. For the student with AS it may require written instructions paired with a picture of what is meant. Neurotypical students will have a general idea of abstract terms such as "organized" or "neat." A student with AS will not have an innate understanding of these terms. Without a concrete pairing of the words to the pictures, the student with AS may not truly understand what is being expected of him or her.

Large assignments may need to be broken down into manageable units and turned in separately. Because students with ASD will have difficulty with time management they will need explicit instructions as to when he or she should begin researching a term paper, writing a rough draft, and writing the final draft of a paper. If the student with ASD can maintain a visual representation of an organizer/calendar in their mind, then teaching a student how to use a personal digital assistant (PDA) can be a useful tool. Audible alarms can be set to remind a student of when to go to class, when to start studying for a test, and when to start researching a term paper etc. If the student is unable to maintain a visual representation, then he or she must be taught to use a hard copy of a calendar/organizer. There are also a number of other computer resources available to help students on the autism spectrum. A sample of some helpful computer programs and links to relevant websites are available at the Yale Child Study Center website (http://www.info.med.yale.edu/chldstdy/autism/pdd).

Evaluation and Testing

Accommodations in testing are frequently required to enable students with a variety of disabilities succeed in college. In accordance with the ADA, students with a

confirmed, registered disability are entitled to standard accommodations set by the law in each of his/her classes. For individuals with ASD, accommodations will likely include being given extra time to complete tests. The provision of extra time for testing is a vital accommodation for many students on the autism spectrum. Neurotypical students are anxious when an instructor gives a test. For students on the spectrum this normal level of anxiety surrounding a test is exacerbated by their experience of testing as a change in the normal routine. This elevated level of anxiety interferes with the student's ability to concentrate necessitating additional time. Furthermore, many students with ASDs have graphomotor difficulties. They need extra time to be able to write out their responses or even fill in the bubbles on Scantron sheets for multiple-choice tests.

A second accommodation in testing pertains to the physical setting in which the testing occurs. Because many of the students on the autism spectrum have difficulties with distractibility a reasonable accommodation would be to conduct the testing in a separate location free of distractions or provide the student with an on-line testing option. Many students on the autism spectrum have sensory integration dysfunction (Ayers 1972). Sensory integration dysfunction refers to an individual's inability to correctly process sensory input. The student on the autism spectrum may be either hyposensitive or hypersensitive to sensory stimulation. In a classroom setting this may manifest as an inability to filter out certain kinds of noises. For example, in the quiet of a testing situation a student on the autism spectrum may not have the ability to concentrate because of the hum of the fluorescent lights. It is imperative that the student's sensory issues are identified and appropriate accommodations be made in the testing situation. The testing accommodation may not necessarily mean that the student must be tested in a separate location. The student may simply be allowed to wear stereo headphones to block out the distracting sounds. By allowing the student to wear stereo headphones rather than earplugs, less attention will be drawn to the student and their accommodation. Having a student wear ear protectors would unnecessarily draw attention to the student.

Social Functioning

Since autism spectrum disorders are developmental disabilities that impact a variety of domains in a student's life, college personnel must expand the areas where they typically intervene. University personnel are familiar with providing academic supports for students with specific learning disabilities or attention deficit disorder. However, they are often unprepared to address non-academic concerns. These concerns include life skills, socializing, doing laundry, budgeting, checking, and getting along with roommates. Issues of sexuality are particularly difficult for this population. Many of these students are very naïve and could be taken advantage of sexually. Others do not know how to negotiate a simple dating situation let alone a far more complex social situation (i.e., negotiating a sexual relationship). There is also a risk that students on the autism spectrum will be told by their peers to say something or do something that is inappropriate to member of the opposite sex as a joke. Students on the autism spectrum must be explicitly taught what is appropriate to say to a person he or she may find attractive (Volkmar 2004). Furthermore, these students will need sexual education that is developmentally appropriate and concrete in its orientation. This includes how to protect themselves from disease and unwanted pregnancy. Volkmar (2004) provides a complete overview to adolescence and sexuality for children on the autism spectrum including teaching about privacy and modesty, establishing boundaries, encouraging healthy sexual relationships, and birth control.

Although there is empirical support for the usefulness of social skills groups for young children with (Kransy et al. 2003; Paul 2003) they are not commonly used with college-aged students on the spectrum. The developmental nature of ASDs and this population's difficulty in generalizing skills to new settings suggests using social skills groups with students on the spectrum as they enter college. They have a need for explicit teaching/role play. Practice should be done in vivo across environments to promote generalization. How to start a conversation with a new person should be practiced in the cafeteria, in a dorm room, in the student lounge, on the quad etc. Professionals working with students on the autism spectrum cannot expect generalization across environments. These skills are often situation specific for this population.

Mental Health Support

Students with autism spectrum disorders often have limited insight to their own emotional states and have even more limited insight into the emotional states of others. Psychoeducation is a more promising approach. This approach teaches the student what it means to have an autism spectrum disorder and what measures they can employ to compensate for their limitations. Directive counseling is needed. The student must be told how to handle a variety of social situations (e.g., how to get along with a roommate). Klin and Volkmar (1996) recommend explicit instruction with homework, role-playing, and coaching. The skills should be taught in "...a rote fashion using a parts-to-whole teaching approach, where the verbal steps are in the correct sequence for the behavior to be effective" (p. 6).

Further, Klin and Volkmar (1996) highlight the need for the individual with an ASD to be taught how to identify novel situations and "resort to a pre-planned, well rehearsed list of steps to be taken" (p. 7). Above all, support personnel must not assume that general explanations will suffice and that the student with an ASD will be able to generalize to similar situations.

Mental health professionals working in university environments should be aware of a possible increase in some co-morbid conditions (e.g., depression/anxiety). The first semester in college will be a critical transitional period for students on the autism spectrum. During the first semester the student's skills will be taxed. The novelty of the new environment will elevate the student's anxiety. This will be further exacerbated by the negotiations of a complex social environment in the dorms. The lack of familiar routine and structure will compound the student's anxiety. The variable schedule of classes and the lack of a consistent daily structure can even further increase the student's sense of anxiety and unpredictability University officials who know that they have students on the spectrum need to proactively reach out to these students and create more structure and predictability for these students Without such proactive supports these students are at increased risk for depression and perhaps increased risk of suicide.

Resident advisors should be alerted to the presence of a student on the spectrum and the warning signs that the student is in crisis. Trained peer life coaches may help students on the spectrum deal with the seemingly unpredictable university environment and provide structure for the student. They, along with the resident advisors may be the first to detect signs of depression or increased anxiety before it becomes an acute crisis.

Case Vignette

Mike was very fortunate and had a number of factors that optimized his potential for living independently and successfully completing college. Although he was born over 30 years ago, he was diagnosed with autism at the age of 2 years old. His parents were university professors. Both his parents and extended family were extremely supportive. Mike received applied behavioral analysis (ABA) when the technique was in the early stages of development. This intervention began shortly after his initial diagnosis. His family belonged to a house of worship that took the family under its wing. The congregation included Mike in its social activities and sought to integrate him into the community.

When Mike began school his I.Q. scores were in the normal intelligence range. However, there was a severe discrepancy between his verbal and performance abilities. Mike was exceptionally talented in non-verbal math skills. Throughout his public school experience he actually received minimal educational supports. One consistent source of support was a private therapist. The therapist employed an eclectic approach to treatment. However, the focus of their work was on social skills development and problem solving. One personal factor that significantly affected Mike's success was a strong desire on his part to "fit in."

Mike had a talent, which his parents encouraged, that aided him in fulfilling his desire to fit in. During high school he was a competitive runner and joined the track team. He received recognition and acceptance from the other students for his athletic abilities.

Mike also continued to excel in mathematics during high school. In his senior year Mike took the Scholastic Aptitude Tests (SATs). He did exceptionally well on the mathematical portion of the exam. His verbal scores were fair at best. He applied to number of different colleges and was accepted to all of them. Mike wanted to go to a large highly competitive technical school that had a world-renowned reputation for its academic rigor in math, science and engineering. His parents wanted him to go to an extremely small college where class sizes were small and he could get individualized attention. They compromised. Mike attended a mid sized college in a small college town in the North East, which was close to his parents' home.

A critical factor to Mike's success was his engagement in social activities. He joined the college track team. The college provided him with a roommate from the track team. The roommate acted as a life skills coach for Mike. This person helped him navigate the social complexities of dorm life and taught him independent living skills. They ate meals together. The roommate even invited him on social outings like camping trips with friends. This "intervention" happened through serendipity—not through design. The roommate took a genuine interest in helping Mike decode the social world. A key function the roommate provided Mike with was a list of rules of how to behave and under what circumstances. Mike did well in situations where the rules were well defined.

Another area of interest of Mike's was developed into mechanism to engage him socially. He loved music. Mike joined the college radio station. He was assigned to a shift in the wee hours of the morning. His vast knowledge of music was extraordinary. He would provide listeners with incredibly detailed background information about a recording. Normally, in a social setting this type of perseveration would turn off a listener in a conversation. Mike's knowledge earned him a reputation and a cult following of devoted listeners who regularly called into his radio show. His active participation in the college radio and

other clubs contributed to his sense of well-being and social success.

Academically Mike did well in his math and sciences classes. He did less well in fast paced classes that required creativity and quick thinking. His parents provided him with tutors for these subjects. The tutors assisted him with the executive functioning aspects of researching, organizing and writing papers. His classroom accommodations were minimal. He was able to take tests in a distraction free environment and was given extra time on tests. Mike also received extra time on his written assignments. Another strategy Mike employed was regarding his scheduling of classes. He scheduled the lightest possible full-time load during the academic year. Summer semesters were reserved for classes that he had the most difficulty with. He typically took only 1–2 classes during this time in his subject that gave him the greatest challenge: English. A final factor that contributed to his success was the continuation of his relationship with his therapist from home.

After graduation from college Mike had difficulty finding employment. Consequently he returned to graduate school and earned a masters degree in computer science. He is currently employed for large organization where he is involved in data management. Mike lives independently and owns his own apartment. Through work he has met a few women that have developed into girlfriends. He currently is not in a relationship.

Vocational Issues

The role of colleges and universities is to prepare students to become productive members of the labor force. This function is done is an indirect manner. Students learn good study habits, which are supposed to translate into good work habits in the future. The university helps the student to identify his or her own strengths through the grades they earn in their courses. The students are trained to think about a problem in a particular manner based upon the academic discipline they are pursuing. The process for a neurotypical student is *sub rosa*. Upon graduation the student is expected to pursue a career based upon a nebulous set of skills. The process of job training is secondary to teaching the student how to think about life. For the majority of neurotypical students, this seemingly haphazard approach to their education and job training appears to work. Most college students are gainfully employed after graduation. According to the US. Department of Labor Statistics, 89% of college graduates ages 25–34 are a part of the civilian labor force. The remaining 11% enter graduate school, stay home to raise a family or enter the military (Dohm and Wyatt 2002).

For the student on the autism spectrum preparing the student for work must be a conscious and planned effort. Direct connections should be made between what he or she is learning in college and the world of work. Explicit preparation is crucial. Completing the job search and application process is a skill that needs to be practiced with students on the autism spectrum. Course instruction and assignments should include how to write resumes. Because their disability is a social disability, students on the spectrum are most severely disadvantaged during a job interview. Teaching students on the spectrum how to conduct themselves during a job interview through role-playing is vital. The job interview should be broken down into discrete tasks for the student to accomplish. Because much of a job interview is unscripted, student on the autism spectrum may have to practice a variety of scenarios in reference to how to introduce themselves, making small talk, whether or not to shake someone's hand, and where to sit. Employment interviewing training programs have been shown to improve interview performance with neurotypical college students (Knudstrup et al. 2003)

The issue of whether and/or when the student should disclose their disability to a prospective employer can be complicated. Past research has shown that knowledge of a disability is a deterrent to granting an interview by employers (Peason et al. 2003). However, properly timed and considered disclosure can allow for an employer to make reasonable accommodations to the employee's work site and assignments (Munir et al. 2005). The topic of disclosure should be discussed with the student prior to any job interviews.

Once the student on the spectrum has been hired, the student must be explicitly taught what the requirements of the job are. This includes the dress code, when to arrive and leave work, how long to take a lunch break, where they are expected to place their personal belongings and how to do their job in detail. Students on the autism spectrum should not be placed in jobs that are highly unpredictable and require the ability to discern complex social interactions. Students on the autism spectrum should seek jobs that focus upon areas of strength. A student's interest or perseveration may be turned into a marketable job skill. Many individuals on the spectrum are quite adept at programming and repairing computers. Others are highly skilled at organizing and filing things, once they are shown what the system is. The key to successfully placing a student on the autism spectrum in a job is to ensure that there is a goodness of fit between his or her strengths and the job requirements. Highly predictable, structured, routinized jobs serve this population well.

Part of the transitioning students with ASDs to the labor force, involves preparing them to leave the university environment. Again this is another transition period that

generates considerable anxiety for this population. The students may finally become habituated to the university environment and have established a routine. They have developed mastery of basic tasks such as going to class, completing assignments, eating in the dormitory cafeteria, but have not mastered the independent living skills necessary to live outside the confines of the university environment. The student may fail to fulfill the course distribution requirements necessary for graduation and thereby delay graduating. Others may actually begin to fail course work as a means to postpone this stressful transition. Finally, a student with an ASD may develop an acute psychiatric crisis in response to the stress of the pending transition to post college life.

Conclusion

Students with ASDs are a burgeoning population. Many have post secondary school aspirations. With specifically tailored interventions students with ASDs can fulfill those aspirations and can reach their potential to become independent contributing members of society. The transition from high school to the college environment is a critical juncture for students on the autism spectrum that must be well planned. It is imperative that the student and his or her parents examine the goodness of fit between the student and the prospective college. The goodness of fit should be examined in terms of the size of the university, the size of the typical classes and the receptiveness of the institution to students with a variety of disabilities. While many universities are quite adept at making accommodations for students with specific learning disabilities and ADHD, they face new challenges when accommodating students on the autism spectrum. Universities will have to learn how to effectively intervene in the areas of communication, social, and independent living skills, and executive functioning. Their repertoire of supportive services will have to be expanded to include social skills groups, psychoeducational groups, directive counseling, vocational training, and life coaching in order to help accommodate students on the spectrum. These interventions will need to be empirically evaluated and if effective, disseminated to professionals in the field. Finally, social policies must be written to support young adults with autism spectrum disorders that focus upon helping the student transition to independent living. This includes the provision of funding for university based supportive services, job skills, transitional programs and supportive housing.

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