


ASC *Quarterly*

Academic Support Center

Volume 7, No. 3
May, 2006



It was the fourth period of the last home game of Greece Athena's basketball season. The Trojans had a healthy lead, so varsity coach Jim Johnson decided to let the team's manager, 17-year-old Jason McElwain, enter the game. In four minutes, Jason scored 20 points. The crowd roared; the coach dropped his jaw; and Jason was carried out on his teammates' shoulders. Why all the fuss? Jason isn't the star basketball player; he isn't even a regular player on the team. Jason has autism.

This story made national news. The student video that caught the magic moments spread to the major networks. Phone calls and e-mails flooded the school. Jason's parents were besieged with inquiries from Hollywood and production companies such as Walt Disney Co. and Warner Brothers. But this isn't a story about an autistic senior's unexpected triumph on the court. Rather, it's a story about the power of providing opportunities for people with disabilities to integrate into the mainstream (Drehs, 2006).

(Continued on page 4, Autism/Asperger's Syndrome)



This issue of *ASC Quarterly* provides a basic overview of various learning and developmental disorders. We hear about them in the news, we live with them in our families, and we work with them in our classrooms. As our knowledge and understanding of the learning process and related disorders evolves, our obligations as educators grow. On one hand, we need to be prepared to provide compensatory strategies, offering several instructional alternatives for the mixed group of learners in our classes, and arranging for varied ways of assessing mastery of content. On the other hand, we must recognize that the nature of some disabilities requires specific accommodations, such as extended test time or texts in alternate format, in order for students to succeed. Awareness and acceptance go a long way in sending a message of respect for every student's unique learning path and in assuring equal access for everyone.

FROM THE DISABILITY SERVICES COORDINATOR, SUSAN ACKERMAN

The Disability Services Office is the gateway for disability issues on campus. Given the focus of this edition of the *ASC Quarterly*, I have been asked to write a guest editorial. While I am not part of the Academic Support Center, we are in the same corridor and we often work cooperatively together.

Currently, about 870 students with disabilities are registered with our office. The two largest groups are students with learning disabilities (LD) and those with attention deficit-hyperactivity disorder (ADHD). Students register with our office in order to make use of accommodations, which allow them equal access to the programs and services on campus. To qualify for accommodations, students must provide documentation of their disability, which is generally a recent psychological evaluation or letter from a doctor. If students do in fact have a diagnosed disability “which substantially limits one or more major life activities such as self-care, walking, seeing, hearing, speaking, breathing or learning” (Section 504), appropriate accommodations are then determined.

Examples of academic accommodations students at RIT use include extended time for testing, the services of a notetaker, interpreter, reader or scribe, books in alternate format, a basic four-function calculator, enlarged print or word processor. The purpose is to provide equal access to learning, which may involve an alternate method for taking in information or demonstrating knowledge of the content.

For students with a more visible disability, this need is more easily understood. Students with limited fine motor control due to cerebral palsy might need someone else to take notes during lectures. Students with a more “invisible” disability such as attention deficit-hyperactivity disorder (ADHD) or a learning disorder (LD) may also need someone to take notes; they may not be able to effectively listen, stay on task, process the spoken words and take meaningful notes.

Faculty concerned about being inclusive of various learning styles may be interested in implementing a rather new concept, called “Universal Design of Instruction” (UDI), which focuses on anticipating student diversity in the classroom and intentionally incorporating inclusive teaching practices. When the concept of UDI is implemented, students with a variety of abilities, disabilities, learning styles and other characteristics benefit from accessible design and instruction that take into consideration a broad range of diverse learners. Based on nine principles for planning and delivering instruction and assessing student learning, UDI provides a framework that promotes creative thinking about pedagogy and respects faculty autonomy as the architects and designers for their courses (Scott & McGuire, 2003).

For more information about the Disability Services Office, please visit our web site at www.rit.edu/~371www or contact me at 475-6988 or smacst@rit.edu.

Nine Principles of Universal Design of Instruction

Equitable	Perceptible	Size and space for approach and use
Flexible	Tolerant of error	A community of learners
Simple and intuitive	Low physical effort	Inclusive instructional climate

For more information, see <http://www.washington.edu/doit/Brochures?Academics/instruction.html>

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ATTENTION DEFICIT-HYPERACTIVITY DISORDER

Anywhere from 2 - 4% of American adults and 3 - 7% of children are diagnosed with ADHD. These figures are often disputed, and misdiagnosis is a problem largely due to untrained physicians and the symptoms mimicking other disorders. Despite the controversy over the numbers, it is important to remember that ADHD is a recognized disorder. In 1998, attention deficit-hyperactivity disorder (ADHD) was recognized as a disorder in the DSM-IV (Diagnostic and Statistical Manual of Mental Disorders*). Fifty percent of all people who have ADHD also have other disorders. ADHD occurs five to seven times more in males than females. Additionally, studies have shown that ADHD has a hereditary component. At RIT, 261 students registered with the Disability Services Office have ADHD.

ADHD is a neurobiological condition that involves the brain's executive function which largely deals with helping attention to organization and connection experiences. According to the DSM IV - TR (2000), ADHD has three categories: inattentive, hyperactive-impulsive or a combination of the two. Those with ADHD in the inattentive category often cannot pay attention, skip around during activities while often not completing any of them, lose or forget things, and may seem uninterested or lethargic. Those who are hyperactive-impulsive are restless, can be fidgety, have difficulty taking turns or waiting, or might blurt out answers at inappropriate times.

ADHD is most effectively treated with a combination of medication and therapy. An appropriate ADHD diagnosis can be difficult to come by given the high likelihood of having some other type of disorder. Drugs are effective in at least 50% of all cases. Some drugs that are used are stimulants (i.e. Ritalin, Concerta, Adderall), tricyclic antidepressants (Aventyl, Tofranil), or Atomoxetine (Strattera).

ADHD has many positive sides. David Neelman, Jet Blue founder, and Paul Orfalea, Kinkos founder, are examples of two successful, prominent businessmen living with ADHD. They and others agree that creativity, out-of-the-box thinking, and boundless energy are some of the advantages of having ADHD. People who live with ADHD successfully learn to manage appointments, calendars, time and social situations. Students with ADHD can learn these skills as well by seeking professional help at the ASC and through accessing accommodations.

Top 10 symptoms of patient-suspected adult ADHD *Archives of Internal Medicine* (June 14, 2004)

- Poor concentration
- General disorganization
- Tendency not to finish projects
- Inattention
- Poor school performance
- Problems with time management
- Difficulty controlling temper
- Impulsive behavior
- Problems with anxiety
- Difficulty functioning at work

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[*The DSM-IV and DSM-IV TR is the Diagnostic and Statistical Manual of Mental Disorders (Text Revision). It is the mental health reference book used by all qualified practitioners for diagnostic criteria for mental disorders.]

AUTISM/ASPERGER'S SYNDROME (continued from page 1)

According to the U.S. Department of Education, autism "is growing at a rate of 10 to 17 percent a year, making it the fastest-growing disability in the country" (Drehs, 2006). Lee Grossman, president of the Autism Society of America, saw the J-Mac video. He "was blown away—not by the frequency of 3-pointers swishing through the net, but by the frenzied students who jumped up and down and waved their arms back and forth and held of pictures of McElwain. Before he had even checked into the game" (Drehs, 2006).

Autism, a developmental disorder that is little understood, affects the ability to relate socially. Talking too loud, laughing too long, missing social cues, and not reading body language are among the range of symptoms. Jason didn't begin talking until he was five years old. According to his high school special-education teacher, Diane Maddock, Jason "still lacks social skills but he has learned to cope well in his teens" (AP, 2006).

Social cuing can help steer awkward behavior to a more acceptable level. In addition, the more Jason interacts with his mainstream teen peers, the better he'll be able to interact with people as he grows older. Jason takes pride in having a lot of friends. "I'm not really that different," he said. "I don't really care about this autistic situation, really. It's just the way I am. The advice I'd give to autistic people is just keep working, just keep dreaming, you'll get your chance and you'll do it" (AP, 2006).

Do you know someone who sometimes lacks proper social clues, seems to focus on primarily one topic, or who speaks differently? Maybe this person appears to have almost genius intelligence with regards to one area of expertise, but lacks the social skills to verbalize his or her thoughts. Regardless of the symptoms, this person spends his formative years dealing with social stigmatization, ostracism, and the bewilderment of family and friends who fail to understand why their loved one cannot be just a little more like everyone else. But what if these traits were more than just characteristics of a quirky personality; what if they were a quantifiable medical condition?

A milder form of autism, Asperger's syndrome (AS), is a relatively newly diagnosed developmental disorder, first described by Hans Asperger in 1944. Those with Asperger's are known for their tendency to obsess on a particular topic or object, such as trains, computers or animals. At times, they remain fixated on this topic and talk of nothing else. Their normal to high levels of intelligence coupled with their formal and structured ways of expressing themselves often lead them to be called "mini-professors" or "geeks with a cause." Other symptoms of AS are a preoccupation with routines and rituals and an inability to understand the nonverbal communication of others. In short, those with AS remain "the odd man out," someone who is unable to fit in despite having real expertise and intelligence in certain areas.

Studies of the incidence of Asperger's suggest that it ranges as high as 20-25 per 10,000 children. It is infinitely more common than "classic" autism and much more common in boys than in girls. Presently, there are ten documented cases of Asperger's Syndrome here at RIT with another five or more students with this disorder admitted for the coming academic year (Ackerman, April 19, 2006).

Treatment for people with Asperger's varies from communication and social skills training to behavioral therapies that reduce anti-social behaviors to medications that improve specific behaviors related to AS, such as anxiety, depression or hyperactivity.

AS is a lifelong condition, even with treatments to reduce symptoms and help those with AS successfully integrate into society. Nonetheless, people with Asperger's often live productive lives with special focus given to their area of expertise.

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LEARNING DISABILITIES OVERVIEW

At RIT, 29% of all students with disabilities report having one or more learning disabilities (LD). Forty-seven percent of all students with disabilities enrolled at post-secondary institutions reported having LD. In public 2-year institutions, 38% of all students with disabilities have LD. At public four-year institutions, 51% of all students with disabilities have LD. (Source: National Center for Educational Statistics, 1999).

A learning disability (LD) is a neurological disorder related to the brain's ability to receive, process, store, and respond to information (DSM-IV-TR, 2000). Identification of a learning disability must be done by a trained professional. Factors considered include family history, intellectual ability, educational background, social environment, and other factors that can affect learning. A person can be of above average intelligence and still struggle in one or more areas of learning including reading, mathematics, written expression, communication, and/or motor skills. Learning disorders are not normal variations in academic achievement due to lack of opportunity, poor teaching, or cultural factors. In addition, other conditions such as ADHD, depression, conduct disorders, etc. may exacerbate learning difficulties.

Learning disabilities can be compensated for and overcome through alternate ways of learning and through the use of accommodations and modifications.

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READING DISORDERS (DYSLEXIA)

The major goal of reading is to develop fluency and comprehension. Besides general intelligence, several processes in the brain affect this development, including phonological awareness (acoustic elements of language), orthographic awareness (visual/spatial elements of letters and words), and semantic memory (language stores). In addition, efficiency and speed of processing as well as the ability to plan and execute processes are involved. These processes are not generally localized. The entire brain is involved in their execution. Students who have a reading disorder may demonstrate difficulties in some or all of the following areas:

- pulling apart or blending together the sounds of a language
- making connections between sounds and letter symbols
- spelling words
- learning sequential information (e.g., days of the week, alphabet, number sequences)
- reading with age-appropriate speed and accuracy
- reading comprehension
- learning a foreign language

Evaluation by a trained professional would include investigation of a person's ability to understand and use spoken and written language and would look at specific areas of strength and weakness in the skills that are needed for reading (National Center for Learning Disabilities, 4/10/2006). There are four major reading disorders:

- Phonological Dyslexia - Difficulty detecting the acoustical elements of speech
- Surface Dyslexia - Difficulty with fluency
- Mixed Dyslexia - Multiple processes may be hindered
- Deep Dyslexia - Difficulty with reading comprehension and/or abstract language

Students who have dyslexia are capable of being good readers and writers through the use of instructional support from processors and tutors, including using multi-sensory approaches when introducing new ideas and encouraging students to practice different kinds of reading, such as reading technical subjects, expository material, narratives, and newspapers. In addition, through the use of academic accommodations such as notetakers, alternate assessments, books in alternative format, assistive technology, and extended time for completing assignments, many students can compensate for their reading difficulties.

Although reading is a fundamental skill for daily living, it is important to remember that students with reading disorders have strengths in areas of learning that do not emphasize language skills. Students with dyslexia should be allowed to express their learning in ways which emphasize those strengths by proving understanding through demonstrations, the creation of actual products, or the application of learning to real life problems.

MATH DISABILITIES (DYSCALCULIA)

Although there is no singular form of math disability, dyscalculia refers to a range of learning disabilities involving difficulty with computational processes used to solve problems and equations. Language skills, working memory, executive functions, verbal retrieval, and visual-spatial skills all can impact math processes (Feifer and De Fina, 2005). Because math disabilities are varied, it may be difficult to distinguish a student with a disability from a student who simply needs to spend more time practicing formal math procedures. Indeed, some would argue that there is no math disability per se; however, understanding a struggling student's strengths and weaknesses and allowing that student to explore more than one approach to solving a problem can help to improve math fluency (Russell, 1999).

The warning signs that may indicate a math disability include:

- slowness in developing counting and basic problem-solving skills such as adding, subtracting, multiplying and dividing;
- difficulty reading numbers or recalling numbers in sequence;
- difficulty understanding patterns and/or inability to predict appropriate procedures, i.e., *knowing when* to add, subtract, multiply and divide or do more advanced problems;
- difficulty organizing objects in a logical way;
- trouble with the concept of time, e.g., chronically late, forgetful of schedules;
- poor sense of direction, easily confused by changes in routine;
- poor memory of concepts, i.e., can do certain functions one day but unable to do them the next day;
- trouble estimating how long something will take, how much something will cost, or how many days until a certain event (deadlines);
- difficulty with strategy games like chess and bridge;
- difficulty keeping score when playing board games;
- unable to find alternate ways to solve problems of self-check work (NCLD, *Dyscalculia*, 2006).

Weak visual-spatial skills can result in the student understanding the needed math facts, but having difficulty putting them down on paper in an organized way or having difficulty understanding what is written on the board or in a textbook. Language processing disabilities can result in difficulty grasping the vocabulary of math. For more advanced math procedures, the ability to follow multi-step procedures can be hindered by disabilities that make it hard to visualize patterns, distinguish among different parts of a math problem, or identify particular information required to solve more complex problems (NCLD, *Dyscalculia*, 2006).

Issues with working memory can impact performance in three ways:

- 1. The “phonological loop” refers to the mind’s inner voice. There may be difficulty with retrieving math facts (automaticity) or reading numbers accurately (fluency).**
- 2. The “visual-spatial sketchpad” relates to the mind’s inner eye and there may be difficulties doing “mental math” (visualizing, estimating comparisons of measure, or performing geometric proofs).**
- 3. The “central executive system” assigns cognitive resources to other memory systems and is critical in directing, shifting, sustaining attention and inhibiting distracters. It’s important to be aware that the central executive functions can be negatively affected by anxiety or emotional distress.**

(Feifer and De Fina, 2005)

Even though there may be some dispute about whether dyscalculia is a “specific learning disability” (SLD) or not, it does fall within the terms used in the federal law for any LD (NCLD, *LD at a glance*, 2006). Approved classroom accommodations, if reasonable, should be allowed, e.g., using a notetaker and/or having extra time for exams. In addition, effective tutoring help outside the classroom allows the student to focus on the specific difficulties the student is experiencing without having the pressure to move on to new topics too quickly. Reinforcement and repeated practice can improve understanding and retrieval. Other strategies for inside or outside the classroom include:

- using graph paper to help organize ideas on paper;
- finding different ways to approach math facts other than just memorizing, i.e., emphasizing the *meaning* behind the math;
- introducing new topics by working from concrete examples before moving to abstract applications;
- explaining ideas and problems clearly, and encouraging questions;
- modeling meta-cognitive strategies such as self-talk and self-check;
- eliminating distracters in the learning environment and providing necessary tools—pencils, erasers, paper, etc.;
- helping students understand their own strengths and weaknesses in math and capitalizing on how they learn best.

WRITING DISORDERS (DYSGRAPHIA)

Writing is the most complex of the communication modes, developing after comprehension, speech and reading (Sandler et al, 1992). In addition to penmanship and organization, writing competence includes skills in sentence structure, grammar, vocabulary, conventions (including spelling), fluency (speed), and content (knowledge of subject matter) (Baker and Hubbard, 2002).

Several processes of the brain affect development of the following skills:

- Attention - the overall plan and execution of a writing project
- Spatial production - the layout of a page
- Memory - retrieval of words, spelling, conventions
- Language - fluency, expression
- Higher-order cognition - analysis, elaboration, sense of audience and purpose
- Graphomotor - handwriting, legibility

Four major writing disorders have been identified:

- Phonological Dysgraphia - over-reliance on visual sight vocabulary, poor spelling
- Surface Dysgraphia - over-reliance on phonetic cues, poor sight vocabulary
- Mixed Dysgraphia - impairments with both visual and auditory cues
- Semantic-Syntactic Dysgraphia - difficulty with rules of grammar, strengths in oral rather than written communication (Baker and Hubbard).

Students with dysgraphia are capable of being good writers through the use of appropriate support. All students, especially those with dysgraphia, benefit from the following suggestions for parents, professors, and tutors:

- Provide a safe, positive emotional environment for writing;
- Create authentic writing assignments which address topics about which the student is familiar or knowledgeable;
- Give choices in assignments;
- Give explicit instructions in the writing process (i.e. pre-writing, graphic organizers, think sheets);
- Give explicit instructions in specific writing genres;
- Promote writing in drafts and provide guided feedback.

Adapted from: Bruning & Horn (2000) and Feifer (2006).

Technological accommodations such as computers and spell checkers help deal with any of the issues related to legibility and conformity to conventions. For those with writer's block, simply talking through ideas and organizing with a trusted friend often brings clarity to the writing task.

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