

Students with Sensory Integration Dysfunctions:

Issues for School Counselors

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### Abstract

A substantial number of school age children suffer from difficulties in integrating sensory input in an adaptive manner (termed sensory integration dysfunction - SID). These students are at high risk for emotional, social, and educational problems. This article defines SID, describes typical behaviors of children with SID, and presents guidelines for school counselors in their intervention concerning students with SID.

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The involvement of the school counselor in fostering students' academic development and well-being requires knowledge and awareness of special needs and disabilities. When the reason, function or purpose of the student's behavior is understood, it can be treated more effectively (Nelson & Williamson, 2004). Thus, recognition of the sensory-processing component of different problems observed in school can contribute an important element to helping students improve academically, become more competent, and achieve greater satisfaction in life.

Sensory integration dysfunction (SID) is a difficulty in modulating, discriminating, coordinating, or organizing sensation in an adaptive manner (Lane, Miller, & Hanft, 2000). Research clearly identifies this dysfunction in up to 70% of children with learning disorders, disorders on the autistic spectrum, Tourette Syndrome, cerebral palsy, premature birth, and brain injury (Dunn, Saiter, & Rinner, 2002; Talay-Ongan & Wood, 2000). Yet this neurological dysfunction is not confined to children with diagnosed developmental disorders. It may occur in students of all age groups, intellectual levels, and socioeconomic backgrounds, and it can affect learning, behavior, and well-being (Ayers, 1972; Fisher, Murray & Bundy, 1991; Parham, 1998).

In her book *The Out of Sync Child* (1998), Carol Stock Kranowitz discusses "look-alike" conditions that share symptoms with SID (pp. 17–20). She suggests that before jumping to conclusions and "leaping to drug therapy," parents and professionals should try to better understand what underlies the maladaptive behavior. Unfortunately,

too many children with SID are misdiagnosed and thus not properly treated, making them prone to more severe social and emotional difficulties.

Undiagnosed students with SID are puzzling to parents and educators. Often, an emotional impairment such as anxiety, depression, aggression, an inability to make friends, or poor self-concept, is secondary to their sensory disorder. Those children are often labeled as uncooperative, belligerent, disruptive, or out of control. Parents and teachers who are not aware of this “secret difficulty” may be blamed or blame each other for their inability to set limits. Unfortunately, they can all be dragged into a vicious circle of frustration in which the child is blamed for something s/he can not control and the parents and teachers feel incompetent due to their inability to help him/her. Thus, although children with SID suffer from “relatively minor” problems, they are definitely at high risk (Cermak & Groza, 1998).

Many schools do not employ a full time occupational therapist, traditionally the person to identify and treat SID. As counselors are challenged to broaden their perspective on their contribution to the students’ academic development and their involvement in this development, and are encouraged to increase their centrality in the overall educational enterprise (Bracken, 1999; Eckert, 2005; Roels, 1998), it is natural for them to take part in identifying and treating SID. Moreover, it is necessary for school counselors to be aware of the kind of environment that would foster learning for students whose sensory functioning is impaired, to be able to identify such an environment, and to know how to construct one.

The purpose of this paper is to foster awareness of sensory disorders among school counselors and to offer general guidelines to be applied in educational settings.

### *What Is Sensory Integration?*

Sensory integration (SI) is an innate neurobiological process in which the brain integrates and interprets sensory stimuli in the environment. Sensations derived from hearing, vision, taste, smell, touch, pressure, and movement provide input to the brain. The brain sorts and organizes the many sensations we receive and makes its interpretations of stimuli available to us for use in movement, cognition, and learning. Thus, SI provides a crucial foundation for more complex learning and behavior.

A general theory and treatment of sensory integration has been developed by Jean Ayres (see Ayres, 1972). As an occupational therapist, Ayres was interested in how sensory-processing and motor-planning disorders interfere with daily functioning and learning (Fisher et al., 1991). Ayer's (1972) theory elucidated why individuals respond in a certain way to sensory input and how this input affects behavior. Her theory and intervention strategies are based on research literature from the fields of neuropsychology, neurology, physiology, child development, and psychology.

Usually people tend to think in terms of five main senses: touch/tactile, sound/auditory, sight/visual, taste/gustatory, and smell/olfactory. Sensory integration theory focuses on the importance of the integration of information by means of the “near senses”: The tactile sense (the sense felt on the surface of our entire body – the skin), the vestibular sense (position and movement – provides information about where the head and body are in space and in relation to the earth’s surface), and the proprioceptive sense (muscles and joints – provides information about where the parts of the body are and what they are doing).

### *What Is Sensory Integration Dysfunction?*

SID is a difficulty in modulating, discriminating, coordinating, or organizing sensation in an adaptive manner (Lane et al., 2000). People with SID misinterpret stimuli around them and therefore overreact or under react to them. This over- or under reactivity may affect only one sense or several senses. A child may be oversensitive to one type of sensory input and undersensitive to another type. Most “normal” people have an average ability to integrate sensory input. Those with a high ability may be excellent in gymnastics, dancing, basketball or other sports. Those whose sensory functioning is impaired might suffer from various cognitive, social, and behavioral problems. SID is not a dysfunction of the actual sense organs; rather, the problem is believed to be in the way the brain processes the information (Ayres, 1972).

Children with an over- or under-sensitive auditory system are easily noticed in classrooms; either they cover their ears and pull away from most noises, or they require a high volume of sound to stimulate their auditory system. It is also easy to notice children with an oversensitive visual sense, who cover their eyes and cannot tolerate bright or flashing lights, or children with oversensitive taste or smell senses who cannot tolerate strong flavors or smells and avoid any environment that provides this stimulation (such as the cafeteria, art room, school restrooms, etc.).

Parents and educators are less familiar with the signs of disorders in integration of the tactile, proprioceptive, and vestibular senses. The integration and interpretation of sensations derived from these three senses are critical to our survival, as integration of the sensory input allows us to experience, interpret, and respond to different stimuli in our environment. These sensory systems interact with other systems in the brain, and

thus dysfunction or disabilities in one or more of them may result in learning, emotional, and behavioral difficulties (Ayres, 1972; Fisher et al., 1991).

### *Typical Behaviors of Children with Sensory Integration Dysfunctions*

School counselors often see students with various behaviors that might indicate SID. Yet these behaviors are frequently misinterpreted and misdiagnosed as emotional or behavioral difficulties. These children might have SIDs that are reflected in over- or under-reactiveness of one or more senses, and are expressed in their behavior.

The over- or under-reactiveness of each of the senses described by Ayres is manifested in typical behaviors that can indicate the existence of the problem. Children with an over-reactive *tactile sense* (tactile defensiveness) tend to avoid physical contact with other people. They dislike being touched, even in a friendly way. They also cannot tolerate the sensation of certain fabrics or materials on their bodies. Thus they often have difficulty wearing certain fabrics. Labels on clothing may annoy them, they prefer seamless socks, and they dislike pants with buttons. Cutting their hair or fingernails might be painful to them. They may avoid any physical contact with others or situations in which other people are near them, even without touching. They will avoid group games, and even standing in line for lunch may be stressful for them. They often wear loose clothing and prefer long-sleeved shirts even on a warm day, so as to avoid contact with the environment. Children with tactile defensiveness often misinterpret social interactions. A friendly or coincidental touch might be interpreted as violent and might produce an aggressive reaction. Thus, children with tactile defensiveness may find social interactions very distressing.

Children with an under-reactive tactile sense will constantly seek physical interaction with people and materials. They tend to disregard the need for “personal space” and are often accused of violence, as their craving for touch is misinterpreted. Because they are not very sensitive to pain and touch, they might not react when they fall or injure themselves and are liable to touch others in a painful way and not understand why they are regarded as violent.

Dysfunctions in the integration of the *vestibular sense* are also manifested in behaviors that may be interpreted as emotional or social impairment. Children with an over-reactive vestibular system display excessive emotional reactions to vestibular sensations even when there is no real danger. This misinterpretation comes from a “mistake” in the vestibular processing in the brain. These children become stressed when their feet leave the ground and avoid any situation that might cause this to happen. This fear arises even at low heights (when they have to climb on a chair) or, in more severe cases, when climbing stairs. Such children do not enjoy playgrounds, and physical-education classes and field trips are a nightmare, since they can’t tolerate even walking on bumpy ground, not to mention climbing a ladder or vaulting over the horse. Because their basic trust in their ability to move in the environment is impaired, children with an over-reactive vestibular sense usually prefer to sit in one place. This inclination distances them from the company of other children from a very early age, as they dislike the activities other children cherish.

Children with an under-reactive vestibular system act differently: They do not process enough vestibular sensations, and therefore functions like hand-eye coordination, muscles tonus, bilateral integration, and coordination, which develop

through sensory input from the vestibular system, are impaired. Thus an under-reactive vestibular system is reflected in clumsiness and difficulty in producing defensive reactions; this results in balance problems and frequent stumbles and falls. These children may seem lazy or bored, and usually suffer from low self-esteem. Because their vestibular system is under-reactive, some of them do not perceive “warning signs” from the environment and therefore might do dangerous things like walking on the edge of a roof, without being aware of the true danger.

SID in the proprioceptive system refers to a misinterpretation of information received from muscles, joints, and tendons that usually provides us with a subconscious awareness of our body position. When proprioception is functioning effectively, one’s body position is automatically adjusted to different situations. But when this system functions poorly, the brain doesn’t get the proper information from the body, and the body reacts slowly and clumsily to the continuous, rapid changes in the environment. Children with SIDs in the proprioceptive system will probably be clumsy, prone to fall, and less aware than normal of the position of their bodies in space. Their body posturing will be odd and they will probably resist new activities that involve motor planning (praxis). They will bump into people and objects and will constantly drop things and fall. These children are likely to be the victims of frequent taunts and abuse, or they might act as “class clowns,” trying to avoid being made fun of by their peers.

Table 1 presents a summary of some typical behaviors and appearance of children with SID.

**Table 1**

***Signs of Sensory Integration Dysfunctions\* in Younger and Older Students in the School Environment\*\****

Dysfunction	Typical behaviors at home and at school
Over-reactive tactile sense	<p>Overreact to physically painful experiences; respond to being touched with aggression or withdrawal; misinterpret physical contact and might complain frequently about physical violence toward them</p> <p>Tend to avoid crowds or group activities, thus would appear isolated</p> <p>React negatively to having hair or nails cut, therefore avoid it and might appear physically neglected</p> <p>Very picky about clothing, very annoyed by labels, and prefer loose clothing, long sleeves, and long pants, even in warm weather; therefore might stand out in their appearance</p> <p>Avoid activities involving mess (e.g., play dough, clay, mud, finger paints, cooking); therefore have difficulty in art classes and on field trips</p> <p>Irritable in closed places; might feel uncomfortable even in the classroom</p>
Under-reactive tactile sense	<p>Do not understand personal space, therefore do not respect it and might seem rude or aggressive</p> <p>Tend to bump or push others, or touch them too often or too hard (which may seem like aggressive behavior)</p> <p>Unaware of touch or pain, seek out intense sensory experiences, bump into objects, may frequently fall on purpose</p>

Dysfunction	Typical behaviors at home and at school
Over-reactive vestibular sense	<p>Abnormal fear of movement and heights; avoid any movement that requires walking on even a slightly raised surface</p> <p>Have difficulty climbing or descending stairs or hills (may hold the banister when walking up stairs); therefore may prefer to stay in the classroom during recess</p> <p>Tend to get sick from exposure to movement or heights (car, train, or elevator)</p> <p>Very cautious and unwilling to take risks or try new things</p> <p>Do not like to be moved by others, particularly if the movement is unexpected</p> <p>Dislike trying new movement activities</p>
Under-reactive vestibular sense	<p>Seek movement experiences (bounce on furniture, rock on chairs, constantly spin in swivel chairs)</p> <p>Enjoy being upside-down</p> <p>Hyperactive (seek more sensation)</p> <p>Unsafe activities, such as climbing too high (enjoy spinning, swinging high, or going extremely fast on a merry-go-round)</p> <p>Not very good at sports and clumsy</p> <p>Stumble and fall more frequently than others their age and make fewer attempts to catch themselves</p>
Disordered proprioceptive integration	<p>Poor organization of behavior: This might affect how they approach motor or academic tasks and may have emotional manifestations. These children may be impulsive or distractible. They may have low tolerance for frustration when learning a new task.</p> <p>Poor self-esteem: Although usually bright, they seem lazy and unmotivated.</p>

\* Based on Ayres (1972); Kimball (1999); and Dunn (1999).

\*\* Only when there is a meaningful cluster of the behaviors described here is the possibility of a problem with SI considered.

### Guidelines for School Counselors

Evaluation, diagnosis, and treatment of SID dysfunctions are usually performed by a professional occupational therapist. Nevertheless, the school counselor can be a key person in the identification and treatment of SID. School counselors have a central role in identifying students with special needs and referring them for special assistance (Bracken, 1999; Eckert, 2005; Tolbert, 1982), thus, they must be aware of the symptoms of SID. Recognition of SID and awareness of how it affects life are first steps in dealing with such problems.

The basic guidelines for the school counselor's involvement in SID are no different from the guidelines regarding other comprehensive developmental or behavioral disorders. All the traditional methods and practices of school counselors can be applied to their work with SID: interpreting and providing information about students' developmental needs through individual and group counseling; advising students' families; facilitating students' personal growth; enhancing parent-child relations by exchanging information with the parents; and supporting services to teachers, residential staff, and community resource personnel. The consultation and collaboration with parents, teachers, school administrators, medical professionals, and social workers is aimed at developing and implementing strategies to help students succeed with SID and other development or behavioral disorders in school.

The school counselor's role can be divided into pre- and post-diagnosis stages.

*The School Counselors' Role Prior to the Diagnosis of SID*

School counselors stand at an information crossroads. Thus they play an important role in gathering relevant information from parents, teachers, SID students, and the students' peers. This information might be useful first in the diagnostic process, since the occupational therapist needs information about the child's adaptation at home and school, and then in adapting the learning environment to the child's special needs. School counselors who are aware of the symptoms of SID and consider it a possible cause of maladaptive behavior can search for more information to reinforce or refute their suspicions. Observations and interviews can be the first step, as they help the school counselor gather information about the child's performance in daily life tasks at school and/or at home.

In the pre-diagnosis stage, a school counselor can interview various people in school and at home and obtain information about the typical behavior of the child. When SID is suspected, the school counselor can ask for a consultation meeting to assess the child's sensory functioning as perceived by parents and teachers. S/he can interview teachers and parents/caregivers, asking questions from standardized checklists such as the Dunn Sensory Profile (Dunn, 1999) or from non-standardized checklists (Ayres, 1972). Dunn's standardized checklist, for example, provides a list of behaviors typical of the various sensory dysfunctions found in younger and older children. School counselors can assess the frequency of these behaviors and dismiss or confirm suspicions regarding children's sensory behavior. In these interviews, school counselors identify specific behavioral or learning problems that might corroborate or dispel their

suspicions of SID. It is very important to collect information from physical education and art teachers. Students' behavior in these classes can provide crucial information. For example, one of the most common symptoms of tactile hypersensitivity is avoidance of various textures and materials (e.g., glue, fabric, feathers, finger paints) and an emotional reaction to touching such things. Since art classes often use these types of materials, information from the art teacher might be important. Moreover, any type of vestibular and/or proprioceptive dysfunction may show up in physical education classes (e.g., avoiding climbing, avoiding group games, etc).

In his/her observations, the school counselor should observe the student in various settings in order to get as good a sense as possible of his/her strengths and difficulties. The child's behavior should be observed especially during recess, at lunchtime, and in class. For these observations the practitioner can again use standardized and non-standardized checklists, which list a variety of typical behaviors common to SID in the school and home environments.

When the school counselor has enough information to suspect SID, a professional evaluation should be conducted by a qualified-certified occupational therapist. The evaluation usually consists of standardized testing and structured observations of responses to sensory stimuli, posture, balance, coordination, and eye movements. The test results are carefully analyzed, together with other assessment data and information from other professionals and the parents. At this point the information previously collected by the school counselor is crucial, as it might help clarify or confirm the diagnosis.

*The School Counselor's Role After the Diagnosis of SID*

1. To coordinate the various functions involved in treatment and, primarily, to be the contact person between the occupational therapist, parents, and school.
2. To meet with parents and teachers to give them a better understanding of SID and to discuss the child's adaptation at home and in class.
3. To conduct various interventions aimed at adjusting the human and non-human environment at school to better meet the child's special needs.

The school counselor can use his/her professional knowledge for educating, advising, and consulting with the occupational therapist, parents, teachers, the child, and the child's peers. However, all actions by the school counselor must be completely coordinated with an occupational therapist, as the occupational therapist is the person with the professional knowledge about the child's sensory strengths and weaknesses and about the strategies to be used to overcome them. If there is no in-school occupational therapist and the child is being treated in a private clinic (as is the case especially with students in middle and high schools), the school counselor's involvement with the child with SID is greater and is essential for the success of the process and for the child's optimal adaptation.

SID involves a tremendous amount of stress for the child and his/her environment. Intervention starts when teachers, parents, and peers are taught about SID, so that they can understand the child's behavior and develop strategies that can help with adaptation or compensate for the dysfunction. Parents, teachers, and peers often use a negative "frame" to explain the child's maladaptive behavior (e.g., describing the child as lazy, unfriendly, impatient, undisciplined, immature, careless,

etc.). This frame can determine their reaction to the behavior and the strategies they use to educate, respond to, and teach the child. Bundy (1991) suggests reframing the behavior. In this process, parents, teachers, and peers come to understand the child's behavior differently. The school counselor can be involved in the reframing process by providing information about SID and the child's specific difficulties and strengths.

Awareness of the reason for the maladaptive behavior might reduce tension for everyone involved. Knowledge of the reasons for the behavior can alleviate parents' guilt and enable them to feel more secure about their parenting abilities. Teachers who know more about SID can better understand maladaptive behavior in school and develop strategies to prevent the child from being inundated with intolerable sensations. These changes in acceptance by the environment will improve the child's well-being, as children tend to feel less stressed when the environment is accepting and comforting.

As with other developmental disabilities, information provided to classmates can be important and can make a real change in the way the child is accepted in the class. The school counselor must plan this intervention carefully, however, because young children can misunderstand and misuse information.

Each child's sensory needs are unique, and anticipating these needs is a key aspect of helping them overcome their difficulties. The school counselor can be involved in anticipating needs and modifying the environment so that the child can better adapt to the situation. The school counselor can be involved in implementing an environment-based approach in the classroom for children with over-reactive tactile systems (Sears, 1981; Wilbarger & Wilbarger, 1991). In this approach, teachers are given practical suggestions for modifying the environment so that it will not overwhelm the

oversensitive child (e.g., approaching the child from the front, letting the child stand at the end of lines so that s/he is less likely to be accidentally touched by other children, placing the child's desk near the periphery of the room so that s/he can see who is moving and where). A school counselor can also be involved in implementing a "sensory diet" – a carefully planned program of specific sensory activities scheduled according to each child's individual needs (Kimball, 1999). This strategy is based on the notion that controlled sensory input can affect one's functional abilities. The school counselor can help with implementation of the sensory diet in all aspects of the child's day, particularly those involving the school and home environments.

The school counselor can be involved in conducting personal and group interventions to help children understand what levels of alertness are appropriate to various situations and regulate their own behavior. One such program is "How Does Your Engine Run?" (Williams & Shellenberger, 1994). This is a method that teaches children simple changes to their daily routine that will help them self-regulate their senses. Through the use of charts, worksheets, and activities, children are guided in improving their awareness and using self-regulation strategies.

The symptoms of the various sensory dysfunctions are most prominent in elementary-school students but, of course, exist and have cognitive and emotional implications in middle- and high-school as well. Thus, the role and objectives of the school counselor might be different in the different grades. The elementary-school counselor will concentrate on evaluating students, referring them to a professional occupational therapist, helping them express their cognitive potential, and helping their home and school environment adjust to their abilities and difficulties. A high-school

school counselor would emphasize the students' self-esteem and the effect of SID on their career decisions, social relationships, and general well-being.

### Summary

A substantial number of school-age children suffer from SID, which leads to non-adaptive behaviors. In this paper it is suggested that school counselors can apply their professional knowledge in playing a critical role in the diagnosis and treatment of children with SID. In addition, a description of the common symptoms of SID and basic guidelines for intervention were given in order to foster the awareness of educational practitioners to SID.

Further research is needed regarding the effectiveness of various types of intervention applied by school counselors in cases of SID. It is also suggested that SID be included in the curriculum of the developmental courses in the various programs for school counselors.

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