Autism

Sensory Integration and Praxis Patterns in Children With Autism

Susanne Smith Roley; Zoe Mailloux; L. Diane Parham; Roseann C. Schaaf; Christianne Joy Lane; Sharon Cemak

American Journal of Occupational Therapy, January/February 2015 Vol: 69, Issue 1

Abstract

OBJECTIVE. We sought to characterize sensory integration (SI) and praxis patterns of children with autism spectrum disorder (ASD) and discern whether these patterns relate to social participation.

METHOD. We extracted Sensory Integration and Praxis Tests (SIPT) and Sensory Processing Measure (SPM) scores from clinical records of children with ASD ages 4–11 yr (N = 89) and used SIPT and SPM standard scores to describe SI and praxis patterns. Correlation coefficients were generated to discern relationships among SI and praxis scores and these scores’ associations with SPM Social Participation scores.

RESULTS. Children with ASD showed relative strengths in visual praxis. Marked difficulties were evident in imitation praxis, vestibular bilateral integration, somatosensory perception, and sensory reactivity. SPM Social Participation scores were inversely associated with areas of deficit on SIPT measures.

CONCLUSION. Children with ASD characteristically display strengths in visuopraxis and difficulties with somatopraxis and vestibular functions, which appear to greatly affect participation.

Sleep problems in children with autism spectrum disorder: examining the contributions of sensory over-responsivity and anxiety

Micah O. Mazureka, Gregory Petroski

Sleep Medicine, http://dx.doi.org/10.1016/j.sleep.2014.11.006

Abstract

Objectives

Children with autism spectrum disorder (ASD) are at high risk for sleep problems. Previous research suggests that sensory problems and anxiety may be related to the development and maintenance of sleep problems in children with ASD. However, the relations among these co-occurring conditions have not been previously studied. The current study examined the interrelations of these symptoms in a large well-characterized sample of children and adolescents with ASD.
Methods

The current study examined the relations among sleep problems, sensory over-responsivity, and anxiety in 1347 children enrolled in the Autism Speaks Autism Treatment Network. Primary measures included the Children’s Sleep Habits Questionnaire, Child Behavior Checklist, and Short Sensory Profile.

Results

In bivariate correlations and multivariate path analyses, anxiety was associated with all types of sleep problems (i.e., bedtime resistance, sleep onset delay, sleep duration, sleep anxiety, and night wakeings; p<.01 to p<.001; small to medium effect sizes). Sensory over-responsivity (SOR) was correlated with all sleep problems in bivariate analyses (p<.01 to p<.001; small effect sizes). In multivariate path models, SOR remained significantly associated with all sleep problems except night awakenings for older children, while for younger children SOR was no longer significantly associated with bedtime resistance or sleep anxiety.

Conclusions

Children with ASD who have anxiety and SOR may be particularly predisposed to sleep problems. These findings suggest that some children with ASD and sleep disturbance may have difficulties with hyperarousal. Future research using physiological measures of arousal and objective measures of sleep are needed.

The role of physiological arousal in the management of challenging behaviours in individuals with autistic spectrum disorders

Andrew McDonnella, Michael McCreadieb, Richard Millsc, Roy Deveauad, Regine nkere, Judy Haydene

Research in Developmental Disabilities Volume 36, January 2015, Pages 311–322

Abstract

Challenging behaviours restrict opportunities and choices for people with autistic spectrum disorders (ASD) and frequently lead to inappropriate and costly service interventions. Managing challenging behaviours of people with autism is an important area of research. This paper examines some of the evidence for the role of physiological arousal influencing these behaviours. Evidence from the emerging literature about sensory differences is examined. It is proposed that sensory reactivity is associated with hyperarousal; catatonic type behaviours are associated with low levels of reactivity (hypoarousal). A low arousal approach is proposed as a generalised strategy to managing challenging behaviours with ASD. The use of non-contingent reinforcement and antecedent control strategies are recommended for use with challenging behaviours which have a sensory component. Examples are provided to illustrate the approach. The implications of arousal and the use of physical interventions are discussed. It is proposed that arousal is a construct which has significant heuristic value for researchers and practitioners.
Hyper-responsiveness to touch mediates social dysfunction in adults with autism spectrum disorders

Lars-Olov Lundqvist

Research in Autism Spectrum Disorders Volume 9, January 2015, Pages 13–20

Abstract

This study investigated whether hyper-responsiveness to touch serves as a mediating variable that predicts social dysfunction in adults with autism spectrum disorders (ASD). Data were obtained from all adults with administratively defined intellectual disability in a region in Sweden (n = 915, where 143 had ASD). A multiple mediation modeling analysis revealed a well-fitted model (Satorra–Bentler scaled chi-square = 10.91, df = 7, p = 0.14, CFI = 0.99, RMSEA = 0.025), demonstrating that social dysfunction among adults with ASD was completely mediated by hyper-responsiveness to touch followed by impairment of speech and aggressive/destructive behavior. The results demonstrated that in adulthood, the tactile sensory system is foundational for social functioning in people with ASD, with diagnosis and intervention implications.

Autism, oxytocin and interoception

E. Quattrocki, Karl Friston

Neuroscience and Biobehavioral Reviews 47 (2014) 410–43

Abstract

Autism is a pervasive developmental disorder characterized by profound social and verbal communication deficits, stereotypical motor behaviors, restricted interests, and cognitive abnormalities. Autism affects approximately 1% of children in developing countries. Given this prevalence, identifying risk factors and therapeutic interventions are pressing objectives—objectives that rest on neurobiologically grounded and psychologically informed theories about the underlying pathophysiology. In this article, we review the evidence that autism could result from a dysfunctional oxytocin system early in life. As a mediator of successful procreation, not only in the reproductive system, but also in the brain, oxytocin plays a crucial role in sculpting socio-sexual behavior. Formulated within a (Bayesian) predictive coding framework, we propose that oxytocin encodes the saliency or precision of interoceptive signals and enables the neuronal plasticity necessary for acquiring a generative model of the emotional and social ‘self.’ An aberrant oxytocin system in infancy could therefore help explain the marked deficits in language and social communication – as well as the sensory, autonomic, motor, behavioral, and cognitive abnormalities – seen in autism.

The Interplay Between Sensory Processing Abnormalities, Intolerance of Uncertainty, Anxiety and Restricted and Repetitive Behaviours in Autism Spectrum Disorder
Abstract

Sensory processing abnormalities, anxiety and restricted and repetitive behaviours (RRBs) frequently co-occur in Autism Spectrum Disorders (ASD). Though the relationship between these phenomena is not well understood, emerging evidence indicates intolerance of uncertainty (IU) may play an important role. This study aimed to determine pathways between sensory abnormalities and RRBs, and the role anxiety and IU may have. We gathered caregiver report data for 53 children with ASD aged 8–16 years. We found sensory under responsiveness and sensory over responsiveness were significantly associated with repetitive motor and insistence on sameness behaviours, and the relationships significantly mediated by IU and anxiety. Our findings indicate different mechanisms may underpin repetitive motor and insistence on sameness RRBs, which can inform treatment interventions.

Classification of Children With Autism Spectrum Disorder by Sensory Subtype: A Case for Sensory-Based Phenotypes


Abstract

This study examines whether sensory differences can be used to classify meaningful subgroups of children with autism spectrum disorder (ASD). Caregivers of children with ASD aged 2–10 years (n = 228) completed the Short Sensory Profile. Model-based cluster analysis was used to extract sensory subtypes. The relationship of these subtypes to age, gender, autism symptom severity, and nonverbal intelligence quotient (IQ) was further explored. Four distinct sensory subtypes were identified: (a) sensory adaptive; (b) taste smell sensitive; (c) postural inattentive; and (d) generalized sensory difference. The sensory subtypes differ from each other on two dimensions: (a) the severity of reported sensory differences; and (b) the focus of differences across auditory, taste, smell, vestibular and proprioceptive domains. Examination of the clinical features of each subtype reveals two possible mechanisms of sensory disturbance in autism: (a) sensory hyperreactivity; and (b) difficulties with multisensory processing. Further, the sensory subtypes are not well explained by other variables such as age, gender, IQ, and autism symptom severity. We conclude that classification of children using sensory differences offers a promising method by which to identify phenotypes in ASD. Sensory-based phenotypes may be useful in identifying behavioral features responsive to specific interventions thereby improving intervention effectiveness. Further validation of the sensory-based phenotypes by establishing neural and physiological correlates is recommended.
The effectiveness of auditory stimulation in children with autism spectrum disorders: A case–control study

Gee B, Thompson K, Pierce A, Toupin M, Holst J

*International Journal of Therapy and Rehabilitation* 2015 22:1, 36-46

Abstract

**Background/Aim:**

The Listening Program (TLP) is a sound-based intervention that claims to treat the behavioural challenges of children diagnosed on the autism spectrum with sensory processing difficulties. There is a paucity of peer-reviewed evidence supporting its use. The purpose of this study was to determine whether TLP reduces sensory over-responsitivity (SOR) to auditory stimuli.

**Methods:**

Data were collected over a 28-week period using an ABAB multiple events case–control design of testing and treatment intervals to capture the responses of three participants to TLP.

**Results:**

Graphs from repeated measures data were drawn to analyse the direction and level of trend lines. There was a high variability of responses, with participants responding positively and others negatively at different stages of the study.

**Conclusions:**

The results lend some support to the use of TLP with children on the autism spectrum who are experiencing auditory SOR.

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**Neuroscience**

*White matter correlates of sensory processing in autism spectrum disorders*
Abstract

Autism spectrum disorder (ASD) has been characterized by atypical socio-communicative behavior, sensorimotor impairment and abnormal neurodevelopmental trajectories. DTI has been used to determine the presence and nature of abnormality in white matter integrity that may contribute to the behavioral phenomena that characterize ASD. Although atypical patterns of sensory responding in ASD are well documented in the behavioral literature, much less is known about the neural networks associated with aberrant sensory processing. To address the roles of basic sensory, sensory association and early attentional processes in sensory responsiveness in ASD, our investigation focused on five white matter fiber tracts known to be involved in these various stages of sensory processing: superior corona radiata, centrum semiovale, inferior longitudinal fasciculus, posterior limb of the internal capsule, and splenium. We acquired high angular resolution diffusion images from 32 children with ASD and 26 typically developing children between the ages of 5 and 8. We also administered sensory assessments to examine brain-behavior relationships between white matter integrity and sensory variables. Our findings suggest a modulatory role of the inferior longitudinal fasciculus and splenium in atypical sensorimotor and early attentional processes in ASD. Increased tactile defensiveness was found to be related to reduced fractional anisotropy in the inferior longitudinal fasciculus, which may reflect an aberrant connection between limbic structures in the temporal lobe and the inferior parietal cortex. Our findings also corroborate the modulatory role of the splenium in attentional orienting, but suggest the possibility of a more diffuse or separable network for social orienting in ASD. Future investigation should consider the use of whole brain analyses for a more robust assessment of white matter microstructure.

SI & Diverse Populations

Is the relationship between sensory-processing sensitivity and negative affect mediated by emotional regulation?

Australian Journal of Psychology published online: 5 JAN 2015 DOI: 10.1111/ajpy.12084

Kimberley Brindle, Richard Moulding, Kaitlyn Bakker & Maja Nedeljkovic

Abstract

Sensory-processing sensitivity (SPS) refers to a trait-like difference in the extent to which individuals strongly and deeply process a variety of stimuli in the environment. While being highly sensitive has been linked to increased experiences of distress, the reasons for this are not well known. One potential mediator of this effect is emotional regulation—the set of processes influencing which emotions we have, when we have them, and how we experience and express them. In this study, n = 157 participants (n = 118 females) completed online questionnaires assessing negative affect, SPS, along with two multidimensional emotional regulation measures. The results indicated that an individual's
lack of access to emotional regulation strategies, greater awareness of emotion, and their lack of acceptance towards feeling distressed, acted as partial mediators between SPS and symptoms of depression. Combinations of these variables also partially mediated the relationship between SPS and symptoms of anxiety and stress. It is suggested that repeatedly experiencing aversive sensory states among those with increased SPS impacts on their general awareness and acceptance of internal states and the confidence that one can regulate them. This in turn leads to the experience of negative affective states. Limitations of the present study and implications for therapeutic interventions are discussed.

**Balance function and sensory integration after mild traumatic brain injury**

Li-Fong Lin, Tsan-Hon Liou, Chaur-Jong Hu, Hon-Ping Ma, Ju-Chi Ou, Yung-Hsiao Chiang, Wen-Ta Chiu, Shin-Han Tsai, Woei-Chyn Chu

*Brain Injury* 0:0, 1-6

**Abstract**

**Objective:** This study examined the disparities in balance functions and sensory integration in patients with mild traumatic brain injuries (mTBIs) and healthy controls.

**Participants:** One hundred and seven patients with mTBI and 107 age- and sex-matched controls were recruited for this study.

**Primary measures:** Symptoms of dizziness, balance functions and the ability to perform daily activities were assessed using the dizziness handicap inventory (DHI). This study also performed the postural-stability test and a modified clinical test of sensory integration by using the Biodex Stability System (BBS).

**Results:** DHI scores (functional, emotional, physical and total self-reported scores) were substantially increased in patients following an mTBI compared with the scores of the controls (p < 0.000). The postural-stability test indices (anterior-posterior) (p = 0.045) and the sensory-integration test index (eyes-open-firm-surface index) (p = 0.006) were substantially lower in patients with mTBI than in the controls. However, indices of two other postural-stability test indices (overall and medial-lateral) and three other sensory-integration tests indices (eyes-closed-firm-surface, eyes-open-foam-surface and eyes-closed-foam-surface) measured for the mTBI group did not differ from those of the control group.

**Stereotyped and self-injurious behavior in children with developmental disorders**

Chukhutova G.L.
Abstract

Stereotyped behavior is defined as rhythmically repeated movements constant in shape and amplitude. They are natural at certain levels of neuromuscular maturation in early age, yet in case of some developmental disorders they attain pathological forms, last significantly longer and hamper everyday adaptation including self-injurious behavior. Stereotypies are observed in case of various impairments like autism, mental retardation, blindness, deafness and in children in orphanage. The general point for all these impairments is the presence of some kind of deprivation: sensory or social. It is suggested that children with autism and mental retardation experience difficulties with development and coordination of visual, auditory and tactile-kinesthetic signals, and that is why they are exposed to a kind of deprivation similar to that of blind and deaf children. Pathogenesis of stereotyped behavior is often regarded as provoked by abnormal functioning of dopamine-ergic and GABA-ergic neurons of the system: frontal cortex-thalamus-cerebellum, whose development takes several years of life and is extremely sensitive to impoverished environment.

Motor development and sensory processing: A comparative study between preterm and term infants

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Research in Developmental Disabilities, Volume 36, January 2015, Pages 102–107

Abstract

Infants born preterm and/or with low birth weight may present a clinical condition of organic instability and usually face a long period of hospitalization in the Neonatal Intensive Care Units, being exposed to biopsychosocial risk factors to their development due to decreased spontaneous movement and excessive sensory stimuli. This study assumes that there are relationships between the integration of sensory information of preterm infants, motor development and their subsequent effects.

Objective

To evaluate the sensory processing and motor development in preterm infants aged 4–6 months and compare performance data with their peers born at term.

Method

This was a cross-sectional and comparative study consisting of a group of preterm infants (n = 15) and a group of term infants (n = 15), assessed using the Test of Sensory Functions in Infants (TSFI) and the Alberta Infant Motor Scale (AIMS).

Results
The results showed no significant association between motor performance on the AIMS scale (total score) and sensory processing in the TSFI (total score). However, all infants who scored abnormal in the total TSFI score, subdomain 1, and subdomain 5 presented motor performance at or below the 5th percentile on the AIMS scale.

Conclusion
Since all infants who presented definite alteration in tolerating tactile deep pressure and poor postural control are at risk of delayed gross motor development, there may be peculiarities not detected by the tests used that seem to establish some relationship between sensory processing and motor development.

Dyslexia and the Integration of Sensory Cues into Motor Action

*Psychology*, 2014, 5, 1870-1878

José A. Barela1,2, Paulo Barbosa de Freitas1, André Rocha Viana3, Milena Razuk1

Abstract
Besides difficulties in mastering literacy, dyslexic children also show poor postural control that might be related to how sensory cues coming from different sensory channels are integrated and trigger proper motor activity. The purpose of this study was to review the body of literature about the functioning of the postural control system in dyslexic children and understand how they use sensory information to produce motor actions. It has been demonstrated that dyslexic children sway more than non-dyslexic ones. Studies have shown that although manipulation of vision and somatosensory information provided by a moving room and a moving touch bar, respectively, induced correspondent body sway in dyslexic children, their postural responses to such manipulations were less coherent as compared to non-dyslexic children. When dyslexic children applied higher force on the moving bar, however, coherence between body sway and sensory manipulations was similar for dyslexic and non-dyslexic children. Finally, in the absence of peripheral visual cues, induced body sway in dyslexic children was temporally delayed regarding visual stimulus.

Taken together, these results indicate that poor postural control in dyslexic children is related to impairments in the manner sensory information is acquired and used to produce postural responses. The need of dyslexic children to apply more force on the touch bar to improve coherence between sensory stimulus and body sway, together with the fact that in conditions in which visual cues were less informative, dyslexic children took longer to process sensory stimuli and produce motor responses, suggest that dyslexic children are more dependent on the quality of sensory cues.

Comparing the executive attention of adult females with ADHD to that of females with sensory modulation disorder (SMD) under aversive and non-aversive auditory conditions
Abstract

Certain behavioral expressions of sensory modulation disorder (SMD) such as distractibility, hyperactivity, and impulsivity are often similar to those of attention deficit/hyperactivity disorder (ADHD) in pediatric and adult populations. There is also a high comorbidity rate between these two diagnoses and absence of research regarding the objective neuropsychological differentiation between them. In the present study we employed a factorial design which enabled us to: (a) systematically examine the effects of SMD and ADHD on executive attention in a sample of adult females using a Stroop-like task, and (b) measure the effect of aversive conditions (sounds) on executive attention. The experimental measures used were the Stroop-like Location – Direction Task (SLDT) to assess executive attention and the battery of aversiveness to sounds (BAS), a standardized measure of aversive sounds that was developed for this study and enabled individual customization of aversive auditory sounds. Results revealed, as expected, a specific core deficit in executive attention for the ADHD factor. In addition to that, the present study provides an important, pioneering finding of SMD impairment in a unique combination of a cognitively demanding task with aversive sounds, providing preliminary objective evidence differentiating SMD from ADHD.

Sensory processing, participation, and recovery in adults with serious mental illnesses.

Pfeiffer, Beth; Brusilovskiy, Eugene; Bauer, Julie; Salzer, Mark S.


Abstract

Objective: People with serious mental illnesses (SMI) have different sensory processing patterns compared to the general population. The purpose of the study was to examine the relationship between different sensory processing patterns and community participation and recovery-oriented outcomes to inform the development of innovative rehabilitation interventions, including those resulting in more accommodating environments. Methods: A quasi-experimental, comparative research design was conducted by using data obtained from 95 adults with SMI who received public mental health services. Participants completed a sensory processing profile and measures of community participation, recovery, and quality of life. Comparisons were made between sensory profile categories for each dependent variable using multivariate analyses of variance. Results: The category with more evidence of self-reported low registration and sensory sensitivity than most reported less participation and lower levels of recovery than did their peers with processing patterns in typical ranges. The category with more self-reported sensory sensitivity than most reported lower quality of life. Finally, the category in the “similar” to “more than most” range on self-reported sensory seeking had higher levels of participation and recovery. Conclusions and Implications for Practice: Assessment of sensory processing patterns in adults with SMI can inform sensory-based interventions that might result in greater community participation and other recovery outcomes. Interventions can include those that seek to enhance person–environment fit by altering the environment, as well as
Neuro-motor deficits in six- to eight-year old learners with ADHD and DAMP

Du Toit, Yolandie, Pienaar, Anita

South African Journal for Research in Sport, Physical Education and Recreation Vol 31 Issue Number Issue 3 Pages 61-74

This study investigated the nature of coordination, visual-motor integration and neurological functioning in children diagnosed with ADHD and whether the likelihood of motor impairment will increase with the presence of co-occurring DCD (DAMP). Ninety-five learners (60 boys; 35 girls) with a mean age of 6.9 years participated in the study. Four groups were compared: An ADHD only group (n=42); a group of typically developing children (n=18); a medicated group (n=14); and a DAMP group (n=21). The MABC-2, QNST-2 and the VMI-4 were used to assess the groups. Descriptive statistics (StatSoft, 2012), two-way frequency tables and an ANOVA were used to analyse the results. ADHD learners using medication had significantly poorer fine motor skills (p<0.05) than those with only ADHD or typical children. ADHD children using medication and DAMP learners displayed comparable fine motor skills and hand control, although both groups had more impaired fine motor skills than those with only ADHD or typical children. Overall coordination and selected sensory and perceptual impairments increased as a function of co-occurring DCD, indicating that motor coordination does account for overall motor coordination and perceptual and sensory deficits seen in ADHD. These results further confirm a link between ADHD and fine motor problems.

Sensory Processing Disorder in Children Ages Birth–3 Years Born Prematurely: A Systematic Review

Anita Witt Mitchell; Elizabeth M. Moore; Emily J. Roberts; Kristen W. Hachtel; Melissa S. Brown

American Journal of Occupational Therapy, December 2014, Vol. 69,

Abstract

This systematic review of multidisciplinary literature synthesizes evidence of the prevalence and patterns of sensory processing disorder (SPD) in children ages birth–3 yr born preterm. Forty-five articles including physiological, behavioral, temperament, and SPD research met the inclusion criteria and provided 295 findings related to SPD—130 (44%) positive (evidence of SPD) and 165 (56%) negative (no evidence of SPD). The majority of findings related to sensory modulation disorder (SMD; 43% positive). The most prevalent subcategory of SMD was sensory overresponsivity (82% of findings positive). Evidence of sensory underresponsivity and sensory-seeking SMD, sensory discrimination disorder, and sensory-based motor disorder was limited. This study supports the education of neonatologists, pediatricians, and caregivers about the symptoms and potential consequences of SPD and helps justify the need for follow-up screening for SPD in children ages birth–3 yr born preterm. Research using measures based on sensory processing theory is needed.
Postural control and sensory information integration abilities of boys with two subtypes of attention deficit hyperactivity disorder: a case-control study.

Ren Y1, Yu L2, Yang L1, Cheng J1, Feng L3, Wang Y4.


Abstract

Attention deficit hyperactivity disorder (ADHD) is one of the most commonly diagnosed psychiatric disorder in childhood. ADHD children with overlapping symptoms and signs of motor problems have more serious prognosis than that of children with ADHD only. However, the motor and sensory processing problems in children with ADHD have not been studied well. Few people adopt the technique of computerized dynamic posturography (CDP) in the study of ADHD, which is applied widely in clinical and laboratory research to objectively evaluate human's balance performance. This study aimed to assess the characteristics of postural control and sensory information processing of boys with two subtypes of ADHD by using CDP, so as to provide the proof for non-drug therapy of ADHD.

METHOD:

From June 2003 to September 2004, a total of 73 boys (7-15 years of age) with ADHD and 73 normal developing boys matched by age and intelligence quotient from Peking University Institute of Mental Health were recruited in the study. The Sensory Organization Test was adopted to test the static balance performance under six sensory input conditions by SMART EquiTest 8.0 (NeuroCom) instrument. The sensory information from three sensory systems were available under condition 1, the visual inputs were removed or distorted under condition 2 or 3, the somatosensory inputs were in conflict with or without the visual inputs removed under condition 4 or 5, and both the visual and somatosensory inputs were in conflict under condition 6. The indexes of equilibrium score, somatosensory, vestibular, and visual ratios, and strategy scores were analyzed to indicate the subjects' postural control ability.

RESULTS:

ADHD boys had significantly lower composite equilibrium score (CES) than the normal group (P < 0.05). Under condition 1 and conditions 3-6, the equilibrium scores (ES) of the ADHD group were significantly lower (all P < 0.05) than those of the control. Significantly lower visual and vestibular ratios and strategy scores under conditions 4-6 were found in boys with ADHD compared with the control group (P < 0.05). Boys of ADHD-predominantly inattentive (ADHD-I) type had a significantly lower CES and ES under conditions 4-6 than the controls (all P < 0.05) while the ESSs of ADHD-combined type (ADHD-C) boys under each condition were similar with that of boys with ADHD-I and no significant difference was found between boys with ADHD-C and the control group (all P > 0.05). Compared with the control group, the ADHD-I boys showed significantly lower visual and vestibular ratios and strategy scores under conditions 4-6 whereas the ADHD-C boys showed a trend of lower visual ratio (all P < 0.05).
CONCLUSIONS:

ADHD boys had a poorer static postural control ability and impaired function of processing visual and vestibular information compared with the normal control. Boys with ADHD-I showed particularly severe defect of static postural control and vestibular function integrating conflict information than normal boys. These deficits may be an important contributor to the clinical presentation of ADHD children and their cognitive deficits. Assessment and training of postural control function would be suggested during the diagnosis and treatment of ADHD children.

**Intervention**

**Effects of Yoga on Patients in an Adolescent Mental Health Hospital and the Relationship Between Those Effects and the Patients' Sensory-Processing Patterns.**


**Abstract**

**Problem**

This study investigated the effects of yoga as a sensory regulation tool in reducing adolescent distress in an acute care psychiatric hospital.

**Methods**

This was a descriptive, correlational pre-intervention/post-intervention design conducted in a mental health hospital over 5 months from mid-January to mid-June 2012. The population consisted of a convenience sample of 75 adolescent mental health unit inpatients and partial-hospitalization patients 12–18 years of age who participated in two or more yoga sessions. Patient charts provided Diagnostic and Statistical Manual of Mental Disorders-IV Axes I-V diagnosis, gender, and age. Dependent variables were pulse and Subjective Units of Disturbance Scale scores, which were recorded before and after each yoga class. The Adult/Adolescent Sensory Profile provided a measure of patient sensory-processing preference levels that were related to the pulse and Subjective Units of Disturbance Scale results.

**Findings**

Yoga sessions significantly improved patient pulse and self-reported distress ratings regardless of gender or sensory profile levels.

**Conclusions**

This article contributes to research on the therapeutic effects of yoga as a sensory regulation intervention in the treatment of psychiatrically hospitalized adolescents. Yoga has the potential to help adolescents in an acute care psychiatric hospital learn to soothe themselves, to regulate their emotions, and to find relief from emotional distress while hospitalized.
The effects of sensory integration therapy on verbal expression and engagement in children with autism

Janet Preis, Meaghan McKenna

International Journal of Therapy and Rehabilitation | Vol 21 | No 10 | October 2014 | pp 476–486

Abstract

Background/Aim:

Sensory-based interventions, including sensory integration therapy (SIT), are one of the most highly requested and provided services for children with autism spectrum disorders (ASDs). Although SIT is predominantly provided by occupational therapists, other service providers, including speech-language pathologists, are expected to understand and, on occasion, are requested to integrate SIT into their treatment. The purpose of this study was to determine whether: (a) SIT improved the communication skills of children with autism, specifically spontaneity, complexity of utterance, and engagement; (b) effects continued following the provision of SIT; and (c) effects were consistent across young children with autism with different learning profiles.

Methods:

A single-subject applied behaviour analysis design was implemented to assess the effectiveness of SIT on verbal spontaneity, grammatical complexity (measured through mean length of utterance) and engagement in four young children with ASD, measuring each area before, during and after SIT. The effects of sensory integration intervention were measured by comparing each participant's expressive language and engagement in a no-treatment phase (A phase) to those same skills in the treatment phase (B phase).

Findings:

All of the participants performed best in the occupational therapy or post-occupational therapy conditions for spontaneity, complexity of utterance, and engagement, and the worst in the pre-occupational therapy condition. Specifically, the greatest percentage of spontaneity was noted post-SIT, with the longest measured length of utterance during SIT, and the greatest engagement found both during and post-SIT. The pre-SIT condition consistently ranked as the lowest for all dependent measures.

Conclusions:

Results from this small study indicate that the SIT condition (occupational therapy) yielded better communication and engagement than the condition immediately prior (pre-occupational therapy); therefore, specific components of SIT need to be examined, particularly issues of motivation and momentum.
Conducting robust intervention trials to address the sensory needs of children with autism spectrum disorder: design challenges in an Australian context

Weeks, Scott; Grimmer, Karen; Bosshof, Kobie; Stewart, Hugh

*The British Journal of Occupational Therapy, Volume 77, Number 10, October 2014, pp. 533-535(3)*

Abstract:

Many occupational therapists administer sensory interventions to address the needs of children with autism spectrum disorder. However, the current evidence regarding the effectiveness of sensory interventions is inconclusive, resulting in calls for more robust testing through randomized controlled trials. Our initial research plan was to conduct a randomized controlled trial that had real-world applications for occupational therapists and children diagnosed with autism spectrum disorder. However, as we conceptualized this study, we identified many uncertainties regarding the criteria required for a robust trial. In this opinion piece we describe and discuss the challenges we encountered when designing a community-clinic-based effectiveness study in an Australian context.

Teaching Children Self-Regulation Skills within the Early Childhood Education Environment: A Feasibility Study

Angela Labrie Blackwell, Danielle C. Yeager, Lisa Mische-Lawson PhD, Ryan J. Bird, Donna Marie Cook

*Journal of Occupational Therapy, Schools, & Early Intervention Volume 7, Issue 3-4, 2014*

Abstract

This study explores the feasibility of teaching self-regulation skills in an early childhood setting. Based on the concepts of the Alert Program, one early childhood classroom of 19 students (ages 3–5 years) and two classroom teachers took part in the Ready CLASS Project. The 8-week intervention focused on increasing self-regulation skills in young children through intentional group instruction and embedded experiences. This study utilized a time-series, quasi-experimental design. The results indicate that children’s vocabulary about self-regulation and feelings recognition capacity can be influenced when the activities and experiences become embedded into the daily routine of the classroom.

A systematic review of sensory-based treatments for children with disabilities

Erin E. Bartona, Brian Reichow, Alana Schnitza, Isaac C. Smith, Daniel Sherlock

*Research in Developmental Disabilities Volume 37, February 2015, Pages 64–80*

Abstract
Sensory-based therapies are designed to address sensory processing difficulties by helping to organize and control the regulation of environmental sensory inputs. These treatments are increasingly popular, particularly with children with behavioral and developmental disabilities. However, empirical support for sensory-based treatments is limited. The purpose of this review was to conduct a comprehensive and methodologically sound evaluation of the efficacy of sensory-based treatments for children with disabilities. Methods for this review were registered with PROSPERO (CRD42012003243). Thirty studies involving 856 participants met our inclusion criteria and were included in this review. Considerable heterogeneity was noted across studies in implementation, measurement, and study rigor. The research on sensory-based treatments is limited due to insubstantial treatment outcomes, weak experimental designs, or high risk of bias. Although many people use and advocate for the use of sensory-based treatments and there is a substantial empirical literature on sensory-based treatments for children with disabilities, insufficient evidence exists to support their use.