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Sensory Integration Education News

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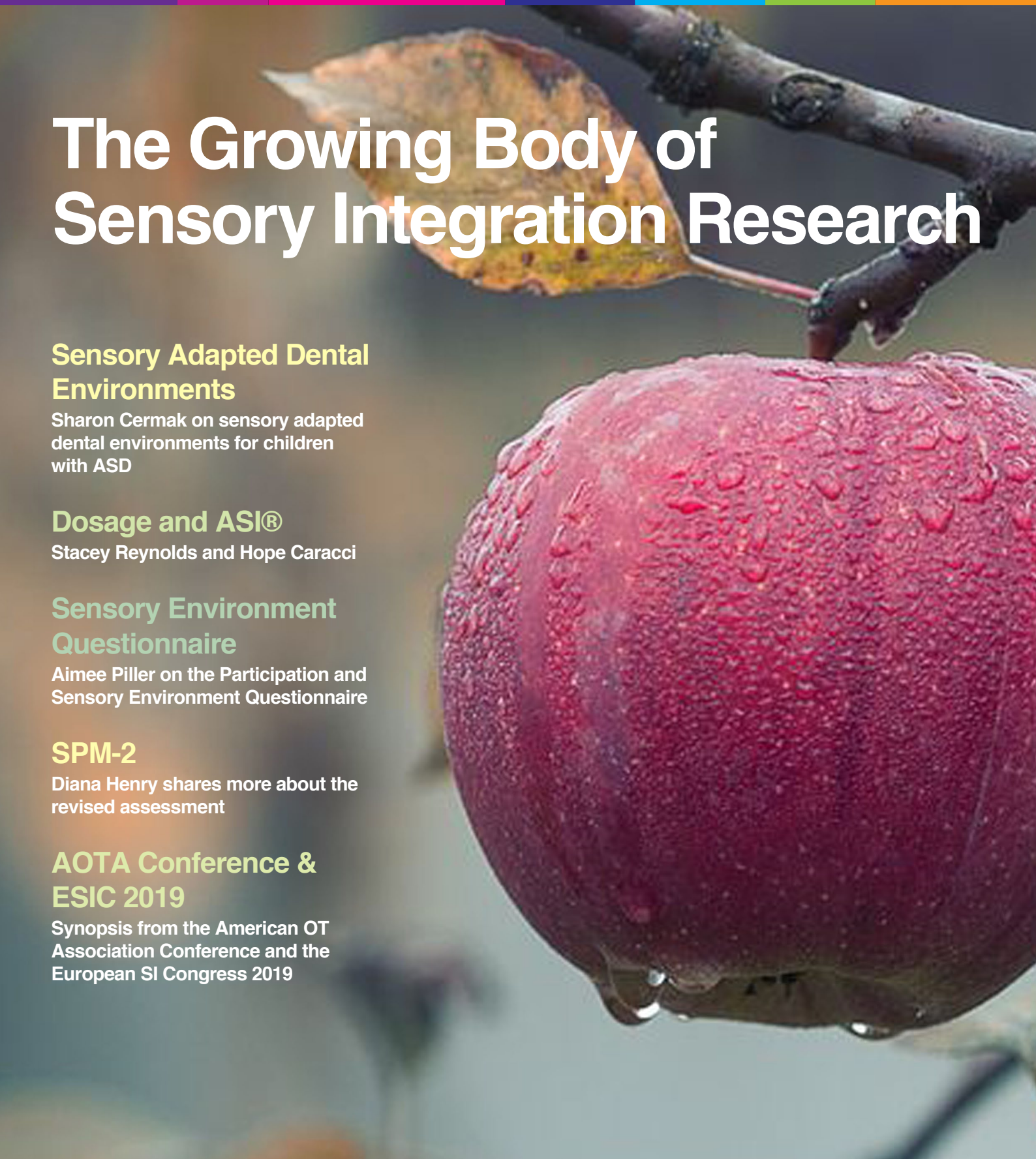

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Attended SIE modular training and want to share your learning?

Contact : Gina Daly, Editor at gina.daly@sensoryintegration.org.uk for more details and the authorship guidelines

We would love to hear from you!

Editor

Gina Daly

Membership Enquiries

Suzanne Leyland

Cathy Maguire

Design

www.abgdesign.uk.com

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Letter from the Editor

Gina Daly

Our July edition is here and we can't wait to share it with you! It has been a whirlwind here at Sensory Integration Education (SIE) since our February edition and there is lots of varied content for you to enjoy in this current edition. We are honored to have input from a wealth of experts in the field – Diana Henry, Sharon Cermak, Aimee Piller, Hope Caracci and Ellen McLaughlin to name but a few. SensorNet is striving to be a publication showcasing the latest evidence, best practice guidelines and research pertaining to Sensory Integration (SI).

In April, SIE was represented at the American Occupational Therapy Association (AOTA) conference and expo by Lelanie Brewer, Head of Education Programmes, Amy Stephens and myself as the editor of SensorNet. The AOTA annual conference and expo is the largest gathering of occupational therapists in the world with access to leaders in the field, the latest evidence based learning and plenty of networking and social events. The diverse and vast programme set out for this congress was astounding with every possible area of practice represented. It was an inclusive and stimulating learning environment with a mix of short courses, oral presentations, research posters, and "conversations that matter" sessions which were intimate discussion forums with expert researchers, educators and clinicians. The inaugural presidential address by Wendy Hildenbrand focused on the new 3 R's - relationships, resilience, and relevance. Delegates were encouraged to "get back to basics" of restoring and creating meaningful relationships, embracing our collective strength and capacity for personal and professional resilience, and committing to innovative "doing" to assure occupational therapy's relevance as a health and human service profession. From a sensory integration (SI) perspective it was magnificent to see that SI was truly embedded in the AOTA conference programme. There is an AOTA SI special interest group which we joined and connected with while in attendance. It was clear to see that SI is recognised in the US as being a valuable approach that occupational therapists use within their practice.

The 6th European Sensory Integration Congress (ESIC) was brought to us in June and was hosted by the Hellanic Scientific Society for Sensory Integration. Thessaloniki, in Greece was the chosen location for the congress which brought delegates together from across the globe, with a primarily European audience. Three occupational therapists were provided with an SIE travel bursary grant to present their SI research at this congress. You can read more about their research within this edition. We value our SIE members and are always encouraging and supporting new research - from early stage career researchers to more advanced career researchers. The ESIC programme was dynamic, engaging and innovative with a key focus on bringing SI into everyday participation. The theme of the congress was how sensory processing translates into everyday participation and impacts on the quality of life.

This congress pushed the boundaries as it explored the possibilities of expanding SI outside the clinical setting. With that in mind, there was a standout presentation given by Maria Protopapadaki on "Sensory integration intervention on a Green Care Farm", where sensory integration intervention was implemented in an outdoor farm setting. In this case study, the intervention was based both on the experiences of the natural environment and the interaction with natural elements, with an emphasis on care farming. The study aimed to investigate whether contact with nature contributes to improving children's sensory processing and therefore to their quality of life. The beautiful video footage captured the creative sessions which showcased the child interacting on home-made swings, in water pools, squeezing and tasting natural fruit, discovering the various tactile experiences of grass, hay, and mud all through the natural context evoking a real sense of playfulness and true exploration.

This was in stark contrast to the previous presentation given that day, by Annamarie Andersen from Sweden, which discussed the impact a sedentary lifestyle is having on our young people today. Maria's presentation on the Greencare farm also rang very true to the type of childhood I had growing up in the west of Ireland in a small country location where being outdoors in nature was central to my upbringing and sensory development. This also had remnants of "bringing it back to basics" which Wendy Hildenbrand called for at the AOTA conference.

This edition has captured key learning and research from both the AOTA and ESIC conferences and demonstrates the growing body of knowledge and evidence for sensory integration. It also highlights how the field of sensory integration is moving forward and is continuing to progress and evolve.

Warmest Regards,

Gina Daly

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Assessing the Sensory Environment

Aimee Piller

Aimee Piller, PhD, OTR/L is a paediatric occupational therapist with more than 13 years experience. She owns and operates Piller Child Development, LLC, a multidisciplinary paediatric therapy practice located in Phoenix, Arizona, USA. She completed her masters in occupational therapy at Temple University in Philadelphia, Pennsylvania, USA and her PhD in occupational therapy from Texas Woman's University in Denton, Texas, USA. Dr. Piller is the author of the Participation and Sensory Environment Questionnaire–Teacher Version. She has published and presented at a national level on a sensory environment, interdisciplinary practice with a speech-language pathologist using sensory strategies to support language development, and the importance and application of practice-based research. She is passionate about the field of occupational therapy and continues to practice paediatric occupational therapy with expertise in sensory integration, feeding therapy, and motor development.

Sensory integration is an evidence-based intervention that is designed to influence children and adults with sensory processing differences to remediate sensory processing difficulties with the goal of increasing participation. Sensory processing differences may occur in any of the sensory systems, in all of the systems, or in how the sensory systems integrate and process together. Sensory processing consists of registration, modulation, and the habituation of sensory input. Traditional sensory integration treatment was designed to address the difficulties in how the sensory systems processes input. Interventions provide enhanced sensory experiences to illicit an adaptive response with the result of improved adaptation, sensory processing, and in turn, participation (Bundy, Lane, Murray, 2002).

Sensory integration is an effective treatment for children with various sensory processing needs. Although evidence is still emerging, current research demonstrates the effectiveness of the intervention in improving motor skills, participation in structured tasks, sleep, social participation, and reducing caregiver burden (Watling & Hauer, 2015). Sensory integration is implemented by skilled occupational therapists to improve sensory processing of the person and increase participation within various environments and activities. Working from an SI perspective involves eliciting an adaptive response and building upon these adaptive responses which will ultimately change routines and habits thus increasing participation. The sensory environment is an often-overlooked aspect of the physical environment, but can greatly impact participation,

especially for individuals with sensory processing differences. Occupational therapists function under the assumption that participation is a result of the interaction of the person and the environment (Law, Cooper, Strong, Steward, Riby, & Letts, 1996). Participation increases when there is a greater fit between these two elements. For a child with sensory processing differences, the fit between the person and the environment is frequently poor, resulting in decreased participation. Occupational therapists may utilize sensory integration treatment to remediate sensory processing differences and increase the fit between the person and environment with a result of increased participation.

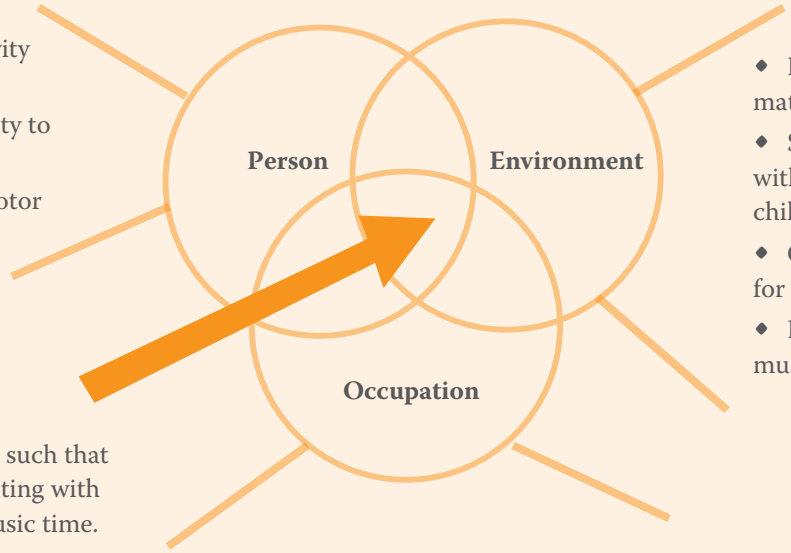
Direct sensory integration intervention is an effective treatment that utilizes the environment to facilitate the internal adaptive process of the child. Consideration of the sensory environment in treatment can influence participation and allow therapists to design interventions that can increase participation within chosen occupations.

Participation is a key goal in occupational therapy principles and sensory integration treatment is a tool used by occupational therapists to increase participation of the child or adult in chosen occupations. Participation and the environment are linked together with one consistently influencing the other.

The result of the interaction of the person and the environment is participation (Law et al., 1996). When the fit between the environment and the person is poor, participation is negatively impacted. The better the fit between the person and the environment, the more the person has successful participation in occupations. If the person is experiencing sensory processing difficulties, and the components of the sensory environment are a poor fit for that individual's sensory processing, then the person may have decreased participation. For example, a child with hyper reactivity to auditory input may have poor participation in a room that is next to a construction zone that has excess background noises.

Post-Intervention: Maximized fit between Person, Environment & Occupation

- Hyper reactivity to sounds
- Hypo reactivity to movement
- Decreased motor planning



- Place sound absorbent material on walls
- Sit child next to student with quieter instrument for child to play
- Child sits in rocking chair for movement
- Provide visual schedule of music time

Occupational Performance:
Fit is maximized such that child is participating with group during music time.

Music Time-Supports & Modifications

- Teacher simplifies movement of songs
- Teacher builds in gross motor movement times for songs
- Instrumental playing is modified to meet child's motor skills
- Physical & verbal support is provided as needed

From Piller (2017) adapted from Law et al., 1996

The child may be so overcome with sensory input within the environment, that the child is unable to participate to his or her fullest ability simply because of the poor fit between the person and the environment. Instead of participating in play and school tasks, the child may run from the room, stay away from the group, cover his or her ears, thus impacting the ability to engage in play and social activities, etc. Conversely, the same child with auditory sensitivities in a quiet room, absent of background noise may experience no difficulties in participation, and perform all activities and tasks as the other children. This example indicates the impact of the sensory environment.

Under sensory integration theory, therapists typically evaluate the sensory processing patterns of the person. They do not necessarily formally examine the sensory aspects of the environment. By including an assessment of the sensory environment, the therapist is able to intervene at the level of the environment to increase participation more immediately. The Participation and Sensory Environment Questionnaire–Teacher Version (PSEQ–TV) (Piller, 2017) is an assessment designed to examine the sensory environment, specifically the school environment and how it impacts participation for young children. Because of the unique aspects of each environment, it is important to examine specific environments, in this case the preschool environment, and participation within one assessment. By examining these two concepts in a single assessment, therapists can design specific environmental interventions that target increased participation in specific tasks.

The PSEQ–TV is a teacher report assessment that consists of three subtests designed to examine the impact of the sensory environment on participation. The first subtest explores specific activities and tasks that occur within the preschool setting. Activities include things such as circle time, snack or lunch time, classroom routines, instructional time, movement time, etc. Each activity is broken down into specific tasks a child may perform during the school day. The respondent is asked to indicate how much the sensory aspects of the environment impact participation for the child on a Likert scale from "none" to "too much to participate." The second subtest explores the amount of support a child is provided to participate in an activity. Support may be physical, verbal, or visual. The third subtest examines modifications to the environment that support participation. Modifications include physical changes to the environment, changes to the task, or changing the timing of the activity. The assessment provides a baseline for identifying where the child may be having barriers in participation due to the sensory aspects of the environment as well as how much support and modifications are currently needed to support participation.

Initial testing reveals that the PSEQ–TV is a reliable and valid assessment. Reliability was established via internal consistency of 0.98 and test-retest reliability of 0.70. Construct and content validity have also been established (Piller, Fletcher, Pfeiffer, Dunlap, & Pickens, 2017). Currently the assessment is available for free use from https://participationandsensoryenvironment.weebly.com/pseq---teacher-version.html. The PSEQ–TV is a companion assessment to the Participation and Sensory Environment Questionnaire (PSEQ) (Pfeiffer, 2017), a parent report tool that examines the impact of the sensory environment on activities and tasks within the home and community. The PSEQ and PSEQ–TV follow the same format for subtests and scoring, but are designed to examine three different environments, which are the school, home, and the community environment for young children.

The PSEQ also exhibits initially strong psychometric properties with reliability at 0.96-0.98 and test-retest at 0.62-0.76. Evidence of construct, content, and concurrent validity have been established (Pfeiffer, Piller, Slug, & Shiu 2018; Pfieffer, Piller, Bevans, & Shiu, 2019). This assessment is available for free at https://participationandsensoryenvironment.weebly.com/view-pseq-tv.html

The results of the PSEQ and PSEQ–TV provide therapists with unique information about how the sensory environment impacts participation within specific activities and tasks. When the results of this assessment are combined with other assessments that identify the sensory processing needs of the child, the therapist is able to tailor interventions within the environment to change the sensory features to better fit the sensory needs of the child. This in turn will increase participation. Assessments that identify sensory processing, specifically modulation and registration, that can be used in combination with the PSEQ–TV and PSEQ include assessments such as the Sensory Processing Measure (Parham, Ecker, Miller Kahaneck, Henry, & Glennon, 2007) and Sensory Profile 2 (Dunn, 2014). These assessments assess the sensory processing patterns of the person while the PSEQ and PSEQ–TV examine the sensory features of the environment and how those influence participation.

To combine the results of the assessment of sensory registration and modulation with the PSEQ or PSEQ–TV, the therapist needs to use skills to analyse the activities and tasks that are impacted by the sensory environment, the information gathered from using the PSEQ and PSEQ–TV. In addition, the therapist must also consider the results of the sensory registration and modulation profile of the child. The therapist should examine what aspects of the sensory environment influence participation based upon the child's sensory processing. For example, if the child's sensory registration and modulation profile indicates hyper reactivity to tactile and the child is experiencing great difficulties in circle time participation, the therapist may conclude that the tactile sensitivities of the child in combination with the tactile aspects of the environment (i.e. other children sitting near and unexpectedly touching the child) may be impeding participation. The therapist would then design an intervention to modify where the child is sitting to decrease unexpected tactile input of other children. The modification may be providing a separate area for the child to sit away from other children, sitting in a chair or modified chair to provide a physical boundary from unexpected touch of other children, or wrapping the child in a weighted blanket while he or she sitting in circle time.

Modifications to the sensory environment can increase and facilitate participation, but are not designed to take the place of sensory integration therapy, which is designed to remediate sensory processing differences. The PSEQ and PSEQ–TV is not only designed to identify barriers within the environment, but also facilitators within the environment. Often teachers and parents almost innately modify tasks and the environment or provide support to facilitate participation (Piller & Pfeiffer, 2016). By honing in on specific facilitators, the therapist can guide teachers and parents to provide the best support and modifications to increase participation of their children.

In summary, the sensory environment is often considered when addressing children with sensory processing difficulties, but not in a formal manner. Examination of the sensory environment through a formal assessment, such as the PSEQ and PSEQ–TV, provides a method to identify barriers and facilitators to participation within the sensory environment. In combination with identification of the sensory processing needs of the person, the PSEQ and PSEQ–TV provides guidance for the therapist to design interventions that modify the environment, thus increasing participation in a more immediate manner.

You can reach Aimee at: aimee.piller@pillerchilddevelopment.com

References:

https://www.sensoryintegration.org.uk/page-18983

Sensory Adapted Dental Environments for Children with ASD

Sharon Cermak

Sharon A. Cermak, Ed.D., OTR/L, FAOTA and Marinthea Richter, MA, OT share their work on this exciting project which is continuing to expand across client populations. The SIE team had the pleasure of meeting Sharon at both the AOTA conference and at the ESIC where we connected, shared ideas and discussed her research which she has detailed below.

Going to the dentist does not often make it to the top of any "fun things to do" list. The sound of the dental equipment, the sensation of the materials in and around the mouth and the bright lights and occasional strange chemical smells is enough to make anyone apprehensive. Now imagine how this experience is perceived by children who are hypersensitive to sensory input. Children with Autism Spectrum Disorder (ASD) have a high rate of co-occurring challenges in sensory processing which negatively affects their oral care (Stein, Polido, & Cermak, 2013). They may become overwhelmed by everyday sensory experiences that may not bother typically developing children, resulting in increased self-stimulation and negative behaviors that may make oral care extremely challenging for the dental team and traumatic for the children and their family. As such, many dentists are not willing to treat children with ASD making it difficult for families to find a dentist. Ensuring good oral hygiene for children is crucial to overall health and well-being, however it may be difficult to ensure adequate care for children with ASD given their behavioral challenges. As a result, some children need pharmacological measures such as general anaesthesia for oral care. However, the risk and cost of performing routine preventative dental care under general anaesthesia may preclude this option for many children with ASD. As such, innovative approaches to oral care are needed.

Initial research into Sensory Adapted Dental Environments (SADE) for children with developmental disabilities was conducted by Dr. Michele Shapiro from Beit Issie Shapiro Centre in Israel. This study found that SADE could potentially be an important consideration for dental cleaning as it helped to enhance cooperative behavior and relaxation of 16 children with developmental disabilities (Shapiro, Melmed, Sgan-Cohen, & Parush, 2009).

Dr. Sharon Cermak (EdD), a professor at the Chan Division of Occupational Therapy and Occupational Science at the University of Southern California (USC) was inspired by the work done by Dr. Shapiro and secured a grant from the National Institute of Dental and Craniofacial Research (NIDCR) to conduct a pilot and feasibility pilot study using SADE with children with ASD to examine whether SADE reduces physiological anxiety, behavioral distress and subjective pain during dental cleaning. The research was done in collaboration with an interdisciplinary team including Dr. Jose Polido, DDS, Director of the Dental Clinic at Children's Hospital Los Angeles (CHLA) and Associate Professor at the Ostrow School of Dentistry USC, Marian Williams, Ph.D., a clinical psychologist at the USC University Center for Excellence in Developmental Disabilities at

CHLA and Michael Dawson, PhD, a psychologist with expertise in Electrodermal Activity measures at USC.

The pilot and feasibility study included 44 participants (22 children with ASD and 22 typically developing children) between the ages of six and twelve years. The children each had two dental visits (four months apart), one in a regular dental office without any adaptations and one in the same dental office but with sensory environmental modifications. The modifications included playing soothing music (a mixture of classical music and nature sounds) in the background, dimming the overhead fluorescent lights, projecting soft moving images ("blue or purple lava lamp bubbles" or swimming fish) onto the ceiling, and having the dentist use a dentist headlamp rather than the large dental light. In addition, the dental chair had a cover on it with a butterfly with wings that attached to the side of the chair. An X-ray bib was placed over the child and the wings of the butterfly wrapped around the child's body providing a deep pressure hug. These modifications were designed to decrease the child's anxiety. Two electrodes were placed on the child's fingers and we recorded electrodermal activity (EDA) before, during, and after the dental cleaning to determine the children's physiological anxiety levels. We also video-recorded the child during the cleaning and coded it for child distress. Children completed subjective evaluations of pain and sensory discomfort after the dental cleaning and the dentist rated levels of cooperation. Both groups of children had reduced subjective pain levels, reduced anxiety, and found the SADE environment more comfortable (Cermak et al., 2015). These results were encouraging as it showed that SADE might be beneficial for both neurotypical children and children with ASD, although the ASD group demonstrate greater benefits than the typically developing children. The children with ASD also required fewer people to restrain them during the cleaning in the SADE compared to the regular dental environment. This implies lower costs for care if fewer people are needed to provide the care.

With these exciting results, Dr. Cermak applied for a large grant from the NIDCR to launch a full-scale randomized control trial. A larger sample would provide better information about the effectiveness of SADE and enable the researchers to look at moderating variables such as the child's age, autism severity, and IQ, and also look at mediating variables to better understand causal mechanisms. This study was funded by NIH and is currently underway with more than 200 participants with ASD enrolled in the study. The team also added an economist to the team, Dr. Joel Hay, Professor of Pharmaceutical and Health Economics at USC, to examine cost effectiveness of the intervention. The research team at CHLA and USC is currently hard at work collecting the data and are eagerly awaiting the results.

The SADE research has opened the door for wonderful collaboration between occupational therapists and dental professionals. Looking at the environmental enhancement from a sensory perspective is an emerging area of occupational therapy practice. Occupational therapists have a wealth of knowledge about sensory processing and understand how sensory input from the environment can influence the participation of people with sensory sensitivities. This multidisciplinary research has given the professionals involved the opportunity to critically examine the often overlooked role of environmental design within health care and discuss how we can adapt settings to allow enhanced participation of children and adults with disabilities. We have extended our work to include suggested modifications to waiting rooms, at oncology units, and in emergency rooms. Environmental modifications have great potential to allow better access for children with ASD to dental care. As the dental environment is more welcoming, we expect that children will be less anxious and show more cooperative behaviour. In turn, parents will be less apprehensive about scheduling return visits to the dentist, and dentists might be more willing to serve children with ASD and other disabilities. These factors will improve oral health for children with ASD.

Research in this area is ongoing and expanding. In a supplemental study, Dr. Cermak and her team received funding to conduct a feasibility study of SADE with children with Down Syndrome. Dr. Cermak believes that this research has the potential to revolutionize the manner in which children with disabilities receive oral health care services not only in the United States of America but around the globe.

References:

https://www.sensoryintegration.org.uk/page-18983#Ref2

Dosage in Ayres Sensory Integration

Stacey Reynolds

Stacey Reynolds and Hope Caracci on using an intensive design model of SI intervention in outpatient paediatric settings: How and why to change practice based on evidence.

Hope and Stacey met some of the Sensory Integration Education team at this year's American Occupational Therapy Association Annual conference where they spoke about the topic of ASI® and dosage. Their highlights from this congress included Ellen Cohn's Eleanor Clark Slagle lecture. Another highlight was seeing more and more practitioners speaking at AOTA 2019 about shared decision making tools that may assist therapists be more client-centered and better able to make individualized decisions regarding frequency, duration and intensity of care.

Stacey Reynolds is an associate professor at Virginia Commonwealth University (VCU) and has a 10+ year history of conducting funded research with over 30 peer review publications in the area of sensory processing and pediatric neurodevelopmental disorders. Her research, conducted in the VCU Sensory Processing and Space Evaluation (SPASE) lab, has focused on how children with neurodevelopmental disorders respond to sensory stimuli in their environment and how these responses impact functional performance and behavior.

Hope Caracci

Hope Caracci is the Quality and Staff Development Manager in a large pediatric therapy at The Children's Hospital of The King's Daughters in Norfolk, Virginia. Hope has 20 years of experience as an occupational therapist with 15 of those years devoted to children. She specializes in treating children diagnosed with ASD and SPD as well as determining appropriate frequency, intensity and duration for children with chronic conditions. Hope has published and presented on topics such as evidence based practice, episodic care, mentorship, and leadership at the local and national level and is certified to administer the Sensory Integration and Praxis Test (SIPT).

Ayres Sensory Integration®

According to Ayres' theory of sensory integration, sensation (in various forms) provides the basis for learning and behavior. Further, successful integration of sensory information is necessary for appropriate adaptive responses and therefore supports participation in occupation. Foundational to sensory integration theory is the idea that both sensation and our responses to sensation shape our interactions with the world, and have the capacity to alter brain pathways through neural plasticity (Schaaf et al., 2010).

The term Ayres Sensory Integration® (ASI®) refers to an individualized therapeutic approach that is based on Ayres theory and practice, which was designed to remediate sensory integrative problems in children. ASI® is also sometimes called OT-SI to emphasize the focus on occupation and participation as outcomes of improved sensory integration. In this intervention, an occupational therapy

practitioner presents activity challenges individually tailored to improve the sensory integration capacity of a child by helping the brain be better able to organize sensory information. Within this approach the occupational therapist creates an environment that evokes increasingly complex adaptive responses from the child using the child's own drive and interest to facilitate engagement. This approach is much different from a sensory – based approach in which a more passive application of sensory strategies is applied to a child (Reynolds et al., 2017).

Best Evidence

The strength of intervention research in the fields of medicine and health care are frequently rated according to hierarchies of evidence. These hierarchies enable different research methods to be ranked according to their rigor and validity of their findings. Three articles have been published studying the effects of OT-SI, which are ranked at the highest level of evidence for their research design and also include other elements of rigor including the use of intervention fidelity manuals and measurable functional goals (Miller, Coll, & Schoen, 2007; Pfeiffer et al., 2011; Schaaf et al., 2014). These three articles are discussed briefly below. Importantly, all three apply OT-SI using a high-frequency dosing model of 2-3 times per week for 6-10 weeks.

Table 1. OT-SI High level of evidence dosage table

Citation	Total number of sessions	How many weeks?	Average number of sessions per week	Length of each session
Miller, Coll & Schoen (2007)	20	10	2	45 - 60 mins
Pfeiffer et al. (2011)	18	6	3	45 mins
Schaaf et al. (2014)	30	10	3	60 mins

Miller, Coll, and Schoen (2007) randomly assigned 24 children with sensory modulation dysfunction (SMD) into an OT-SI group, no treatment group, or an activity group. Children were evaluated for sensory modulation disorder (SMD) using rigorous criteria; comorbidities included attention deficit hyperactivity disorder (ADHD) or learning disability. The children were provided therapeutic intervention 2x per week for 45-60 minutes for 10 weeks. Results found that the group receiving OT-SI made functional gains that were significantly greater than the children in the other two groups. Children in the OT-SI group also increased significantly more than the other groups on the Attention subtest and Cognitive/ Social composites of the Leiter International Performance Scale-Revised. Outcomes on the Short Sensory Profile, Child Behavior Checklist and physiology were in the expected direction, with the OT-SI group having greater gains, but statistically significant differences were not found with the small sample.

Pfeiffer et al. (2011) studied two groups of children who received OT services 3x per week for 45 minutes for six weeks. Group 1 received an OT-SI intervention based on Ayres theory and adhering to fidelity criteria, and group 2 received fine motor (FM) interventions; assignment to either Group 1 or Group 2 was random. Both groups demonstrated significant improvements towards individualized functional goals, but the OT-SI group demonstrated statistically greater improvement than the FM group. The OT-SI group also showed fewer mannerisms associated with autism than the FM group as measured by the Social Responsiveness Scale, indicating OT-SI interventions may have an impact on core features of Autism Spectrum Disorder (ASD).

Schaaf et al. (2014) randomized children into OT-SI group and usual care (UC) intervention group, and they received intervention 3x per week for 60 minutes for 10 weeks. Inclusion criteria included diagnoses of autism and sensory processing disorder (SPD). Results showed a significant difference between the OT-SI group and the UC group on individualized functional goals with the OT-SI group achieving significantly higher scores.

Results also revealed significantly greater improvement for the OT-SI group compared to the UC group in the areas of Self-Care Functional Skills and Social Functions subtests of the Pediatric Evaluation of Disability Inventory (PEDI). No significant changes were shown on the Pervasive Developmental Disorders Behavior Inventory.

Based on these three high level studies, there is reason to support the use of an OT-SI approach for children with deficits in sensory processing which impact function. However, it is important to not only consider the type of intervention, but the dosage used during service delivery. And if we are using these studies to support our clinical practice, there is a need to contemplate how dosage is being determined in clinical practice as well.

Clinical Reasoning

Despite the evidence described above, most practitioners in outpatient pediatric practice settings continue to see clients once a week indefinitely. And little research exists to explain the process practitioners might use to select the dosage for a client's plan of care or what factors influence their decision making. Some factors might include the culture of the facility (e.g., the expectations that clients will be seen a certain number of times per week) and scheduling logistics (Caracci, Reynolds & Ivey, 2018). However, it's unlikely that these factors alone will result in the optimal therapeutic dose for each client. There is also pressure that some clinicians feel obliged to continue services as long as a family desires, which may lead to children remaining on a therapists caseload for prolonged periods of time. Fortunately, scientific, pragmatic, narrative, interactive, conditional and ethical reasoning may help therapists make educated decisions about dosage in occupational therapy using OT-SI approach and effectively communicate decisions to families and administrators.

Scientific reasoning guides a therapist to apply research evidence to clinical practice, and in the case of OT-SI, informs practitioners to consider applying an intensive dosage of therapy. However, other forms of reasoning also inform the decision making process. Pragmatic reasoning addresses "…both the practice context in which therapy is occurring as well as personal factors within each individual practitioner" (Schell & Schell, 2008). When applied to OT-SI, pragmatic reasoning leads practitioners to consider if they have the proper training, environment, and equipment to implement the intervention. It also leads the therapist to collaborate with families to ensure that they are able to participate in an intensive frequency of therapy. That is, is the family able to commit to being at therapy 2-3x per week? Do they have the transportation and resources to attend consistently? Do they understand the financial implications of intensive therapy? Are they able to afford multiple co-payments each week? The answers to these questions may support or deter a therapist from recommending a high frequency OT-SI approach.

As a therapist considers whether an intensive OT-SI approach is warranted they may use interactive and narrative reasoning to see the big picture. Practitioners may maximize the therapeutic relationship and build rapport through active listening, sharing personal stories,

joint problem solving, and using positive verbal and nonverbal communication. This type of reasoning is closely aligned with Ayres' approach to using an individualized, client centred approach to intervention. With a "no therapist left behind" mentality clinicians, caregivers and children become partners during intervention.

During this process the therapist will ensure caregivers are directly involved in all sessions, and consider a family's past experiences and expectations to make sense of their circumstances and recommend dosage based on what is best for the individual client.

Ethical and conditional reasoning should also guide a therapist's decision for dosage, and national therapy associations have started providing guidance for practitioners related to this decision making process (Caracci, Reynolds, & Ivey, 2018). In 2014 the American Occupational Therapy Association, American Physical Therapy Association, and American Speech-Language-Hearing Association released a joint consensus statement indicating it is not acceptable for administrative guidelines to influence a clinician's clinical judgment related to dosage. That is, a therapist must ethically make decisions related to how much and how often a client is seen in therapy based on their clinical and professional reasoning secondary to the client's need for skilled services.

Conditional reasoning guides therapists to monitor therapy progress and be flexible and respond to changing conditions. Therefore, when recommending a high frequency of intervention it becomes increasingly important for practitioners to create goals with caregivers that are realistic and easily monitored, with a specific start and end date. Discharge should be the goal, and therefore discussions regarding discharge should occur upon initial evaluation and at subsequent therapy sessions. Practitioners must monitor and report progress to caregivers regularly, and changes to frequency should be made if a lack of progress is noted. This is especially important because families are investing a high level of time and resources to the care plan, and should not continue to do so if the plan is not working. Goal Attainment Scaling (GAS) may be one way to create goals that provide objective information that may inform a therapist and caregiver of progress or lack thereof (for more information on GAS see Mailloux et al., 2007).

Conclusion

Sensory integration interventions continue to be heavily scrutinized, yet they are one of the professions most evidence based approaches for children with neurodevelopmental disorders. It is important that clinicians and administrators understand how to make the best decisions related to the frequency and duration of OT-SI and how to support their decisions using evidence based practice, clinical reasoning and caregiver collaboration.

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https://www.sensoryintegration.org.uk/page-18983#Ref3

Theoretical and Neuroscience foundations for paediatric interventions

Dr. Ellen McLaughlin, Ed.D., OTR/L, FAOTA, is an associate professor and Program Director, for the Occupational Therapy programme in Misericordia University. She presented a short course on "Theoretical and Neuroscience Foundations for Paediatric Interventions" at the AOTA conference in April. This presentation was evidence based and the information was synthesised succinctly which made it meaningful for clinicians. Dr. McLaughlin, kindly shared a snapshot of this short course for the benefit of our readers allowing us to disseminate information from this international conference.

Ellen McLaughlin

As therapists we always strive to provide the best experiences for our clients so they can achieve their potential. Clearly specifying the theoretical and neurological principles that underlie some of our most common interventions helps us to move in that direction efficiently and effectively. In a recent editorial, The State of the Science in Sensory Integration (Pfeiffer, May-Benson & Bodison, 2018, p. 2) it was stated, "researchers should articulate the underlying mechanism for why the intervention…..is expected to enhance child participation… this would allow researchers to test the underlying theory of why the intervention is thought to be helpful, as well as the intervention's effectiveness in supporting child participation. "

We can adapt this challenge about research to our activities as clinicians by:

- Ensuring that valid assessments have been conducted to confirm that the performance deficits seen are due to sensory processing difficulties.
- Articulating the specific principle that guides the intervention being used, with some understanding of the neurological processes of why the intervention is proposed to work.

Sensory Integration from a Broad Perspective

Principle: If we provide an enriching sensory environment, with active engagement & appropriate challenge and dosage, changes to the brain will occur (Lane & Schaaf, 2010).

There is a strong foundation of basic research that supports these claims (Lane & Schaaf, 2010), yet therapists must consider and specifically apply each of the elements in this principle.

Active involvement in an enriching Sensory Environment

When providing multisensory or cross modal sensory interventions it is essential that these sensory elements be required components of the task. Strong task analysis skills with critical judgment must be applied here, as simple inclusion of a specific sensation may not be enough to elicit the change in the nervous system. Recent computational models of multisensory processing in the

brainstem suggest that for sensory integration to advance during development, direct experience in coordinated sensory processing is necessary to surpass the brain's tendency to have individual sensory inputs compete, rather than collaborate (Cuppini, Stein & Roland, 2018).

Appropriate challenge & dosage

To achieve this, it must be based on a valid, clear assessment, with interventions focused to include the specific sensory functions implicated, at the just right level, as one size does not fit all in respect to sensory integration interventions.

Deep Pressure

Key Neurological Areas:

Low threshold Aβ Mechanoreceptors - Dorsal Horn - Dorsal Column Pathway - Reticular Formation -Vagal and Parasympathetic System - Sympathetic System - Cortical Awareness.

Principle: If you apply sustained, deep tactile input to the skin, it can produce an inhibited, relaxed state in the client, affecting such areas as mood, muscle tone, and autonomic function.

A common intervention for occupational therapists to employ is the use of deep pressure, often as a method to calm the nervous system through brushing, wrapping in blankets, and using compression devices or garments. When we use deep pressure to reduce a negative sensory tactile experience, such as tactile defensiveness, we are incorporating a process involving presynaptic inhibition. In this case, activation of mechanoreceptors (by shaking your hand, rubbing or placing pressure on the skin) starts a process called presynaptic inhibition, whereby the pressure impulses conveyed along the dorsal column medial leminiscus pathway "fire back" at the dorsal horn area of the spinal cord to inhibit the nociceptive (pain, tickle, itch) sensations that are sent along the anterolateral nociceptive pathway, to lessen them. When deep pressure is instead used for a more generalized effect, other pathways are implicated and the focused neurological effect occurs higher up, in brain stem areas. These brain stem areas impact the reticular activating system which has a direct influence on increasing parasympathetic activity through increased vagal tone, and decreasing sympathetic response. The effect of deep pressure using a pressure vest after a stressor was applied, resulted in outcomes such as lessening of arousal as measured by physiological parameters such as heart rate, respiration, electrodermal activity (Reynolds, Lane & Mullen, 2015). Champagne, Mullen, Dickson, & Krishnamurty (2015) confirm the physiological effects of deep pressure sensation in adults. More recently, Bestbier & Williams (2017) provided an account of significant results in a well-designed study conducted in a residential facility with 8 children with autism or severe intellectual disabilities over a period of three months.

Soothing Tactile Input

Key Neurological Areas:

Unmyelinated C Tactile Afferents on Hairy Side of Skin -Mechanoreceptors-Dorsal Colum Pathway - Thalamus – Posterior Insular Cortex – Orbitofrontal Cortex

Principle: If we utilize soothing social touch we can impact emotional regulation, and promote social responsiveness and connection.

Soothing social or pleasant touch is differentiated from discriminative touch or pressure touch. While it starts out on the same dorsal column pathway, the receptors are different, and the final processing areas in the brain are different.

It has been shown through physiological measures, behavioral responses and functional brain imaging that these C tactile primary afferents contribute to pleasant touch and provide an important sensory underpinning of social behavior (Liljencrantz & Olausson, 2014). For this type of touch, the emotional, sense of self/ body scheme, interoceptive and embodied cognition processes of the brain are most impacted. Clinicians working with mental health and trauma may be particularly interested in investigating evolving research in this area, as it indicates that activation of these fibers triggers oxytocin release, reducing physiological arousal, impacting positive affect and potentially inhibiting pain (Walker, Trotter, Swaney, Marshall, & Mcglone).

Movement Input

Key Neurological Areas:

Oxygen consumption – improved inhibition evident via EEG – increased activation of anterior cingulate cortex and superior frontal gyrus – better executive functioning.

Principle: Movement increases blood flow to the brain, promoting attention, mental clarity and memory. Movement will assist children to focus.

Movement breaks, sensory pathways, advocating for recess time…all of these activities contribute to better attention, executive functioning and learning for our children. Studies with elementary and adolescent children have demonstrated this on a neurological level through viewing activity of the brain, as well as in academic outcome measures (Hillman, et al, 2014). The more consistency, enjoyment and intensity we can integrate into these movement activities, the better.

Proprioception

Key Neurological Areas:

Muscle spindle and golgi tendon sensory receptors – dorsal column pathways to conscious cortical and unconscious brainstem areas – hypothalamus, pituitary, adrenal areas

Principle: If we activate proprioceptors in the context of meaningful occupation, we can increase awareness of body scheme, modulate arousal state and ultimately improve focus in purposeful activity.

One way that therapists often use proprioception is to help children modulate their arousal levels through oral motor stimulation, specifically chewing. Chewing is an effective stress-coping behavior. While evidence was not available to document the impact of this clinically with children, in a comparison of nursing students who were randomly assigned to a 2-week mint gum chewing experience, or a control group the gum chewers were found to have significantly better scores on measures of anxiety and mood (Yu, Chen, Liu, & Zhou, 2013). Geriatric research also shows us that there is a clear association between geriatric loss of teeth and loss of the ability to chew with cognitive decline and dementia (Azuma, Zhou, Niwa, & Kubo, 2017).

It all starts when the muscle spindle embedded in the muscle and the golgi tendon organ located on the tendon, which are sensory receptors, detect muscle and tendon lengthening and shortening. These impulses are sent through conscious pathways to our cortex for awareness, and through unconscious pathways to our brainstem for cranial nerve input from chewing. Chewing suppresses the hyperactivity of the hypothalamus-pituitary-adrenal (HPA) axis which then can have a positive effect on, stress related hippocampus cognitive deficits.

Interoception

Key Neurological Areas:

Visceral organs or muscles - small diameter C or A fibers – spinothalamic tract or vagus and glossopharyngeal cranial nerves and the solitary tract– insula – cingulate cortex.

Principle: If we optimize our ability to detect and process interoceptive signals we can influence sensory and emotional regulation supporting daily behaviors.

Interoception is the sensing and awareness of our internal body signals, including those that help us maintain homeostasis, i.e. hunger, thirst, urination, sleep, and those that reflect emotions such as anxiety, excitement, and calm. It includes any bodily information that is sent by either small diameter C or A fibers through lamina I and the spinothalamic tract to the insula and cingulate cortex (Craig, 2002), and to vagus and glossopharyngeal cranial nerves and the solitary tract (Critchley and Harrison, 2013). Mahler (2017) provides a multitude of interventions addressing distress tolerance and recommending mindfulness skills to improve interoceptive awareness and provide increased self-control for better occupational performance, particularly for children with autism spectrum disorder. Payne, Levine, and Crane-Godreau, address interoception difficulties and interventions associated with trauma.

Interoceptive feelings are regulated by the brain's insular cortex. Today's scientists are now identifying connections between an under or over-functioning insular cortex with ASD, OCD, PTSD, ADHD, anxiety, BPD, etc.

It is often our intent to improve sensory processing and integration and to modulate arousal and emotional regulation levels, as these are neurological foundations essential for the social interaction, attention and environmental interactions that are embedded in the performance demands of every child's day. When we carefully consider the theoretical and neurological principles that support our interventions we increase our chances of providing the best therapeutic outcomes possible.

References:

https://www.sensoryintegration.org.uk/page-18983#Ref4

Supporting Research

Julia-Marie White

Julia-Marie White received her MSc through Ulster University and Sensory Integration Education. Here, she shares her research project.

Julia-Marie White qualified from London South Bank University as an occupational therapist in 2007, and has since worked in various roles within Forensic Mental Health services. Attending an 'Introduction to Sensory Integration' course through SI Education in 2011 provided a 'lightbulb moment', and she consequently embarked upon the modular pathway to become a qualified ASI practitioner, completing her MSc in Sensory Integration with Distinction through Ulster University and SI Education in Dec 2018. Julia-Marie shares her findings from her research project entitled "A mixed-methods approach to investigate the implementation of Ayres' Sensory Integration® (ASI) by qualified ASI practitioners working with adolescents / adults / older adults in the UK".

Take a moment and consider how you have found the process of implementing Ayres' Sensory Integration® (ASI) in your workplace following qualification. Have you managed to implement ASI in the way that you envisaged, or at all? Along your journey, have you been able to communicate your factors for success and discuss the associated challenges? It turns out that stopping to think about these questions may provide a useful conduit to improve both our own ASI practice and others'.

The ability to implement evidence-base into routine practice is key to demonstrating effective intervention (Eccles and Mittman, 2006). We are fast approaching 2020; for the ASI community, this marks 100 years on from the birth of the theory's originator, Dr A. Jean Ayres and proposes a vision for future ASI development. For the NHS, it is the target year marked to close the projected £30 billion funding gap (NHS England, 2014). Whilst associated service redesign may offer ASI practitioners' opportunities for newly commissioned health care roles, the focus on cost-effective and outcomes-focused service delivery requires us to demonstrate effective intervention. Within this climate, leading ASI researchers are appealing for increased practitioner engagement in advocacy, education and practice-based research activity, to better capture service user outcomes and move the field forward (Schaaf et al., 2015). Implementing evidence-based practice can be complex though, demonstrated by the growing research field of implementation science. There is acknowledgement that interventions (such as ASI) that aim to improve quality and outcomes for clients may not always be fully realized due to implementation challenges (Aarons et al., 2011). In order to address these challenges, research

suggests that consideration of the environmental, contextual and cultural factors that affect implementation (Marshall 2011; Shaw 2012) can support our practice development, and help transfer knowledge to others where achieving best practice may remain difficult.

The MSc research project completed by Julia-Marie investigated ASI implementation in the population of qualified ASI practitioners working with adolescents/adults/older adults in the UK. A convergent identical mixed methods design was used. Qualitative data sought to understand practitioners' experience and explore the factors that could support or act as barriers to ASI implementation, in addition to factors that might support future implementation.

Quantitative data sought to provide descriptive statistics to define ASI practitioner/workplace characteristics and provide a broader understanding of variables that might be linked to successful/unsuccessful ASI implementation. The data was triangulated to provide a more holistic understanding of the research issue. Ethical approval was gained from the Ulster University filter committee. Recruitment and funding support was received from the Sensory Integration Education (UK & Ireland), which advertised the study online and via a membership database of ASI-qualified practitioners who consented to be contacted for research purposes.

Key Findings

24 eligible respondents participated in the survey.

The quantitative data identified two key, statistically significant variables that had a positive impact upon ASI implementation: 'Support from service leaders' and 'Sufficient supervision to discuss clinical aspects of ASI'. Data triangulation identified an additional key variable; 'MDT support/understanding'. Analysis of the survey responses revealed several important findings with regards to these variables: Firstly, whereas MDT support seemed to impact more upon how ASI was processed, service leader support appeared to link more to how ASI was structured and resourced. 'MDT support/understanding' linked most directly with how ASI was perceived and implemented within the workplace. Where MDT colleagues valued intervention, survey respondents identified

Table 1. First Cycle Coding Results: Factors affecting ASI Implementation

Facilitators	Barriers	Future Supports
Access to resources	Limited access to resources	Access to Resources
Networking	Limited autonomy	Mentoring
MDT Support	Service user engagement challenges	Awareness / Understanding of ASI
Mentoring	Limited awareness / Understanding of ASI	Autonomy
Managerial support	Expert supervision limitations	Evidence base
Evidence base	Assessment-only service	Managerial support
Awareness / Understanding of ASI	Limited evidence base	Practitioner experience
Identified service user need	Limited practitioner expertise	Networking
Autonomy	ASI Practitioner isolation	
Practitioner Experience	Environmental challenges	
Ease of access to service users	Practitioner uncertainty	
Personal resources & motivation	"Not always the best modality"	
Care Pathways	Limited managerial support	
	Non-clinical roles	
	"Not practicing'	

to specialize and offer ASI formulations / interventions. In contrast, lack of MDT understanding deprioritized ASI intervention, and had the potential to reduce it to an assessment-only basis. Another important finding related to ASI practitioner independence: It was interesting to see how increased autonomy enhanced practitioner flexibility, however too much could lead to feelings of isolation. Expert supervision was identified as a desired future means to mitigate isolation but securing this on a consistent basis was acknowledged to be problematic, with many respondents identifying peer mentoring as a current support strategy. Table 1 displays the factors that survey respondents identified as influential to current and future ASI implementation.

The survey respondents identified many variables that impacted upon their ASI implementation. It is important to be aware that there are implementation frameworks and socio-economic theories available that we can draw upon to better understand the factors that influence ASI implementation, why they may be difficult to access, and how we can work with others to secure them. Sharing our factors for success and the challenges we face, and making visible to others the value, meaning and outcomes of ASI intervention may be the first steps to improving the effectiveness of our services.

References:

https://www.sensoryintegration.org.uk/page-18983#Ref5

Recommendations for Action

The following recommendations are based upon the study findings, and resource and implementation-based research used to provide context.

- Seek out implementation frameworks to help guide you to plan, implement and sustain ASI practice in your workplace e.g. i-PARIHS (Harvey and Kitson, 2016)
- Obtain consistent, expert supervision – where unavailable, seek out peer mentoring as an alternative
- Get involved in local ASI support networks, if they don't exist, try regional/ online support networks – or set up a local group yourself!
- If using online support networks for education / support – research suggests that relatively closed / organized groups may work better than open forums
- Create a communication strategy to improve others' understanding of ASI – make sure you communicate (Rogers, 2003)
- The 'relative advantage' of ASI (the extent to which ASI is perceived as improving existing practice) – this is one of the strongest predictors of how quickly an innovation is adopted
- 'Complexity' (make sure ASI is made easy to understand by others)
- 'Compatibility' (how ASI can fit with existing values, past experiences and client needs)
- 'Trialability' (consider proposals for how ASI could be trialled on an initial basis – this makes it more likely for teams to consider)
- 'Observability' (ensure that ASI outcomes are made visible to others)
- Secure senior managerial support – research has linked this to increased provision of resources and logistical support
- Actively enrol and work with stakeholders to decide how ASI will operate within the workplace – joint decision making is a powerful way to activate practice
- Engage service users as key stakeholders - research indicates that raising consciousness and working collaboratively with service users can effect positive organisational culture change and help to redress inequality / accessibility issues
- Get involved in building up the ASI evidence base and share your knowledge openly.

If you would like to find out more about the above research project, a copy can be accessed through the Royal College of Occupational Therapy library: A mixed-methods approach to investigate the implementation of Ayres' Sensory Integration® (ASI) by qualified ASI practitioners working with adolescents / adults / older adults in the UK. You can also contact Julia-Marie at marie.white@sensoryintegration.org.uk. Many thanks to Dr Greg Kelly, Ulster University, who provided academic supervision for the research study and to SI Education for providing funding and recruitment support. Huge thanks also to members of the pilot sample and to all those who responded to / participated in the study, who took time to provide valuable, considered feedback.

The Sensory Processing Measure 2

Diana Henry, one of the authors of the SPM-2 and author of the SPM Quick Tips, kindly shared more information about the new edition of the assessment due for release at the end of 2020. Diana's occupational therapy career began with the study of Sensory Integration in 1975 under the mentorship of Lorna Jean King, who expanded on the work of Dr. Jean Ayres. One of Diana's missions throughout the years has been to bring sensory integration and processing to the key stakeholders on the team: the parents, teachers, students, administrators and other health professionals. She began with Tools for Teachers, Tools for Students, the Tool Chest, and then collaborated on Tools for Infants, Tots, Parents, Teens and yes, even Tools for Pets.

Diana Henry

Diana's husband Rick, has been an instrumental member in her team and has accompanied her on the road for 11 years whilst teaching and educating about sensory integration. One of Diana's highlights from the recent AOTA Conference was meeting the SIE team where we had the opportunity to hear about the new SPM-2 assessment at the WPS stand with a special 'meet the author" session. It was wonderful to connect with Diana and we look forward to meeting again soon.

The SPM-2 - (Author(s): Diane Parham, Cheryl Ecker, Heather Miller Kuhaneck, Diana A Henry, Tara J Glennon)

The SPM-2 is an updated, norm-referenced assessment tool with substantial normative data, allowing for evaluation of sensory integration (SI)/ sensory processing, praxis, and social participation. The SPM-2 will have normative data on typically developing children and data for clinical samples. The SPM-2 systematically assembles information about sensory processing from infancy through adulthood in natural environments. It facilitates intervention planning across the lifespan using a team-based approach. Specific forms include those for infants, preschool age, school-age, adolescent, and adult ages. Each age range includes forms for varied informants (including caregivers, teachers, and self-report) which can be compared in varied settings (e.g., day care, home, school environments, and a driving form).

The restandardization of the Sensory Processing Measure, including the expansion of age ranges from birth through adulthood, allows occupational therapy practitioners the ability to systematically assemble information regarding specific aspects of sensory integration/ processing, including modulation, praxis, and social participation. Diana reported that updating assessments is normal practice in order to ensure that the assessment is moving with the times. While the authors have still kept many of the items on the SPM that therapists will be familiar with, many more items have been added to reflect the changes in children's play and occupations. Practitioners will appreciate the timeliness of such an instrument, thus contributing to their scholarship, currency in the field, and ability to support occupational engagement for individuals of all ages.

Practitioners rely on carefully

developed assessment tools to help them understand their client's performance concerns to develop effective interventions. To meet this charge, assessment of sensory processing skills in a variety of contexts is important. The SPM-2 allows OT practitioners to consider the sensory factors that might be impacting the occupations, personal interests, performance patterns, roles, routines, and patterns of engagement which were identified during the occupational profile portion of the OT evaluation as described on page 13 of the OT Practice Framework (AOTA, 2014), McGuire, & Metzler 2016).

Based on theory developed by A. J. Ayres, the SPM-2 helps the practitioner to discern whether sensory modulation or praxis issues are affecting participation from infancy through adulthood. The SPM-2 is a reliable and valid assessment developed through a rigorous psychometric process, suitable for clinical and research purposes, and supporting occupational therapy as a science-based profession. The tool is easy to administer and score using either paper or online administration, facilitating full inclusion of all team members.

Celebrating international friendships: Diana Henry & Lelanie Brewer connecting at the AOTA conference in New Orleans

The new SPM-2 provides practitioners with a reliable and valid way to gather information regarding sensory processing across the lifespan, with new forms developed for infants (including a parent form to understand the impact on co-occupations), adolescents (with self-rating, parent, and teacher forms), and adults, in addition to the previously available preschool and school age forms. Additional new forms allow rating of caregivers and the driving environment. New scale development allows for varied cross comparisons between raters providing a more comprehensive picture of a client's performance.

The SPM-2 allows for gathering of information about the impact of SI on family, school occupations and routines. SPM-2 raters provide information about an individual's responses and behaviors during feeding, hygiene, play/leisure, school activities, work, caregiving, driving, and other occupations throughout the day. For families of children with SI issues and comorbid autism spectrum disorder (ASD), the most common family- identified goals are ADLs and social participation (Schaaf et al., 2015), areas that the SPM-2 evaluates. Driving is another important occupation for social participation. Adolescents and adults with diagnoses such as ASD/ADHD frequently obtain driver's licenses, but they may struggle with driving (Curry et al., 2017). Use of the SPM-2 enables practitioners to assess SI issues related to driving and communicate how these issues impact driving performance.

During initial SPM development, a primary intent was to create a tool that could facilitate team communication across and between client environments. The new SPM-2 forms allow even greater collaboration between individuals involved in a client's life and care. Additionally, practitioners appreciate the significant impact of context specific information in order to understand the full scope of a client's functional engagement in life activities. The SPM-2 allows for greater understanding of a client's performance due to concurrent assessment in multiple contexts offered through the multiple SPM-2 forms. This allows for greater understanding of the impact of sensory contextual features on the client's performance. The concept of assessment within the natural environment is the core of our professional responsibility.

Diana explained the main driving force behind revising and expanding the SPM assessment:

The SPM was published in 2007 and the SPM-Preschool in 2010, over 10 years ago. It is best practice to update assessments and re-standardize to fit the changing times and demographics.

During the process, we as authors discovered changes related to the impact of new technology on play, school and work, so we had to update our items to fit. For example the use of tablets in many of the environments. We also wanted to expand the age groups to include individuals from across the lifespan. We have known for some time now that sensory processing challenges are often evident in infancy. We also now know that sensory processing challenges can be seen in adolescence as well as in adulthood. Knowing that plasticity continues throughout life as practitioners, we can help our adult clients better understand their sensory processing strengths and challenges so they can have an impact in their neurophysiological growth through the strategies, activities and environmental adaptations they develop.

Interested in contributing to the upcoming collection of strategies for the SPM-2 Quick Tips?

Would you like to share your favorite interventions/strategies that you use in practice? If yes, they can email Diana at SPM2QT@henryot.com

If your strategy is chosen, your name will be included in the acknowledgments section as a contributor to the SPM-2 Quick Tips.

Diana strongly believes that international collaboration leads to a rich variety of ideas.

Best of Luck!

Some important information:

- The SPM-2 will have both an online and paper format. For the online format, you can email a link to parent, caregiver or teacher and they can complete the assessment in this manner. The link will bring you through to a platform and you can track the person's progress on filling in the assessment form.
- There will be one comprehensive manual that will cover all of the forms across the lifespan.
- Therapists will have the option to purchase forms separately based on their clinical needs.
- There will be a way to compare record forms - for example if parents who are separated complete the home forms individually, there will be different ways to compare the reports meaningfully.

SPM-2 Quick Tips (Author: Diana Henry)

Empowering stakeholders when addressing SI within their individual contexts is critical, and the SPM-2 Quick Tips™ process answers this need [3]. AOTA [4], the Individuals With Disabilities Education Improvement Act of 2004 [5], and the Affordable Healthcare Act and Centers for Medicare and Medicaid Services policy [6] all identify best practice as involving the family in goal setting and intervention. When addressing SI the stakeholders are pivotal in supporting the child for improved behavioral and functional outcomes throughout the child's life, beyond the treatment room. In addition to clinic and school models, the SPM-2 Quick Tips clinical reasoning process makes it a natural fit for best practice in Data-Driven Decision Driven Making (DDDM) [7] so interventions continue throughout the child's normal routines.

Reference: https://www.sensoryintegration.org.uk/page-18983#Ref6

The SPM-2 Quick Tips focuses not only on the objective of addressing underlying deficits through ASI® intervention or sensory-based strategies but it also targets the following seven objectives:

1. Improve sensory- motor functions
2. Educate to support functioning
3. Promote self-advocacy and empowerment
4. Develop adaptations and accommodations
5. Use cognitive or behavioral strategies
6. Teach new skills
7. Address the sensory integration and processing patterns of others.

See the table included which expands on this in greater detail https://www.sensoryintegration.org.uk/resources/Documents/01J31%20SI%20Module%201/SPM-2QuickTipsObjectivesChart Draft6-24-19%20(1).pdf

This diagram provides a visual representation of the process involved in using the new SPM-2 online assessment and SPM quick tips. (Hippa secure - refers to data security when using the platform)

1. The therapist has the option to send an email to a parent or teacher which will include a link to the platform and not the assessment form. When the parent/teacher receives the email and clicks on the link, the form will then be shown. This avoids the need to send forms back and forth through email. You are instead emailing them a link and people work on the platform.

2. The online platform allows you to know if the person has opened the assessment, whether they have started to complete it, and when they have finished it.

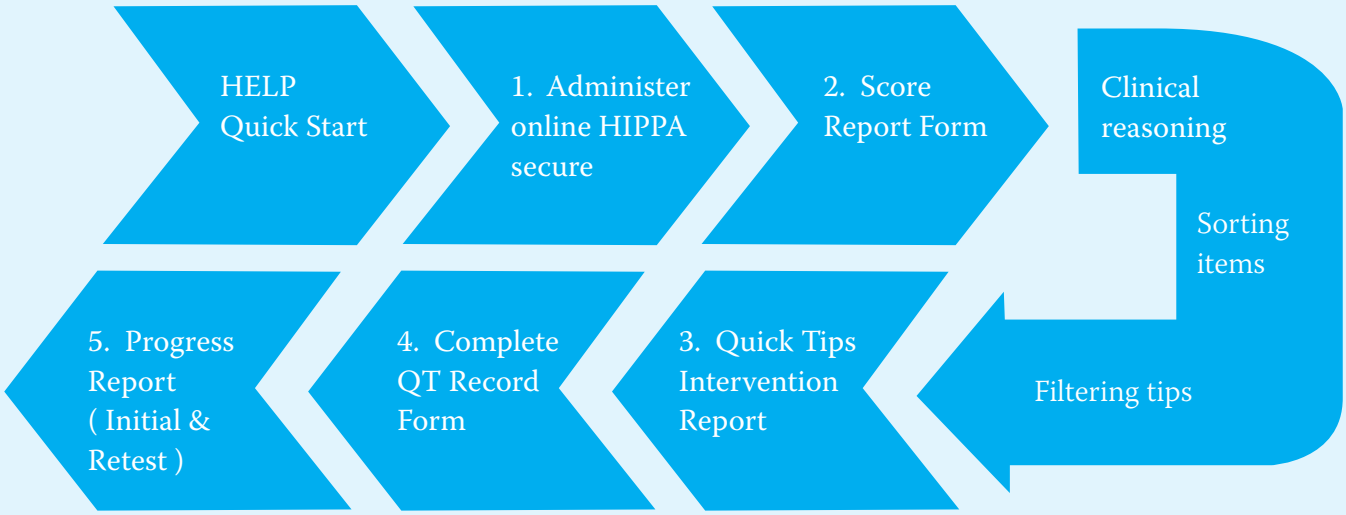
3. Once the assessment is finished, you can click on "score", and the assessment is scored automatically for you.

4. Once you receive the results, you can begin your clinical reasoning and you can refer to the SPM-2 Quick Tips which is another product available for online purchase.

5. This will integrate the results from each item of the SPM-2 together. Each item has several tips, and there is the choice to sort the tips by what it is you want e.g. you can sort all the tactile over responsive items and it will present the relevant tips related to this.

6. Once you click on the tips, it creates an intervention report form which explains why you selected the tips you did as it relates back to the items on the assessment. This ties in with explaining Data-Driven Decision Driven Making intervention. Informing caregivers that there is a reason why certain sensory systems are targeted and what drove your clinical reasoning is captured in this way.

ONLINE WORKFLOW



https://platform.wpspublish.com

AOTA Conference Round-up

Lelanie Brewer

Lelanie Brewer, Head of Education Programmes for Sensory Integration Education (SIE) provides us with her lightbulb learning moments from attending the AOTA Conference in April 2019. Lelanie attended this conference as a representative for SIE as well as presenting her own research related to her PhD, which she is currently completing through Newcastle University.

I was very excited in October 2018 once I found that two of my abstracts for poster presentations were accepted for the AOTA 2019 Annual Conference and Expo in New Orleans. From the moment that my abstracts were accepted, I was extremely impressed by the organisation and the professionalism of the conference. All abstracts were peer reviewed and scored by two reviewers. The feedback that I received from the peer review process was not only useful in relation to the preparation for the conference but also relevant to further developing my research ideas. Once sessions were confirmed by presenters, the AOTA conference organisers shared the full schedule in an app that could be downloaded by all delegates. Although all delegates were presented with a paper copy of the full conference schedule upon registration at the conference, I was impressed by how useful the app was to plan and manage my time at the conference. With more than 1600 educational and poster sessions, it was important to plan ahead to make the most of the experience. Therefore, my first take-away from this conference is that I can not recommend it highly enough for anyone (clinicians or academics) who want to present their work related to occupational therapy, or for occupational therapy practitioners who want to keep up with the latest research. Not only was the quality of the content outstanding but the sense of a community of practice was well throughout the conference. Further, I was also impressed by the breadth and depth of presentations and posters related to Sensory Integration and by how welcome we were made to feel by other delegates and the organisers.

An area that I was particularly interested in was to see the application of Ayres Sensory Integration and other sensory interventions in relation to improving participation in everyday life. I attended a session by Dr. Alexa Grief and Dr. Ashley Stoffel titled: "Using Participation and Occupation to Guide the Paediatric Occupational Therapy Process" which was useful to see how a sensory integration frame of reference could be used as a complementary model alongside occupation-focussed models when applying the International Classification of Functioning-Children and Youth (ICF-CY) in clinical practice. I was particularly struck by how challenges in sensory processing and sensory integration were recognised and integrated in many forms of practice as opposed to Sensory Integration

as a frame of reference being seen in isolation and not relevant to "occupation focused" practice. Practical application of sensory integration included topics from sensory-based programmes to improve self-regulation for veterans to sensory adapted dental environments to enhance oral care for children with Autistic Spectrum Disorders (Cermak). Sharon Cermak's presentation also made reference to the first Sensory Friendly airport in the world which happened to be Shannon Airport in Ireland. It was also pleasing to see the scope of SI practice in different clinical populations from infants to older people.

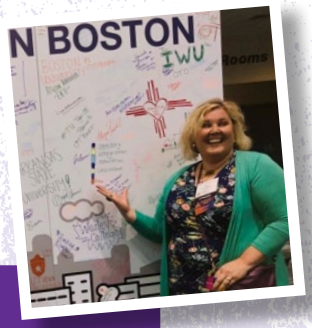
Another lightbulb moment for me was the technology used throughout the conference by presenters. As Head of Education Programmes, I am always interested in new ways that encourage learning and engagement in courses and presentations. Free WiFi was available throughout the conference venue for delegates which ensured that delegates with computers, tablets or smartphones could join in with any interactive activities or quizzes throughout conference presentations. Quizzes were used by presenters for a number of reasons including to get more information about the audience and their clinical experience, and to get feedback about specific aspects of a presentation. Feedback from one delegate regarding this included that in a room where several hundred delegates were present, participation in the online quiz made her feel more connected and part of the audience. This has inspired me to include this type of technology or similar for conference presentations in the future, and particularly for very large audiences where it can be more difficult to facilitate audience participation.

I was also surprised to see how seriously poster presentations were taken. There were dedicated time slots for posters and presenters were expected to stay with their posters for the full two hour slot. Most delegates made a point to go and see the posters and as a result many conversations and new contacts were made within the poster hall. I certainly didn't expect to be talking about my research on self-care in children for four hours (which was more than I would have in an oral presentation) but was delighted to talk to interested parties and have conversations about my work. It certainly made me reconsider the value of poster sessions. I would highly recommend applying for the poster session at the AOTA conference and Expo if you wanted to have more in depth conversations with a number of people about your work instead of a standard oral presentation where you don't always get feedback or questions.

References:

https://www.sensoryintegration.org.uk/page-18983#Ref7

Amy Stephens shares her highlights from the AOTA conference which she attended as a representative for Sensory Integration Education in April 2019.



Amy Stephens

I was overwhelmed by the sheer scale of the event: more than 10,000 delegates attending, dozens of parallel sessions, an exhibition hall bigger than a football pitch, so many posters that there was only space for each to be displayed for 2 hours – all in a conference centre spread over 4 floors and stretching for more than ¼ of a mile. This required the delegates to think and plan about what they wanted to get out of the conference for their own practice, and to tailor their schedules, being quite strategic in planning which sessions they wanted to attend. Unlike smaller European conferences, there weren't really plenary or "whole delegation" sessions. Instead they ran parallel workshops and short courses - ranging from 1-3 hours in length. This meant that the speakers didn't tend to run over by trying to cover a complex topic in a 20 minute time slot, allowing plenty time for questions at the end. I think from a learning perspective, there is a lot to recommend this approach.

One of the topics which wove through a number of sessions, and which I think is particularly relevant to us as ASI Practitioners, was the work of critically evaluating the evidence base and then translating and adapting that for practice. There was a strong emphasis on the risks (and ineffectiveness) of cherrypicking a few strategies here and there from different approaches, and then combining them all together. Instead, the call was to think clearly and critically about making adaptations to existing programmes in the face of new evidence, and to have a process for such adaptations. In Kari Burch's sessions on adapting published dementia support programmes, she referenced the work of Gitlin, Marx, Stanley, and Hodgson (2015) and Rolleri et al. (2014) as a good place for clinicians to start to create a protocol for their own settings. Stacey Reynolds and Hope Caracci talked about the issues and critical thinking in translating the evidence for ASI dosage into outpatient settings where there would be no possibility of seeing a client multiple times a week, while the bigger and most robust studies in ASI effectiveness are all modelled on high-intensity dosage (including Miller, Coll, and Schoen (2007), Pfeiffer, Clark, and Arbesman (2018) and Schaaf et al. (2014).)

My second take-away learning point is the emphasis on making support and training for families and caregivers a priority, shifting to more of an indirect therapeutic relationship with the clients, and instead working in a coaching and teaching role. This ranged from Bobbi Pineda's SENSE programme coaching parents of babies in NICU to manage their sensory needs, to Evan Dean and Winnie Dunn's work coaching young adults with learning disabilities and those who support them. This approach is used in other areas of practice, such as in Hanen/Parent-Child Interaction programmes in SLT, and is very much the model which Eadaoin Breathnach's Sensory Attachment Intervention uses to work with traumatised children and families. It brought home to me that as the evidence builds for the benefits of working with

and through key stakeholders as a priority for therapy, not as an "add on", it challenges some of the classical conceptions of ASI in set ups where a parent or teacher or care-worker might observe but does not participate.

And my third big learning point, which came up time and time again in different forms, was the encouragement for OTs (and by extension other AHPs) to see themselves as changemakers and influencers, actively advocating for their clients and for their profession. The incoming president of AOTA, Wendy Hildenbrand, used her inaugural address to emphasise this as an integral part of our professional roles as AHPs. We become agents of change by creating and nurturing strategic relationships; by building our personal and professional resilience; and by committing to innovation to assure our relevance in a changing field of health and human sciences. One of the things which particularly struck me was how integrated the understanding of sensory processing was across so many clinical areas – clinicians made reference to clients' sensory processing and integration, even if that wasn't their intervention focus, rather than seeing SI in its own little silo. It made me realise what a great job our American counterparts have done in advocating for SI throughout professional bodies and networks, and how the challenge continues for us in Europe to explain the sensory piece running through so many areas of practice.

Other things which struck me at the AOTA conference was the warm welcome, support and friendliness which we received as the representatives of Sensory Integration Education, with genuine curiosity and interest from so many international ASI experts about what's happening in other countries, in other professions, and in other settings. It made me feel how connected we are, as ASI therapists, to the global community of practitioners.

ESIC 2019 Round-up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The 6th European Sensory Integration Congress 2019

Annie Sampsonidis

Annie Sampsonidis, tells us about her role in hosting ESIC in Thessaloniki, Greece and how she is determined to keep the tradition of the ESIC alive.

Ms. Anna Sampsonidis MA, OTR, is an occupational therapist who graduated from New York University with a professional graduate degree in occupational therapy. Prior to moving to Greece she worked as an occupational therapist in the USA, predominantly in pediatrics and neonatal care. She was an instructor for the University of Southern California & Western Psychological Services training program in Sensory Integration and was also a presenter in several EBTA basic NDT courses on occupational therapy subject areas. She has been an invited speaker for the post graduate programs for the Department of Educational and Social Policy of the University of Macedonia in Thessaloniki, Greece and for Nova Southeastern University in USA. She has presented in various professional conferences and educational seminars on different issues regarding pediatric rehabilitation and is associated as an advisor with different centers in Greece and Cyprus. She maintains continuing collaboration with the University of Southern California, Department of Occupational Science & Occupational Therapy in hosting the continuing education training and certification program in Sensory Integration in Greece. She is a founding member of the Hellenic Scientific Society for Sensory Integration (EELEAO) which represents Greece in international collaborations of similar organizations for the promotion and research of Sensory Integration. Ms. Sampsonidou is the programme leader of the Occupational Therapy Department at Metropolitan College, Thessaloniki campus since 2014. She has co-authored several articles on occupational therapy and pediatric practice. Having approximately 30 years of experience in clinical practice she is also co-owner and coordinator of the professional & scientific development of the 2 pediatric therapeutic clinics, "Syn-Ergasia, Therapeutic Intervention", located in Northern Greece.

SN: Can you explain what this year's congress theme "Translating Sensory Processing into Quality of Life in Various Environments" means?

AS: Well, in looking at the trend in effectiveness studies we noticed that there is a tendency to focus more on the improvement of skills at the body level rather than at the participation level. This in combination with the narratives from parents about the effects of sensory processing & sensory integration intervention in their everyday life, made it clear that this is a relationship that needs to be emphasized and investigated. Also, there are now a variety of ways to apply sensory integration principles outside a clinical setting and we decided to add that to the theme as well, and invite innovators to show us their work.

SN: Tell us about your role in bringing this congress together from vision to reality?

AS: The congress was initiated by Elisabeth Soechting in Austria in 2003 and has evolved into a tradition for Europe. When we were asked to organize the next ESIC we gave a positive response and vowed to make it an exceptional one. We worked hard to make it happen and we felt maximally rewarded when we received such positive feedback.

SN: You had quite the line-up of presenters this year – tell us about this selection and what they are offered.

AS: Our goal was to make this ESIC an example of good collaboration and a gold standard of including all the major players who are advancing Sensory Integration (SI) theory including application of SI principles and producing evidence through research. We invited representatives from the different groups and institutions and were very lucky to have them accept and be part of this congress.

SN: How do you think SI affects quality of life?

AS: I believe that the issues related with modulation as well as those associated with motor performance can affect the individual and the family on an activity and participation level. These restrictions can occur in everyday life participation. An individual may avoid exposure to certain activities or environments in order to avoid either a motor challenge or a sensory overload which can affect the quality of life of those around the individual with sensory processing issues.

SN: Tell our readers more about the Hellenic Scientific Society for Sensory Integration? What does this organisation stand for (values, beliefs, work completed?)

AS: The Hellenic Scientific Society for Sensory Integration (ELEEO) evolved from our attempt to create a reference point for anyone seeking for more knowledge and education about sensory integration. It is named a 'Scientific Society' because we wanted to give emphasis to the nature of the organization. The mission of ELEEO is to promote quality and up to date education in Sensory Integration as well as promoting common knowledge of SI in the general population. We aim to collaborate with leaders in SI education in different countries as well as other educational programs. We have goals that include research & replication studies that will be more in our scope in the upcoming future. We have done some pilot studies that are pending publication. We also have plans to promote publications (translated or new). It has been a slow process but we are finally blooming and reaching our goals as well as forming new ones.

SN: What is the state of SI currently in Greece?

AS: Although Sensory Integration is popular in Greece, as in every other country it can be overused to explain certain behaviour, especially in the ASD population. There is the common practice of over-simplifying the theory in order to make it available to everyone which puts emphasis on protocols/strategies that relieve symptoms for a period of time. Although this practice increases the popularity of SI, it creates the notion that this is all it is, and incorrectly equates sensory integration with sensory strategies. Our goal is to promote education on the different ways that the appropriate sensory experiences can enhance our lives and differentiate these from the individualized treatment. We also have a mission to provide high level education to professionals.

SN: What do you hope to achieve from this congress?

AS: Well initially to show that the European Sensory Integration Congress is an important event for all the European countries and that it shouldn't cease to exist. Also, it was important to showcase all the different perspectives and the work that is being carried out throughout Europe and the SI world. This and every congress should be about sharing new ideas and achievements and respecting all the relevant work that is done by our colleagues in all the different working

groups in the world. For us there is no better and worse, there is only variety of work that can complement SI theory, evaluation, and intervention.

SN: Tell us the importance and significance of the pre-congress workshop on "Blending Sensory Integration with other Approaches."

AS: The reality is that most of the time in our clinical intervention we are blending approaches. This is done automatically and without reflection towards our clinical reasoning. There are many diagnostic categories (of course ASD being a major one) that require more than just one approach. Many individuals have expressed the need to talk about the blending process and the issues that we need to pay attention to. Erna Imperatore Blanche, Clare Giuffrida and Mary Hallway have been editing a book that will be coming out possibly by the end of 2019 on this subject. I therefore asked them to do this workshop for us because it was a good match for this congress and a relevant issue for practice.

SN: What is your greatest challenge in terms of SI practice, accessibility and research in Greece currently?

AS: Our greatest challenge is that we don't have a great amount of therapists with post graduate degrees that can initiate and carry out research. We don't have post graduate educational programs in occupational therapy and therefore those that do go on to post graduate studies, do so in a different field. This limits their subjects of research to more generic areas rather than focused on occupational therapy or sensory integration. Once most therapists finish their training in sensory integration we are not sure how they proceed with applying the intervention principles in their daily practice.

SN: What were your ESIC highlights?

AS: The highlights seem to have been the workshops from the various teams and some of the keynote speakers. Namely, Virginia Spielman and the entire team from the Star Center, Lucy Miller, Shelley Mulligan, Sara Schoen. The USC presence was very powerful. It was also very interesting to hear about the EASI project updates from Dr. Zoe Mailloux. However, besides all these great names and work, I think the most impressive presentations were in the last session of the congress. The work of teams in taking the principles of sensory integration into nature and everyday life through participation and the arts, I believe is quite inspirational. These presentations (M. Protopapadaki & Kivotos Center) serve as examples to all of us to utilize SI principles in everyday life in order to promote the quality of life.

ESIC 2019 Bursary Awards

Rebecca Matson

We hear from the three Sensory Integration Education members who presented their research at this year's ESIC.

Rebecca Matson is a Head Occupational Therapist for a site called Cygnet Delfryn in Mold, North Wales which has both male and female adult mental health rehabilitation units. She completed her SI module 4 in June 2018. As part of her MSc in Sensory Integration through Ulster University and SIE, she is currently conducting her research project exploring the use of sensory strategies in female mental health. Rebecca is also interested in completing training in trauma related approaches. Rebecca received a travel bursary award from SI Education to attend ESIC and present an oral presentation on a case example of trauma and Ayres Sensory Integration.

I began working with Jo*, a 53-year-old patient on a mental health rehabilitation unit, while completing my Sensory Integration module 4: Advanced Treatment. Jo presented with poor self-regulation, including a history of fire setting, self-harm and sleep difficulties, but also with prominent motor difficulties. Jo experienced high levels of frustration at feeling misunderstood, describing how people would see her trip and bump in the community and assume she was drunk, or think she was being awkward when she needed to leave a place due to the noises that to everyone else went unnoticed, but to her caused distress.

The more I worked with Jo the more it became apparent that the trauma she experienced in childhood was a big part of the picture. During her early childhood years Jo suffered neglect, sexual and physical abuse all of which trauma literature suggests are likely to have impacted significantly on her sensory processing and motor development.

The assessment process in itself provided some validation for Jo to know that her need to flee places or move away from people could be connected to auditory and tactile hyper-responsivity, that her discomfort in hugging her daughters could be connected to poor tactile discrimination, and that her tripping and bumping could be connected to her gravitational insecurity and poor body scheme, not a need to "be more careful" as she reported often being told in childhood. Goal Attainment Scaling (GAS) was used to focus priorities and connect these to functional areas of concern for Jo. From there the ASI sessions were planned.

ASI® therapy is so different to

approaches normally used within the setting of an adult mental health rehabilitation unit but that is perhaps what supported Jo's motivation to engage with the twice weekly sessions. The playfulness of the approach allowed Jo to experience play for herself; her main recall of play being with her children not from her own childhood, while attaching more positive experiences to difficult sensations and engaging Jo's competitive spirit. Sessions became a partnership where I was with her in the challenges of sessions while asking her to tackle the difficulties that had led to further trauma as a child being "told off" for her clumsiness.

By the end of the course of 12 sessions, Jo had made progress in three of her four GAS goals. Sensory assessments including the Adult Adolescent Sensory History and Clinical Observations reflected improved postural control, gravitational security and body scheme. Jo showed improvements in self-regulation with decreased use of PRN (as required) medication, a decrease in incidents of self-harm and improved sleep pattern. While Jo's overall somatosensory processing showed improvement, tests of tactile discrimination and modulation did not correlate with the final GAS goal which showed no improvement of feeling comfortable when hugging her daughters. This suggested that Jo's perception of tactile input had improved but her ability to regulate this input was still a work in progress. The connection between touch experiences and memories of specific traumatic experiences may have made strategies usually utilised to treat tactile hyperreactivity less effective.

Recommendations

- There needs to be more focus on bodily-based and bottom up approaches for trauma.
- ASI® has potential as an intervention for trauma to improve sensory processing, self-regulation, functioning and participation.
- There is a need for formal studies into the use of ASI with trauma.

Learning points

- "Play" needs to be given more focus when working with adults, particularly trauma survivors whose "energy now becomes focused on suppressing inner chaos, at the expense of spontaneous involvement in their life" (Van der Kolk 2014).
- The importance of humility as a therapist is significant. We never stop learning and our patients have so much to teach us. We can become so focused on "doing" therapy that we can forget to be in the process with our patients and to let them guide us.
- Don't be tempted to skip the education – one of the main catalysts in progress for Jo was the assessment process that gave her answers for many of the problems she had experienced for years.

References:

https://www.sensoryintegration.org.uk/page-18983#Ref8

Angeliki Drougka has 21 years of experience in clinical practice as an occupational therapist. She obtained her Science in Occupational Therapy (BA) at Athens Technological Educational Institution, School of Health Science. In 2009, eager to delve deeper into Sensory Integration theory and practice, Angeliki joined the Sensory Integration Education UK & Ireland and sought to combine extensive training with clinical supervision. She is an Advanced Sensory Integration Practitioner and has successfully completed her masters of Science in Sensory Integration through Ulster University. Her MSc Research Project focused on the exploration and evaluation of the evidence associating sensory processing disorders with anxiety in diverse populations.

Angeliki Drougka

Angeliki runs 'Exelixi Center", a private practice in Argos City in Peloponnese, Greece. It is a multidisciplinary service providing comprehensive evaluation and intervention for children and adolescents with developmental, learning and mental problems. She is particularly interested in combining different approaches for children with ASD, including Ayres Sensory Integration, sensory-based interventions, Floortime, Applied Behavioral Techniques and Cognitive Behavioral Therapy.

She has recently joined the SI Module 3 Clinical Mentor Register providing clinical mentoring sessions and supporting Sensory Integration postgraduate students gaining SI intervention experience. Angeliki was funded by SIE to attend ESIC and present her literature review as an oral presentation at the congress in Greece.

Purpose of the presentation:

- To show how Sensory Processing Disorders (SPDs) and anxiety/anxiety disorders affect quality of life, which was the main focus of the ESIC 2019.
- To offer insight into the patient's and parent's experience of sensory abnormalities with comorbid anxiety.
- To present the systematic review of the literature that focused on exploring and evaluating the evidence of the association between SPDs and anxiety/anxiety disorders.

Methods

A systematic search of four electronic databases (MEDLINE, Embase, PsycINFO, ERIC) was undertaken in April 2018. In total, 1674 references were identified and screened against a set of pre-specified eligibility criteria.

37 studies were included in the final stage of analysis. 46% (17) of them were classified as Level II and 54% (20) were classified as Level III evidence. The retained papers were rated using the Standard Quality Assessment Criteria for Evaluating Primary Research Papers from a Variety of Fields - Checklist for assessing the quality of quantitative studies (Kmet et al., 2004). In addition to the quality assessment scores, evidence synthesis was conducted by consideration of population categories, study design, sample size and accuracy of the reported results.

Findings

Summary for the body of studies:

- All studies reported a consistent, statistically significant association between SPD and anxiety
- Most correlations referred to low threshold patterns of sensory processing

- Significant correlations were reported between anxiety and high threshold sensory patterns in six studies
- Limited evidence in regard to the association of SPD and specific anxiety disorder subtypes.
- Further, main findings were presented by diagnostic groups. The evidence was moderate for participants with ASD, insufficient for participants with ADHD, limited for subjects with Affective Disorders and limited for healthy/non-clinical individuals (Grade Definitions - US Preventive Services Task Force)

Discussion

- Findings do not establish causality
- Individuals with developmental conditions or chronic mental health problems are more likely to exhibit sensory symptoms and anxiety.
- Subjects with ASD compared to those diagnosed with other developmental conditions exhibit indications of sensory over responsiveness (SOR) and anxiety more frequently.
- The association exists beyond clinical categories
- SPDs appear to be strong predictors of several functional outcomes: repetitive behaviors, sleep problems, eating problems, gastrointestinal problems.
- Anxiety explained a series of psychological and emotional variables: intolerance of uncertainty, self-esteem and social acceptance, perceived social supports and parenting stress.
- Limited evidence from one prospective study (Green et al. 2012) involving infants with ASD: SOR emerges earlier and remains relatively stable over time / may predict increases in anxiety.

Limitations

One significant limitation was that the electronic literature search was not supplemented by a hand-search to ensure that all relevant articles on the topic were identified. Secondly, the lack of parallel independent data assessment in each stage, from screening through data extraction, reduces the overall reliability of the project.

High heterogeneity between studies was found, in terms of different diagnostic and age groups, different behavioral constructs assessed, great variability in the outcome measures, dissimilar methods defining exposures and outcomes. In addition, consistent methodological issues were noticed: the majority of the designs were underpowered, with systematic differences in the baseline characteristics of groups, recruitment or selection bias and systematic differences in outcome assessment (blind or objective assessment) measurement or detection bias.

Implications for practice and future research

A deeper understanding of the mechanisms explaining the associations between SPD and anxiety would be of great public health significance. Advancing the evidence of this co-occurrence could lead to improvements in treatment strategies, in that, addressing more integrative approaches for both areas of defect would enhance the therapeutic response of patients with anxiety disorders.

In the present context, occupational therapists working with children with difficulty processing sensory information should be aware that their clients may be at increased risk of developing anxiety. They should, therefore, become more vigilant with regard to not dismissing symptoms of anxiety and be able to build up a network of contacts that communicate and manage potential outbreaks of anxiety.

Subsequently, health care providers working with patients with affective disorders should become more open to consdering the value of requesting for prescribing an SPD evaluation for their clients.

The review warrants more precise estimates of the association between SPD and anxiety. Informed decisions in public health and clinical practice require methodologically sound epidemiological studies with appropriate allocation and blinding procedures that also consider exposure and outcome assessment from measured data. Researchers should also consider viewing anxiety as the independent variable in future studies, as this kind of research is limited. Further to this, more high-quality prospective studies are recommended in order to enlighten the temporal relation of SPD and anxiety. Finally, where feasible, future randomized control interventional studies using a replicable intervention protocol with adherence to Ayres Sensory Integration principles could include measures of anxiety in order to clarify potential causal links.

References:

https://www.sensoryintegration.org.uk/page-18983#Ref9

Alison Double is a senior lecturer at the University of Worcester, teaching on the undergraduate occupational therapy programme. She is also a clinician working in special schools, using the theory of Sensory Integration to frame her practice. The presentation she gave at ESIC 2019, which she received a bursary from SIE for, bridged her roles as an academic and a specialist clinician. Her presentation entitled "How can Football Stadiums be more Autism Friendly" discussed one of her greatest passions as an occupational therapist, which is sensory processing. It explored how the occupation of going to see your favourite team play football can be impossible with a diagnosis of autism, due to the sensory challenges that the environment of a stadium creates. Alison shares her presentation with you, the readers.

Alison Double

The focus of the conference was 'Using Sensory Integration to enhance quality of life'. When I saw this advertised last November, I felt that this theme encapsulated my research topic well. The majority of children and adults with autism have difficulties processing information from their senses in everyday life, and the nature of a football match and entering the environment of a stadium makes this hugely challenging. The scoping exercise and research that I presented at ESIC was carried out by myself and a special needs teacher, Jodie Fotheringham, at Hamilton School (Birmingham), along with two Occupational Therapy Students (Lois Connelly and Frances Rodgers), from the University of Worcester.

About the research

Families with children who have autism frequently miss out on social and leisure activities, due the child's condition. Autism can effect children's social and emotional development and the ability to process sensory information in unfamiliar and unpredictable environments, often resulting in behavioural difficulties. These make attending social and public events problematic and inaccessible to families of children with autism.

There is increasing interest in developing autism friendly football stadiums to support these families to participate in football events. In 2017, Redknapp highlighted the need for football stadiums and clubs to become 'autism friendly', supporting the important role that football clubs can play in providing "a perfect opportunity for children who often feel like outsiders to become part of a group, strengthen bonds with family and even form new bonds with fellow fans". Autism Wessex (2018) published suggestions for autism friendly football clubs, including training for stewards, quiet rooms for people who feel overwhelmed, and videos showing routines, acknowledging that every stadium and club will have its individual challenges that need to be assessed and addressed.

West Bromwich Albion have established a quiet, sensory space to provide a retreat for people with autism and similar conditions, however, this room

does overlook the stadium and is therefore not often used during matches.

This research project set out to gather evidence to support autism friendly football and to evaluate the sensory barriers of the stadium environment. It also identified effective individualised strategies to enable children and their families to attend matches, and made recommendations of how to make the best possible sensory spaces within a stadium. West Bromwich Albion ground have since made some changes to their stadium based on the recommendations.

What next?

This summer we will seek to publish our results so far. We will also continue to work with West Bromwich Albion using 'Action research' to identify ways that families can be introduced to football with strategies in place. The 'icing on the cake' will be if we can get to work with the Football Association regarding a set of 'standards' that clubs should adhere to be 'Autism Friendly'. This is our dream, so that we can ensure that all stadiums consider the small things that can make a big difference to a person with autism who is trying to use sensory regulation strategies in an overwhelming environment.

Having the opportunity to travel to the conference was fantastic, and I would like to thank Sensory Integration Education for the bursary which helped to make this possible. I would also welcome contact from anyone interested in knowing more about the research we have carried out so far (a.double@worc.ac.uk).

sensory integration education

SIE Research Awards

Robust evidence in support of Ayres' sensory integration is critical. Sensory Integration Education is committed to supporting the development of research in SI.

You can make an essential contribution to this evidence base:

Has Ayres' SI changed the lives of those you work with?

Has Ayres' SI impacted on your life?

Has Ayres' SI changed how you provide services?

Research in Ayres' SI Integration and related approaches is being done, but we need more.

Contact us for Researcher Support from our Researcher Support Committee:
We can support the development of researcher capability in Ayres' SI knowledge and practise for Novice Researchers, Early Career Researchers and Advanced Researchers.

Contact us for Research Study Support:
SIE can provide support for UK/Ireland Research Studies related to Ayres' Sensory Integration

- SIE Research Award Information
- MSc Projects - £5,000
- PhD Projects - £5,000
- Small Projects Award - £7,000
- Dissemination Award - £3,000
- Opportunities to access potential study recruits

www.sensoryintegrationeducation.com/research

Research updates

Gemma Cartwright

Bringing the most recent SI research to you. Click on the hyperlinks below to read about new research relating to sensory integration across a number of sectors. Share with your colleagues, friends and clients.

Mental health

Link to Mental Health research resources on our website: https://www.sensoryintegration.org.uk/(Resources)-Mental-Health-Research

Impact on occupation

Link to Impact on Occupation research resources on our website: https://www.sensoryintegration.org.uk/page-18978

Assessment

Link to Assessment research resources on our website: https://www.sensoryintegration.org.uk/page-18436

Neuroscience

Link to Neurosicence research resources on our website: https://www.sensoryintegration.org.uk/page-18260

Autism

Link to Autism research resources on our website: https://www.sensoryintegration.org.uk/page-18437

Diverse populations

Link to Diverse Populations research resources on our website: https://www.sensoryintegration.org.uk/(Resources)-Diverse-Populations-Articles-&-Research

Intervention

Link to Intervention research resources on our website: https://www.sensoryintegration.org.uk/page-18313

Aetiology

Link to Aetiology research resources on our website: https://www.sensoryintegration.org.uk/page-18980