

**A PILOT STUDY OF THE EFFECT OF A SENSORY DIET ON THE IN-SEAT
BEHAVIOUR OF GRADE ONE LEARNERS IN THE CLASSROOM.**

Maria Demopoulos

A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, in fulfilment of the requirements for the degree of Masters of Science in Occupational Therapy.

Johannesburg, 2009

Declaration

I, Maria Demopoulos declare that this research report is my own work. It is being submitted for the degree of Master of Science in Occupational Therapy in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other University.

Maria Demopoulos (Signature of Candidate)

25th day of February 2009

Dedication:

I am honoured to recognise my parents, the late Panayioti and Panayiota Demopoulos; relatives who have been second parents to me, John and Natalie Philippedes and Lyle and the late Maro Edelstein as well as my siblings, Despina and Dino Demopoulos, Chris Philippedes and Zarko and Maria Mitjatovic, as the individuals that inspired this research.

They have deeply touched my life with their dedication to their family. Their perseverance to meeting and overcoming life's challenges is my source of inspiration, safety and strength.

Abstract:

Children with difficulties in processing sensory input often have difficulty in maintaining an optimal level of arousal for learning when seated in the multisensory busy classroom. Occupational Therapists (OT) commonly function as consultants to assist teachers to develop strategies to help promote the classroom performance of these students. This pilot study used a simple pre-test post-test quasi-experimental research design to analyse a classroom intervention strategy (sensory diet) recommended to teachers by OTs to promote an appropriate level of arousal for these children. Trends of decreased undesirable (distractibility, poor task execution; impulsivity, working too fast, poor planning) and increased undesirable (restless, overactive and fidgety, disorganized on self and in work, difficulty getting down to work, slow work pace) in-seat behaviours were noted. However, all trends were not found to be statistically significant. Implications of these results for therapists working with students with SPD and their teachers are discussed.

Acknowledgements:

The process leading to this research report has been challenging and enriching. I want to express my sincere gratitude to many people helping and supporting me in this process:

- First of all I would like to thank the participants of this study, Mrs. Gail Whelan along with her first grade students and class facilitators at Cedarwood School for allowing me to observe a part of their lives. This research rests upon their participation.
- I also thank Cedarwood School for their cooperation with this study.
- I recognize and thank my supervisor and co-author, Mrs. Denise Franzsen, for her guidance, time, patience and valuable contributions to my work.
- I thank Dr. Rosemary Crouch who has always been there when I needed help and support. I thank Mrs. Stefanie Kruger- your extensive knowledge with respect to the child development has been a great help and inspiration. I greatly appreciate the assistance I received from Mrs. Paula Barnard-Ashton in understanding children with Sensory Integration difficulties and in mastering computer technicalities. I would like to especially thank the Research Support Section of the School of Therapeutic Sciences at the University of Witwatersrand for their valuable help and encouragement received during the writing retreats and support group meetings. Their thoughtfulness and warm encouragement has kept me going and helped me immensely during the whole process.
- My close friends, Jennifer Hooper and Kathy Schwenke, you are great, thank you for many laughs, tears and shared experiences! Your encouragement and never-ending support has been a constant source of inspiration to me.
- I would like to extend my gratitude to the observers Nadia Cusack and Lisa Barrett, without whom there would have been no research analysis.
- I gratefully acknowledge Professor Bakker for his assistance with the statistics.

- Whilst completing my Masters degree I have worked as a clinical Occupational Therapist at the Child Integration Centre and at Land of Oz. I have received a lot of encouragement and support there, for which I am very grateful.
- To my love, George, for always believing in me and caring for me. I thank you for your love, gentleness, support, kindness and willingness to let me grow. Rock and water.
- My dearest family: Natalie, John, Lyle, Despina, Dino, Chris, Maria, Zarko, for endless support and encouragement, and my two nephews, Aleksander and Nikola, for the joy of watching them grow and sharing their days. To my dear mother Panayiota, we all know that I could not have done this without you! To my two role models, my late father, Panayioti, and late aunt, Maro, for showing me the joys of life in the face of obstacles. You are always with me in my thoughts and my heart.

TABLE OF CONTENTS:

	Page
DECLARATION	ii
DEDICATION	iii
ABSTRACT.....	iv
ACKNOWLEDGEMENTS	v
TABLE OF CONTENTS.....	vii
<u>Chapter One: Introduction</u>	1
1.1 Introduction	1
1.2 Statement of the Problem.....	2
1.3 The Purpose of this Study.....	2
1.4 The Aim of the Study	3
1.5 Objectives of the Study	3
1.6 Justification of the Study.....	3
1.7 Nul Hypothesis	3

Chapter Two: Literature Review	4
2.1 Introduction	4
2.2. Sensory Integration	4
2.2.1. Sensory Processing Disorder (SPD).....	5
2.2.2 Sensory Modulation Disorder.....	7
2.3. Diagnostic Groups Showing Prevalence of Sensory Processing and Sensory Modulation Disorders.....	9
2.3.1 Learning Disabilities (LD)	10
2.3.2 Attention Deficit Hyperactivity Disorder (ADHD)	10
2.3.3 Autistic Spectrum Disorder (ASD) or Pervasive Development Disorder (PDD).....	11
2.3.4 Anxiety-related Disorders.....	12
2.4 Measurement of Behaviour Related to Sensory Processing	12
2.4.1 Short Sensory Profile (SSP)	13
2.4.2. Daily Behaviour Assessment Scale	14
2.5 Factors Influencing Treatment of Sensory Modulation Disorder	14
2.5.1 Medication	14
2.5.2 Diet	16
2.5.3 Sleep	16
2.5.4 Stressors	17
2.6 Occupational Therapy for Sensory Modulation Disorder	17
2.6.1 Sensory Diet.....	17
2.6.2 Effectiveness of Therapy	20
2.7. Conclusion.....	26

Chapter Three: Research Methodology	28
3.1 Introduction	28
3.2 Research Design	28
3.3 Sample Selection	29
3.4 Ethical Considerations	30
3.5 Measurement Techniques.....	31
3.5.1 Short Interview Questionnaire (Appendix Vi).....	31
3.5.2 The Short Sensory Profile	31
3.5.3 Pre-Test and Post-Test Videos.....	32
3.5.4 Daily Behaviour Assessment Scale	33
3.5.5 Measurement of In-Seat Behaviours.....	33
3.6 Research Procedure and Data Collection	34
3.6.1 Pre Test Phase (No Intervention)	35
3.6.2 Intervention.....	36
3.6.3 Post Test Phase.....	36
3.6.4 Control of Extraneous Variables	37
3.7 Data Analysis	37
3.8 Conclusion	38
Chapter 4: Results	39
4.1 Introduction.....	39

4.2	Demographics	39
4.3	Sensory Profile.....	40
4.4	Therapies.....	44
4.4.1	Therapy and Medication	44
4.4.2	Specialised Assistive Devices	45
4.5	Significant Stressors	46
4.6	Sleeping Patterns and Nutrition	47
4.7	Comparison Pre and Post Intervention	47
4.8	Conclusion	54
<u>Chapter 5: Discussion</u>		55
5.1	Introduction	55
5.2	Demographic Data and Sensory Profile of Grade One Learners in Special Needs School.....	55
5.3	Extraneous Variables Impacting on In-Seat Behaviours.....	60
5.4	The Effect of a School Based Sensory Diet Intervention on Grade One Learners' In-Seat Behaviour During a Handwriting Lesson	66
5.6	Limitations Of Study And Directions For Future Research	72
5.7	Conclusion	74
<u>Chapter 6: Conclusion</u>		75

Reference list78

Appendices91

LIST OF FIGURES.....XI

LIST OF TABLES.....XII

OPERATIONAL TERMS.....XIII

LIST OF ABBREVIATIONS.....XIIIV

LIST OF FIGURES:

Figure		Page
2.1	Relationship between sensory processing and temperament	9
4.1	Frequency of overall sensory processing difficulties from sensory profile	41
4.2	Comparison of the sensory profile of participants with psychiatric conditions	42
4.3	Comparison of the sensory profile of participants with learning difficulties	43
4.4	Degree and type of specialised programmes participants are receiving	45
4.5	Significant stressors participants were experiencing	46
4.6	Pre and post test comparison of in-seat behaviours in participants with learning difficulties	48
4.7	Pre and post test comparison of in-seat behaviours in participants with psychiatric conditions	48
4.8	Pre and post test comparison of in-seat behaviours in participants with no specified diagnosis	49
4.9	Pre and post test comparison of in-seat behaviours in participant with asthma	49
4.10	Comparison of mean percentages of behaviours present pre and post-test	51
5.1	Relationship between neurological threshold continuum and self regulatory strategies	58

List of Tables:

Table	Page
4.1 Summary of Participants Demographics at Pre-test	41
4.2 Percentage of rehabilitative and habilitative therapy and pharmacotherapy received by the participants	44
4.3 Sleeping patterns and consumption of sweets of participants	47
4.4 Parametric and non-parametric comparison of pre and post test scores	52
4.5 Comparison of the number of observations in a period of time intervals	54

Operational Terms:

1. Adaptive response: A successful response to an environmental challenge.¹
2. Sensory Integration: a complex set of processes (including modulation, perception and practice functions) in the central nervous system organising sensation for use. This term also refers to a frame of reference for treatment of children who have difficulty with these neural functions.²
3. Sensory Processing: handling of sensory information by neural systems including the functions of receptor organs, peripheral and central nervous systems.²
4. Sensory diet: the daily total of sensorimotor experiences needed by a person to adaptively interact with the environment.³
5. Sensory Modulation: the intake of sensation via typical sensory processing mechanisms such that the degree, intensity and quality of response is graded to match environmental demand and that a range of optimal performance/adaptation is maintained.⁴
6. Responsiveness: behavioural manifestation of sensory modulation. The individual with a sensory modulation disorder may behave with under-responsivity or over-responsivity to sensory input.⁵
7. Self regulation: coping mechanisms employed by an individual which are calming and organising for the central nervous system.⁵

List of Abbreviations:

- Occupational Therapy (OT)
- Sensory Integration (SI)
- Sensory Processing Disorder (SPD)
- Reticular Formation (RAS)
- Sensory Processing Disorder (SPD)
- Central Nervous System (CNS)
- Autonomic Nervous System (ANS)
- Sensory Modulation Disorder or Disruption (SMD)
- Dorsal Column Medial Lemniscus (DCML)
- Diagnostic and Statistical Manual Text Revised (DSM-IV-TR)
- Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood (DC: 0-3R)
- Regulation Disorders of Sensory Processing (RDSP)
- Attention-Deficit Hyperactivity Disorder (ADHD)
- Autistic Spectrum Disorder (ASD)
- Pervasive Developmental Disorder (PDD)
- Learning Difficulties (LD)

- Sensory Integration and Praxis Tests (SIPT)
- Short Sensory Profile (SSP)
- Electrodermal reactivity (EDR)
- Rapid Eye Movement (REM)
- Randomised Control Trial (RCT)
- Standard Deviation (SD)
- Incidence Rate Ratio (IRR)