

**PARENTS, EDUCATORS AND CHILDREN:  
PERCEPTIONS ON DYSPRAXIA**

by

Carli van Staden

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Department of Occupational Therapy  
Faculty of Health Sciences  
University of the Free State  
South Africa

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Supervisor: Mrs A. van Jaarsveld

# DECLARATION

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I hereby declare that the dissertation entitled

**'PARENTS, EDUCATORS AND CHILDREN:**

**PERCEPTIONS ON DYSPRAXIA',**

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at the University of the Free State, is my independent work. I declare  
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Carli van Staden

*"The question is not what you look at, but what you see."*

- Henry David Thoreau -

I hereby dedicate this work to:

*Wiehan van Staden, my husband.*

*For all your love, patience and support.*

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# LIST OF ACRONYMS

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ADHD	Attention deficit hyperactivity disorder
AOTA	American Occupational Therapy Association
ASI	Ayres sensory integration
BIS	Bilateral integration and sequencing
BMC	Bilateral motor coordination (SIPT subtest)
BOTMP	Bruininks-Oseretsky Test of Motor Proficiency
CI	Confidence interval
COSA	Child Occupational Self-Assessment
DC	Design copying (SIPT subtest)
DCD	Developmental coordination disorder
DSM-IV	Diagnostics and Statistical Manual of mental disorders 4 <sup>th</sup> ed
EACD	European Academy for Childhood Disability
EP	Equivalent person
HDR	Household density ratio
HPCSA	Health Professions Council of South Africa
MABC	Movement Assessment Battery for Children
MAc	Motor accuracy (subtest SIPT)
MNS	Mirror neuron system
OPA	Occupational performance area
OPC	Occupational performance component
OPr	Oral praxis (SIPT subtest)
OT	Occupational therapy/therapist
PEGS	Perceived Efficacy and Goal Setting System
SA	South Africa
SAISI	South African Institute for Sensory Integration

SBMD	Sensory-based motor disorder
SD	Standard deviation
SDD	Sensory discrimination disorder
SI	Sensory integration
SIPT	Sensory Integration and Praxis Test
SPD	Sensory processing disorder
SWB	Standing and walking balance (SIPT subtest)
TIP	Test of Ideational Praxis
UFS	University of the Free State
UK	United Kingdom
UNICEF	United Nations Children's Fund (previously United Nations International Children's Emergency Fund)
USA	United States of America
WFOT	World Federation of Occupational Therapists
WPS	Western Psychological Services

## CONCEPT CLARIFICATION

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### **Perception and perceived competence (efficacy)**

Perception, as referred to in this study, describes the way in which something is regarded, understood, or interpreted by a specific person. Perceived competence is the personal view of an individual that is formed by his judgement of his or someone else's capability to be successful in producing intended results in a specific functional task in a given situation. As this is a subjective view that includes an emotional competent, a perception of capability might be incongruent with the person's actual performance or abilities (Christiansen, Baum & Bass-Haugen, 2005:574). Bandura (1986:391) states that "the perception of what a person can do is more critical than the skills or skill level per se", to mobilise a person's motivation.

### **Dyspraxia**

For the purpose of this study, dyspraxia is viewed as a sensory integration based developmental disorder. Sensory integrative based dyspraxia is difficulty with the ability to ideate or conceive of, plan and execute a sequence of new and novel actions in response to environmental demands (Bundy, Lane & Murray, 2002:477-478; Kramer & Hinojosa, 2010: 115-116).

### **Educator**

Educators referred to in this study are qualified in South African foundation phase education (grades R, 1, 2 and 3) (South Africa 2011b:6)

and working in either private or public schools that follow an approved curriculum.

**He/him/his**

Throughout this document, all words referring to the male gender (he/him/his) can also be substituted with the female form (she/her/hers).



# CHAPTER 1      INTRODUCTION AND ORIENTATION

---

## 1.1      INTRODUCTION

Dyspraxia is a developmental condition in which the ability to ideate, plan and execute new and novel actions is impaired. These difficulties with praxis refer to deficits in one or more of the three praxis processes: to create ideas on interaction with the environment; put together the steps and sequence of the plan; and carry out the correct motor execution to match the desired outcome in unfamiliar motor tasks (Bundy *et al.*, 2002:477-478; Schaaf & Roley, 2006:21). Depending on criteria used, dyspraxia occurs in 5 – 6% of children (Zwicker, Missiuna, Harris & Boyd, 2012) and persists into adolescence in 50% of cases where no intervention program was followed (Cantell, Smyth & Ahonen, 2003:428).

Literature describes different assessment approaches used by practitioners (paediatricians, psychologists, physiotherapists and occupational therapists) to identify dyspraxia, mostly focusing on the assessment of motor coordination (Gibbs, Appleton & Appleton, 2007:536; Sugden & Chambers, 2003:546; Wilson, 2005:807), without clear guidelines of when an actual diagnosis of dyspraxia is applicable.

Ayres (1989:1) developed the Sensory Integration and Praxis Test (SIPT) over a period of three decades as a diagnostic and descriptive tool to identify children with sensory integrative and praxis deficits. This instrument is able

to discriminate between different praxis deficits, such as visuo- and somatodyspraxia. It was standardised for the assessment of English-speaking children (Ayres, 1989:1) but was translated to Afrikaans with permission from the publisher, when the first South African occupational therapists were trained in the use of the SIPT in 2006 (Buitendag & Aronstam, 2010:18).

The occupational therapist assesses all relevant occupational performance areas and components. For a child with dyspraxia, these may include, but are not limited to, self-maintenance, school activities, play and leisure, social participation and performance skills and patterns, such as routines and habits (Ayres's, 1989:9; Gibbs *et al.* 2007:535). Apart from problems with functional and academic skills, reduced self-esteem, consisting of the components of perceived efficacy and social acceptance, is also evident in children with dyspraxia (McWilliams, 2005:394; Watson & Knott, 2006:451). As a child participates in activities in different environments, for example at home with his parents, at school with his educator and in play/leisure with his peers, the impressions of all these role-players together are needed to paint a comprehensive clinical picture of the child with dyspraxia. These findings are interpreted and intervention planned with the identification of goals (Schaaf & Roley, 2006:6-8; Sugden & Chambers, 2003: 546; Case-Smith & O'Brien, 2010:351-364). The results of intervention are reviewed throughout the process and changes made as necessary.

Taking into account the variety of functional problems experienced by children with dyspraxia, ranging from handwriting difficulties to problems with skipping with a rope, it is of utmost importance that the prioritization of goals into a workable therapeutic plan does not only reflect the main concerns of

the family, but should also include the voice of the child (Case-Smith & O'Brien, 2010:352, 355).

Children's rights, as stated in the international Convention on the Rights of Children (UNICEF, 1989) and the South African Constitution (South Africa, 1996), accentuate that the input of the child is required in order to determine the best interests of the child. The voice of the child must be heard and respected in all matters concerning their rights and children must have meaningful participation in decision-making that affects them.

This right of the child has been acknowledged by occupational therapists internationally in recent years by including the child in the process of goal-setting through the development of formal assessments tools, such as the Perceived Efficacy and Goal Setting System (PEGS) (Missiuna, Pollock & Law, 2004) and Child Occupational Self-Assessment (COSA) (Kielhofner, 2002:221). This supports the use of client-centred practice that gives all clients a bigger voice in therapy (Kielhofner, 2002:213; Sturgess, Rodger & Ozanne, 2002:108). By being included in the goal-setting process, the child also takes ownership of the process and "satisfaction with and pursuit of goal-directed need fulfilment in supportive environments enhance activity engagement and lead to personal growth" (Poulsen, Rodger & Ziviani, 2006:78).

There are however none of these self-report assessments for children on the list of standardised and other tests used by occupational therapists in South Africa (HPCSA, 2004) and no proof is evident of the inclusion of such assessments for children by South African therapists in daily practice (Aronstam, 2003: 12-13).

## **1.2 PROBLEM STATEMENT**

As stated in the procedures of occupational therapy testing (HPCSA, 2004:7), a proper evaluation is necessary before occupational therapy intervention is planned and applied. Without it, the treatment plan will at best be an educated guess.

Within the South African context the identification of dyspraxia has been a combination of observations of motor performance and conclusions drawn from other motor performance tests, until 2006, when the Sensory Integration and Praxis Test (SIPT) was first used in South Africa.

Unfortunately the SIPT does not yet clarify dyspraxia identification for the whole South African population, as the standardised instructions are only available in Afrikaans and English. The exclusion of children who are not fluent in either of these languages is an ethical issue and South African occupational therapists have brought this problem under the attention of the publishers. Solving this dilemma is outside the scope of this research proposal.

This ethical issue should however not prevent South African research on dyspraxia from being done without delay, with the identified population available.

A lack of research that includes the perceptions of all groups involved with the child with dyspraxia, namely the parent, educator and child was confirmed internationally by Dunford, Missiuna, Street, & Sibert (2005:213).

Such research will further the understanding of the complexities surrounding a child with dyspraxia.

The need for improvement of family-related skills of South African occupational therapists in the use of a family-centred approach in assessment and treatment of children was indicated by Aronstam's research (2003:13).

And finally, the voice of the child in decision-making that affects them should not be ignored, especially by occupational therapists claiming a client-centred approach.

The combination of these issues led to the formulation of the research aim.

### **1.3 RESEARCH AIM AND OBJECTIVES**

The aim of this study was to investigate the child's, parent's and educator's perceptions on dyspraxia in the context of the occupational performance areas of school/productivity, play/leisure and self-care, in order to identify comprehensive client-centred treatment goals.

The study objectives were to identify:

- a) What the child's perceptions on dyspraxia are, in the context of his occupational performance areas?
- b) What the child's parents' perceptions are on dyspraxia, in the context of the child's occupational performance areas?
- c) What the child's educator's perceptions are on dyspraxia, in the context of the child's occupational performance areas?

- d) What the goals are as identified by the child, parent and educator, respectively, for occupational therapy intervention?

## **1.4 METHODOLOGY**

A descriptive, cross-sectional study was done. Descriptive questions were used to obtain primary (new) data, from three groups: the perceptions of the children, parents and educators. Numerical and textual data from the three groups of units were compared to obtain information on similarities and differences between the groups. The researcher had medium control over data gathered, as a structured questionnaire/form (PEGS) was used with items that are similar for all three groups (Mouton, 2001:154; Polit & Beck, 2006:179-180).

## **1.5 SCOPE OF STUDY**

The study population consisted of children diagnosed with dyspraxia as per the criteria of the Sensory Integration and Praxis Test (SIPT) (Ayres, 1989).

The SIPT, developed as a diagnostic tool for the identification of sensory integrative and praxis deficits (Ayres, 1989:1), may only be administered by occupational therapists who completed both the Theory and Test Mechanics courses presented by the South African Institute of Sensory Integration, as well as a peer review of test administration and the testing of 4 typically developing children with the SIPT (Cook, 2009:6).

Occupational Therapists qualified to administer the SIPT, using the SIPT in their practice and working in Bloemfontein and surrounding areas, identified the study population of children with praxis dysfunctions according to a diagnostic prototype of the SIPT, from their clinical records. The prototype was one of the following (Ayres, 1989:140-145):

- Low Average Bilateral Integration and Sequencing
- Visuodyspraxia
- Somatodyspraxia
- Generalised Sensory Integrative Dysfunction

All children from this study population whose parents/caregivers/guardians gave consent to participate, were included in the study sample. The study sample further consisted of the parent(s)/caregiver(s)/guardian(s) of the child who were involved in the occupational therapy process, as well as the educator of the child concerned.

According to the age range on which the SIPT (Ayres, 1989:1) were developed and standardised, the children's ages could range between 4 years 0 months and 8 years 11 months. The Perceived Efficacy and Goal Setting System (PEGS) was effectively used by its authors in research studies (Dunford *et al.*, 2005:208; Missiuna & Pollock, 2000:103) with children between the ages of 5 to 10 years, with the PEGS stated to be most appropriate for children developmentally or chronologically between the ages of 6 and 9 years (Missiuna *et al.*, 2004:1). When comparing activities featured in the PEGS to what is expected of children in the South African school curriculum (South Africa, 2011:22; South Africa, 2011a:12-13; South Africa, 2011b:26-30), the researcher found the PEGS to be appropriate for children in grade R. Thus, children between the ages of 5 years and 8 years

11months, who were enrolled in grade R or a higher grade, were included. Boys and girls were included.

Exclusion criteria were children who have been treated by an occupational therapist for more than 24 sessions of 30 minutes each. Research indicates that no statistically significant change in self-esteem, including perceived efficacy, was found before at least 12 hours of treatment (McWilliams, 2005:395-396).

## **1.6 SIGNIFICANCE / IMPORTANCE OF STUDY**

The importance of seeing the impact of dyspraxia through the eyes of all involved as well as the effect dyspraxia has on all spheres of the child's life will be highlighted.

The researcher will submit a journal article for publication in an accredited Occupational Therapy journal, to raise the awareness of therapists of the results of this research study.

Results and the implications thereof will be disseminated at relevant national conferences and professional platforms.



## **1.7 ETHICAL CONSIDERATIONS**

The protocol for this research was approved by the Ethics Committee of the Faculty of Health Sciences, University of the Free State (Nr: 22/2010).

The researcher at no stage had any access to the treating occupational therapists' patient records or information. All initial correspondence was handled anonymously via the treating occupational therapist. The first time that any data was made available to the researcher, was when the parent/caregiver/guardian of the child had returned the signed letter of consent to the treating occupational therapist.

Informed consent was requested from therapists, parents and educators in writing, as well as assent from the children participating (see appendices B-E). They were also made aware that participation is voluntary and that they had the right to withdraw at any time without prejudice.

There was no harm or physical discomfort in participation and both the treating occupational therapists as well as parents/caregivers/guardians did receive a copy of the PEGS results. These results could then be used as a therapeutic tool by the treating therapist, in consultation with the parent and child, at their discretion.

If the referring occupational therapist was not yet treating the child, the child was referred for treatment.

As the SIPT is only standardised in Afrikaans and English, the exclusion of children who are not fluent in either of these languages is an ethical issue.

This is however unavoidable, as the SIPT is the only diagnostic tool available to clearly diagnose dyspraxia with its prototypes. South African occupational therapists have brought this problem under the attention of the publishers.

The language of choice of the participant was used.

Confidentiality was adhered to – all participants are identified by numbers only and the researcher and biostatistician were the only people to handle test results.

## **1.8 CHAPTER OUTLINE**

**Chapter 1, the Introduction and Orientation**, presented an overview of the aim, purpose and basic methodology of the research, as well as the ethical considerations that were taken into account.

In **Chapter 2, Literature Perspective**, relevant literature that was explored during the research is discussed. This includes historical and recent information regarding dyspraxia, its influence on occupational performance and the role of the occupational therapist in the assessment and intervention processes. This chapter further looks at family-centred practice, goal setting as part of the clinical process and the use of self-assessment instruments with children, focusing on the Perceived Efficacy and Goal Setting System (PEGS).

The research design and method of data collection is explained in **Chapter 3, Research methodology**. The measuring tools used, the study population and procedures followed will be clarified in this chapter.

In **Chapter 4, Results**, the reader will be introduced to the tables and graphs containing the results of this research study.

**Chapter 5, Discussion of results**, follows. Trends and patterns that emerged will be discussed here. Available literature will also be taken into consideration, in order to determine if results found in this study corresponds with those described in local and international publications.

Finally, in **Chapter 6, Conclusion and recommendation**, the researcher will discuss the value of this study, limitations, conclusions and recommendations will be made as to how knowledge gained from this study can be applied to better assist occupational therapists in their understanding and treatment of dyspraxia.

## **1.9 SUMMARY**

This chapter aimed to orientate the reader to dyspraxia, the debilitating effect it has on children suffering from it and the role of the occupational therapist in the assessment and treatment thereof. The importance of including all role-players, especially the child, in the goal-setting process was mentioned and reference was made to relevant studies that explored this approach of identifying different people's perceptions of a certain condition.

The aim of the study was stated and the reader was introduced to the methodology that was used. A short overview was also given of what is to follow in each chapter.

The next chapter will discuss literature that indicated the development of the problem statement. Local and international sources are reviewed to further the reader's understanding of the key concepts of this study.

## **CHAPTER 2      LITERATURE PERSPECTIVE**

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### **2.1      INTRODUCTION**

Occupational therapy is defined as a client-centred health profession, with the primary goal to enable people to participate in everyday life (WFOT, 2012:4). When the occupational therapist's client is a child with dyspraxia, all of the child's occupational performance areas, including self-care, school and play and leisure, can be expected to be affected by dyspraxia (Kramer & Hinojosa, 2010:130). In order to truly enable such a child to effectively interact with his world, the occupational therapist needs to be aware of the child's feelings of powerlessness, incompetence and frustration. Occupational therapists working with children with dyspraxia should attempt to understand a world where the child "knows what he wants to do, but can't do it". Only then will she be able to change an overwhelming situation into a therapeutic situation where the child can assist in directing his therapy (Ayres, 2011:29-32).

The following chapter contains relevant literature to give the reader a clearer understanding of dyspraxia, as seen from a sensory integration frame of reference. This includes historical and recent information regarding dyspraxia, its influence on occupational performance and the role of the occupational therapist in the evaluation and intervention processes. Pertinent information regarding family-centred practice, goal setting as part of the clinical process and the use of self-assessment instruments with children, focusing on the Perceived Efficacy and Goal Setting System (PEGS), is also included.

## **2.2 DEFINING DYSPRAXIA**

### **Sensory Integration**

Throughout this research study, the sensory integration frame of reference was used as the looking glass through which dyspraxia was explored. The sensory integration frame of reference originated in the work of A. Jean Ayres in the late 1960s and 1970s (Case-Smith & O'Brien, 2010:325; Kramer & Hinojosa, 2010:99). Ayres, an occupational therapist and psychologist with training in neuroscience, defined sensory integration as "the organization of sensations for use" (1979:184).

Sensory integration theory considers how the sensory systems (auditory, vestibular, proprioceptive, tactile and visual) interact with and relate to each other to allow for adaptive responses. Ayres (2005:199) defined an adaptive response as "an appropriate action in which the individual responds successfully to some environmental demand". Normal sensory integrative processes enable a child to purposefully engage in actions on the environment and successfully meet environmental challenges he is faced with. For example, sensations from the vestibular and proprioceptive systems are integrated to support the development of balance and posture. These integrated vestibular-proprioceptive sensations then interact with tactile sensations to contribute to adequate body awareness and praxis. When a child is presented with a challenge where he is required to interact with the environment, like needing to pump a swing, his brain compares current sensory information regarding the position of his body against existing information from previous experiences, providing a basis for action. This information is then used to plan and execute movement, and if successful, is added to the knowledge base of how to efficiently react to a

certain demand from the environment (Case-Smith & O'Brien, 2010:326-327; Kramer & Hinojosa, 2010:99-102; Roley, Blanche & Schaaf, 2001:5-7).

### **Praxis & dyspraxia**

Sensory integrative based praxis is the ability to ideate or conceive of, plan and execute a sequence of new and novel actions in response to environmental demands. Dyspraxia, a difficulty with praxis, refers to deficits in one or more of the three praxis processes: to create ideas on interaction with the environment – ideational praxis; to put together the steps and sequence of the plan – motor planning; and carry out the correct motor execution to match the desired outcome in unfamiliar or novel motor tasks (Bundy *et al.*, 2002:477-478; Kramer & Hinojosa, 2010: 115-116; Schaaf & Roley, 2006:21).

Unfamiliar/novel tasks require a great deal of praxis, as the brain responds to each new situation by using available knowledge of similar previous actions to solve a new complex action. With dyspraxia, "brain processes that should be automatic or accurate are not" (Case-Smith & O'Brien, 2010:333). Although the components of a movement might be present, the ability to execute the movements outside of the familiar context is not – children with dyspraxia are not able to generalise movement sequences or skills (Miller, Anzalone, Lane, Cermak & Osten, 2007:138; Roley *et al.*, 2001:125).

### **A developmental deficit**

Apraxia, the loss of ability to perform movements that were previously acquired, is mostly associated with persons who had sustained traumatic brain injury. In comparison, dyspraxia entails problems with the acquisition of new motor skills and is a developmental rather than acquired condition

(Bundy *et al.*, 2002:71; Sanger, Chen, Delgado, Gaebler-Spira, Hallett & Mink, 2006:2159). As dyspraxia is a developmental deficit, the study population for this study was pre- and primary school children.

### **Terminology used in research reports on dyspraxia**

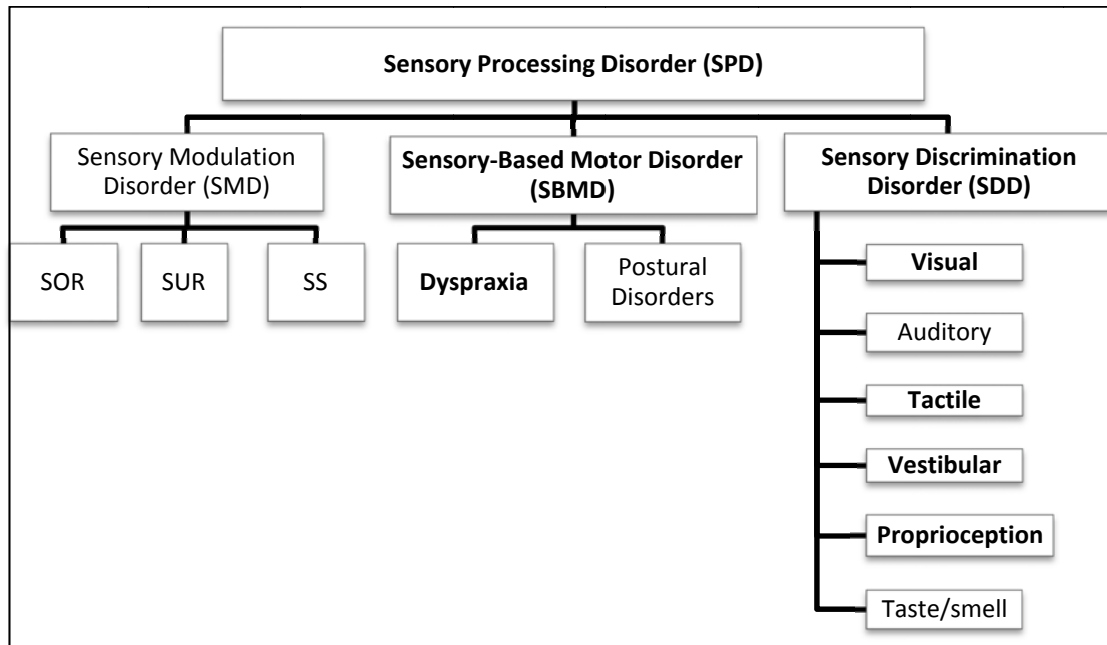
There is an ongoing debate amongst writers regarding the use of the terms *developmental coordination disorder (DCD)* and *dyspraxia*. Depending on the professional orientation of the writer (e.g. neurologist, occupational therapist), as well as the writer's nationality, some use it as synonyms (Vaivre-Douret, Lalanne, Ingster-Moati, Boddaert, Cabrol, Dufier, Golse & Falissard, 2011:615; Gibbs *et al.*, 2007:535; Polatajko & Cantin, 2006:250), whilst others consider DCD to be a possible cause of dyspraxia, with dyspraxia as a neurological sign or symptom (Baxter, 2012:3; Steinman, Mostofsky & Denckla, 2010:73; Sanger *et al.*, 2006:2164).

The European Academy for Childhood Disability (EACD) recommended in 2011 that DCD should be used as the term to refer to children with developmental motor problems, as it is defined in the Diagnostic and Statistical Manual of mental disorders 4<sup>th</sup> ed. (DSM-IV) (Blank, Smits-Engelsman, Polatajko & Wilson, 2012:63).

In their proposed nosology for diagnosis, Miller and other authors (2007:136-138) suggest the use of the term sensory processing disorder (SPD) to refer to problems of sensory integration that impair a person's performance of daily roles. SPD comprises of three categories (Figure 2.1), including sensory-based motor disorder (SBMD), with dyspraxia as subtype, and sensory discrimination disorder (SDD). The common co-occurrence of dyspraxia and a



visual, tactile, vestibular and/or proprioceptive SDD is described in the literature (Miller *et al.*, 2007:138).



**Figure 2.1** A proposed nosology for sensory processing disorder (Miller *et al.*, 2007:137).

In the American Journal of Occupational Therapy (2010:365), Schaaf and Davies on the other hand point out that “no critical mass of research supports the naming of a disorder” and recommend that the problems the child faces should rather be described, than making assumptions regarding diagnoses and terminology.

However, information from research articles relating to both dyspraxia and DCD is used by these authors in their work and citations, as have been done for the purpose of this research study. As this study is based on the sensory integration frame of reference the term developmental dyspraxia, as described in the work of Ayres (2005:87), has been used.

## 2.3 PREVALENCE AND EXTENT OF DYSPRAXIA

The prevalence of dyspraxia is estimated at 5 to 6%, with indications from different studies that 70% - 80% of children with dyspraxia are boys (Zwicker *et al.*, 2012; Missiuna, Gaines, Mclean, DeLaat, Egan & Soucie, 2008:839; Missiuna & Polatajko, 1995:622).

Although dyspraxia is a developmental disorder (Case-Smith & O'Brien, 2010:349) that is usually associated with childhood, an increasing number of studies have shown that dyspraxia continues into adolescence and adulthood in as many as 50% of cases where no intervention plan was followed (Kirby, Edwards, Sugden & Rosenblum, 2010:136; Cantell *et al.*, 2003:428). Frustrations caused by dyspraxia are described as having a negative influence on adolescent's relationships at school, with peers and with family members (Missiuna, Moll, King, King & Law, 2007:99), leading to poor emotional health. Adults participating in studies by Kirby, Edwards and Sugden (2011:1357-1358) and Cousins and Smyth (2003:454) confirmed that dyspraxia continues to affect their coordination in writing and driving, participation in sport and choices of social engagement.

As Clark and Whittall (2011:1244) comment,

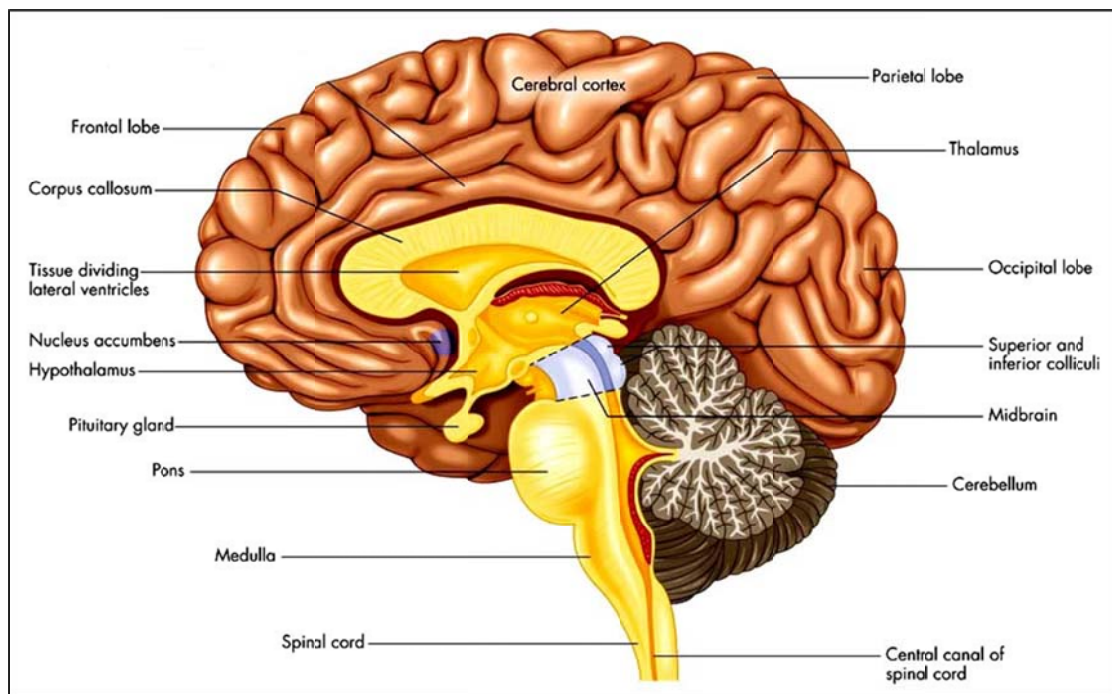
"... dyspraxia should not be ignored because it is trivial by comparison with more obvious physical or mental disabilities . . . nor is the hope that children will grow out of it, a suitable attitude".

## 2.4 HYPOTHESES ON ETIOLOGY

The etiology of dyspraxia is largely unknown. An increased risk of dyspraxia was found to be associated with pre-term birth (Zhu, Olsen & Olesen, 2012:3), with more than doubled risk of dyspraxia in children born at 32 to 36 gestational weeks.

Werner, Cermak and Aza-Zadeh (2012:259-262) postulate that a dysfunction in the mirror neuron system (MNS), located in the frontal- and parietal lobes (figure 2.2), is implicated. The MNS, together with the middle frontal gyrus, is theorised to be involved in imitation skills of humans, which are needed to learn and imitate a new motor program.

Using functional MRI, Zwicker, Missiuna, Harris and Boyd (2010:e678) measured and compared brain activation patterns of 7 children with DCD and 7 age-matched peers. They found that there was a difference between the brain regions activated by children with DCD when executing a similar task to that of typically developing children. In a later article, these authors (Zwicker *et al.*, 2012) implicate the cerebellum (figure 2.2) as a possible contributor underlying dyspraxia.



**Figure 2.2** Saggital image of cerebral cortex and subcortical structures (Bennett, Good & Kumpf, 2003: online)

Vaivre-Douret *et al.* (2011:616) compiled a summary of proposed causes for dyspraxia using studies done from 1975 to 2009, but could find no consensus amongst researchers. Their literature review concludes a connection between dyspraxia and maturational processes in the central nervous system, which links with the theory of neuroplasticity (the ability of the nervous system to change in response to ongoing activity or environmental input and demands) used in Ayres Sensory Integration (ASI) intervention (Lane & Schaaf, 2010:377; Case-Smith & O'Brien, 2010:327).

Vaivre-Douret *et al.* (2011:635) further suggests that dyspraxia does not relate to the cerebral cortex, but rather the sub-cortical network (figure 2.2) of the brain and the transmission of incorrect information by the thalamus (figure 2.2).

## 2.5 HOW IS DYSPRAXIA IDENTIFIED?

### **Assessments by health care practitioners**

The road to identifying dyspraxia can be very long and frustrating. Current research has shown that, in sharp contrast to 70% of parents who trust that their physician (general practitioner or paediatrician) would be able to make a timely and accurate diagnosis, only 16% of physicians from Canada, the USA and the UK responded that they are familiar with dyspraxia (Wilson, Neil, Kamps & Babcock, 2012).

Steinman *et al.* (2010:79) gives the following tip to physicians for assessing dyspraxia: "Look for impaired execution of skilled learned movements . . . as dyspraxia is typically not identifiable by history or routine neurologic examination". Echoing this, literature describes assessment of motor coordination as the customary way of identifying dyspraxia, by using assessments such as the Bruininks-Oseretsky Test of Motor Proficiency (BOTMP) or the Movement Assessment Battery for Children (MABC) (Wuang, Su & Su, 2012:160; Gibbs *et al.*, 2007:536; Wilson, 2005:810). As the possible etiology of dyspraxia are still only hypothesis, without specific indicators found during medical or neurological examinations, the identification of dyspraxia falls into different practitioner's scope of practice (Missiuna *et al.*, 2008:839), as Gibbs *et al.* (2007:536) confirms that occupational therapists are more familiar with motor coordination assessments and should assist the paediatrician in making a diagnosis.

The use of these motor coordination assessments as sole indicator of dyspraxia are criticised, as they have only become the standard due to the frequency of their use in research and practice, and not their unique ability to

identify dyspraxia. It is emphasised that investigations involving neuromuscular examinations, visual motor perceptual, qualitative and quantitative measures of coordination, praxis, laterality and body integration should be integrated in the assessment of dyspraxia (Vaivre-Douret *et al.*, 2011:617,638).

### **The Sensory Integration and Praxis Test (SIPT)**

Ayres (1989:1) developed the Sensory Integration and Praxis Test (SIPT) over a period of three decades as a diagnostic and descriptive tool to be used by occupational therapists to identify children age 4 through 8 years with sensory integrative and praxis deficits. Described as the “gold standard” for evaluating praxis (Roley *et al.*, 2001:218), the SIPT contains seventeen test items in four overlapping groups, measuring:

- tactile and vestibular-proprioceptive sensory processing;
- form and space perception and visuomotor coordination;
- praxis ability; and
- bilateral integration and sequencing (Bundy *et al.*, 2002:453);

This instrument provides a standardised set of measures to discriminate between different patterns of praxis deficits (Mailloux, Mulligan, Smith Roley, Blanche, Cermak, Geppert Coleman, Bodisan & Lane, 2011:143).

### **Patterns of dyspraxia**

Through cluster and factor analysis during the development of the SIPT (Ayres, 1989:131) and later confirmed by Mulligan (1998:821,825), recognisable patterns of sensory integrative dysfunction were identified as:

- visuodyspraxia
- somatodyspraxia;

- bilateral integration and sequencing; and
- generalised sensory integrative dysfunction.

Mailloux *et al.* (2011:147-149) further verified and clarified dysfunctional patterns of sensory integration through factor analysis of SIPT data as visuodyspraxia and (sometimes overlapping) somatodyspraxia, as well as a factor they named “vestibular and proprioceptive bilateral integration and sequencing”.

Somatodyspraxia involves impaired tactile- and proprioceptive processing, which negatively influences the development of body scheme and body awareness. The behaviour of these children indicates problems in the motor planning and execution phases of the practic process (Kramer & Hinojosa, 2010:124).

Visuodyspraxia reflects the common conceptual component between visual perception and motor planning and consists of the elements of form and space perception, visual construction and visual-motor coordination (Bundy *et al.*, 2002:8 & 455). Visuodyspraxia is often seen in combination with somatodyspraxia.

Bilateral integration and sequencing (BIS) deficits are associated with vestibular and proprioceptive discrimination problems that interfere with the coordinated sequenced movement of two parts of the body (Kramer & Hinojosa, 2010:124; Mailloux *et al.* 2011:148). Whether problems with BIS are an aspect of dyspraxia or a separate sensory integrative dysfunction is currently debated in literature (Kramer & Hinojosa, 2010:124, 126). As no

conclusion has yet been reached, BIS was included as a practic dysfunction for the purpose of this study.

Children who scored poorly on most or all of the SIPT test items, without a clearly distinguishing pattern, are grouped in the category of generalised sensory integrative dysfunction (Bundy *et al.*, 2002:472) and are inclusive of praxis problems.

These patterns of dyspraxia can however not be considered in isolation, as it manifests in different ways and combinations in different children. It can, for example, be clear to describe a child's SIPT profile as reflecting a generalised sensory integrative dysfunction, with a particular weakness in the area of somatopraxis (Bundy, *et al.* 2002:81, 463; Mulligan, 1998:826). It is again emphasised that the practic problem, together with the underlying foundational problems and clinical manifestation should be considered for each child.

It should also be noted that the SIPT is not a good indicator for the identification of children who exclusively experience problems with the first part of the practic process – ideation. The use of the Test of Ideational Praxis (TIP) (May-Benson & Cermak, 2007:148-152) is recommended as a measure to capture individual ideational abilities (Kramer & Hinojosa, 2010:126). The TIP was however not used in this study, as it is not yet standardised and only preliminary standard scores are currently available. As the authors of the TIP point out, although the TIP provides a means to assess ideation, further research with larger samples need to be done in order to make it a “clinically useful tool” (May-Benson & Cermak, 2007:152).



### **The SIPT and the use thereof on South African children**

The SIPT was standardised for the assessment of English-speaking children (Ayres, 1989:1) but instructions were translated to Afrikaans with permission from the publisher, when the first South African occupational therapists were trained in 2006 in the use of the SIPT (Buitendag & Aronstam, 2010:18).

Contemporary research on the use of the SIPT with South African children indicated that, for 12 of the 17 test items, the normative USA sample can be used to score against (Van Jaarsveld, Mailloux and Herzberg; 2012:17). It was recommended that the other five (DC, BMC, OPr, SWB and MAC) test items' computerised scores within the older age bands (6y0m – 8y 11m), where the SA sample of children performed moderately to significantly better than the USA sample, should each be adapted with  $\frac{1}{2}$  a SD unit to the negative side by the assessing therapist. This should be done during the process of clinical reasoning. These authors were of the opinion that the SIPT would then be a fair and just indicator of sensory integration dysfunctions inclusive of praxis dysfunctions within the South African population.

For the purpose of this study, the SIPT was used to identify the study population of children with dyspraxia.

## **2.6 OCCUPATIONAL PERFORMANCE OF THE CHILD WITH DYSPRAXIA**

Even though there is still controversy amongst different practitioners, authors and researchers as to the use of terminology, different methods of

assessment of dyspraxia and subtypes of dyspraxia, all seem to agree with the functional implications of this condition. Ayres's (1989:9) description of praxis as the ability to figure out how to use your body in skilled tasks, such as playing with toys, using tools (e.g. pencil and fork) and tidying of a room, is confirmed by Gibbs *et al.* (2007:535) stating that "DCD (dyspraxia) manifests functionally by difficulties in all aspects of daily living".

Apart from problems with functional and academic skills, reduced self-esteem, consisting of the components of perceived efficacy and social acceptance, is also evident in children with dyspraxia (McWilliams, 2005:394; Watson & Knott, 2006:451). Eggleston, Hanger, Frampton and Watkins (2012:457) describe factors that could influence a person's self-esteem: social support and positive feedback from others; perceptions of competence in occupations that are important to the individual; genetic factors; environmental effects, such as parenting styles and peer interactions (Raevuori, Dick, Keski-Rahkonen, Pulkkinen, Rose, Rissanen, Kaprio, Viken & Silventoinen, 2007:1631); and the occurrence of psychiatric disorders. Shin & Cho, (2012:1) further add chronic medical conditions as a factor that could influence self-esteem negatively.

Human occupation is defined as "the doing of work, play, or activities of daily living within a temporal, physical, and socio-cultural context that characterizes much of human life" (Kielhofner, 2002:1). It also is described as being central to a person's identity and sense of competence (AOTA, 2008:628). The occupational performance areas (OPA) for children are play and leisure, education, activities of daily living, rest and sleep, and social participation. As a child participates in activities in different environments, for example at home with his parents, at school with his educator and in

play/leisure with his peers, the impressions of all these role-players together is needed to paint a comprehensive clinical picture of the child with dyspraxia (Peters, Barnett & Henderson, 2001:409).

Parents of children with dyspraxia often state that, since the child's early development, they felt that "something was wrong, but they didn't know what it was" (Fischer, Murray & Bundy, 1991:143). As the child grows and is expected to acquire skills for personal care, the parents recognize for example that the child experiences problems with blowing his nose, fastening buttons, zippers and laces, manipulating door handles and eating skills. The child is unable to complete these actions satisfactorily within the required time frames as set by a daily household routine and this often leads to battles between parents and the child (Bundy *et al.*, 2002:75; Miller *et al.*, 2007:138; Kramer & Hinojosa, 2010:141).

The pre-school educator may recognize that a child seldom participates in activities involving cutting, colouring, puzzles and playground equipment. It is however possible that dyspraxia may not be identified until much later, as pre-school allows individual choice of activities and it might be interpreted as the child's preference to not participate (Bundy *et al.*, 2002:75). When the child enters grade 1, where participation in activities is not voluntary, and where organisation of schoolwork is a priority, neatness will be a problem and educators often identify handwriting as a great concern (Polatajko & Cantin, 2006:252; Miller *et al.*, 2007:138). Recent changes to the South African National Curriculum Policy, now includes Grade R as an official grade in the school curriculum with specific outcomes relating to language, mathematics and life skills (South Africa, 2011:3). Skipping with a rope, a complex skill that involves many practic abilities, is an example of an activity that is first

introduced and assessed in the third term of grade R and which the child is supposed to have mastered by the first term of grade 1 (South Africa, 2011b:29,40). As the expectations of children in this last year of pre-school is now more specific and children have less choice in participating, this may lead to dyspraxia being identified earlier.

As written output becomes increasingly important in higher grades, problems with this kind of motor activity lead to a decline in performance, which further lowers the child's motivation and self-esteem. Participation in organized sports is also problematic for children with dyspraxia (Polatajko & Cantin, 2006:252; Miller *et al.*, 2007:138).

Play is also influenced by dyspraxia. Fantasy-, instead of "doing-", games are often preferred, as well as sedentary activities such as watching television, playing electronic games and reading. Children with dyspraxia are more often onlookers in social play or seek out younger playmates, in order for them to be in control of the game (Miller *et al.*, 2007:138-139; Bundy, Shia, Qi & Miller, 2007:201, 205; Koenig & Rudney, 2010:432; Kramer & Hinojosa, 2010:141).

The child with dyspraxia is often aware of his inability to do what his peers can and experiences this when playing ball, riding a bicycle and skipping with a rope. He is often teased, bullied and excluded from activities and this, together with his inability to effectively interact with and influence the environment, impacts negatively on the child's belief in his skills (Bundy *et al.*, 2002:75; Case-Smith & O'Brien, 2010:333; Kramer & Hinojosa, 2010:141; Poulsen, Johnson & Ziviani, 2011:100). An increased risk of depression (Lingam, Jongmans, Ellis, Hunt, Golding & Emond, 2012:e882), as well as

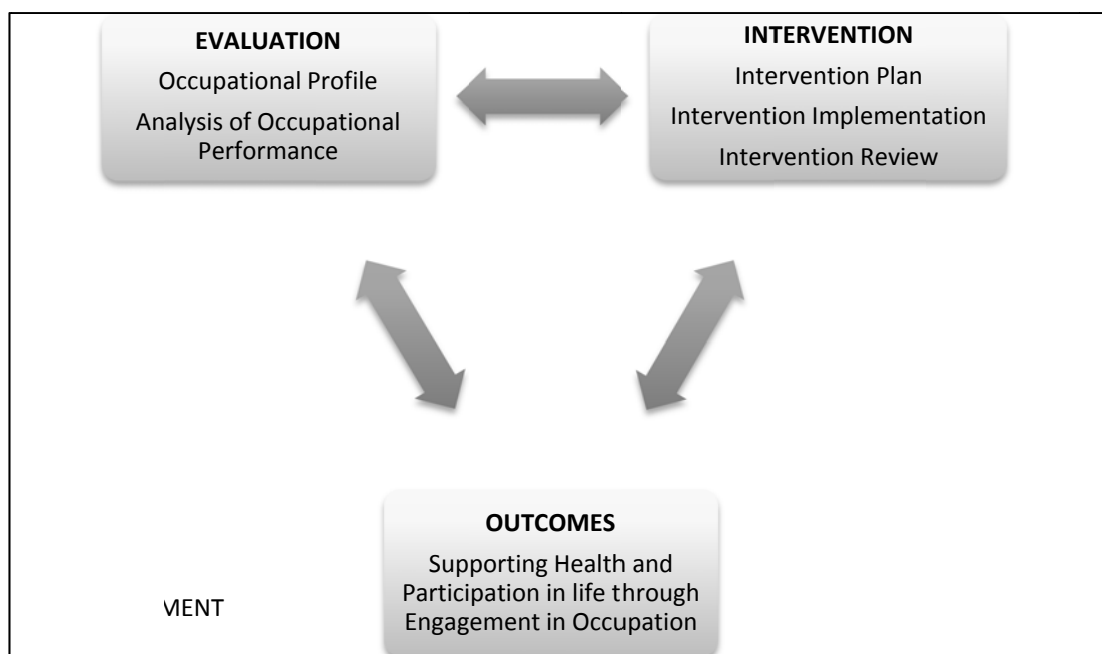
elevated anxiety levels (Pratt & Hill, 2011:1256), were found in children with dyspraxia.

His relationship with his siblings may also be influenced as the typically developing child generally dominates the child with a developmental problem (Case-Smith & O'Brien, 2010:113). Some siblings may perceive that they receive less attention from their parents and thus act out, whilst others may internalise their problems, in order not to add further stress to their parents, which in turn puts them at risk of depression (Giallo, Gavidia-Payne, Minett & Kapoor, 2012:40). It may also be expected of siblings to assist the child with dyspraxia in tasks he is unable to manage by himself, which can lead to frustration for the non-affected sibling (Case-Smith & O'Brien, 2010:113).

This literature summary of the clinical picture of a child with dyspraxia led the researcher to the conclusion that dyspraxia affects all occupational performance areas of the child. As the influence of dyspraxia seems to extend across all aspects of the child's life, the presenting picture may differ for individual children. These children are often labelled as "naughty" because they find it difficult not to break toys, to conform to expectations and to behave socially correct. However, when these children are viewed from a sensory integrative frame of reference, their behaviour can be better understood as the debilitating consequence of dyspraxia.

## 2.7 THE OCCUPATIONAL THERAPY PROCESS AND DYSPRAXIA

The occupational therapy process (figure 2.3) entails evaluation, intervention and the measuring of outcomes related to engagement in occupation, all done in collaboration with the client, taking into consideration the relevant context and environment (AOTA, 2008: 644-663).



**Figure 2.3** Occupational Therapy's Process (AOTA, 2008:627)

### Evaluation

The occupational therapist evaluates all relevant occupational performance areas and components. For a child with dyspraxia, these may include, but are not limited to, self-care, school activities, play and leisure, social participation and performance skills and patterns, such as routines and habits (Schaaf & Roley, 2006:6). This is done through the use of standardised assessments (such as the SIPT), observations (both informal and formal e.g. clinical

observations) and communication with relevant role-players in the child's life, such as parents and educators (Bundy *et al.*, 2002: 87; Kramer & Hinojosa, 2010:146-150; Case-Smith & O'Brien, 2010:352-354). These findings are interpreted and intervention planned accordingly with the identification of goals or outcomes.

### **Intervention**

The main objective in intervention for children with dyspraxia is improvement of motor actions and skills and their contribution to everyday function (Sanger *et al.*, 2006:2160), thus the importance of the occupational therapist's assessment and intervention are emphasised (Gibbs *et al.*, 2007:536; Sugden & Chambers, 2003:559).

Together with motor actions and skills and functional improvement through occupational therapy intervention, emphasis should also be on improvement of the child's perception of his competence, as a component of global self-esteem. In a study by McWilliams (2005:395-398), children with dyspraxia received between 6 and 12 hours of occupational therapy treatment focused on the improvement of their self-esteem. A validated measure of self-esteem was used pre- and post-treatment. Although a positive trend was visible in the mean value percentile ranks obtained for total -, general -, social - and academic self-esteem, only the trend for the parental attitude showed statistically significant improvement. This may be due to enhanced parental understanding of the child's difficulties, leading to a change in parental attitude. The child's perception of his competence seems to be less flexible than that of his parents, which has implications for his participation and social competence in the community (Koenig & Rudney, 2010:437).

Implementation of intervention can be done through direct, individual therapy sessions with the child, group occupational therapy and collaborative consultation with family and educators to assist in adaptation of the environment (Schaaf & Roley, 2006:6-8; Kramer & Hinojosa, 2010:155; Case-Smith & O'Brien, 2010:355-364). The results of intervention is reviewed throughout the process and changes made as necessary.

Debate on the most effective intervention approach and who should provide it, is a recurrent theme in dyspraxia literature. Some present a strong case for the use of Ayres Sensory Integration (ASI), with its components of purposeful activity, adaptive response, and active participation of the child in a context of play (Schaaf & Davis, 2010:364; May-Benson & Koomar, 2010:412), whilst critics argue just as heatedly, proposing the use of specific skills training (Polatajko & Cantin, 2006:254 & 2010:428; Blank *et al.*, 2012:79). No clear research evidence however substantiates a single approach at this time, as studies report that, although outcomes following a SI approach were better than a no-treatment control group, it was just as effective as perceptual-motor-based-therapies in some studies (Sugden, 2007:470; May-Benson & Koomar, 2010:412). The recent development of a fidelity measure for research on the effectiveness of Ayres Sensory Integration interventions by Parham and others (2011:140) may shed some more light on this issue in future.

The minimum duration of occupational therapy for a child with dyspraxia before some improvement in motor measures and self-esteem were evident, are reported to be approximately 8 months (32 sessions) (Cohn, 2001:286). It was however found that most clients receive intervention for 1 to 2 years (Bundy *et al.*, 2002:257) to improve praxis deficits.



## **2.8 THE VOICE OF THE CHILD**

### **Role-players**

The importance of gathering information from different role-players to form a complete picture of the life of a child with dyspraxia is stressed repeatedly in literature (Kirby *et al.*, 2011:1351; Kramer & Hinojosa, 2010:150-151; Case-Smith & O'Brien, 2010:351). The educator will be unaware of problems the child is experiencing with brushing teeth, but will emphasize the need to organise his desk at school, a skill that parents might not see as a priority and vice versa. Discrepancies between the response of caregivers and educators, when reporting on behaviour of children with dyspraxia, were noted (Buitendag & Aronstam, 2012:6).

Magalhães, Cardoso and Missiuna (2011:1313) call attention to the fact that, although most children with DCD have the cognitive ability to report on their own abilities, most literature focuses only on the view of the parents.

Taking into account the variety of functional problems experienced by children with dyspraxia, ranging from handwriting difficulties to problems with skipping rope activities, it is of utmost importance that the prioritization of goals into a workable therapeutic plan does not only reflect the main concerns of the family, but should also include the voice of the child.

### **Children's rights**

Principles from the "most widely ratified human rights treaty in history", the International Convention on the Rights of Children (UNICEF, 1989), includes that the voice of the child must be heard and respected in all matters concerning their rights and that children must have meaningful participation

in decision-making that affects them. South Africa underwrites the Convention on the Rights of Children and includes children's rights in our Constitution (South Africa, 1996), stating that "a child's best interests are of paramount importance in every matter concerning the child". As the Convention on the Rights of Children emphasize, the input of the child is required in order to determine the best interests of the child that is referred to in the Constitution.

### **The voice of the child in Occupational Therapy**

When scrutinising literature, it is evident that occupational therapists have taken a significant time to acknowledge these rights of children in their practice.

The mind shift from the practitioner's "role as expert", where the "consumer" was expected to provide information and comply with the intervention plan the practitioner proposed, towards family-centred care (considering the parents during intervention planning) was described as complex and challenging (Lawlor & Mattingly, 1998:259; Cohn & Cermak, 1998:545). Two years later, professionals (Cohn, Miller & Tickle-Degnen, 2000:36, 42) seemed more positively inclined to actively involve parents, as primary decision makers for their children, in formulating intervention plans, and also enquiring about their hopes and outcomes for therapy.

This focus on family-centred practice has since move further towards child-centred practice. Several self-report instruments for children, e.g. the Child Occupational Self-Assessment (COSA) (Kielhofner, 2002:221) and the Perceived Efficacy and Goal Setting System (PEGS) (Missiuna, Pollock & Law, 2004), were developed to include the child in the occupational therapy

process. Collaboration with both the child and the parents is necessary to tailor the intervention plan to both perspectives and to agree on goals and intervention outcomes. Collaboration with the child in activity choice was also included as a core element in ASI treatment (Parham *et al.*, 2007:219). Only when all perspectives are included and valued, real family-centred care is taking place (Morgan & Long, 2012:17; O'Brien, Bergeron, Duprey, Olver & St. Onge, 2009:178).

The role of the occupational therapist is to include this collaboration with the child, parent and educator throughout the occupational therapy process, as depicted previously in figure 2.3. The occupational therapist should control the process using clinical and professional reasoning to form an integrated intervention plan and to reach the required outcomes (AOTA, 2008: 644-663).

There are however none of these self-report assessments for children on the list of standardised and other tests used by occupational therapists in South Africa (HPCSA, 2004) and no proof is evident of the inclusion of such assessments for children by South African therapists in daily practice (Aronstam, 2003:12-13). The South African occupational therapists who participated in Aronstam's research also rated their assessment and treatments skills relating to the child as a part of the family-structure as below average (2003:13). This further emphasises the need for South African occupational therapists to apply family-centred practice.

### **The Perceived Efficacy and Goal Setting System**

Missiuna and Pollock (2000:107) found in a pilot study that young children can express their perception of abilities, even though they perceived

themselves to be generally more competent at performing tasks than their parents did. The children were however able to identify specific tasks that were difficult for them and were able to set goals, but the prioritization of goals differed between children and parents.

A follow-up study by Dunford *et al.* (2005:213) in Wales, using the research version of the PEGS developed from Missiuna and Pollock's pilot study (2000:101-109), aimed to understand children's views of the impact of coordination difficulties (dyspraxia) on their daily lives and to compare this with the views of parents and educators. The children voiced the most concern over their abilities to perform sports, with dressing identified as the second biggest concern. In contrast to this, the parents' and educators' main concerns were related to schoolwork. However, the parents and educators did not comment on the same items as the children and only a general comparison could be done. This was pointed out by the researchers as a limitation and they concluded that further research using all three components of the PEGS would be recommended.

In a later study by Missiuna, Pollock, Law, Walter and Cavy (2006:212-213), the PEGS in its final format were completed by children with neurodevelopment disabilities, their parents and educators. In this study, educators consistently rated children as less competent than did the parents or children. As with the study in 2000 (Missiuna & Pollock, 2000:107), although children were able to identify tasks in which they were less competent, they consistently rated their perceived efficacy as higher than did their parents or educators. It was also found that the goals children set appeared relatively stable over time, suggesting that the child committed to a

certain goal should still be willing to work on achieving that goal after 2 weeks. The PEGS was thus found suitable for use in therapeutic planning.

Occupational therapists working in Sweden (Vroland-Nordstrand & Krumlinde-Sundholm, 2012:497-505) studied the applicability of the PEGS for their population. They first translated the PEGS to Swedish and then studied the relevance of test items for their cultural and school context. They found that children from grade 1 upwards could use all the items as they were in the original version of the PEGS. For children aged 5 and 6 years, the items of “finishing schoolwork on time, organizing numbers, printing and keeping a desk tidy” had to be adapted to be applicable to the Swedish school system.

### **Significance of using self-report assessments**

Self-report assessments promote client (family)-centred practice that gives all clients a greater voice in therapy (Kielhofner, 2002:213; Sturgess, Rodger & Ozanne, 2002:108). By being included in the goal-setting process, the child also takes ownership of the process and “satisfaction with and pursuit of goal-directed need fulfilment in supportive environments, enhance activity engagement and lead to personal growth” (Poulsen, Rodger & Ziviani, 2006:78). Using goals chosen by the child, children remain motivated to work on skills they find difficult, but important (Polatajko & Cantin, 2006:256; Kramer, Kielhofner & Smith, 2010:621).

## **2.9 SUMMARY**

This review of literature commenced with a discussion on the history and terminology regarding dyspraxia, as viewed from a sensory integration frame

of reference. The prevalence and extent were discussed, as well as the hypotheses on the etiology. The process of identifying dyspraxia was described, with the SIPT as a tool to identify specific patterns of dysfunction. The reader was provided with a clinical picture of the child with dyspraxia, as painted mostly by the parents and educators. The Occupational Therapy Process, as applied to children with dyspraxia was unravelled, with great emphasis on family-centred practice. Finally, the voice of the child was introduced, as a very important role-player in assessment and intervention.

The following chapter, Chapter 3, presents the methodology used in obtaining the perceptions of the parents, educators and children on dyspraxia.

## **CHAPTER 3      RESEARCH METHODOLOGY**

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### **3.1 INTRODUCTION**

Research is required for a profession to grow and be evidence-based and science-driven (Sladyk, Jacobs, & MacRae, 2010:423). This research study, aimed at better understanding dyspraxia, will attempt to further establish the importance of child-centred practice by South African occupational therapists.

The previous chapter gave an overview of literature relevant to dyspraxia, client centred practice and goal setting.

In this chapter, the methodology of the research study is discussed in detail and includes the study design, study participants, measuring instruments, pilot study, data collection methods and methodological and measurement errors.

### **3.2 STUDY DESIGN**

A descriptive, cross-sectional study was done. Descriptive research entails the accurate portrayal of characteristics related to a sample, without manipulating it in any way. Cross-sectional data is selected at a single point in time (Polit & Beck, 2006:154,179,498). Descriptive questions were used to obtain primary (new) data, from three groups: the perceptions of the children, parents and educators. Numerical and textual data from the three

groups of units were compared to obtain information on similarities and differences between the groups.

The researcher had medium control over data gathered, as a structured questionnaire/form (PEGS) was used with items that were similar for all three groups. The degree of control or structure in the method of data collection can range from high (e.g. laboratory experiments) to low (e.g. observation of people in their natural environment) (Mouton, 2001:144-145).

This was a non-experimental study, as no manipulation of an independent variable has taken place (Mouton, 2001:154; Polit & Beck, 2006:179-180).

### **3.3 STUDY PARTICIPANTS**

The study population consisted of children diagnosed with dyspraxia according to the criteria of the Sensory Integration and Praxis Test (SIPT) (Ayres, 1989).

The SIPT, developed as a diagnostic tool for the identification of sensory integrative and praxis deficits (Ayres, 1989:1), may only be administered and interpreted by occupational therapists who completed the Theory, Test Mechanics and Interpretation courses presented by the South African Institute of Sensory Integration (or an acknowledged international training body), as well as a peer review of test administration and the testing of 4 typically developing children with the SIPT (Cook, 2009:6; Schaaf & Roley, 2006:11).



Occupational therapists qualified to administer the SIPT, using the SIPT in their practice and working in Bloemfontein and surrounding areas, identified the study population of children with a praxis dysfunction from their clinical records in the period of January to June 2012. Detailed information regarding the method and subtypes of dyspraxia included is discussed in the following section, “measuring instruments”.

All children from this study population who themselves gave assent and whose parents gave consent to participate, were included in the study sample. The study sample further consisted of the parent(s) of the child who were involved in the occupational therapy process, as well as the consenting educator of the child concerned.

According to the age range on which the SIPT (Ayres, 1989:1) was developed and standardised, the children’s ages could range between 4 years 0 months and 8 years 11 months. The Perceived Efficacy and Goal Setting System (PEGS) was effectively used by its authors in research studies (Dunford *et al.*, 2005:208; Missiuna & Pollock, 2000:103) with children between the ages of 5 to 10 years, with the PEGS stated to be most appropriate for children developmentally or chronologically between the ages of 6 and 9 years (Missiuna *et al.*, 2004:1). When comparing activities featured in the PEGS to what is expected of children in the South African school curriculum (South Africa, 2011:22; South Africa, 2011a:12-13), the researcher found the PEGS to be appropriate for children in grade R. Thus, children between the ages of 5 years and 8 years 11months, who were enrolled in grade R or a higher grade, were included. Boys and girls were included.

Children who have been treated by an occupational therapist for more than 24 sessions of 30 minutes each were excluded. Research indicated that no statistically significant change in self-esteem, including perceived efficacy, was found before 12 hours of treatment (McWilliams, 2005:395-396), but the possible effect of more exposure to therapy on the child's perceived efficacy had to be taken into consideration.

In summary, children included in the study were identified with dyspraxia by applying the theoretical perspective of ASI. Their perceived level of occupational performance was then measured by completing the PEGS, which specifically focused on the OPAs of school/productivity, leisure and self care. The PEGS items were found to be applicable for the South African population of foundation phase learners, as it relates to the National Curriculum.

### **3.4 MEASURING INSTRUMENT**

#### **3.4.1 The Sensory Integration and Praxis Test (SIPT)**

The results of the Sensory Integration and Praxis Test (SIPT) (Ayres, 1989) were used as inclusion criteria to identify the study population of children with dyspraxia.

There are two sets of SIPT criteria that can be used to identify dyspraxia in children:

- A computerised D-square value, calculated using the statistics of the American population on which the SIPT was standardised, can indicate the fit between a child's scores and a sensory integration functional or dysfunctional group as identified by the SIPT (Ayres, 1989:139); or
- Clusters of subtest scores, which in combination point to a certain type of dyspraxia, can be used to identify a specific subtype of dyspraxia (Ayres, 1989:132).

As described in chapter 2, to make the SIPT more reliable for use with South African children 6 years and older, it was recommended that certain subtests' scores should be adapted (Van Jaarsveld *et al.*, 2012:17). Thus, for the purpose of this study, the cluster of SIPT test item scores with the adapted scores was applied for identifying dyspraxia in these South African children.

The specific subtests involved in identifying the subtype of dyspraxia, were the following (a SD-score of  $\leq -0.80$  was used to indicate a below average score):

- Low Average Bilateral Integration and Sequencing dysfunction: (Oral Praxis, Sequencing Praxis, Bilateral Motor Coordination, Graphesthesia, Standing and Walking Balance, with Postural Praxis as additional indicator)
- Visuodyspraxia (Design Copying, Constructional Praxis, Space Visualisation, Motor Accuracy, with Finger Identification as additional indicator)
- Somatodyspraxia (Postural Praxis, Sequencing Praxis, Oral Praxis, with two of Finger Identification, Graphesthesia, Standing and Walking Balance, Kinesthesia, Localisation of Tactile Stimuli)

- Generalised Sensory Integrative Dysfunction (combination of the above subtypes).

If was foreseen by the researcher that, as the instructions of the SIPT is only standardised in English and Afrikaans, some children with dyspraxia could have been excluded from this study as language difficulties prevented them from being assessed with the SIPT. This exclusion would not have been due to a convenience sample, but rather to the lack of a diagnostic instrument that is specifically standardised for the South African population in all official languages. None of the occupational therapists that participated has however indicated that any children were excluded due to this reason.

The reliability and validity of the SIPT were of importance to this study, as the SIPT was used as the single diagnostic tool to identify the study population.

- The inter-rater reliability score for accuracy on the subtests of the SIPT were all  $r \geq 0.94$  (Ayres, 1989:213), as evaluated using a sample of 63 children between the ages of 4 years 0 months and 8 years 11 months.
- Seventy-one percent (71%) of subtests' accuracy scored  $r \geq 0.70$  for test-retest reliability. This was determined by testing 51 children twice with the SIPT, with one to two weeks between the tests (Ayres, 1989:209-212).
- For concurrent validity, a study using a matched sample of 293 normal and dysfunctional children found all subtests could indicate significant differences ( $p < 0.01$ ) (Ayres, 1989:183).
- Correlation was also found between SIPT subtests and subtests of the Kaufman Assessment Battery for Children (K-ABC; Kaufman &

Kaufman, 1983), and the Bruininks-Oseretsky Test of Motor Proficiency (BOTMP; Bruininks, 1978) (Ayres, 1989:186-189).

- Research by van Jaarsveld, Mailloux and Herzberg (2012:17) on the use of the SIPT with South African children, concluded that there are five test items (DC, BMC, OPr, SWB and MAc) within the older age bands (6y0m – 8y 11m) where the SA sample of children performed moderately to significantly better than the USA sample. They recommend that, before interpreting a SA child in the age bands of 6y 0m – 8y 11m SIPT scores, these five test item's scores must each be adapted with  $\frac{1}{2}$  a SD unit to the negative side. The use of the cluster of SIPT test item scores with the adapted scores was thus applied for identifying dyspraxia in these South African children.

### **3.4.2 The Perceived Efficacy and Goal Setting System (PEGS)**

The PEGS (Missiuna, Pollock & Law, 2004) was used as the measuring instrument to obtain the perceptions regarding dyspraxia from the child, parent and educator.

The PEGS's assessment for children consists of 24 pairs of cards showing children participating in activities from the occupational performance areas of self-care, school/productivity and leisure/play. The child had to indicate if he is like the picture of the child who is "more competent" or "less competent" in the activity. The child then indicated if he is "a lot" or "a little" like the child in

the picture. The researcher recorded the data on a standardised form (appendix F), using the following scale:

- 1 – agrees a lot with the “less competent” picture
- 2 – agrees a little with the “less competent” picture
- 3 - agrees a little with the “more competent” picture
- 4 - agrees a lot with the “more competent” picture

The child was then given a chance to name up to four activities that he were good at and up to four activities that he struggled with, that were not included in the series of cards. The researcher then showed the child the cards that he indicated he was less competent in and the child selected up to four goals and priorities that can be addressed during occupational therapy intervention.

During an interview with the parent(s), the researcher asked the parent(s) to rate the child’s competency on the same activities as those of the child’s cards of the PEGS according to a 4 point scoring system (1=less competent and 4=more competent). The researcher noted this on the required form (appendix G). The researcher then listed the activities that the parent(s) had identified as those that the child are the least competent in and the parent(s) chose up to four as goals to be addressed during occupational therapy intervention, which were also noted by the researcher. The structured interview with the parent was completed either by the parent involved in the occupational therapy process or both parents. Provision had also been made for this interview to be done with the caregiver/guardian. This was however not applicable to any of the children included in the study.

The importance of the input of the educator in the treatment plan of the child was emphasised in order for the educators to willingly cooperate. During an interview with the educator, the researcher asked the educator to rate the child's competency on the same activities as those of the child's cards of the PEGS according to a 4 point scoring system (1=less competent and 4=more competent). The researcher noted this on the required form (appendix H). The researcher then listed the activities that the educator had identified as those that the child are the least competent in and the educator chose up to four as goals to be addressed during occupational therapy intervention, which were also noted by the researcher.

A 4 point scoring system was used (1=less competent and 4=more competent) on PEGS forms (appendix F, G and H) to complete the PEGS forms during data collection and scores were transferred to the summary score sheet (appendix I). Information from the PEGS summary score sheet (appendix I), as well as the SIPT data provided by the treating occupational therapists, were transferred to the relevant data sheet (appendix J) by the researcher. This was checked by a trained assistant who was used only for the purpose of ensuring that no errors were made in transferring data.

The calculation of PEGS scores were as follows:

- The sum of all items for all three groups: the child and parent's score in a range from 24 to 96 and the educator's score in a range from 20 to 80. The sum for an individual was converted to a percentage of the total. The percentages gave an overall impression of how the child's own overall rating compared to that of the parent and educator.

- The sum of items 2, 8, 11, 15 and 18 for occupational performance area of self-care: the child and parent's score up to a total of 20 and the educator's score up to a total of 12 (items 2 and 11 were not included in the educator's questionnaire). The sum for an individual was converted to a percentage of the total. The percentages gave an impression of how the child's own self-care rating compared to that of the parent and educator.
- The sum of items 5, 6, 9, 12, 13, 17, 19, 20 and 21 for occupational performance area of school/productivity: all groups scores up to a total of 36. The sum for an individual was converted to a percentage of the total. The percentages gave an impression of how the child's own school/ productivity rating compared to that of the parent and educator.
- The sum of items 1, 3, 4, 7, 10, 14, 16, 22, 23 and 24 for occupational performance area of leisure/play: the child and parent's score up to a total of 40 and the educator's score up to a total of 32 (items 4 and 14 were not applicable for educators). The percentages gave an impression of how the child's own leisure/play rating compared to that of the parent and educator.
- The number of goals per occupational performance area was calculated as a percentage.

The reliability and validity of the PEGS were calculated by different studies:

- The first aspect of reliability, internal consistency, was calculated using data from a study with 48 participants (Missiuna et al., 2004:37). The Cronbach's alpha reliability coefficient, an index of internal consistency ranging from 0 (no consistency) to 1 (perfect



consistency), was 0.91. This suggests a sufficient level of internal consistency.

- Test-retest reliability was calculated using data from a study with 24 participants that were tested and re-tested two weeks later. Pearson product-moment correlation coefficients were ( $r = 0.77$ ). This suggests sufficient test-retest reliability (Missiuna et al., 2004:38).
- Goal stability, as an aspect of reliability, was studied with 117 participants. 92% of children who participated in the standardization study selected between two and four of the same goals at the second administration, two weeks after the first. This suggests that PEGS provide a reliable method to identify children's goals that appear to be stable over time (Missiuna et al., 2004:38).
- Evidence of validity based on test content, was described by Missiuna et al. (2004:39). Test items were drawn from developmental literature and other measures of perceived efficacy. Items were revised through various studies, after the input from expert clinicians and participating children. In the standardization study for PEGS ( $n=117$ ), relevance of the items included in PEGS were confirmed by 25 occupational therapists (Missiuna et al., 2004:39).
- Numerous studies (Missiuna et al., 2004:39-41) were done where the PEGS were administered at the same time as others tests measuring the same constructs, in order to examine the relationship of test scores to external variables. Correlation coefficients indicates a sufficient degree of agreement with the Pictorial Scale of Perceived Competence and Social Acceptance for Young Children (PCSA; Harter & Pike, 1984) ( $r = 0.80$ ). A moderate

correlation was found between PEGS and motor proficiency tests Developmental Test of Visual-Motor Integration (VMI; Beery, 1989) ( $r = 0.64$ ) and the Bruininks-Oseretsky Test of Motor Proficiency (Bruininks, 1978) ( $r = 0.73$ ), indicating that this is a valid measure of the child's perceived competence of his performance of motor-based activities.

### **3.5 PILOT STUDY**

A pilot study was conducted in November 2011 to ensure that all instructions and questions were clear and easily understood, to test the information document, as well as the consent forms, in terms of clarity and to determine the duration of the different interviews, as well as the PEGS assessment with the child.

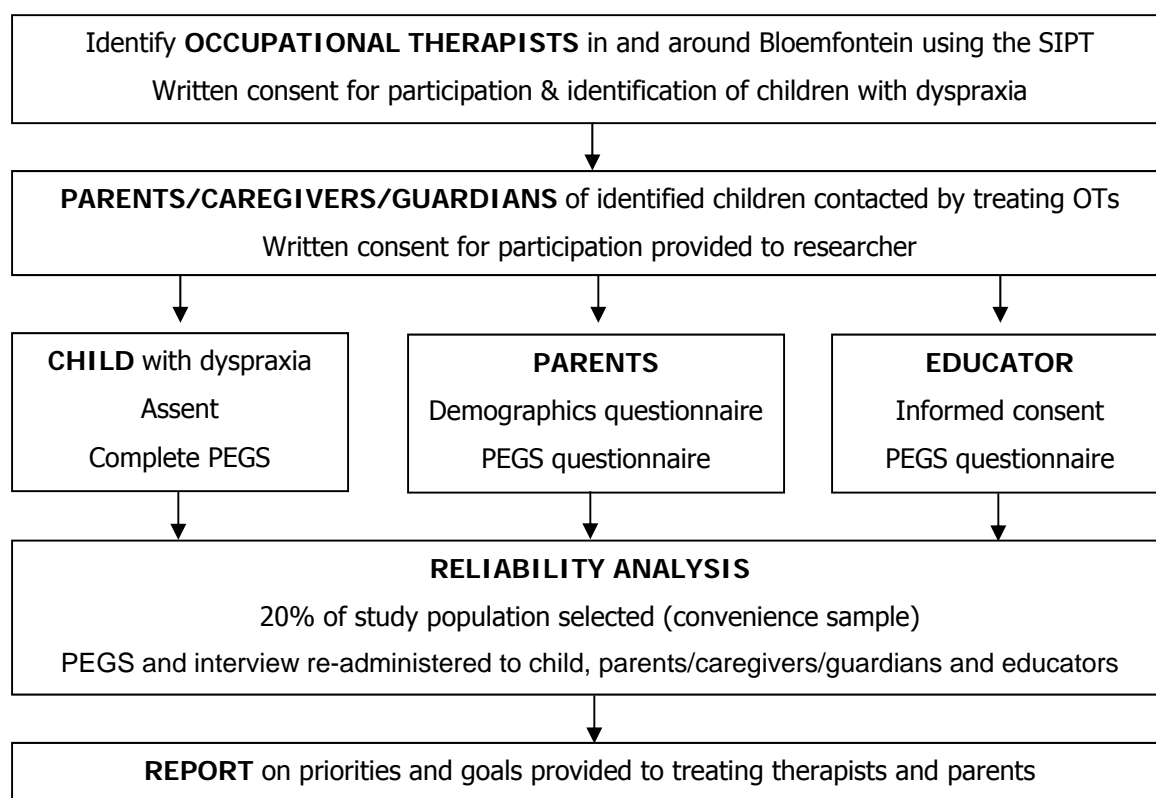
The PEGS evaluation and structured interviews were conducted with one Afrikaans child, one English child and one Sotho-speaking child using English as a second language, together with their respective parents and educators. These were not children with dyspraxia, but children receiving occupational therapy for other reasons. A summary of their PEGS results were provided to the parents and the therapist.

Questionnaires were coded in order to check whether there are enough coding blocks and coding was checked by a trained assistant, to ensure that no errors were made in the transfer of data.

The description of one test item was broadened after the pilot study, in order to be applicable to both children in pre-school and primary school. This specific item (number 13) questioned if the child “can organise numbers on a page” and was changed to “can work in an organised fashion on a page”. Other than was found by the Swedish researchers (Vroland-Nordstrand & Krumline-Sundholm, 2012:497), all other test items could be commented on by all three parties. Data from the pilot study was not included in the results.

### 3.6 DATA COLLECTION METHOD

Figure 3.1. summarises the method used to collect the data for this research study.



**Figure 3.1** Flow chart of data collection method (designed by C van Staden)

### **3.6.1 Setting up appointments**

Occupational therapists working in the Free State and qualified in using the SIPT were identified from the database of The South African Institute for Sensory Integration (SAISI). They were contacted telephonically and in writing (appendix B – language of choice) to request that they identify children with dyspraxia from their practice records. Five therapists indicated that they do use the SIPT in their practice and gave consent to participate in the study.

A number of letters of informed consent for the parents/caregivers/ guardians of the children (appendix C – language of choice) were then provided to these occupational therapists. In the period from January to June 2012 the occupational therapists handed out and collected the completed consent letters from the parents of the children identified for the study. The treating occupational therapists then attached the WPS SIPT report (as per appendix C). Eighteen children were identified for the study, of which fifteen participated in this study. Three children's parents did not consent to participation.

These completed letters of informed consent were then handed over to the researcher. The parents were contacted by the researcher and appointments were made to collect data from the children as well as the parents. The appointment with the child and parent took place at the treating occupational therapist's practice or at a place of convenience for the parent.

The parent also gave consent that the child's educator may be contacted for an appointment. The educator was then contacted by the researcher, the research project and the educator's possible participation was discussed and

they were provided with a letter of informed consent (appendix D – language of choice). The appointment with the child’s educator took place at a place of convenience for the educator.

### **3.6.2 Data collection – child**

The researcher explained the process to the child at the start of the session in order for the child to assent to participation (appendix E – language of choice).

The Perceived Efficacy and Goal Setting System (PEGS) (Missiuna *et al.*, 2004) was administered. This evaluation took 20-30 minutes per child. The child was seated at a table, with the researcher next to the child. The assessment was done in either Afrikaans or English, according to child’s home language. The PEGS was published in English, but it stated clearly that there was no standardised wording, that instructions and wording provided was only a suggestion and that discussion on items should be encouraged. The only idea that had to be conveyed to the child was that a child on one picture is more competent and that the child on the other picture is less competent (not all children are the same) (Missiuna *et al.*, 2004:19). The original, copyrighted scoring-sheets were used (appendix F). Scoring was done as described previously under “measuring instrument”.

### **3.6.3 Data collection – parent/caregiver/guardian**

The researcher then conducted a structured interview with the parent of the child who is most involved in the child's occupational therapy process or with both parents, depending on who was available for the interview. During this interview, information regarding family demographics and the child's medical and therapeutic history (appendix J) was gathered and completed on the data sheet by the researcher. This interview took place in Afrikaans or English, according to the parent's preference. The PEGS was then administered with the parent(s), as discussed previously under "measuring instrument".

### **3.6.4 Data collection – educator**

The researcher conducted a structured interview with the educator of the child concerned, in order to administer the PEGS. This interview took place in Afrikaans or English, according to the educator's preference.

### **3.6.5 Reliability Analysis**

In order to confirm the reliability of this study, 20% of the study population was selected by means of a convenience sample and the questionnaires and PEGS re-administered four to six weeks after the first evaluation. This was done to ensure that the data gathered during the structured interviews were reliable.

### **3.6.6 Report back to study participants**

After collection of all data, a summary of the PEGS results per child was made available to the treating occupational therapists and the parents of the children concerned.

### **3.6.7 Method of data analysis**

Descriptive statistics, namely frequencies and percentages for categorical data and means and standard deviations or medians and percentiles for continuous data, were calculated per group. The groups were compared by means of 95% confidence intervals for the percentage, mean or median differences.

A reliability analysis was included in this study. Where answers to questions differed with more than 20%, the question was deemed unreliable and the results thereof were not reported, except where outside variables influenced the response.

The analysis was done by Department Biostatistics, Faculty of Health Sciences, UFS.

### 3.7 METHODOLOGICAL AND MEASUREMENT ERRORS

Table 3.1 describes the possible methodological and measurement errors, as well as precautions taken by the researcher to prevent these possible errors.

Table 3.1 Possible methodological and measurement errors

Possible methodological/ measurement error	Precautions taken to prevent error
Limited number of children	All children who qualified and had given consent were included
Limited number of occupational therapists using the SIPT, due to cost and time constraints	All OT's qualified in using the SIPT in Bloemfontein and surrounding areas were contacted numerous times
Not all questions answered by participants	Structured interviews were done by researcher
Difference in the way questions are asked in different interviews	Structured interview in Afrikaans or English was only conducted by the researcher, with no interpreter involved
Participation of illiterate persons, e.g. pre-school children	Structured interviews and picture cards were used to collect data
SIPT not standardised for SA population	This is the golden measure for identifying dyspraxia and recommendations as to the adaptation of scores to make it more reliable for use in the SA population, were applied
PEGS not standardised for SA population	This was the only assessment available, and was thus used
PEGS questions only available in English	Questions were translated to Afrikaans. This did not influence the outcome of the PEGS, as wording provided in the PEGS manual was only a suggestion and discussion was allowed (Missiuna <i>et al.</i> , 2004:19).



Different interpretation of PEGS items by various parties, e.g. "printing"	The researcher conducted all the PEGS assessments and interviews and items were discussed with participants to clarify their understanding of the concepts.
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All possible efforts were made to prevent any methodological or measurement errors from influencing this research study.

### 3.8 ETHICAL CONSIDERATIONS

- The protocol for this research was approved by the Ethics Committee of the Faculty of Health Sciences, University of the Free State (No: 22/2010).
- The researcher at no stage had any access to the treating occupational therapists' patient records or information. All initial correspondence was handled anonymously via the treating occupational therapist. The first time that any data was made available to the researcher, was when the parent of the child had returned the signed letter of consent to the treating occupational therapist.
- In order to ensure willing cooperation of the occupational therapists, the researcher made it clear to the therapist treating the child that this would not interfere with therapy, but was an additional assessment. The initial contact with the parents was through the therapist, the interviews and assessment was at her practice, if possible, and the researcher made the results per child

available to the therapist, in order for her to include the results in the treatment plan as she saw fit.

- Informed consent was requested from therapists, parents and educators in writing, as well as assent from the children participating (see appendices B-E).
- All the participants were also made aware that participation was voluntary and that they had the right to withdraw at any time without prejudice.
- There was no harm or physical discomfort in participation and both the treating occupational therapists as well as parents received a copy of the PEGS results. These results could then be used as a therapeutic tool by the treating therapist, in consultation with the parent and child, at their discretion.
- As the SIPT was only standardised in Afrikaans and English, the exclusion of children who were not fluent in either of these languages was an ethical issue. This was however unavoidable, as the SIPT is the only diagnostic tool available to clearly diagnose dyspraxia with its prototypes. South African occupational therapists have brought this problem under the attention of the publishers.
- The language of choice of the participant was used – either Afrikaans or English.
- Confidentiality was adhered to – all the participants were identified by numbers only and the researcher and biostatistician were the only people to handle test material.

### **3.9 SUMMARY**

This chapter gave the reader an overview of the methods followed during this research study. The study design was described and the method of identifying the study participants explained. This was followed by a discussion on the two measuring instruments used, namely the SIPT and PEGS. The pilot study and method of data collection were presented. Reference was made to precautions taken to prevent possible methodological and measuring errors. Ethical matters that were taken into consideration were discussed.

The results and statistical data will be presented in the next chapter.

## CHAPTER 4 RESULTS

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### 4.1. INTRODUCTION

The data obtained by applying the research method described in Chapter 3, follows. The reader will find the following in this chapter:

- **Demographic information**, as reported by the parent(s) through means of a structured interview. This includes information regarding the age, gender, siblings and their school level and -activities of the children with dyspraxia. The parents' educational level and employment category are also described, as well as the family structure and socio-economic status. Medical and therapeutic information of the child are included. A short note on the educators, as the third group of participants, concludes this section of the chapter.
- Serving as inclusion criteria for the study, **SIPT results** used to identify the type(s) of praxis dysfunctions are presented.
- Containing the essence of this research study, the children, their parent(s) and educators' perceived efficacy regarding the activities contained in the **PEGS** are portrayed and compared. The different functional therapeutic goals set by the three different groups (child, parent, educator) are also conveyed.

## **4.2. DEMOGRAPHIC INFORMATION OF PARTICIPANTS**

Fifteen (15) children, with their parent(s) and educators participated in the study. For all results that are reported on  $n=15$ , unless otherwise indicated.

Structured interviews with the parent(s) to obtain demographic information took place over a period of 4 months, from 25 February to 27 June 2012. In 13 of these interviews, only the child's mother was present, with both parents present at the other 2 interviews.

Data acquired through these structured interviews was deemed reliable, as the demographic data that was obtained six weeks later from 20% of the participants only differed as expected from the original data with regards to the time that passed between the interviews, such as ages and number of treatment sessions received. In three questions outside variables changed the response of the parent(s) - this is indicated as footnotes in the applicable paragraphs. This did however not negatively influence the reliability of the structured interview questions.

### **Children**

The age of the children ranged between 64 and 98 months, with 50% of the children aged 77 months and older. Ten of the children were male. The home language of the children was mostly Afrikaans (93.3%), with only 1 English-speaking child participating in the study.

As discussed in chapter 2, dyspraxia can influence the relationship between siblings. The number of siblings and birth order of the children is depicted in table 4.1.

**Table 4.1 Number of siblings and birth order**

Number of siblings	n	Birth order		
		% oldest	% second	% third
0	1	100.0%		
1	11	72.7%	27.3%	
2	3	33.3%	33.3%	33.3%

In total, 66.7% of the children were the eldest, 26.7% second born and 6.7% third born.

Sixty percent (60.0%) of the children were in grade R, 33.3% in grade 1 and one child in grade 2. It was reported that 2 children repeated grade R and 1 child had to repeat grade 1.

More than half of the children's school days included afternoon care at the school, as seen in table 4.2.

**Table 4.2 After school care**

After school care	n	%
Afternoon care at the school	8	53.3%
Caregiver / nanny	2	13.3%
Parent / grandparent	7	46.7%

One of the children's after school care was shared by a nanny and the parent, and another child either stayed at the school for afternoon care or was looked after by the parent.

Extra-curricular activities the children participated in are portrayed in table 4.3.

**Table 4.3 Extra-curricular activities**

Extra-curricular activity	n	%
Team sport at school	3	23.1%
Individual sport	5	38.5%
Music	3	23.1%
Playball / Monkeynastix	4	30.8%
Computer classes	2	15.4%
Chess	1	7.7%
Voortrekkers / nature club	3	23.1%
Reading classes	3	23.1%
Ballet, dance & pom-pom girls	3	23.1%
Drama	1	7.7%
Experi-buddies	1	7.7%

The number of activities individual children took part in ranged from 0 to 5, with 60.0% of children participating in 1 or 2 activities. The results indicate that 13.3% of the children did not participate in any extra-curricular activities.<sup>1</sup>

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<sup>1</sup> Both of the children whose parents indicated in the first interview that they did not participate in any extra-curricular activities, had joined a team sport at school when the second interview, as part of the reliability analysis, took place.

## Parents

The parent(s) of the children with dyspraxia formed the second group of participants in this study. Although 15 mothers and two fathers were interviewed, the structured questionnaires gathered information on both of the birth parents of each of the 15 children. Thus the data presented here refers to the 15 birth mothers and fathers of the children involved.

The highest level of education of the parents is shown in table 4.4.

**Table 4.4 Parents' highest level of education**

Highest level of education	% fathers	% mothers
Lower than Grade 12	13.3%	13.3%
Grade 12	66.7%	20.0%
Diploma	13.3%	13.3%
Bachelors or honours degree	6.7%	26.7%
Master's degree	0.0%	20.0%
Doctor's degree	0.0%	6.7%

The mothers of the children participating in the study had obtained a higher average level of education than the fathers, with 66.7% of mothers reporting tertiary qualification in comparison to 20.0% of the fathers. Two thirds of the children had at least one parent with a qualification higher than grade 12 and in only one case none of the parents had completed grade 12.

The mothers' category of employment was also higher than that of the fathers, as shown in table 4.5.



**Table 4.5 Parents' category of employment**

<b>Category of employment</b>	<b>% fathers</b>	<b>% mothers</b>
Executive/ Advanced professional	6.7%	20.0%
Business-manager/ lower professional/ teacher	13.3%	33.3%
Administrative/small business owner	33.3%	26.7%
Clerical/sales/technical	33.3%	13.3%
Skilled manual	6.7%	0.0%
Unskilled manual	0.0%	0.0%
Unemployed	6.7%	0.0%
Other: unemployed by choice	0.0%	6.7%

Two thirds (66.7%) of fathers were employed in administrative/small business and clerical/sales/technical work. Opposed to this, more than half of the mothers (53.3%) worked in the higher employment sectors, such as professionals and business managers.

Nine (9) of the children included in this study lived with both their biological parents. The other 6 all lived with their mothers and in 4 of these cases the household also involved a stepfather or mother's partner.<sup>2</sup>

### **Socio-economic status**

Children's access to occupational therapy practices where the SIPT is used as assessment tool is influenced by their socio-economic status, as well as their access to medical aids.

The household density ratio (HDR) of participants was calculated using the Indices of crowding (Coetzee, Yach & Joubert, 1988:354), as an indicator of socio-economic status:

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<sup>2</sup> When re-interviewed for reliability analysis purposes, 1 of the mothers indicated that her partner has since moved out and that she is now the only adult in the household.

- Each person aged  $\geq 10$  years counted as one equivalent person (EP), and those aged  $< 10$  years counted as half an EP.
- A household of not more than 2.5 EPs required 1 sleeping room, one of up to 3.5 EPs required 2 sleeping rooms, and one of up to 5 EPs 3 sleeping rooms; another additional sleeping room was required for every further 2.5 EPs.
- The HDR was calculated as follows:

$$\frac{\text{No. of EPs in dwelling}}{\text{Ideal No. of EPs for No. of sleeping rooms}} \times 100$$

- A value of over 100% indicated crowding and thus a lower socio-economic status.

Applying the mentioned criteria, 20% of the participants' calculated HDR implied a lower socio-economic status.

### Medical and therapeutic background information

The complexity in identifying dyspraxia and the role-players involved in this process were discussed in detail. Different people referred the children for assessment (see table 4.6).

**Table 4.6 Person responsible for referral to occupational therapist**

Referred to OT by	n	%
General practitioner (GP)	2	13.3%
Paediatrician	0	0.0%
Educator	8	53.3%
Parents	6	40.0%
Educational psychologist	1	6.7%
Play therapist	2	13.3%

In this study, more than 50% of the children (53.3%) were referred to an occupational therapist by an educator.

One of the exclusion criteria that were applied during this study stated that the maximum number of occupational therapy sessions the child had received for dyspraxia, could be 24. The number of occupational therapy treatment sessions the children in the study had participated in ranged from 0 to 22, with 2 the median number of sessions. At the time of the interview, 1 of the children was also receiving speech therapy (2 sessions completed) and another child was also being treated by a play therapist (15 sessions).

It was reported that 10 of the children had previously received some form of therapy, as portrayed in table 4.7.

**Table 4.7 Therapy children received prior to being identified as suffering from dyspraxia**

<b>Therapy previously received</b>	<b>% (n=10)</b>	<b>Median number of sessions</b>	<b>Range of sessions</b>
Speech therapy	20.0%	2.5	2 - 3
Play therapy	40.0%	3.5	2 - 20
Occupational therapy	40.0%	14	8 - 24
Attachment therapy	10.0%	1	1

One of these 10 children had previously received both speech- and occupational therapy, with the others only involved in one type of therapy before their problems were identified as related to dyspraxia.

Parents were requested to clarify any other medical conditions that could influence the child's functional ability. Three (3) parents specified additional medical information, as per table 4.8.

**Table 4.8 Additional medical information**

<b>Additional medical information</b>	<b>n</b>
Heart valve dysfunction	1
ADHD (attention deficit hyperactivity disorder)	1
Premature birth - 32 weeks gestation	1

In response to an open-ended question, parents identified the following variables besides dyspraxia that could affect the child's perceived efficacy (Table 4.9)<sup>3</sup>:

**Table 4.9 Issues that could affect the child's perceived efficacy**

<b>Possible issues</b>	<b>n</b>
Mother diagnosed with depression	1
Divorce / parents separated	4
Recent death & illness of grandparents, divorce in close family	1
New baby brother	1
Sensory modulation difficulties leading to emotional oversensitivity	1

For 46.7% of the children the parent(s) indicated that they were not aware of any other factors that could influence the child's perceptions of his abilities.

### **Educators**

Fourteen (14) educators from 12 different schools completed the educator questionnaire through interviews. One educator was interviewed twice, as 2 of the learners from her class were included in the study<sup>4</sup>.

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<sup>3</sup> One of the children of divorced parents was allegedly molested in the period between the first and second interview (that was performed for reliability purposes).

<sup>4</sup> This data concerning the educators was obtained from the letters of consent signed by the participating educators.

### **4.3. SIPT RESULTS**

As described in detail in chapter 3, the Sensory Integration and Praxis Test (SIPT) were used as assessment tool to identify children for inclusion in the study. The start date of the SIPT assessments, done by 5 occupational therapists in Bloemfontein, ranged from 7 June 2011 to 21 June 2012.

In 50.0% of the cases, the interview with the parents took place within 14 days of the start date of the SIPT assessments.

Clusters of subtest scores, which in combination indicated the presence of a certain type of dyspraxia, were used to identify the children's subtypes of dyspraxia (table 4.10). The specific subtests applied to indicate a best fit to a cluster were described in chapter 3. For all subtests, unless otherwise indicated, a SD-score of  $\leq -0.80$  was used to indicate a below average score. As described earlier, the adaption to scores as per the SA criteria were made for children 6 years and older and is indicated in table 4.10.

Table 4.10 Types of dyspraxia as per SIPT results

CHILD NR	Using subtest scores (* indicates SA adapted scores)		
	Visuodyspraxia	Somatodyspraxia	Bilateral integration and sequencing deficit
1		x *	
2			x <sup>a</sup>
3	X		
4			x <sup>b</sup>
5	x *	x *	x *
6	x *	x *	x *
7	X		
8	x *		
9	X		
10	x *		
11	X		
12		x *	x *
13	x *	x *	x *
14	X		
15	X		

As indicated by table 4.10, for 26.7% of the children more than one subtype of dyspraxia were identified. The SIPT results indicated that more than eighty percent (86.7%) of the children included in the study suffered from visuo- and/or somatodyspraxia. In forty percent (40.0%) of the children bilateral integration and sequencing deficits were present.

Child 2 (<sup>a</sup>) met 6 of the 7 criteria for a bilateral integration and sequencing deficit as his SWB SD-score was -0.50. He was included in the study as his computerised D-square value on the WPS SIPT-report confirmed a statistical fit to 3 clusters (low average BIS, low average SI & praxis and visuo- and somatodyspraxia) of possible SI dysfunctions. As he was younger than 6 years and thus not in the age group where adaptations to SD-scores were recommended for SA children, these D-square values can be used as appropriate indicators of possible dysfunction.

The same reasoning applies for child 4 (<sup>b</sup>). She met 5 of the 7 criteria for BIS, with an OPr score of 0.05 and a GRA score of -0.72. Her D-square values on the WPS SIPT report however indicated a statistical fit to both low average BIS and low average SI & praxis. She was also younger than 6 years when the SIPT was administered, thus the D-square values can be applied for inclusion in the study.

## **4.4. PEGS RESULTS – PERCEIVED EFFICACY**

The Perceived Efficacy and Goal Setting System (PEGS), served as the tool to report on the perceived efficacy of the child regarding 24 different functional tasks in 3 occupational performance areas of self-care, play and leisure, and school and productivity. The child, parent and educator commented if the “more competent statement” or “less competent statement” best fit the child, as well as the degree of the fit (e.g. a lot less competent or a little less competent). A scale of 1 to 4, as described in chapter 3, was used to record the selected statement during the assessment and interviews.

In order to simplify the presentation of the results, the following scale was used in the tables to present the responses by the participants:

- 1 – “Less competent” (this includes both the responses of a little less competent and a lot less competent, or 1 and 2 on the PEGS score sheet); and
- 4 – “More competent” (this includes both the responses of a little more competent and a lot more competent, or 3 and 4 on the PEGS score sheet)

All calculations were however made using the scale of 1 to 4, as per the original response of the participant.

These results on the perceived efficacy of the child with dyspraxia will first be discussed and compared per item of the PEGS as responded to by all three groups of participants. Summary scores and results as it pertain to OPAs then follow.



## 4.4.1 Results per item

The wide range of problems children with dyspraxia experience is portrayed in table 4.11. For each of the 24 PEGS items at least one participant perceived a child with dyspraxia to be less competent in executing that specific activity successfully.

**Table 4.11** Percentage of respondents who indicated a score of 1 (less competent) per PEGS item

ITEM NR	ITEM DESCRIPTION	CHILD		PARENT		EDUCATOR	
		N	%	n	%	n	%
1	Catching balls	15	66.7%	15	40.0%	15	46.7%
2	Cutting food (e.g. meat)	15	53.3%	15	53.3%		
3	Sport	15	40.0%	15	73.3%	15	60.0%
4	Playing electronic games	13	38.5%	13	23.1%		
5	Finishing work on time	15	20.0%	15	60.0%	15	60.0%
6	Making things (e.g. crafts)	15	26.7%	15	26.7%	15	46.7%
7	Playing/watching games and sports	15	33.3%	15	66.7%	15	60.0%
8	Tying shoelaces	15	60.0%	15	60.0%	12	66.7%
9	Cutting with scissors	15	33.3%	15	60.0%	15	60.0%
10	Trying new things on the playground	15	26.7%	15	60.0%	15	46.7%
11	Buttoning	15	33.3%	15	20.0%		
12	Working on a computer	12	16.7%	12	8.3%	12	0.0%
13	Working organised on a page	14	50.0%	14	50.0%	15	53.3%
14	Riding a bicycle	15	53.3%	15	66.7%		
15	Dressing	15	13.3%	15	53.3%	14	21.4%
16	Playing ball games (e.g. cricket, tennis)	15	66.7%	15	46.7%	15	66.7%
17	Printing	15	60.0%	15	53.3%	15	53.3%
18	Zippering	15	13.3%	15	6.7%	12	8.3%
19	Keeping desk neat	15	6.7%	15	66.7%	15	53.3%
20	Painting	15	13.3%	15	53.3%	15	40.0%
21	Drawing	15	6.7%	15	60.0%	15	53.3%
22	Skipping with a rope	15	80.0%	13	84.6%	14	100.0%
23	Kicking a ball	15	26.7%	15	26.7%	15	33.3%
24	Running	15	33.3%	15	40.0%	15	53.3%

These items will be discussed in more detail in section 4.5.3., where it is grouped per OPA. For 6 of the items, the percentage of children perceived to be less competent in those items were similar within a 10% range across all three groups of participants. These items were cutting food, tying shoelaces, working in an organised fashion on a page, printing, zipping and kicking a ball.

Table 4.12, based on the response of less (1) or more (4) competent for each PEGS item, was compiled to indicate whether there were any differences in the perceptions of the combination of child, parent and educator (grouped as adults) that would necessitate obtaining the opinion of all role-players to form a complete picture of the child with dyspraxia.

Table 4.12 Comparison between perceptions of children and adults per PEGS item

ITEM NR	ITEM DESCRIPTION	All agree "less competent"	Child "less competent" Adults "more competent"	Adults disagree on competence	Child "more competent" Adults "less competent"	All agree "more competent"
1	Catching balls	3	3	7	0	2
2	Cutting food (e.g. meat)	5	3		3	4
3	Sport	4	1	4	4	2
4	Playing electronic games	2	3		1	7
5	Finishing work on time	2	0	6	4	3
6	Making things (e.g. crafts)	0	0	9	1	5
7	Playing/watching games and sports	3	2	3	5	2
8	Tying shoelaces	8	1	1	0	5
9	Cutting with scissors	3	1	8	2	1
10	Trying new things on the playground	1	1	8	3	2
11	Buttoning	1	4		2	8
12	Working on a computer	0	2	0	1	9
13	Working organised on a page	4	0	4	1	5
14	Riding a bicycle	6	2		4	3
15	Dressing	0	1	9	1	4
16	Playing ball games (e.g. tennis, cricket)	5	0	7	0	3
17	Printing	5	1	4	1	4
18	Zippering	0	1	2	0	12
19	Keeping desk neat	1	0	6	5	3
20	Painting	0	0	8	3	4
21	Drawing	0	0	7	5	3
22	Skipping with a rope	11	0	2	2	0
23	Kicking a ball	2	1	3	1	8
24	Running	3	2	2	3	5

The child, parent and educator agreed on the level of competence of the child at least 3 times for each of the PEGS items. However, for 16 of the items (66.7%) between 1 and 4 children perceived themselves to be less

competent in activities the adults did not perceive as such. This was also true for 20 items (83.3%) where adults perceived less competence, 1 to 5 of the children did not agree with them. For all items where both the parent and educator responded, a difference of opinion was found, except for the item “working on a computer”.

#### **4.4.2 PEGS summary scores**

The summary scores are calculated by the sum of all items a participant responded to, using the scale of 1 to 4. The PEGS manual emphasises that the summary score does not represent a standard score to be used as an indicator of the child’s competency. It only serves as an overall impression of the child’s perception of his competency in participating in the activities described in the PEGS compared to the rating of his parent(s) and educator (Missiuna *et al.*, 2004:25).

As the child and parent could respond to 24 items, a maximum score of 96 was possible. The educator’s possible maximum score was 80. However, some of the items were not commented on by all. Thus, in order to be able to compare the different ratings, percentages were calculated using the summary score for each participant divided by that participant’s possible maximum score (table 4.13).

**Table 4.13 PEGS summary scores and percentages per participant group**

	<b>MINIMUM</b>	<b>MEDIAN</b>	<b>MAXIMUM</b>
	Summary score Percentage	Summary score Percentage	Summary score Percentage
<b>CHILD</b>	48 54.5%	67 70.7%	82 85.4%
<b>PARENT</b>	38 41.3%	63 66.3%	70 72.9%
<b>EDUCATOR</b>	22 31.6%	50 65.8%	63 87.5%

The children rated their overall perception of their ability to participate in the activities featured in the PEGS higher than did their parents and educators. From table 4.13 it is clear that the child's range of summary score percentages was more than 12% higher than that of the parents. The difference for the median percentage comparing the child and parent responses was however less (4.4% difference). Although the maximum percentage rated by an educator was higher than that of the parent or child, the minimum and median percentages of the educators were the lowest for the three groups.

Table 4.14 shows the 95% confidence intervals (CI) for the median difference for paired data when comparing the summary scores of the child, parent and educator.

**Table 4.14 95% Confidence interval for the percentage difference for paired data between summary scores of the participant groups**

<b>Comparison of participant groups' summary PEGS score percentages</b>	<b>95% CI</b>
Summary: Child vs parent	[0 ; 14.6]
Summary: Child vs educator	[-2.7 ; 22.0]
Summary: Parent vs educator	[-7.0 ; 11.5]

No statistical significant difference was found between the summary score percentages of the three groups of participants.

### 4.4.3 PEGS results per OPA

#### Self-care

Table 4.15 displays the percentage of each group of participants who indicated that they perceived the child to be less competent in the specific items relating to the occupational performance area of self-care.

**Table 4.15** Percentage of respondents who indicated a score of 1 (less competent) for items related to OPA self-care

ITEM NR	ITEM DESCRIPTION	CHILD		PARENT		EDUCATOR	
		n	%	n	%	n	%
2	Cutting food (e.g. meat)	15	53.3%	15	53.3%		
8	Tying shoelaces	15	60.0%	15	60.0%	12	66.7%
11	Buttoning	15	33.3%	15	20.0%		
15	Dressing	15	13.3%	15	53.3%	14	21.4%
18	Zippering	15	13.3%	15	6.7%	12	8.3%

More than half (53.3% to 66.7%) of all participants responding to the questions on the cutting of food and tying of shoelaces indicated that these activities are perceived as difficult to complete for the child with dyspraxia. Fifty three percent (53.3%) of parents also described their children finding it difficult to dress themselves in a reasonable amount of time. Using a zipper was the self-care item the least problems were perceived with. Two additional self-care items were added by parents: one parent indicated that

independent use of the toilet was a problem and two parents included difficulty in using cutlery as a functional problem.

Table 4.16 reports on the sum of scores and percentages for self-care related items. For all three groups of participants at least one of the children was perceived to be competent in all PEGS items related to self-care, thus the maximum score of 100%.

**Table 4.16 PEGS sum of scores and percentages for items related to OPA self-care**

	<b>MINIMUM</b>	<b>MEDIAN</b>	<b>MAXIMUM</b>
	Summary score Percentage	Summary score Percentage	Summary score Percentage
<b>CHILD</b>	9 45.0%	15 75.0%	20 100.0%
<b>PARENT</b>	9 45.0%	13 65.0%	20 100.0%
<b>EDUCATOR</b>	2 37.5%	8 75.0%	12 100.0%

The educator's minimum percentage was the lowest for the three groups, but the median percentage of the child and educator were in complete agreement. The parent's median percentage was 10% lower.

The 95% confidence intervals (CI) for the median difference for paired data when comparing the percentage of the sum of the scores related to the OPA of self-care for the child, parent and educator, were calculated and is presented in table 4.17.

**Table 4.17 95% Confidence interval for the percentage difference between sum of scores related to OPA self-care**

Comparison of participant groups' self-care score percentages	95% CI
Self-care : Child vs parent	[-5 ; 10]
Self-care : Child vs educator	[-13.3 ; 25]
Self-care: Parent vs educator	[-18.3 ; 20]

No statistical significant difference was found between the summary score percentages related to self-care of the three groups of participants.

### **School and productivity**

Table 4.18 shows the percentage of each group of participants who indicated that they perceived the child to be less competent in the specific items relating to the occupational performance area of school and productivity.

**Table 4.18 Percentage of respondents who indicated a score of 1 (less competent) for items related to OPA school/productivity**

ITEM NR	ITEM DESCRIPTION	CHILD		PARENT		EDUCATOR	
		n	%	n	%	N	%
5	Finishing work on time	15	20.0%	15	60.0%	15	60.0%
6	Making things (e.g. crafts)	15	26.7%	15	26.7%	15	46.7%
9	Cutting with scissors	15	33.3%	15	60.0%	15	60.0%
12	Working on a computer	12	16.7%	12	8.3%	12	0.0%
13	Working organised on a page	14	50.0%	14	50.0%	15	53.3%
17	Printing	15	60.0%	15	53.3%	15	53.3%
19	Keeping desk tidy	15	6.7%	15	66.7%	15	53.3%
20	Painting	15	13.3%	15	53.3%	15	40.0%
21	Drawing	15	6.7%	15	60.0%	15	53.3%

The children perceived few problems in their competence in school activities and for only 2 school-related items did 50.0% or more (60.0%) indicate that



they were less competent. These items were working in an organised fashion on a page and printing.

This was in contrast to the perceptions of both groups of adults, as there was only 2 school related items less than 50% of the parents found not to be a problem (making things and working on a computer). For two-thirds of the items more than 50% of educators indicated 'perceived poor competence'.

One additional item, colouring in, was added to the list of perceived problems twice, by one child as well as another child's educator.

In table 4.19 the minimum, median and maximum calculated sums of the items related to the OPA of school and productivity, as well as their percentages, are given. The minimum, median and maximum percentages by children were the highest, as they did not perceive that many problems related to their competence in school activities.

**Table 4.19 PEGS sum of scores and percentages for items related to OPA school/ productivity**

	<b>MINIMUM</b>	<b>MEDIAN</b>	<b>MAXIMUM</b>
	Summary score Percentage	Summary score Percentage	Summary score Percentage
<b>CHILD</b>	15 41.7%	28 77.8%	35 97.2%
<b>PARENT</b>	11 30.5%	23 63.9%	33 91.7%
<b>EDUCATOR</b>	8 22.2%	21 58.3%	29 80.6%

The difference between the median percentage of the educators, whose were the lowest, and the children is almost 20% (19.5%). The parent's minimum

and median percentages are in closer agreement to the educator's than that of the child's median percentages.

This difference between the perception of the child and educator regarding their competence in school and productivity related activities, proofed to be statistically significant, when calculated as a 95% confidence interval (CI) for the median difference for paired data (table 4.20).

**Table 4.20 95% Confidence interval for the percentage difference between sum of scores related to OPA school/ productivity**

<b>Comparison of participant groups' school score percentages</b>	<b>95% CI</b>
School : Child vs parent	[0 ; 22.2]
School : Child vs educator	[11.1 ; 25]*
School: Parent vs educator	[-2.78 ; 11.1]

\* Statistical significant difference

No statistical significant difference was found between the child and parent or the educator and parent's summary score percentages for school/ productivity.

### **Play and leisure**

The percentage of each group of participants, who indicated that they perceived the child to be less competent in the specific items relating to the occupational performance area of play and leisure, is shown in table 4.21.

**Table 4.21 Percentage of respondents who indicated a score of 1 (less competent) for items related to OPA play/leisure**

ITEM NR	ITEM DESCRIPTION	CHILD		PARENT		EDUCATOR	
		N	%	n	%	n	%
1	Catching balls	15	66.7%	15	40.0%	15	46.7%
3	Sport	15	40.0%	15	73.3%	15	60.0%
4	Playing electronic games	13	38.5%	13	23.1%		
7	Playing/watching games and sports	15	33.3%	15	66.7%	15	60.0%
10	Trying new things on the playground	15	26.7%	15	60.0%	15	46.7%
14	Riding a bicycle	15	53.3%	15	66.7%		
16	Playing ball games (e.g. cricket, tennis)	15	66.7%	15	46.7%	15	66.7%
22	Skipping with a rope	15	80.0%	13	84.6%	14	100.0%
23	Kicking a ball	15	26.7%	15	26.7%	15	33.3%
24	Running	15	33.3%	15	40.0%	15	53.3%

For 40.0% of the items related to play and leisure, more than 50% (53.3% to 80%) of the children associated their abilities with the “less competent picture”. These items are catching balls, riding a bicycle, playing ball games such as cricket or tennis and skipping with a rope.

Half of the play and leisure items drew “less competent” responses from 60% or more (60.0% to 84.6%) of the parents. This included sport, watching rather than playing games and sport, trying new things on the playground, riding a bicycle and skipping with a rope. Two additional play or leisure items were added by parents: participating in concerts and playing with play dough.

Play and leisure related items where more than half (53.3% to 100.0%) of the educators reported perceptions of lesser competence, were sport, watching rather than participating in sport and games, playing ball games, skipping with a rope and running.

Skipping with a rope was perceived to be the single most difficult to perform activity featured in the PEGS, as 80.0% or more of the respondents indicated less competence in this item.

Table 4.22 provides a summary of scores and percentages related to the OPA play and leisure. The educator's range between the minimum and maximum percentage was the greatest.

**Table 4.22 PEGS sum of scores and percentages for items related to OPA play/leisure**

	<b>MINIMUM</b>	<b>MEDIAN</b>	<b>MAXIMUM</b>
	Summary score Percentage	Summary score Percentage	Summary score Percentage
<b>CHILD</b>	20 50.0%	26 60.0%	34 85.0%
<b>PARENT</b>	14 35.0%	24 50.0%	34 85.0%
<b>EDUCATOR</b>	8 25.0%	16 31.3%	30 93.8%

The children's minimum percentage was the same as the parent's median, with a similar maximum percentage for both these groups. It can thus be said that the children's overall perception of their play and leisure abilities was generally higher than that of their parents or educators.

The 95% confidence intervals (CI) for the median difference for paired data when comparing the percentage of the sum of the scores related to the OPA of play and leisure for the child, parent and educator, is presented in table 4.23.

**Table 4.23 95% Confidence interval for the percentage difference between sum of scores related to OPA play/leisure**

<b>Comparison of participant groups' leisure score percentages</b>	<b>95% CI</b>
Leisure: Child vs parent	[-7.5 ; 12.5]
Leisure: Child vs educator	[-3.8 ; 33.8]
Leisure: Parent vs educator	[-11.3; 28.8]

No statistical significant difference was found between the summary score percentages related to play/leisure of the three groups of participants.

## **4.5. PEGS RESULTS – FUNCTIONAL GOALS**

Every participant was given the opportunity to identify up to 4 of the items that they perceived the child to be less competent in, which they found important to improve on. Achieving competence in these items served as functional goals to be worked towards during occupational therapy treatment. These goals are reported in the following sections, first per item of the PEGS and then per occupational performance area. Comparison between the activities identified as difficult and goals are also drawn for the three groups of participants.

### **4.5.1 Goals per PEGS item**

All participants could select up to 4 of the items they perceived the child to be less competent in as therapeutic goals. Additional goals that were identified were also taken into consideration in the following discussion and are included in the table as item 28.

In total, the 15 children selected the most goals (59) and the 15 parents the least (43). The 15 educators selected 44 goals in total. All selected at least one goal.

A summary of the number of participants per group, who selected a specific item as a therapeutic goal, is portrayed in table 4.24. The items are arranged in the order of the most selected goal across all participant groups, to the least selected goal.

Table 4.24 Summary of goals per frequency selected across all participant groups

ITEM NR	OPA <sup>a</sup>	ITEM DESCRIPTION	CHILD		PARENT		EDUCATOR	
			n	%	n	%	n	%
17	S	Printing	5	33.3%	7	46.7%	6	40.0%
16	L	Playing ball games	5	33.3%	4	26.7%	7	46.7%
22	L	Skipping with a rope	7	46.7%	1	6.7%	6	40.0%
9	S	Cutting with scissors	3	20.0%	3	20.0%	6	40.0%
8	SC	Tying shoelaces	5	33.3%	3	20.0%	0	
1	L	Catching balls	2	13.3%	2	13.3%	3	20.0%
24	L	Running	3	20.0%	2	13.3%	2	13.3%
5	S	Finishing work on time	1	6.7%	2	13.3%	3	20.0%
7	L	Playing/watching games and sports	3	20.0%	1	6.7%	2	13.3%
3	L	Sport	3	20.0%	2	13.3%	0	
11	SC	Buttoning	3	20.0%	2	13.3%		
14	L	Riding a bicycle	3	20.0%	2	13.3%		
19	S	Keeping desk tidy	0		2	13.3%	3	20.0%
2	SC	Cutting food (e.g. meat)	4	26.7%	0			
4	L	Playing electronic games	4	26.7%	0			
10	L	Trying new things on the playground	1	6.7%	2	13.3%	1	6.7%
13	S	Working organised on a page	2	13.3%	1	6.7%	0	
15	SC	Dressing	0		3	20.0%	0	
20	S	Painting	1	6.7%	1	6.7%	1	6.7%
21	S	Drawing	0		1	6.7%	2	13.3%
23	L	Kicking a ball	1	6.7%	0		1	6.7%
6	S	Making things (e.g. crafts)	1	6.7%	0		0	
12	S	Working on a computer	1	6.7%	0		0	
18	SC	Zippering	1	6.7%	0		0	
28	L	Participating in concerts	0		1	6.7%	0	
28	L	Playing with play dough	0		1	6.7%	0	
28	S	Colouring in	0		0		1	6.7%

<sup>a</sup> OPA: Occupational performance area; L: leisure; SC: self-care; S: school

All of the items featured in the PEGS were at least once selected as a goal. Printing was the item that featured in the PEGS that was selected the most (n=18) as a therapeutic goal. In second place, selected by 16 participants,

was the leisure activity of playing ball games that require hitting a ball, such as tennis and cricket. The items of skipping with a rope (n=14) and cutting with scissors (n=12) followed.

The most participants in a group (children, parents, educators) to select a specific item, were 7. This was the case for three items (with the group who selected the goal in brackets): skipping with a rope (children), printing (parents) and playing ball games (educators). Three functional activities not featured in the PEGS were added as goals, 2 by parents and 1 by an educator.

Items in table 4.24 will be discussed in more detail in the following sections, when they are depicted per OPA.

## 4.5.2 Goals per OPA

Table 4.25 summarises the number of goals relating to an OPA that were selected by each participant group, as well as all the participants combined. Percentages per OPA are calculated by the number of goals selected per OPA divided by the total number of goals for the group of participants.

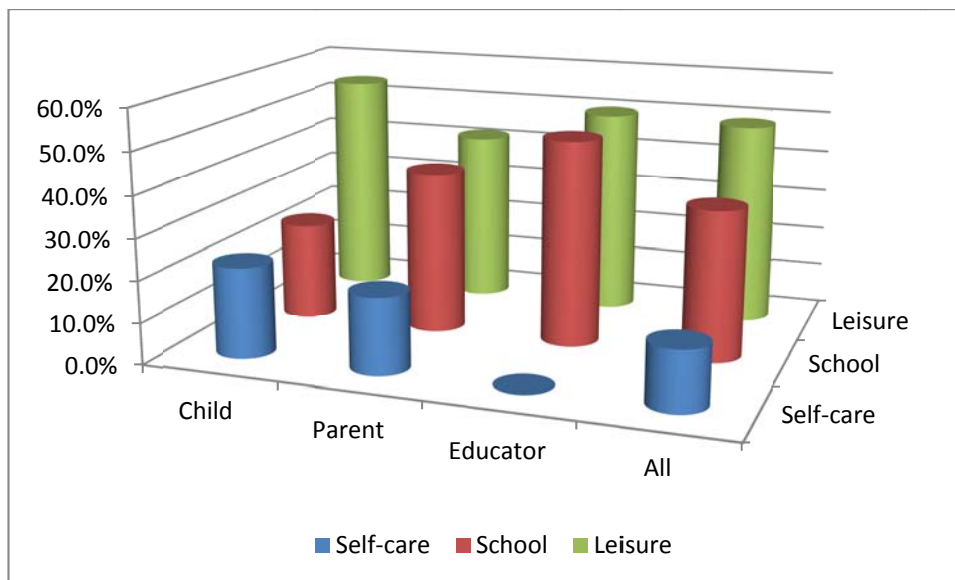
Table 4.25 Summary of number of goals per OPA

	Self-care		School		Leisure	
	n	%	n	%	n	%
<b>All</b>	21	14.4%	53	36.3%	72	49.3%
<b>Child</b>	13	22.0%	14	23.7%	32	54.2%
<b>Parent</b>	8	18.6%	17	39.5%	18	41.9%
<b>Educator</b>	0	0.0%	22	50.0%	22	50.0%



Almost 50% of the total number of goals related to the OPA of leisure (49.3%). This was followed by school-related goals (36.3%). Goals focusing on the improvement of self-care activities were selected the least (14.4%).

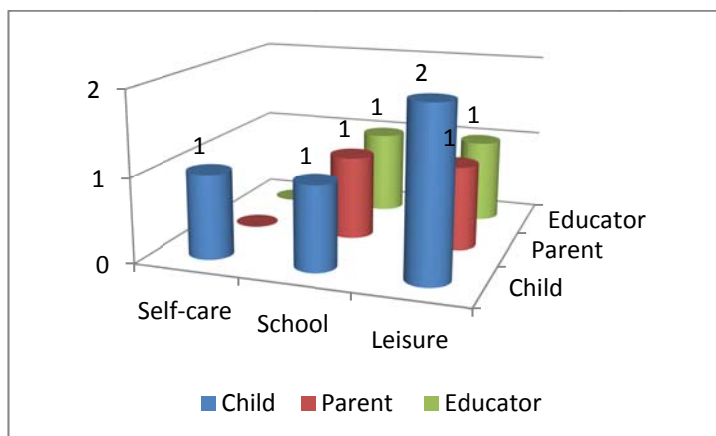
As illustrated in figure 4.1, more than half of the goals children prioritised were in the OPA of leisure (54.2%). School and leisure were seen as equally important (50.0% each) by educators when selecting therapeutic goals. The educators did not select any self-care goals.



**Figure 4.1 Goals per OPA as selected by groups of participants**

The number of goals set by parents for the OPAs of leisure (18) and school (17) only differed by 1, with a few (8) self-care goals included.

When considering the median number of goals prioritised per OPA by each group of participants, the selection is illustrated in figure 4.2.



**Figure 4.2 Median number of goals selected by participant group per OPA**

The goals will next be discussed per OPA. Data is presented in table-format ranging from goals selected the most across participant groups at the top to those least selected at the bottom.

### Self-care

Children were the participant group to prioritise most self-care goals. None of the educators identified any of the self-care items featured in the PEGS as a goal (table 4.26).

**Table 4.26 Goals per participant group for OPA self-care**

ITEM NR	ITEM DESCRIPTION	CHILD		PARENT		EDUCATOR	
		n	%	n	%	n	%
8	Tying shoelaces	5	33.3%	3	20.0%	0	
11	Buttoning	3	20.0%	2	13.3%		
2	Cutting food (e.g. meat)	4	26.7%	0			
15	Dressing	0		3	20.0%	0	
18	Zippering	1	6.7%	0		0	

Zippering was selected by the least children (1) as an activity they would like to master. Tying shoelaces was the self-care goal selected most (8 participants).

### School and productivity

Printing was the school activity, featured in the PEGS, that was selected the most by all three participant groups as a goal to be reached in therapy, with 18 of the respondents prioritising it (table 4.27). Forty percent (40.0%) of educators indicated that they would also like to see improvement in the children's skilled use of scissors.

**Table 4.27 Goals per participant group for OPA school and productivity**

ITEM NR	ITEM DESCRIPTION	CHILD		PARENT		EDUCATOR	
		n	%	n	%	n	%
17	Printing	5	33.3%	7	46.7%	6	40.0%
9	Cutting with scissors	3	20.0%	3	20.0%	6	40.0%
5	Finishing work on time	1	6.7%	2	13.3%	3	20.0%
19	Keeping desk tidy	0		2	13.3%	3	20.0%
13	Working organised on a page	2	13.3%	1	6.7%	0	
20	Painting	1	6.7%	1	6.7%	1	6.7%
21	Drawing	0		1	6.7%	2	13.3%
6	Making things (e.g. crafts)	1	6.7%	0		0	
12	Working on a computer	1	6.7%	0		0	
28	Colouring in	0		0		1	6.7%

Craft activities (making things) and working on a computer were the school-related items selected the least as goals (table 4.27). Colouring in was added by an educator as an activity to work on in therapy.

## Play and leisure

Playing ball games where hitting of the ball is involved, such as tennis and cricket, was the leisure activity selected most (table 4.28). Fourteen of the participants prioritised skipping with a rope as a therapeutic goal.

Table 4.28 Goals per participant group for OPA play and leisure

ITEM NR	ITEM DESCRIPTION	CHILD		PARENT		EDUCATOR	
		n	%	n	%	n	%
16	Playing ball games (e.g. cricket, tennis)	5	33.3%	4	26.7%	7	46.7%
22	Skipping with a rope	7	46.7%	1	6.7%	6	40.0%
1	Catching balls	2	13.3%	2	13.3%	3	20.0%
24	Running	3	20.0%	2	13.3%	2	13.3%
7	Playing/watching games and sports	3	20.0%	1	6.7%	2	13.3%
3	Sport	3	20.0%	2	13.3%	0	
14	Riding a bicycle	3	20.0%	2	13.3%		
4	Playing electronic games	4	26.7%	0			
10	Trying new things on the playground	1	6.7%	2	13.3%	1	6.7%
23	Kicking a ball	1	6.7%	0		1	6.7%
28	Participating in concerts	0		1	6.7%	0	
28	Playing with play dough	0		1	6.7%	0	

Participating in concerts and playing with play dough were added as leisure goals.

### 4.5.3 Comparison between perceived problems and selected goals

The percentage of participants, who prioritised an item that they indicated the child was less competent in as a goal, is portrayed in table 4.29. This was

done to determine which items were deemed most important to improve in by those who perceived it as troublesome.

**Table 4.29 Percentage of participants who prioritised indicated problem as a goal**

ITEM NR	ITEM DESCRIPTION	CHILD		PARENT		EDUCATOR	
		n	%	n	%	n	%
1	Catching balls	10	20.0%	6	33.3%	7	42.9%
2	Cutting food (e.g. meat)	8	50.0%	8	0.0%		
3	Sport	6	50.0%	11	18.2%	9	0.0%
4	Playing electronic games	5	80.0%	3	0.0%		
5	Finishing work on time	3	33.3%	9	22.2%	9	33.3%
6	Making things (e.g. crafts)	4	25.0%	4	0.0%	7	0.0%
7	Playing/watching games and sports	5	40.0%	10	10.0%	9	22.2%
8	Tying shoelaces	9	55.6%	9	33.3%	8	0.0%
9	Cutting with scissors	5	60.0%	9	33.3%	9	66.7%
10	Trying new things on the playground	4	25.0%	9	22.2%	7	14.3%
11	Buttoning	5	60.0%	3	33.3%		
12	Working on a computer	2	50.0%	1	0.0%	0	
13	Working organised on a page	7	28.6%	7	14.3%	8	0.0%
14	Riding a bicycle	8	25.0%	10	20.0%		
15	Dressing	2	0.0%	8	37.5%	3	0.0%
16	Playing ball games (e.g. cricket, tennis)	10	50.0%	7	57.1%	10	70.0%
17	Printing	9	55.6%	8	87.5%	6	75.0%
18	Zippering	2	50.0%	1	0.0%	1	0.0%
19	Keeping desk neat	1	0.0%	10	20.0%	8	37.5%
20	Painting	2	50.0%	8	12.5%	6	16.7%
21	Drawing	1	0.0%	9	22.2%	8	25.0%
22	Skipping with a rope	12	58.3%	11	9.1%	14	42.9%
23	Kicking a ball	4	25.0%	4	0.0%	5	20.0%
24	Running	5	60.0%	6	33.3%	8	25.0%

For four items 60% or more of the children who identified that they experienced a problem with it also prioritised it as goals. Three items for

which children rated their abilities as “less competent” were not selected once as a goal.

For the parents, this trend of selecting a problem as a goal by more than 60% of participants was observed only for one item, namely printing (87.5%). There was however six items that parents did not identify as a goal, although they perceived children to experience difficulties with it.

Three items, cutting with scissors, playing ball games and printing, were selected as goals by more than 60% of educators who identified it as tasks the child with dyspraxia were less skilled in. Although six items were identified by educators as difficult for the child with dyspraxia, none found it a priority to work on in therapy.

Items that were perceived as “less competent” by only one of the three participants who responded to it, as portrayed earlier in table 4.12, was compared with the items that were selected as goals, to determine whether that participant viewed his perception of his inability as important enough to prioritise it as a goal.

The following items only the child identified as ‘perceived less competent’, were deemed important for improvement by the child (table 4.30):

**Table 4.30 Items only children perceived as “less competent” that were selected as goals**

ITEM NR	OPA <sup>a</sup>	ITEM DESCRIPTION	N
1	L	Catching balls	1
2	SC	Cutting food (e.g. meat)	1
3	L	Sport	1
4	L	Playing electronic games	3
7	L	Playing/watching games and sports	1
11	SC	Buttoning	2
12	L	Working on a computer	1
17	S	Printing	1
18	SC	Zippering	1

<sup>a</sup> OPA: Occupational performance area; L: leisure; SC: self-care; S: school

Three children, who perceived themselves as struggling with electronic games, selected it as a functional goal. Items selected were mostly related to leisure and self-care, with only one school item selected.

The problems that the parents were the only to identify and then select as goals, are portrayed in table 4.31.

**Table 4.31 Items only parents perceived as “less competent” that were selected as goals**

ITEM NR	OPA <sup>a</sup>	ITEM DESCRIPTION	n
9	S	Cutting with scissors	1
10	L	Trying new things on the playground	1
11	SC	Buttoning	1
15	SC	Dressing	2
16	L	Playing ball games (e.g. cricket, tennis)	1
19	S	Keeping desk neat	1

<sup>a</sup> OPA: Occupational performance area; L: leisure; SC: self-care; S: school

Two parents wanted the children’s ability to dress independently in a reasonable amount of time to improve, even though neither the child nor his

educator perceived that he was less competent in this. Items from all three OPA's were included.

Items only perceived by educators to have room for improvement, is depicted in table 4.32.

**Table 4.32** Items only educators perceived as “less competent” that were selected as goals

ITEM NR	OPA <sup>a</sup>	ITEM DESCRIPTION	n
5	S	Finishing work on time	1
9	S	Cutting with scissors	2
16	L	Playing ball games (e.g. cricket, tennis)	1
17	S	Printing	1
19	S	Keeping desk neat	1
21	S	Drawing	1
23	L	Kicking a ball	1
24	L	Running	1

<sup>a</sup> OPA: Occupational performance area; L: leisure; SC: self-care; S: school

Cutting with scissors was the only item identified and selected by more than one educator, where none of the other role-players agreed that this was a problem.

For all three groups of participants, some items were perceived only by one person as difficult to perform and deemed important enough to select it as a goal.



## 4.6. SUMMARY

Chapter 4, results, contained all the information that was gathered during the data collection process of this research study. The method of data analysis was described.

Included in this chapter were the demographic data, describing the children that participated in the study, their parents, their socio-economic status, as well as relevant medical and therapeutic background information.

The SIPT data used as inclusion criteria was reported on, describing the cluster/s of dyspraxia the children experienced difficulty with.

PEGS results on the perceived efficacy of the children followed. This was first discussed per item, with a comparison of the child's competence in the featured items as perceived by the child, parent and educator. Summary scores and calculated confidence intervals were reported on, for all items as well as items per OPA.

The goals selected were compared and a summary of goals, including the goals per OPA, were portrayed. A comparison was then made between the items where "less competence" was indicated and those items prioritised as therapeutic goals.

These results will be discussed in more detail and combined with literature from chapter 2, in the next chapter.

## **CHAPTER 5      DISCUSSION OF RESULTS**

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### **5.1. INTRODUCTION**

Fifteen children with dyspraxia, based on SI difficulties, their parents and educators participated in this research study where the Perceived Efficacy and Goal Setting System (PEGS) was used to identify the three groups' perceptions on dyspraxia. All commented on the child's perceived competence in similar items related to the occupational performance areas (OPAs) of self-care, school and productivity and play and leisure. Each of the three groups also selected functional goals from the items featured in the PEGS. These results were all reported on in chapter 4.

In this chapter results reported on in the previous chapter will be summarised, findings will be elaborated on and discussed and where applicable, results will be compared with relevant literature that was discussed in chapter 2.

First, the demographical data will be discussed. The children's SIPT results that were used as inclusion criteria will now be explained and discussed. The perceptions on the functional competence of the children with dyspraxia will be viewed from different angles, looking at the items that were identified as difficult to perform for these children, as well as comparing the perceptions of the children, parents and educators. These perceptions will also be discussed as they pertain to the three OPAs.

The goals that were selected will be compared between the three participating groups, as well as discussed per OPA. The frequency of the selected goals per item will also be elaborated on.

Comments on the reliability analysis's findings will be included throughout the discussion, where applicable.

## **5.2. DEMOGRAPHICS**

Fifteen children, their parent(s) and educators participated in this research study looking at the perceptions on dyspraxia, by commenting on functional items featured in the PEGS. Structured interviews to obtain demographic data were conducted with 13 mothers and in 2 cases both the child's mother and father were present. For most of the children the mother was the parent most involved in the occupational therapy process and, traditionally viewed as the primary care-giver, also well qualified to comment on the child's perceived competence.

### **Children**

The children's ages ranged between 64 and 98 months, with 50% of the children aged 77 months (6 years 5 months) and older. Two-thirds (66.7%) of the children were male, and supports other studies that indicated 70% - 80% of children with dyspraxia were boys (Zwicker *et al.*, 2012; Missiuna *et al.*, 2008:839; Missiuna & Polatajko, 1995:622).

Only 1 English-speaking child was included, with the home language of the children mostly (93.3%) Afrikaans. No other explanation than chance can be

given for this as the occupational therapists participating in the study's patients consisted of different cultural groups and included Afrikaans-, English and Sotho-speaking children.

All children except one had siblings (table 4.1), with more than 60% of the children with dyspraxia firstborn (66.7%). Having siblings who may be typically developing can influence the child's perception of his own ability, as the typically developing child generally dominates the child with a developmental problem such as dyspraxia (Case-Smith & O'Brien, 2010:113). As expressed by one child during the discussion of the PEGS pictures, he found it very frustrating that his younger brother is able to ride a bicycle, but he is not competent in doing that. No literature could however be found that linked dyspraxia to birth-order.

Sixty percent (60.0%) of the children were in grade R, 33.3% in grade 1 and one child in grade 2. The many grade R-children included in the study might seem in contrast with literature that implied that dyspraxia is usually not identified in pre-school years (Bundy *et al.*, 2002:75). As discussed in chapter 2, recent changes that now includes the grade R curriculum in the foundation phase of the National Education Policy of SA (South Africa, 2011:3) changed the activities grade R children are expected to accomplish in such a way that problems in printing and other school-related activities that requires praxis abilities, are now identified earlier.

Children with dyspraxia find it difficult to cope in the different environments that form part of each day. More than half of the children's school days included afternoon care at the school (53.3%). This is important, as it implies that these children spend most of their day surrounded by peers, where they

can be exposed to being teased, bullied and excluded from activities (Bundy *et al.*, 2002:75; Case-Smith & O'Brien, 2010:333; Kramer & Hinojosa, 2010:141).

The influence of dyspraxia on the choice of extra-curricular activities was described in literature as continuing into adolescence and adulthood (Kirby *et al.*, 2011:1357-1358). Children participating in this study partook in 0 to 6 activities (table 4.3), with 60.0% participating in 1 or 2 activities. The nature of the activities varied, with individual sport the extra-curricular activity most children (38.5%) engaged in. Both of the children who at first did not participate in any extra-curricular activities, had joined a team sport at school by the second time they were interviewed for reliability analysis purposes. Information on the influence of the parents in enrolling their children in extra-curricular activities versus the child's participation by choice is however unknown and it is suggested that this be included as a question in future studies of this kind.

## **Parents**

The parent(s) of the children with dyspraxia formed the second group of participants in this study. For all 15 of the children participating in this study, their mothers were involved in the interview and the perceptions of the mother on her child's competence were recorded using the PEGS<sup>5</sup>.

The mothers of the children participating in the study had obtained a higher average level of education than the fathers, with 66.7% of mothers reporting a post grade 12 qualification in comparison to 20.0% of the fathers (table

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<sup>5</sup> During one of the reliability study interviews and PEGS assessments, only the father was involved, not both parents as per the first interview.

4.4). Two thirds of the children had at least one parent with a qualification higher than grade 12 and in only one case none of the child's parents had completed grade 12. Aunola, Nurmi, Onatsu-Arviolommi and Pulkkinen (1999:307, 313) found that parenting styles could be predicted by the parents' level of education. They described that parents with a higher level of education, such as the group involved in this study, tended to be more child-centred and to direct their children in a rational, issue-orientated manner, an approach that has been associated with positive outcomes in child development. This is opposed to parents with a lower level of education, who were found to be more strict and controlling.

Two thirds (66.7%) of fathers were employed in the administrative/small business owner and clerical/sales/technical work sectors (table 4.5). Opposed to this, more than half of the mothers (53.3%) worked in the higher employment sectors, such as professionals and business managers. As this was an unforeseen finding, no literature on this subject was included in chapter 2. The researcher however found it necessary to consult literature as to this result and found that this may be reflective of the modern tendency of women to combine motherhood with career opportunities, a tendency confirmed by van Klaveren, Tijdens, Hughie-Williams and Ramos Martin (2009:52). Their overview of women's work and employment in South Africa indicated a considerable growth from 2000 to 2009 in the number of women in the higher categories of occupation, especially management and professional occupations.

Nine of the children included in this study lived with both their biological parents. The other six all lived with their mothers and in four of these cases the household also involved a stepfather or mother's partner. Each parent

participating in the study was thus one of the primary caretakers of the child and able to comment on the child's abilities, as primary caretakers are expected to spend the most time with the child and will thus know the child and his abilities the best.

### **Socio-economic status**

Twenty percent (20.0%) of participants' calculated household density ratios placed them in the lower socio-economic group. It was expected that most of the children who had access to occupational therapists working with sensory integration problems would be from a higher socio-economic status and not necessarily representative of the South African population, as was also observed by Van Jaarsveld *et al.* (2012:16). It is however possible that these children from a lower socio-economic group had access to medical aid funds, which gave them access to private occupational therapy practices, something that needs to be considered in the interpretation of the results and in future studies need to be clarified.

### **Medical and therapeutic background**

More than 50.0% of children (53.3%) in this study were referred to an occupational therapist by an educator and 40.0% by their parents (table 4.6). School related problems are usually the marker that leads to the child being referred to a therapist (Bundy *et al.*, 2002:75). As parents and educators are the role-players most involved in the OPA of school, it could be expected that they would notice problems first and react to it.

General practitioners (GPs) referred 13.3% of the children and none were referred by paediatricians. This links with the study by Wilson *et al.* (2012),

who found that only 16% of physicians from Canada, the USA and the UK responded that they were familiar with dyspraxia.

One of the exclusion criteria that were applied during this study stated that the maximum number of occupational therapy sessions the child had received for dyspraxia, could be 24. The number of occupational therapy treatment sessions the children in the study had participated in ranged from 0 to 22, with 2 the median number of sessions. At the time of the interviews, 1 of the children was also receiving speech therapy (2 sessions completed) and another 1 was also being treated by a play therapist (15 sessions).

It was reported that 10 of the children had previously received some therapy (table 4.7). This included play therapy, speech therapy, occupational therapy and attachment therapy. Information regarding the therapeutic treatment the child had received was deemed relevant, as an increase in perceived self-efficacy, as a part of self-esteem, would be expected after receiving therapeutic intervention. However, McWilliams (2005:395-396) found no statistically significant improvement in self-esteem of dyspraxic children after 6 to 12 hours (12 to 24 sessions) of occupational therapy intervention specifically focused on improving self-esteem. As none of the children had received more than 24 therapy sessions, the influence of these sessions on their perceived efficacy should have been minimal.

Three parents reported medical conditions (table 4.8) that could influence the children's functional abilities, and thus their perceived competence. The conditions (table 4.8) were heart valve dysfunction, ADHD and premature birth at 32 weeks gestational. Two of these conditions' relation to dyspraxia was evident in literature. Dyspraxia often co-occurs with ADHD (Blank *et al.*,



2012:61) and more than doubled risk of dyspraxia in children born at 32 to 36 gestational weeks was confirmed in a study by Zhu *et al.* (2012:3). Although no research could be found on the co-occurrence of dyspraxia and heart disease, the increased risk of children suffering from chronic conditions such as this to develop emotional problems and low self-esteem, is documented (Shin & Cho, 2012:1).

For 53.3% of the children, additional issues were identified by parents that they thought could affect the child's perceived efficacy (table 4.9). The most frequent issue was the divorce or separation of the child's parents (4 cases). It was previously stated that environmental effects were found to influence a person's self-esteem (Eggleston *et al.*, 2012:457), such as parenting styles (Raevuori *et al.*, 2007:1631) and the home environment. Research indicates that higher levels of marital conflict (leading to separation or divorce) are related to lower self-esteem in children (Pawlak & Klein, 1997:303).

These above-mentioned factors were beyond the control of the researcher, but could have influenced the child's perception of his competence.

### **Educators**

Fourteen (14) educators from 12 different schools completed the educator questionnaire through interviews. One educator was interviewed twice, as 2 of the learners from her class were included in the study. Educators were spread across Bloemfontein and surrounding areas working in schools varying from private schools to government schools situated in middle socio-economic suburbs. All educators were trained in foundation phase education and thus knowledgeable regarding what can be expected from children at a specific developmental level. The researcher observed during the

administration of the PEGS that the educators relied heavily on both their specific assessment of a child's ability as per the assessment criteria of the curriculum, as well as comparison of the child with his peer group, in responding to the PEGS items. Educators would, for example, refer to the end-of-term reports and workbooks to validate their perception of the child's ball skills and handwriting, or would state that the child always finished later than the rest of his class.

### **5.3. SIPT RESULTS**

All children that were included in the study were identified as having dyspraxia based on the results of the SIPT, the most comprehensive and statistically sound method of identifying dyspraxia (Bundy *et al.*, 2002:169). As observed by the researcher, the SIPT is not generally included in the assessment battery by occupational therapists during the initial assessment of children, as the administration of the SIPT is quite comprehensive. Should the occupational therapist however suspect dyspraxia after the initial assessment using e.g. clinical observations and other motor assessments, further assessment using the SIPT is then suggested to the parents as a means of identifying dyspraxia.

In practice, a trained occupational therapist applies clinical reasoning and additional observations to interpret the SIPT subtest results, as well as the d-squared value, in order to come to a final conclusion and classify the type of dyspraxia (Bundy *et al.*, 2002:199).

As clinical reasoning might be subjective, to ensure that all children included in the study could really be said to suffer from dyspraxia only the cluster of subtest scores and where absolutely necessary, the d-squared values, were applied to identify dyspraxia. It was however possible that the type of dyspraxia indicated was not the only subtype the child suffered from. Thus the SIPT results only served as inclusion criteria for this study and the subtype of dyspraxia will not be considered when looking at the PEGS results. More than 80.0% of the children included in the study were found to suffer from visuo- and/or somatodyspraxia (table 4.10). These results support literature that states that dyspraxia most commonly occurs in the presence of visual-motor deficits (visuodyspraxia) or together with vestibular, proprioceptive and/or tactile sensory discrimination disorders (somatodyspraxia) (Miller *et al.*, 2007:138). Bilateral integration and sequencing deficits (BIS) were indicated in 40.0% of the children. In 26.7% of the cases, more than one subtype of dyspraxia was identified using the cluster of subtest scores.

Although the sample size was quite small, evidence was found that supported both sides of the current debate whether BIS is a subtype of praxis dysfunction or a separate subtype of sensory integrative dysfunction (Kramer & Hinojosa, 2010:124). Two children were only identified as having a bilateral integration and sequencing deficit, whilst three of the other four children with BIS deficits also suffered from visuo- and somatodyspraxia. Eight children were found to have only visuodyspraxia, an observation supported by the findings of Mulligan (1998:825).

## **5.4. PEGS RESULTS – PERCEIVED EFFICACY**

The 24 items of the PEGS featuring functional activities across three occupational performance areas (self-care, school and productivity, play and leisure) were sorted into categories of perceived “less competence” and “more competence” by all three groups of participants in the study.

The results regarding the perceived efficacy of children with dyspraxia should be looked at from different angles in order to reach the objectives of this study:

- The extent of the influence of dyspraxia on the competence of children in functional activities featured in the PEGS, as perceived by the children, parents and educators;
- How do the perceptions of the children, parents and educators compare; and
- How do these perceptions reflect when categorised per OPA?

### **5.4.1 The influence of dyspraxia on the perceived competence of children in functional activities**

The extent of the influence of dyspraxia was found to reach across all of the 24 items (table 4.11), with additional functional activities added to the list by all three groups of participants. All of the items received at least one vote per group of participants in the “less competent” category, except for the item “working on a computer” where no educator indicated it to be problematic.

### **The child**

Table 4.11 indicated the percentage of the children who associated their abilities with the “less competent” picture for each of the 24 items.

Skipping with a rope was the activity most children (80.0%) with dyspraxia struggled with, according to their own perceptions. One child described her experience in trying to skip with a rope as if “the rope was trying to catch her feet”. Skipping with a rope requires a high level of integration of the different sensory systems; the child has to have an idea of what to do with the rope, which motor actions need to be carried out to be successful in jumping over the rope (not only once but sequentially) and then the child has to perform the motor actions successfully. Children with praxis difficulties lack the mentioned abilities (Roley *et al.*, 2001:139-140). This was followed by catching balls and playing ball games that required hitting the ball, such as tennis and cricket. It can be expected that this could be a great challenge for the child with dyspraxia as it entails projected action sequences that requires timing, a skill which is seldom found in children with dyspraxia (Case-Smith & O’Brien, 2010:333).

Tying shoelaces and printing were perceived to be difficult by 60.0% of the children. One additional item, colouring in, was added as an activity a child with dyspraxia perceived himself to be less competent in. These activities all rely, in part, on fine motor manipulation that is dependent on functions of the somatosensory systems, and skills the child with dyspraxia may also experience difficulties with (Miller *et al.*, 2007:138).

For 8 of the 24 items 50.0% or more of the children expressed a perception of less competence. For each of the 24 items, at least 1 child indicated that

they associated their ability with the “less competent” picture, painting a wide range of activities that were affected by dyspraxia. This finding is supported by literature that describes the influence of dyspraxia on all spheres of the child’s life, including in the classroom, at home, on the sports field and with friends (Bundy *et al.*, 2002:75; Ayres, 2005:11-12).

Children seemed to enjoy the discussions regarding the PEGS and found it easy to identify which picture they related to. The researcher observed that most of their discussions revolved around activities their peers or siblings were perceived to be successful at, with the children often stating that “the children in my class are able to do that, but I am not”.

### **The parent**

Perceptions of lesser competence were also expressed at least once for each of the PEGS’ items during the interviews with the parents. Table 4.11 contained the percentage of parents that indicated lesser competence per item of the SIPT.

Agreeing with the children, skipping with a rope was reported by parents to be the most troublesome item. As discussed previously, this complex skill requiring great integration and sequencing could be expected to be troublesome for a child with dyspraxia.

For 15 of the 24 PEGS items 50.0% or more parents indicated that they perceived their children to be less competent in performing these activities. These included “watching rather than playing games and sport”, a characteristic often associated with children with dyspraxia, as they tend to avoid difficult activities (Miller *et al.*, 2007:138; Bundy *et al.*, 2002:75);

“riding a bicycle”, which again requires integration of the different sensory systems as well as a well-developed sense of their body in space; and “keeping their desk tidy”, something that is very difficult for people with dyspraxia who often appear disorganised and unkept (Miller *et al.*, 2007:138).

Parents tend to compare their children’s skills on the playground and in the classroom with that of other children (Missiuna *et al.*, 2007:96) creating certain expectations as to their child’s performance. During the administration of the PEGS, it came to researcher’s attention that parents were often concerned that their child’s difficulty in performing certain activities that were expected at certain stages, such as riding a bicycle, interfered with the child’s ability to socialise with his friends, leading to social isolation. O’Brien *et al.*, (2009:174 & 177) confirmed this observation, stating that parental concerns are often related to a fear that other’s view of his child’s occupational performance will lead to the child being excluded. Parents seem to believe that improvement of the child’s motor skills and activity performance according to peer expectations will improve the child’s chances of social acceptance.

The parents acknowledged the extent of the functional difficulties their children faced, covering all items featured in the PEGS, as well as some additional activities. Participating in concerts, using cutlery, independence in the toilet and playing with play dough were activities some of these children with dyspraxia also found difficult to perform. All of these activities and skills the parents perceived their children to have difficulty with can be related to dyspraxia, as it is all described in and supported by literature (Miller *et al.*, 2007:138-139; Bundy *et al.*, 2002:75; Kramer & Hinojosa, 2010:141).

Parents appeared greatly concerned with their children's lack of competence when discussing the items featured in the PEGS. More than once the researcher was asked if she thought that the child would ever be able to cope in school and be accepted by peers. One parent described her sadness when her typically developing son was able to ride a bicycle without side-wheels, whilst his older brother suffering from dyspraxia could not yet manage to pedal. Parents seemed to depend greatly on the input from educators when forming their perceptions of the child's performance in school activities such as cutting with a scissor, stating that "the educator says that the child struggles with it, thus it must be a problem, even though I do not observe it as such". The researcher came to the impression that parents based their perception of their child's competence more on comparison with that of the child's siblings and peers, than on expected developmental milestones. For example, a parent replied to the item of tying shoelaces that she was unsure whether the child should be able to perform this at his age, but thought that his older brother could do it at that same age, thus indicating that she perceived her child as "less competent" in this activity. When requested to select goals, parents recurrently referred to their child's happiness and future success.

### **The educator**

The educators commented on 20 of the items featured in the PEGS. They were the only group to all indicate perceived competence in one of the items, namely working on a computer. It may be possible that the children were competent in this activity, as it falls into the category of sedentary activities which is often preferred by children with dyspraxia (Miller *et al.*, 2007:138). The use of a computer can also become a skill that not necessarily requires a lot of praxis abilities once the child has learnt how to use a computer.



The percentage of educators, who indicated a perception of lesser competence in a specific item, is portrayed in table 4.11.

Skipping with a rope was reported by all educators who responded to the question as the single activity all children were perceived to be less competent in. This item was the most selected item across all three groups of participants. Even though skipping with a rope is a complex skill that involves great sensory integration and praxis, it is included in the Curriculum and Assessment Policy Statement (CAPS) for the Foundation phase as an activity a child should be skilled at in the first term of grade 1 (South Africa, 2011b:40). Thus skipping with a rope is a motor milestone that is assessed and emphasised in the South African school system.

For 12 of the 20 items, more than 50.0% of educators perceived children to be less competent. These included tying shoelaces, playing ball games, being competent in sport and finishing work on time. Colouring in was again added as an additional item. These findings were again as expected, as the role of praxis in accomplishing all of these activities and skills were discussed earlier (Miller *et al.*, 2007:138-139; Bundy *et al.*, 2002:75; Kramer & Hinojosa, 2010:141).

### **Summary**

These results describing the great extent of activities/abilities dependent on praxis abilities perceived by the role-players as not competent in, confirmed the clinical picture of a child with dyspraxia that was described from literature in chapter 2. This also fulfils the first part of the aim of the study, as stated in chapter 1 " . . . to investigate the child's, parent's and educator's perceptions on dyspraxia, . . .".

### **5.4.2 Comparing the perceptions of the children, parents and educators**

The perceptions of each group of participants on the effect dyspraxia had on their perceived competence in functional activities have been described in the previous sections. These perceptions will now be compared and discussed, first looking at participating groups and then at summary scores.

#### **Children vs. adults**

When scrutinising table 4.12, it was evident that for 16 of the PEGS items (66.7%) at least one of the children that participated in the study perceived themselves to be less competent in an item the adults did not indicate as such.

This is a clinically relevant finding, as these perceptions of lesser competence in specific functional activities would not have been known to the occupational therapist working with the child if she had not specifically asked the child's opinion. The usual method of interviewing the parent(s) and educator would not have been sufficient to identify all problems the child perceived himself to experience. The child's rights, as set out in the Convention of the Rights of Children (South Africa, 1996) would have been ignored if he was not given an opportunity to voice his concerns regarding his perceptions of his competence.

On the other hand, at least one child also identified himself as more competent in 20 of the PEGS items (83.3%) that the adults found them to be less competent in (table 4.12). This has definite implications for intervention as it might prove difficult to motivate these children on working on and

improving in those specific activities/abilities, as they do not perceive themselves to struggle with it and would ask for a different approach to the child that could be crucial for the success of intervention.

The observation by Magalhães *et al.* (2011:1313) that most children with dyspraxia had the cognitive ability to report on their own abilities was also confirmed in this study as the child's perceived efficacy agreed completely with that of his parent(s) and educator at least once for all of the items of the PEGS (100.0%).

### **Parents vs. educators**

For 95.0% of PEGS' items both the parent and educator responded to, a difference in their opinions of the child's competence were found (table 4.12). This highlights the importance of including the perceptions of both these role-players in all aspects of the occupational therapy process and echoes the findings of many authors (Kirby *et al.*, 2011:1351; Kramer & Hinojosa, 2010:150-151; Case-Smith & O'Brien, 2010:351), as only focusing on the perceptions of one role-player could create a one-dimensional view of the child's abilities. It is also significant to consider and include in therapy all of the child's occupational performance areas that may be influenced by dyspraxia, such as social participation, self-care, leisure and school performance (Schaaf & Roley, 2006:6-7), to facilitate improvement and greater independence in all areas of the child's life.

### **Summary scores and percentages**

The children rated their overall perception of their ability to participate in the activities featured in the PEGS higher than did their parents and educators, when looking at their median summary score percentage in table 4.29. Both

the minimum and maximum summary score percentages of the children were more than 12% higher than that of the parents (table 4.13). The median percentage comparing the child and parent was however closer (4.4% difference).

Although these results were not statistically significant, the pattern is similar to the findings by Missiuna *et al.* (2006:212) in their study of using the PEGS with 117 children with neurodevelopmental problems. They reasoned that children might not be aware of the assistance provided by adults to support them in participating in different activities, thus not experiencing their lack of competence fully. Although the children could identify tasks that were more difficult for them, children still perceived themselves to be more competent than did the adults in their lives.

As observed by the researcher, another possible reason for this apparent discrepancy with what literature describes as the “lower self-esteem” of children with dyspraxia (Bundy *et al.*, 2002:75; McWilliams, 2005:394; Watson & Knott, 2006:451), may be that the higher socio-economic group most of the participants grew up in, with educated parents and educators trained to work with children experiencing problems, concentrating on making children feel good about themselves, regardless of their actual abilities, may have contributed to the results of this study. Eggleston *et al.*, (2012:457) referred to social support and positive regard by other’s as factors that could improve self-esteem. The community within higher socio-economic settings has greater understanding for children with difficulties and all involved are more concerned with including the children in all school and leisure related activities by assisting children and adapting activities, as can be seen by the tendency to give each and every child an award at the end of

grade R and grade 1, and for example having as many rugby teams as are required to include every boy in grade 1, even though some of the children are not even able to catch a ball. This may contribute to children with dyspraxia feeling more competent about their abilities than would be the case when they were faced with their actual performance and excluded from participating.

Although the maximum percentage rated by an educator (87.5%) was the highest of the three groups, the minimum (31.6%) and median (65.8%) percentages of the educators were the lowest for the three groups. Thus the educators were the “group” who perceived the children to be least competent. The reason for this may be that the educator is the furthest detached from the child, and perceives the child’s abilities in a more objective fashion by comparing them to their classmates (peers) and the expectations set in the curriculum. This hypothesis is supported by literature (Missiuna *et al.*, 2006:212) who also found that educators consistently rated children’s performance as “less competent” than did the children or parents.

No statistical significant difference was however found between the summary score percentages of the three groups of participants (table 4.14). This may be due to the reason that all three groups of participants were able to clearly identify tasks that were difficult for the children to perform, even though there were differences in their perspectives. This level of agreement was also found between the children and parents during the development of the PEGS (Missiuna & Pollock, 2000:107).

## **Summary**

These findings filled a gap in research identified by Dunford *et al.* (2005:213) who aimed to understand children's views of the impact of coordination difficulties (dyspraxia) on their daily lives and to compare this with the views of parents and educators. When looking at a child with dyspraxia through the eyes of his parents or his educator or through his own eyes, three different images are formed, all of which are important to consider and address in therapy.

### **5.4.3. Perceptions per OPA**

The items featured in the PEGS could be categorised into three occupational performance areas, self-care, school and productivity, and play and leisure. The perceived efficacy of children with dyspraxia, as they relate to these OPAs, is discussed in the following paragraphs and the perceptions of the three groups of participants are compared.

#### **Self-care**

It is clear from table 4.15 that more than half (53.3% to 66.7%) of all participants responding to the questions on the cutting of food and tying of shoelaces indicated that these were activities the child with dyspraxia experienced difficulty with. Fifty three percent (53.3%) of parents also described their children finding it difficult to dress themselves in a reasonable amount of time. This may be due to the child with dyspraxia's lack of ability to perform the required fine motor skills, handle the material and tools, and to plan and sequence the steps needed to perform the activity in the required

time (Schaaf & Roley, 2006:6). Using a zipper was the self-care item the least perceived as difficult.

The parents were the group to perceive the most self-care activities as difficult, with their median percentage 10% lower than that of the children or educators. This finding was expected, as the parents are the role-players mostly affected and frustrated by their children's slow, poor quality performance of self-care activities (Bundy *et al.*, 2002:75; Schaaf & Roley, 2006:6). The children may not be completely aware of the assistance they receive from their parents, as more than one of the parents stated that they would rather just assist the child in cutting food and dressing, rather than wait for the child to do it himself. Thus the child might perceive himself to be more competent in self-care. The educators seem not to be greatly concerned by the children's self-care, as they might perceive it to be the responsibility of the parents to assist the child in becoming independent and the percentage of self-care activities performed within the school environment are less than those performed at home..

No statistical significant difference was found between the summary score percentages related to self-care of the three groups of participants (table 4.17). This may be explained by the small sample size and the limited number of self-care items (3 for educators and 5 for children and parents) featured in the PEGS.

### **School and productivity**

The children perceived themselves as competent in school activities and in only two activities 50.0% or more (60.0%) indicated less competence: working in an organised fashion on a page and printing (table 4.18). Missiuna

*et al.*'s (2006:212) hypothesis is shared by the researcher that the children may be unaware of the level of assistance they receive from their educators, thus not perceiving themselves as "less competent" in school-related activities. The minimum, median and maximum percentages by children for their perceived efficacy in school related activities were the highest (table 4.19).

This was in contrast with the perceptions of both groups of adults. More than half (53.3% - 66.7%) of all parents and educators (table 4.18) agreed that the children were perceived as less competent in six of the school related activities featured in the PEGS. Three of these items, finishing work on time, working in an organised fashion on a page and keeping a desk tidy, are complex skills that require planning, organisational skills, sequencing and performing tasks at a required speed, all areas children with dyspraxia suffer with (Bundy *et al.*, 2002:75; Miller *et al.*, 2007:137-138). As discussed previously, a lack of fine motor skills, motor planning and bilateral integration and sequencing, to name just a few prerequisites for successfully cutting with scissors, printing and drawing, are also associated with dyspraxia.

The educators perceived the most incompetence in the OPA of school and productivity, as indicated by their minimum, median and maximum percentages being the lowest. The parent's minimum and median percentages were in greater agreement with the educator's than with the children's. Although parents were aware that their children were experiencing difficulties at school, some of the parents were not certain as to their children's specific behaviour at school (e.g. working in an organised fashion) and formed their perception of the child's ability to perform school activities on what they experienced at home when doing homework or engaging their



children in tasks at home. The educators, whose focus area is mainly school-related, could be seen as the “best qualified” to answer questions as to the child’s competence in school activities.

A statistical significant difference was found between the child and educator’s summary score percentages for school/ productivity (table 4.20). As discussed earlier, the children may be unaware of the level of assistance they receive from their educators, thus not perceiving themselves as “less competent” in school-related activities. The educators, on the other hand, measure the children’s performance against peers as well as objective assessment criteria, giving them a much clearer picture of the children’s difficulties related to schoolwork (Missiuna *et al.*, 2006:212). The young age of the study population may also be a reason for this result, as older children might be more perceptive to their incompetencies regarding school work.

### **Play and leisure**

For 80% of the leisure activities featured in the PEGS, at least one group of participants indicated lesser competence in more than half of the children (table 4.21). Two of these items, riding a bicycle and skipping with a rope, were perceived as difficult to perform by more than 50% (53.3% - 100%) of all the groups of participants who responded to it. The great level of sensory integration and adaptive responses required to perform these activities were previously discussed and these activities are repeatedly included in literature as examples of motor difficulties children with dyspraxia often experience (Polatajko & Cantin, 2006:252; Ayres, 2005:14-15; Bundy *et al.*, 2002:75).

The only two activities 60% or more (66.7% - 76.9%) of the participants in each group rated as “more competent”, were playing video games and

kicking a ball. As discussed earlier, playing video games and using a computer forms part of a category of sedentary activities which is often preferred by children with dyspraxia (Miller *et al.*, 2007:138), as it does not require many adaptive responses. Kicking a stationary ball is a less complex motor task than catching and hitting balls, thus more competence in performing this activity may be perceived.

The educators' range between the minimum and maximum percentages was the greatest, with their minimum (25.0%) the lowest and maximum (93.8%) the highest (table 4.22).

The children's minimum percentage (50.0%) was the same as the parent's median (50.0%), with a similar maximum percentage (85.0%) for both these groups. It can thus be said that the children's overall perception of their play and leisure abilities was generally higher than that of their parents or educators. Children may again be unaware of the way adults adapt activities to assist the child in successfully performing it, such as guiding the child to look at a ball, place his hands in the correct position for catching and then throwing the ball softly and directly to the child. This may lead to a child's perception that he is able to, for example, catch or hit a ball. Their choice of playmates can also increase their perceived competence, as children with dyspraxia often seek out younger playmates (Bundy *et al.*, 2007:201) or children with similar difficulties, whose leisure skills are at the same level, thus avoiding facing their lack of competence.

No statistical significant difference was found between the summary score percentages related to play/leisure of the three groups of participants (table 4.23). The reason for this may be that there is an overall agreement between

the three groups of participants as to the competence, or lack thereof, of children with dyspraxia to participate in leisure activities, even though there is a difference of opinion as to the specific items a child might struggle with. A larger sample size may also influence the statistical calculations.

### **Summary**

All items in the PEGS were related to the OPA's of self-care, school/productivity and play/leisure. Most activities listed in literature as problematic for children with dyspraxia, as discussed in chapter 2, was also featured in the PEGS. Participants also had the opportunity to add activities they identified as difficult for the child with dyspraxia that were not included in the PEGS and this was done by some participants. For example, using cutlery was added by two parents, a skill that literature also singles out as being difficult for children with dyspraxia (Miller *et al.*, 2007:138).

All three groups of participants (children, parents, educators) indicated a range of activities across all three OPAs of school, self-care and play/leisure that were perceived to be difficult for children with dyspraxia to perform.

Significant though, was that for all three groups of participants, the median percentage for items related to the OPA of play and leisure were the lowest (tables 4.16, 4.19 & 4.22). It can thus be concluded that play and leisure was perceived by all to be the occupational performance area children with dyspraxia within the age range of 64 and 98 months were the least competent in.

## **5.5. PEGS RESULTS – FUNCTIONAL GOALS**

The PEGS items prioritised by every participant as a functional goal they found important to improve on in therapy were reported in section 6 of the previous chapter. The findings made from these results are presented in the following sections.

### **5.5.1 Goals per PEGS item**

Printing was the item featured in the PEGS that was selected the most (n=18) as a therapeutic goal (table 4.24). In second place, selected by 16 participants, was the leisure activity of playing ball games that require hitting a ball, such as tennis and cricket. The items of skipping with a rope (n=14) and cutting with scissors (n=12) followed. All items featured in the PEGS were selected at least once as a goal. No literature was found by the researcher that indicated specific goals frequently selected by and for children with dyspraxia.

This wide range of goals emphasised the importance of identifying the specific priorities for each individual's (child, parent and educator) therapeutic intervention plan, as described in the occupational therapy process (AOTA, 2008:627). It would be of significant value if the occupational therapist working with a child with dyspraxia were able to engage the child, his parents and his educator in a process of identifying, selecting and prioritising specific functional goals for treatment. All would be better motivated to work together to achieve those goals and a balance could be found between the expectations of the different role-players, leading to greater satisfaction with

the occupational therapy process. Achieving functional goals also presents a measurable outcome for occupational therapy intervention.

### **5.5.2 Goals per OPA**

Referring to table 4.25 and fig. 4.1., almost half of the total number of goals selected by all participants related to the OPA of leisure (49.3%). This was followed by school-related goals (36.3%). Goals focusing on the improvement of self-care activities were selected the least (14.4%).

More than half of the goals children prioritised were in the OPA of leisure (54.2%), with self-care (22.0%) and school (23.7%) goals picked in almost equal percentages by children. Children with dyspraxia's need to be more competent in leisure activities may be related to their perception of increased social acceptance by their peer group. They might reason that, if they were also able to ride a bicycle, catch a ball or participate in sport, as do their peers, they would have more friends. They did not seem to be that concerned with improving in self-care and school, as their parents and educators assisted them in these tasks (Missiuna *et al.*, 2006:212), as discussed earlier when comparing the summary scores.

School and leisure were seen as equally important (50.0% each) by educators when selecting therapeutic goals. The educators did not select any self-care goals, even though they indicated that some children had difficulty with some aspects of self-care, like tying shoe-laces. School and sport-related activities were the focus areas of the educators and the goals selected by the educators were activities for which they had to provide assistance to children

struggling with performance. Greater competence for the children in school and leisure activities would decrease the child's dependence on the educator; therefore it is clear why the educator would prioritise these activities as goals for intervention.

The number of goals set by parents for the OPAs of leisure (18) and school (17) only differed by one, with a few (eight) self-care goals included. When considering these findings, it appears that parents were the most concerned with the overall development of their children. During the administration of the PEGS, the researcher observed that it was important for parents that their children perform well at school, were happy, competent and socially accepted during leisure time, and became more independent in self-care activities. A selection of goals across all occupational performance areas could thus be expected.

The median number of goals per OPA as selected by each group of participants was illustrated in fig. 4.2. The median combination of goals selected by the children included 1 self-care, 1 school and 2 leisure related goals. The profiles of the parent's and educator's goals were similar, with 1 school and 1 leisure goal each (fig. 4.2). These median combinations of goals paint a different picture than did the overall selection of goals, with the children selecting the most balanced set of goals across all OPAs. This might be indicative of the children's greater need for independence and functionality across all areas where they learn, play and live.

The median number of goals set by the parents per OPA did not include any self-care goals. As discussed earlier, some parents might find it easier to perform the child's self-care tasks themselves than to assist the child in

gradually becoming more independent. The parents' and educators' main concerns were focused on the improvement of the children's skills during leisure and school activities, areas where children's performance are compared to their peers' performance. The adults may see these two OPA's as areas children need to be functional in, in order for the child to be socially accepted and successful later in their life.

### **Self-care**

One of the self-care goals selected most by both the children and parents was the tying of shoelaces (table 4.62). This goal was appropriate for the developmental stage of the children, as it is a task they have to master during their grade R year.

Being able to use a knife was also a goal children found important to master independence in, although it seemed that parents were content to assist children with this, as none of the parents set it as a goal. Parents' other most selected self-care goal was for children to be able to dress themselves correctly in an amount of time reasonable to their parent's expectations, a skill that consists of many steps. As the child with dyspraxia seems unsure of where his body is in space and finds it difficult to organise himself in relation to his environment, dressing himself and mastering fasteners like buttons is quite a complex task (Miller *et al.*, 2007:138; Bundy *et al.*, 2002:75).

None of the self-care items was seen as important enough by educators to select it as a goal. As discussed previously, educators may see children's self-care as none of their concern, as it is an OPA parents are mostly responsibly for.

### **School and productivity**

Printing, only one of the skills required to be successful at school, was the single item most participants in the study selected as a goal for therapy (table 4.27). Printing, as the written output for most school-related tasks, was previously discussed as one of the main difficulties influencing children with dyspraxia's school performance. The underlying processes required for legible written output and the influence of dyspraxia on the development of these processes were discussed. As printing is now already required as part of the grade R curriculum (South Africa, 2011a:12-13), the great focus on improving the child with dyspraxia's handwriting skills is easily understood.

School-related items that were prioritised as goals were not similar for many of the participants and, except for printing, using scissors were the only school item selected by more than 2 children or parents. This is also a skill included in the grade R assessment criteria from the second term in grade R (South Africa, 2011b:24), thus the emphasis on improving scissor skills.

Educators' attention was focused mainly on school-related goals. They also agreed that printing and using scissors were the items improvement in were necessary most often. Using scissors and printing as a way to record e.g. mathematical concepts in an individual workbook, are skills that form part of the foundation phase curriculum from the first term in grade R (South Africa, 2011a:12-13; South Africa, 2011b:22) and are assessed and reported on by educators. Complex skills of finishing work on time and keeping desks tidy were also judged important. As discussed previously, children with dyspraxia struggle with organising, planning and working at a certain pace and often appear dishevelled and careless in performing tasks. Assisting children in becoming more efficient in their interaction with and control over the



environment are however not simply skills that can be taught, but end products of children being more comfortable in their own bodies, who are then able to form appropriate adaptive responses to expectations from the environment.

### **Play and leisure**

As discussed previously, being able to successfully participate in both organised sport, such as cricket and tennis, and unorganised games during play time, such as skipping rope and playing with a ball, might be perceived as means to be socially accepted by peers. Children with dyspraxia are often left alone during play time or teased for their lack of skills in these areas.

Playing ball games that require hitting the ball, such as cricket and tennis, was the leisure activity selected by most participants (table 4.28). It can be expected that this could be a great challenge for the child with dyspraxia as it entails projected action sequences, a skill which is seldom found in children with dyspraxia (Case-Smith & O'Brien, 2010:333). The perceived importance of being able to participate in such leisure activities in order to be socially accepted was discussed previously and could again be applicable to this finding.

Skipping with a rope, an activity that requires integrated abilities of motor planning and sequencing and that forms part of the grade R and grade 1 assessment criteria of the school curriculum (South Africa, 2011b:29,40), was another goal selected by many children and educators. As described earlier, educators referred to the assessment reports of the children in question when responding to the PEGS items, as well as during the selection of goals.

Improvement in tasks related to the assessment criteria appeared to be of great concern to the educators.

Playing electronic games was selected as a goal by more than 25% of the children (26.7%), but not by any of the adults. This finding may be indicative of the generation gap, where peer pressure leads to children expecting themselves to be competent in playing electronic games, but their parents do not acknowledge this as an activity that is important for the child to achieve competence in.

### **5.5.3 Comparison between perceived problems and selected goals**

The percentage of participants, who prioritised an item that they indicated the child was less competent in as a goal, was portrayed in table 4.29. This was done to determine which items were deemed most important to improve in by those who perceived it as troublesome.

The only items 60% or more of the children identified as having difficulty with and that was also prioritised as goals were playing electronic games, cutting with scissors, buttoning and running. These may be skills and activities these children observed their peers in being competent at, thus prioritising it as goals for themselves, in order to be able to keep up with their friends. Keeping a desk neat, dressing in reasonable time and drawing were not once chosen as goals; although they were earlier identified as activities the children were less competent in. Neatness and dressing may, as discussed earlier, be some of the activities the children are used to being assisted with

by their parents or educator; consequently they are not greatly concerned with improving their performance. As observed by the researcher, drawing is often perceived as a skill some people are "just not good at", hence not receiving great emphasis as a goal.

For the parents, printing was the only activity that more than 60% of parents who identified it as a difficulty (87.5%) also included it as a goal. The possible explanations for this were discussed numerously throughout this document. There were however many items that, although parents perceived children to experience difficulty performing it, none identified it as a goal, such as cutting food, craft activities and kicking a ball. These may again be activities or skills parents do not mind to assist the child with (e.g. cutting food) or not perceived as important for the future success of the child (e.g. crafts).

Three items, cutting, printing and playing ball games, were selected as goals by more than 60% of educators who identified it as a task the child with dyspraxia was less skilled in. As previously noted, these activities all form part of the assessment criteria from grade R (South Africa, 2011b:24,30; South Africa 2011a:12), consequently educators are greatly concerned with children's improved performance in these skills. Although eight educators identified working in an organised fashion on a page as a difficult task, none identified it as a priority to improve in, perhaps acknowledging that this is a complex skill that cannot be addressed during the first phase of therapy. No educators prioritised the tying of shoelaces as a goal, although it was indicated as an item children found difficult. Grade R educators avoid having to assist children with tying their shoes by requesting children to wear shoes

that fasten with velcro, thereby reducing their concern over children's incompetence in doing this.

An important observation was made when comparing the items perceived only by one of the three participants as "less competent" and the items that were selected as goals. For all three groups of participants some items perceived as a difficulty by a single person was considered important enough by that person to also prioritise it as a goal.

This happened in nine items as selected by 12 children (table 4.30). The most noteworthy of these with the children was playing electronic games, an item which three children were the sole judge to see it as a difficulty and identify it as a goal. The generation gap as a possible explanation for this was explained previously.

On six items seven adults (table 4.31) identified lesser competence and also selected the item as a goal. Dressing independently in reasonable time was selected by two different parents, as children with dyspraxia's problem in performing this is described throughout literature as a great frustration for parents (Bundy *et al.*, 2002:75; Miller *et al.*, 2007:138).

Nine educators identified eight items as "less competent" that were not perceived as such by the relevant child or his parent (table 4.32). Two educators reasoned that improvement in cutting with scissors should be a priority for a specific child, although the child and the parent did not agree. Possible explanations for this were also discussed throughout this chapter.

These discrepancies between the items selected as goals for each individual could prove problematic if all the role-players' priorities were not considered during the occupational therapy process (figure 2.3), as the outcomes expected from therapy differs.

This finding adds the educator to the reflection by other authors that, only when perspectives of both the parent and child are included and valued, real family-centred care is taking place (Morgan & Long, 2012:17; O'Brien *et al.*, 2009:178).

It remains the role of the occupational therapist to analyse and integrate all of the role-players' perceptions and priorities with her own professional observations and findings into an organised and realistic therapeutic intervention plan.

## **5.6. SUMMARY**

Chapter 5 took the reader along a discourse of the results reported in chapter 4, by summarising the data gathered during the research process, elaborating on and discussing important findings and considering linkages with available literature.

First, the demographical data was discussed and the children's SIPT results that were used as inclusion criteria were reviewed.

The perceptions on the functional competence of the children with dyspraxia were viewed from different angles, in order to reach the objectives of the

study. The extent of the influence of dyspraxia on the competence of children in functional activities featured in the PEGS, as perceived by the children, parents and educators were discussed. A comparison between the perceptions of the children, parents and educators brought the reader to an understanding of the great importance of including the voice of the child, as he was found to have a unique view of his perceived efficacy. These perceptions were also discussed when categorised per OPA and a conclusion was reached that play and leisure was perceived by all to be the occupational performance area children with dyspraxia was the least competent in. A statistical significant difference was found between the child's and educator's perceptions relating to competence in the OPA of school and productivity.

The goals that were selected were compared between the three participating groups and discussed per OPA, emphasising the significance of involving all role-players in the occupational therapy process, as both their perception of difficulties and priorities for therapy were found to differ.

Conclusions that could be made from this study, as well as the value of the study, will be discussed in the following chapter. The limitations of the study will be reviewed and recommendations made.

## **CHAPTER 6                      CONCLUSIONS AND RECOMMENDATIONS**

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In the previous chapter, the findings relating to this study were discussed and interpreted along with relevant literature. Findings described and compared the perceptions of parents, educators and children on dyspraxia, by means of the Perceived Efficacy and Goal Setting System (PEGS). Findings, as they pertain to the occupational performance areas of self-care, school and productivity, and play and leisure, were also discussed. Goals that were selected for therapy were also discussed and compared.

This chapter will conclude the study, first referring to limitations of the study. The value of the study is described and conclusions from the previous chapter are summarised. Following this, recommendations towards child-centred occupational therapy are made and, finally, the dissertation is closed.

### **6.1. LIMITATIONS OF THE STUDY**

Limitations that affected this study, as well as recommendations on how it could be improved, will be discussed next.

A definite limitation to the study, that was foreseen, was the small sample size. Even though the small sample size of this study agreed with the small sample size of other studies on dyspraxia (Bundy *et al.*, 2007:202; McWilliams, 2005:394; Missiuna, *et al.*, 2007:84; Watson & Knott, 2006:451), a larger number of participants could have influenced the statistical

significance of the findings. The sample size could have been increased by including occupational therapists and participants from outside the Free State. A longer timeframe could also have increased the number of participants that qualified for inclusion. This was however not possible for this research study, due to time and financial constraints.

Using SIPT results as inclusion criteria also limited the number of children. The SIPT is quite a comprehensive and expensive assessment tool to use and additional training and qualification are needed for the use thereof. Some occupational therapists, even though they are qualified to use the SIPT, indicated that they do not use it in their practices and rather rely on observations and clinical reasoning. However, to ensure that all children included in the study could be identified in a scientific manner as children with dyspraxia based in poor sensory integration, the use of the SIPT as golden measure (Schaaf & Roley, 2006:25) of dyspraxia weighed heavier than a bigger sample size.

The need for the development of a South African dyspraxia assessment tool, which is affordable, accessible to more occupational therapists, applicable to the complete SA population and less time-consuming than the SIPT, was again clear from the study.

As discussed in chapter 2, the SIPT does not identify children suffering from ideational dyspraxia. By using the SIPT as only measure of dyspraxia, children with ideational dyspraxia, as a standalone form of dyspraxia, might not have been included in this study. The diagnosis of ideational praxis as a standalone diagnosis is however still being researched and does not currently



form part of the prototypes of praxis dysfunctions identified by factor- and confirmatory analysis.

The cost associated with SIPT assessment and private occupational therapy led to the study population belonging mostly to the higher socio-economic population and was thus not representative of the Free State population and could therefore not be generalised to other populations. The data can however be seen as a strong indicator for further research.

The use of the PEGS also added limitations to the study. The OPA of social participation is not included in the PEGS and thus the influence thereof on the results is not known. The inclusion of a self-report instrument that contains items related to social participation, as well as emotional components such as self-esteem, could address this limitation.

## **6.2. VALUE OF THE STUDY**

This study was a first step for occupational therapists in South Africa involved with and treating children with dyspraxia based in sensory integration difficulties. No literature on the use of self-report instruments with children could be found by the researcher. The importance of including all role-players in the occupational therapy process was highlighted and should be brought to the attention of occupational therapists working within South Africa.

This study also responded to a recommendation by Dunford *et al.* (2005:213) who aimed to understand children's experience and views of the impact of

coordination difficulties (dyspraxia) on their daily lives and to compare this with the views of parents and educators.

No other literature was found that focused specifically on the perceived efficacy and goals set for children with dyspraxia, as they relate to different OPAs.

## **6.3. CONCLUSIONS**

The aim of this study, as set out in chapter 1, was to investigate the child's, parent's and educator's perceptions on dyspraxia, in order to identify comprehensive client-centred treatment goals.

The study's objectives were to identify the child, parent and educator's perceptions on dyspraxia, in the context of the child's occupational performance areas and to pinpoint the goals identified by the child, parent and educator, respectively, for occupational therapy.

The conclusions of the study, as it relates to the aim and objectives, is summarised as follows.

### **Perceptions on dyspraxia**

- The extent of dyspraxia was found to reach across all functional spheres from three occupational performance areas featured in the PEGS, as well as additional activities. Skipping with a rope, the skill featured in the PEGS that requires the most comprehensive praxis,

was perceived by all three groups of participants perceived as the activity most children with dyspraxia were less competent in.

- The perceptions of the parent, child and educator regarding the child's competence in specific activities differed, although not always statistically significant. The children rated their overall perception of their ability to participate in the activities featured in the PEGS higher than did their parents or educators, who perceived the most difficulty.
- Children that participated in the study were able to express their perceived efficacy and made themselves out to be less competent in some items the adults did not indicate as difficulties. Thus each child has a unique contribution to add to the clinical picture of dyspraxia as it is experienced and applied to him.
- Children also disagreed with adults on their perception of their competence in some activities the adults rated as "less competent". This holds implications for treatment, as children might not be motivated to work on goals to improve in activities they do not perceive themselves to struggle with it, such as keeping their desk neat and finishing work on time.
- A difference in opinion was also found between the parent and educator regarding their perceptions of the child's competence e.g. dressing and trying new things on the playground. The importance of including all role-players in the therapeutic intervention process, in order to obtain a multi-dimensional view of the child's abilities and perceived problems, was again highlighted by this finding.
- Play and leisure was perceived by all to be the occupational performance area children with dyspraxia were the least competent in including tasks such as riding a bicycle and playing ball games that require catching and hitting balls. As all these activities require many

adaptive responses from the child, this finding could be directly related to an actual lack of competence in performing these activities, when compared to the performance of their peers.

- A statistical significant difference was found between the child and educator's summary score percentages for school/productivity. It was concluded that the child might not be aware of the level of assistance he received from his educator, whereas the educator compared the child to his peer group's performance.

### **Goals selected for therapy**

- Parents, children and educators selected different combinations of items as goals.
- Printing, playing ball games that require hitting a ball, such as tennis and cricket, skipping with a rope and cutting with scissors were the specific goals selected by the greatest number of participants. All items featured in the PEGS were selected as a goal at least once, emphasising the different and wide variety of priorities each of the participants brought to the table.
- Almost half of the total number of goals selected by all participants related to the OPA of leisure. This was followed by school related goals and goals focusing on the improvement of self-care activities were selected the least. The same pattern was evident for children and parents. Educator selected the same number of school and leisure related goals and no self-care goals. The importance of perceived social acceptance through leisure activities and future success that require greater performance in school related activities, especially those that form part of the assessment criteria, were recurrent themes throughout the discussion of the results.

- All three groups of participants perceived items only they described the child as “less competent” in as important enough to select as a goal for therapy, emphasising that all concerned should be heard and their contributions valued when compiling the therapeutic intervention plan.

## **6.4. RECOMMENDATIONS**

Recommendations as to how the study’s findings can be implemented in occupational therapy practice for children with dyspraxia, as well as in future research, follow.

### **Occupational therapy for children with dyspraxia**

The occupational therapist working with children with dyspraxia should never under-estimate the extent of the influence of dyspraxia on all areas of the child’s functioning. The expectations that are set for the child in all environments he is exposed to throughout the day should be considered and the importance of leisure activities should not be disregarded.

The child does have something to add! The child must specifically be given an opportunity to express his perceptions of his abilities, through the use of a self-report instrument such as the PEGS. This is not only client-centred practice at best, but also allows the right of the child to voice his concerns regarding his perceptions of his competence.

Occupational therapists have to take into account the child’s perception of activities he finds himself competent in, as motivating the child to improve in such activities might be a challenge.

The differences between children, parents and educators in both their perceptions regarding children's competence in certain items, as well as selecting which items are important to select as goals, could influence the perception of the role-players on the effectiveness of occupational therapy. Some might not observe improvement in specific functional areas during the process of OT, as their perception of the difficulties of the child and the priority in which it should be handled differed from the goals discussed, and/or selected and considered important by the specific role-players that participated in the OT process. The importance of including both the perceptions and priorities of all relevant role-players must be emphasised. This includes the child, both parents, the educator, the after-school caregiver and where possible, the siblings.

It is important for occupational therapists working with children with dyspraxia, to take note of the wide range of functional goals selected by participants in this study, and to specifically identify for every individual child in therapy which activities the role-players see as important to work on and improve in. The OT cannot assume that the functional outcomes desired for every child with dyspraxia would be similar.

### **Further research opportunities**

Possible adaptations to the PEGS as a self-report instrument, to formally translate it and make its items specifically applicable to the South African context, can form part of further research studies, as was done for the Swedish population (Vroland-Nordstrand & Krumline-Sundholm, 2012:497). PEGS items can also be graded per functional skills and activities that are relevant for different age/developmental groups.

The perceptions of the child, parent and educator regarding the OPA of social participation, as well as emotional components, could be included by using additional self-report instruments.

## **6.5. CLOSURE**

The aim of the study as stated in chapter 1 "... to investigate the child's, parent's and educator's perceptions on dyspraxia, in order to identify comprehensive client-centred treatment goals" was reached.

The great extent of the influence of dyspraxia across all of the occupational performance areas of the child was confirmed during the study. Children between the ages of 5 years 4 months and 8 years 2 months were able to express their opinion of their own perceived competence through the use of a self-report instrument, such as the PEGS, and were found to add a new dimension to all three steps of the occupational therapy process, namely the identification of problems, the prioritising of intervention and the selection of functional outcomes. The perceptions of the parent and educator were also examined and differences as well as parallels were found in their perceptions and goals. The importance of including all role-players to add different dimensions to the clinical picture of the child with dyspraxia was clear throughout the study.

Although this was the first known South-African study on the use of a self-report instrument with children and very limited in size, it added useful recommendations for occupational therapists working with children with dyspraxia.

The words of Henry David Thoreau, found at the beginning of this document, conclude this dissertation:

"The question is not what you look at, but what you see."



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# APPENDIX A: LETTER OF APPROVAL FROM ETHICS COMMITTEE

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UNIVERSITEIT VAN DIE VRYSTAAT  
UNIVERSITY OF THE FREE STATE  
YUNIVESITHI YA FREISTATA

Direkteur: Fakulteitsadministrasie / Director: Faculty Administration  
Fakulteit Gesondheidswetenskappe / Faculty of Health Sciences



Research Division  
Internal Post Box G40  
☎ (051) 4052812  
Fax (051) 4444359

E-mail address: StraussHS.md@ufs.ac.za

Ms H Strauss

2010-03-15

MS C VAN STADEN  
P O BOX 43733  
HEUWELSIG  
9332

REC Reference number: REC-230408-011

Dear Ms van Staden

**ETOVS NR 22/2010**

**PROJECT TITLE: RESEARCH PROJECT ON PARENTS, EDUCATORS AND CHILDREN:  
PERCEPTIONS ON DYSPRAXIA.**

- You are hereby kindly informed that the Ethics Committee approved the above study at the meeting on 09 March 2010
- Committee guidance documents: Declaration of Helsinki, ICH, GCP and MRC Guidelines on Bio Medical Research. Clinical Trial Guidelines 2000 Department of Health RSA; Ethics in Health Research: Principles Structure and Processes Department of Health RSA 2004; Guidelines for Good Practice in the Conduct of Clinical Trials with Human Participants in South Africa, Second Edition (2006); the Constitution of the Ethics Committee of the Faculty of Health Sciences and the Guidelines of the SA Medicines Control Council as well as Laws and Regulations with regard to the Control of Medicines.
- Any amendment, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.
- The Committee must be informed of any serious adverse event and/or termination of the study.
- A progress report should be submitted within one year of approval of long-term studies and a final report at completion of both short term and long term studies.



339, Bloemfontein 9300, RSA ☎ (051) 405 2812  
Republiek van Suid-Afrika / Republic of South Africa

✉ StraussHS.md@ufs.ac.za



- Kindly refer to the ETOVS reference number in correspondence to the Ethics Committee secretariat.

Yours faithfully

.....  
**CHAIR: ETHICS COMMITTEE**

Cc Ms A van Jaarsveld, Dept of Occupational Therapy, UFS

# **APPENDIX B: INFORMATION DOCUMENT AND INFORMED CONSENT FORM – OCCUPATIONAL THERAPISTS**

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Date: .....

Dear Occupational Therapist

## **RESEARCH PROJECT ON PARENTS, EDUCATORS AND CHILDREN: PERCEPTIONS ON DYSPRAXIA**

Children with dyspraxia are usually referred for occupational therapy due to the great number of functional problems they experience. Different role-players in the child with dyspraxia's life are aware of different problems. The teacher is often unaware of problems the child is experiencing at home, for example brushing teeth, but will emphasize the need to organise his desk at school, a skill that parents might not see as a priority and vice versa.

When all these difficulties are taken into account, it is possible that the attempts of adults (parents, educators and occupational therapists) to assist the children in becoming more independent in different tasks are done according to the priority the adults see fit. The small voice of the child is often lost in this process of trying to put the chaos caused by dyspraxia in a family and classroom into a workable therapeutic plan.

I am a qualified Occupational Therapist, registered with the HPCSA, and enrolled as a Master's degree student in Occupational Therapy, Faculty of Health Sciences at the University of the Free State. The Master's degree entails a complete research project that was approved by the Ethics Committee of the Faculty of Health Sciences at the University of the Free State (number 22/2010).

In this research study, the perceptions of the child, parent/caregiver/guardian and educator regarding dyspraxia and occupational performance will be investigated using the Perceived Efficacy and Goal Setting System (PEGS), an assessment new to South Africa. The PEGS consists of 24 pairs of cards showing children participating in activities that include self-care, school/productivity and leisure/play activities.

The child must indicate if he/she is like the picture of the child who is “more competent” or “less competent” in the activity. The child then gets a chance to name four activities that he/she is good at and four activities that he/she struggles with, that were not included in the series of cards. The researcher then shows the child the cards that he/she indicated he/she is least competent in and the child selects four goals and priorities for therapy. This evaluation takes 20-30 min. per child.

A structured interview for the parent/caregiver/guardian involved in the occupational therapy process and the educator of the child depicting the same activities as those of the child’s cards in the PEGS, is conducted with both groups of adults during an interview that takes approximately 15 minutes each. Background information is also gathered from the parent/caregiver/guardian during this interview.

The aim of this research is to investigate the child’s, parent’s and educator’s perceptions on dyspraxia, in order to identify comprehensive client-centred treatment goals. The importance of including all three group’s perceptions in the planning of and goal-setting during therapy can ensure that all relevant problems in occupational performance can be addressed.

You are hereby kindly requested to participate in this research by identifying children who, through the assessment with the Sensory Integration and Praxis Test (SIPT), were identified with a praxis dysfunction according to a diagnostic prototype of the SIPT. The prototype will be one of the following:

- Low Average Bilateral Integration and Sequencing
- Low Average Sensory Integration and Praxis
- Visuo- and Somatodyspraxia
- Generalized Sensory Integrative Dysfunction

The children may currently be in treatment at your practice, but have not received more than 24 sessions (30 min. each) of therapy. They must be between the ages of 5 years 0 months and 8 years 11 months. Boys and girls can be included.

Letters explaining the research and requesting consent for participation will be given to you for distribution to the identified children's parent/caregiver/guardians. Kindly inform the researcher of the number required per language. They will be informed that participation is voluntary and that they can withdraw from the study at any time without any prejudice and that there is no harm or physical discomfort in participation. No extra cost is involved for taking part in the research and no remuneration will be made either. Only after they have given consent, their details should be made available to the researcher. The researcher will at no stage have any access to your patient records or information. The first time that any data is made available to the researcher, is when the parent/caregiver/guardian of the child has returned the signed letter of consent to you.

An appointment will be made to complete the parent/caregiver/guardian's questionnaire, as well as the PEGS, at your practice (if possible), or at the child's home. The identified child's educator will also be contacted for an interview.

The PEGS is an additional assessment and will in no way interfere with your treatment of the child. The findings of the PEGS will be made available to you and the child's parent/caregiver/guardian after all data is collected.

You are welcome to contact the researcher, Carli van Staden, at 083 406 0906 or the study leader, Annamarie van Jaarsveld at 051 401 2829 should any further information be required.

Your kind consideration of this request is appreciated. Kindly inform Carli van Staden of your decision by completing the attached form and contacting her at 083 406 0906 to collect it.

Yours faithfully

Carli van Staden

**RESEARCHER**

*Study Leader: Mrs. A. van Jaarveld, Department of Occupational Therapy, Faculty of Health Sciences, University of the Free State.*

## OCCUPATIONAL THERAPIST CONSENT TO PARTICIPATE IN RESEARCH

Title: *Parents, educators and children: Perceptions on dyspraxia*

Your practice has been selected to participate in the above-mentioned research study by Carli van Staden. You may contact her at 083 406 0906 at any time, should you have any questions regarding the research. You may contact the Secretariat of the Ethics Committee of the Faculty of Health Sciences, UFS at 051 – 405 2812 (ref. 22/2010) should you have any questions regarding the rights of research subjects. Participation in this research is voluntary and all information will be treated as confidential.

I, \_\_\_\_\_ (title, initials and surname),  
HPCSA registration number OT\_\_\_\_\_, hereby consent to participation in  
the research.

Contact numbers: \_\_\_\_\_ or  
\_\_\_\_\_

\_\_\_\_\_  
Signed

\_\_\_\_\_  
Date

*Kindly call Carli van Staden at 083 406 0906 for collection.*

Datum:.....

Beste Arbeidsterapeut

## **NAVORSINGSPROJEK OOR OUERS, OPVOEDERS EN KINDERS: PERSEPSIES OOR DISPRAKSIE**

Kinders met dispraksie word meestal vir Arbeidsterapie verwys weens die groot aantal funksionele probleme wat hulle ervaar. Verskillende rolspelers in die kind met dispraksie se lewe is bewus van verskillende probleme. Die onderwyser is meestal onbewus van probleme wat die kind tuis ervaar, byvoorbeeld met die borsel van tande, maar beklemtoon die belangrikheid van die orden van sy lessenaar by die skool, 'n vaardigheid wat die ouers nie noodwendig as belangrik beskou nie en vice versa.

Al hierdie probleme in ag genome, is dit moontlik dat die pogings van volwassenes (ouers, opvoeders en arbeidsterapeute) om die kinders te help om verskillende take met groter onafhanklikheid uit te voer, volgens die volwassenes se prioriteite georden word. Die sagte stemmetjie van die kind word dikwels in die harwar wat dispraksie tuis en by die skool veroorsaak verloor, tydens die samestelling van 'n werkbare terapeutiese plan.

Ek is 'n gekwalifiseerde Arbeidsterapeut, geregistreer by die HPCSA, en 'n ingeskrewe student vir 'n Meestersgraad in Arbeidsterapie by die Fakulteit van Gesondheidswetenskappe, Universiteit van die Vrystaat. Die Meestersgraad behels 'n volledige navorsingsprojek wat goedgekeur is deur die Etiekkomitee van die Fakulteit van Gesondheidswetenskappe by die Universiteit van die Vrystaat (nommer 22/2010).

In hierdie navorsingstudie word die persepsies van die kind, ouer/versorger/voog en opvoeder rakende dispraksie en “occupational performance” (taakuitvoering) ondersoek met behulp van die Perceived Efficacy and Goal Setting System (PEGS), ‘n evaluasie nuut in Suid-Afrika. Die PEGS bestaan uit 24 pare kaarte, met prente van kinders wat aan verskillende selfsorg -, skool-/produktiwiteit- en ontspannings/spel-aktiwiteite deelneem.

Die kind moet aandui of hy/sy soos die prentjie is van die kind wat “meer vaardig” of “minder vaardig” in die aktiwiteit is. Die kind kry dan die geleentheid om vier aktiwiteite te noem waarmee hy/sy goed vaar en vier waarmee hy/sy sukkel, wat nie by die prente ingesluit was nie. Die navorser wys dan aan die kind die kaarte wat hy/sy aangedui het hy die minste vaardig in is en die kind kies vier doelwitte en prioriteite vir terapie. Hierdie evaluasie neem ongeveer 20-30 min. per kind.

Gestruktureerde onderhoud word gevoer met die ouer/versorger/voog wat betrokke is by die kind se arbeidsterapie, asook met die opvoeder van die kind, waartydens hulle hul persepsie oor die kind se vaardigheid in die uitvoering van dieselfde aktiwiteite as die waarop die kind gereageer het, weergee. Die onderhoud neem ongeveer 15 min. per persoon. Agtergrondinligting word ook tydens hierdie onderhoud van die ouer/versorger/voog verkry.

Die doel van hierdie navorsing is om die kind, ouer en versorger se persepsie oor dyspraksie te ondersoek, ten einde omvattende kliënt-gefokusde behandelingsdoelwitte daar te stel. Die belang daarvan om al drie groepe se persepsies tydens die beplanning en doelstelling van terapie in te sluit kan verseker dat alle toepaslike probleme in die uitvoering van take aangespreek kan word.

U word hiermee vriendelik versoek om deel te neem aan hierdie navorsing deur kinders te identifiseer wat, na evaluasie met die Sensory Integration and Praxis Test (SIPT), geïdentifiseer is met ‘n praxis-disfunksie volgens die diagnostiese prototipes van die SIPT. Die prototipe moet een van die volgende wees:



- Low Average Bilateral Integration and Sequencing
- Low Average Sensory Integration and Praxis
- Visuo- and Somatodyspraxia
- Generalised Sensory Integrative Dysfunction

Die kinders moet nie meer as 24 arbeidsterapie behandelingsessies van 30min. elk ontvang het nie. Hulle kan tussen die ouderdom van 5 jaar 0 maande en 8 jaar 11 maande oud wees. Seuns en dogters word ingesluit.

Briewe aan die geïdentifiseerde kinders se ouer/versorger/voog, wat die navorsing verduidelik en toestemming vir deelname versoek, sal aan u verskaf word. U moet asseblief die aantal briewe wat u per taal nodig aan die navorser deurgee. Hulle sal ingelig word dat deelname vrywillig is, dat hulle te enige tyd sonder gevolge van die studie kan onttrek en dat daar geen risiko of persoonlike ongemak in deelname is nie. Daar is geen ekstra koste of vergoeding vir deelname nie.

Eers nadat hulle toestemming gegee het deur die dokument te onderteken en aan u terug te besorg, moet hul besonderhede aan die navorser bekend gemaak word. Die navorser het geensins toegang tot u pasiënte se inligting of rekords nie.

Die navorser sal 'n afspraak maak om die PEGS-evaluasie, asook die gestruktureerde onderhoud met die ouer/versorger/voog, by u praktyk (indien moontlik) of by die kind se huis te voltooi. Die opvoeder van die kind sal ook gekontak word vir 'n onderhoud.

Die PEGS is 'n aanvullende evaluasie en sal op geen wyse inmeng met u behandeling van die kind nie. Die bevindinge van die PEGS sal aan u en die kind se ouer/versorger/ voog beskikbaar gestel word na afloop van die studie.

U is welkom om die navorser, Carli van Staden, by 083 406 0906 of die studieleier, Annamarie van Jaarsveld by 051 401 2829 te kontak indien u enige verdere inligting verlang.

U vriendelike oorweging van hierdie versoek word waardeer. Stel asseblief vir Carli van Staden in kennis van u besluit deur die aangehegte vorm te voltooi en haar te kontak by 083 406 0906 om dit te kom afhaal.

Vriendelike groete

Carli van Staden

**NAVORSER**

*Studieleier: Mev. A. van Jaarveld, Departement Arbeidsterapie, Fakulteit van Gesondheidswetenskappe, Universiteit van die Vrystaat.*

## ARBEIDSTERAPEUT TOESTEMMING TOT DEELNAME AAN NAVORSING

Titel: *Ouers, opvoeders en kinders: Persepsies oor dispraksie*

U praktyk is genader om deel te neem aan bogenoemde navorsingstudie deur Carli van Staden.

U kan haar kontak by 083 406 0906, sou u enige navrae in verband met die navorsing hê. U kan die Sekretariaat van die Etiekkomitee van die Fakulteit Gesondheidswetenskappe, UV by 051 – 405 2812 kontak indien u enige vrae oor u regte as 'n deelnemer aan die studie het.

U deelname aan hierdie navorsing is vrywillig, en u sal nie gepeenaliseer word of voordele verbeur as u weier om deel te neem of besluit om deelname te staak nie. Alle inligting sal as vertroulik hanteer word.

Ek, \_\_\_\_\_ (titel, voorletters en van),  
HPCSA registrasie nommer OT\_\_\_\_\_, stem vrywillig in om deel te neem.

Kontaknommers: \_\_\_\_\_ of  
\_\_\_\_\_

\_\_\_\_\_  
Handtekening Arbeidsterapeut

\_\_\_\_\_  
Datum

*Kontak asseblief vir Carli van Staden by 083 406 0906 om hierdie brief te kom afhaal.*

# **APPENDIX C: INFORMATION DOCUMENT AND INFORMED CONSENT FORM – PARENTS/CAREGIVERS/GUARDIANS**

---

Date: .....

Dear Parent/caregiver/guardian

## **RESEARCH PROJECT ON PARENTS, EDUCATORS AND CHILDREN: PERCEPTIONS ON DYSPRAXIA**

Praxis can be described as the ability to figure out how to use your body in skilled tasks, such as playing with toys, using tools (e.g. pencil and fork), tidying of a room and engaging in many occupations, such as schoolwork and self-care.

Children with dyspraxia, or difficulty with praxis, are usually referred for occupational therapy due to the great number of functional problems they experience. Different role-players in the child with dyspraxia's life are aware of different problems. The teacher is often unaware of problems the child is experiencing with brushing teeth, but will emphasize the need to organise his desk at school, a skill that parents might not see as a priority and vice versa.

I am a qualified Occupational Therapist, registered with the HPCSA, and enrolled as a Master's degree student in Occupational Therapy, Faculty of Health Sciences at the University of the Free State. The Master's degree entails a complete research project that was approved by the Ethics Committee of the Faculty of Health Sciences at the University of the Free State (number 22/2010).

In this research study, the perceptions of the child, parent/caregiver/guardian and educator regarding dyspraxia and occupational performance, specifically the child's participation in activities that include self-care, school/productivity and leisure/play, will be compared.

Your child's treating Occupational Therapist was requested to identify children for participation in this research project, as per their results on the Sensory Integration and Praxis Test (SIPT). She was then requested to hand this letter to all parents/caregivers/guardians whose children qualified for participation. The researcher did not have any access to the occupational therapy records and the confidentiality agreement between you and your child's occupational therapist was in no way breached. The researcher will only be informed of the identity of possible study participants once you return this completed letter of consent to your child's occupational therapist.

I would hereby kindly like to request your consent for your child's and your own participation. The Perceived Efficacy and Goal Setting System (PEGS), consisting of cards showing children participating in activities, will be used. This is an assessment new to South Africa. The child must indicate if he/she is like the picture of the child who is "more competent" or "less competent" in the activity. A discussion on activities the child would like to work on in therapy follows. This evaluation takes 20-30 min. per child.

All information will be treated as confidential. Participation is voluntary, you can withdraw from the study at any time without any prejudice and there is no harm or physical discomfort in participation. The PEGS is an additional assessment and will in no way interfere with your child's treatment. There is no additional cost involved to participate and no remuneration either. A summary of the PEGS results will be made available to you and your child's treating therapist after all data is collected.

Should you consent to participation the researcher will contact you to make an appointment. The assessment will take place at either the treating therapist's practice or your home. The researcher will discuss the same items your child will comment on during the assessment with you in a structured interview. Background information will also be gathered during this interview of approximately 15min.

Your consent is also requested for the researcher to arrange a structured interview with your child's educator. The perception of the educator on the same activities that you and your child commented on will be discussed in this interview. Data gathered in this interview will also be included in the summary of findings.

To ensure the reliability of the data gathered, 10% of study participants who have been randomly selected will be contacted one month after the initial appointment to repeat the interview and assessment. It is possible that you may be included in this group to be re-interviewed.

The aim of this research is to investigate the child's, parent's and educator's perceptions on dyspraxia, in order to identify comprehensive client-centred treatment goals. The importance of including all three group's perceptions in the planning of and goal-setting during therapy can ensure that all relevant problems in occupational performance can be addressed.

Research findings will be submitted for publication in an Occupational Therapy journal and presented at appropriate conferences. Findings will only include analysed data and no individual information will be made known.

If you are willing to participate, please complete the attached letter of consent and return it to the child's therapist as soon as possible. If your child does not want to participate on the day, he/she will not be forced, even though we have your permission.

You are welcome to contact the researcher, Carli van Staden, at 083 406 0906 or the study leader, Annamarie van Jaarsveld at 051 401 2829 should any further information be required.

Thank you for your cooperation.

Yours faithfully

Carli van Staden

**RESEARCHER**

*Study Leader: Mrs. A. van Jaarsveld, Department of Occupational Therapy, Faculty of Health Sciences, University of the Free State.*

**CONSENT TO PARTICIPATE IN RESEARCH –  
PARENT/CAREGIVER/GUARDIAN**

Title: *Parents, educators and children: Perceptions on dyspraxia*

You and your child have been selected to participate in the above-mentioned research study by Carli van Staden. You may contact her at 083 406 0906 at any time, should you have any questions regarding the research. You may contact the Secretariat of the Ethics Committee of the Faculty of Health Sciences, UFS at 051 – 405 2812 should you have any questions regarding the rights of research subjects. Participation in this research is voluntary and all information will be treated as confidential.

I, \_\_\_\_\_ (title, initials and surname),  
parent/caregiver/guardian of \_\_\_\_\_ (name  
and surname) hereby consent to participation in the research. My contact number for  
an appointment is \_\_\_\_\_. My child's therapist is  
\_\_\_\_\_. The summary of findings of the PEGS can be  
emailed to \_\_\_\_\_.

I also give permission that the researcher may contact my child's educator,  
\_\_\_\_\_ (title, name and surname), teaching at  
\_\_\_\_\_ (child's school) at telephone number  
\_\_\_\_\_ to arrange an interview.

\_\_\_\_\_  
Signed

\_\_\_\_\_  
Date

*Kindly return to your child's Occupational Therapist.*

---

To be completed by the Occupational Therapist after consent from  
parent/caregiver/guardians:

Date of SIPT assessment: \_\_\_\_\_

Kindly attach a copy of the WPS SIPT TEST REPORT.



Datum:.....

Beste Ouer/versorger/voog

## **NAVORSINGSPROJEK OOR OUERS, OPVOEDERS EN KINDERS: PERSEPSIES OOR DISPRAKSIE**

Praksis kan beskryf word as die vermoë om uit te pluig hoe om jou liggaam te gebruik om vaardige take uit te voer, soos bevoorbeeld speel met speelgoed, die gebruik van 'n vork en potlood en netjies maak van 'n kamer, en deel te neem aan verskeie aktiwiteite soos skoolwerk en selfsorg.

Kinders met dispraksie, oftewel probleme met praksis, word meestal vir Arbeidsterapie verwys weens die groot aantal funksionele probleme wat hulle ervaar. Verskillende rolspelers in die kind met dispraksie se lewe is bewus van verskillende probleme. Die onderwyser is meestal onbewus van probleme wat die kind tuis ervaar, byvoorbeeld met die borsel van tande, maar beklemtoon die belangrikheid van die orden van sy lessenaar by die skool, 'n vaardigheid wat die ouers nie noodwendig as belangrik beskou nie en vice versa.

Ek is 'n gekwalifiseerde Arbeidsterapeut, geregistreer by die HPCSA, en 'n ingeskrewe student vir 'n Meestersgraad in Arbeidsterapie by die Fakulteit van Gesondheidswetenskappe, Universiteit van die Vrystaat. Die Meestersgraad behels 'n volledige navorsingsprojek wat goedgekeur is deur die Etiekkomitee van die Fakulteit van Gesondheidswetenskappe by die Universiteit van die Vrystaat (nommer 22/2010).

In hierdie navorsingstudie word die persepsies van die kind, ouer/versorger/voog en opvoeder rakende dispraksie en "occupational performance", wat die deelname van die kind aan selfsorg -, skool-/produktiwiteit- en ontspannings/spel-aktiwiteite insluit, ondersoek.

Die arbeidsterapeut wat u kind behandel is versoek om kinders vir deelname aan hierdie navorsingsprojek te identifiseer, na aanleiding van hul resultate na evaluasie

met die Sensory Integration and Praxis Test (SIPT). Sy is verder versoek om hierdie dokument aan alle ouers/versorgers/voogde van kwalifiserende kinders te gee.

Die navorser het geensins toegang tot die arbeidsterapierekords nie en die vertroulikheidsverhouding tussen u en u kind se arbeidsterapeut is te alle tye gerespekteer. Die navorser sal eers van die identiteit van moontlike deelnemers aan die studie ingelig word wanneer u hierdie voltooide toestemmingsdokument aan u kind se arbeidsterapeut terugbesorg.

U en u kind word hiermee vriendelik versoek om deel te neem aan hierdie navorsing. Die Perceived Efficacy and Goal Setting System (PEGS), bestaande uit kaarte met prentjies van kinders wat aan aktiwiteite deelneem, sal gebruik word. Hierdie evaluasie is nuut in Suid-Afrika. Die kind moet aandui of hy/sy soos die prentjie is van die kind wat “meer vaardig” of “minder vaardig” in die aktiwiteit is. ‘n Bespreking van aktiwiteite waaraan die kind graag in terapie wil werk, volg. Hierdie evaluasie duur 20-30 min. per kind.

Alle inligting sal as vertroulik hanteer word. Deelname vrywillig is, u kan te enige tyd sonder gevolge van die studie onttrek en daar is geen risiko of persoonlike ongemak in deelname nie. Daar is geen ekstra koste of vergoeding vir deelname nie. Die PEGS is ‘n aanvullende evaluasie en sal op geen wyse inmeng met u kind se behandeling nie. Die bevindinge van die PEGS sal aan u en die kind se behandelende arbeidsterapeut beskikbaar gestel word na afloop van die studie.

Sou u instem tot deelname, sal die navorser u kontak vir ‘n afspraak. Die evaluasie sal óf by die behandelende terapeut se praktyk óf by u huis plaasvind. Die navorser sal dieselfde aktiwiteite waarop u kind moet reageer met u bespreek tydens ‘n onderhoud. Agtergrondinligting sal ook tydens die onderhoud van ongeveer 15 min. verkry word.

U toestemming word ook verlang vir ‘n onderhoud tussen die navorser en u kind se opvoeder. Die opvoeder se persepsies oor dieselfde aktiwiteite as waarop u en u

kind gereageer het, sal verkry word. Inligting vanuit hierdie onderhoud sal ook by die bevindinge ingesluit wees.

Om die betroubaarheid van data te verseker, sal 10% van deelnemers wat ewekansig gekies is een maand na die aanvanklike onderhoud gekontak word, om die onderhoud en evaluasie te herhaal. U mag moontlik by hierdie groep ingesluit word.

Die doel van hierdie navorsing is om die kind, ouer en versorger se persepsie oor dyspraksie te ondersoek, ten einde omvattende kliënt-gefokusde behandelingsdoelwitte daar te stel. Die belang daarvan om al drie groepe se persepsies tydens die beplanning en doelstelling van terapie in te sluit kan verseker dat alle toepaslike probleme in die uitvoering van take aangespreek kan word.

Navorsingsbevindinge sal voorgelê word vir publikasie in 'n Arbeidsterapiejoernaal en voorgedra word by gepaste konferensies. Bevindinge sal slegs geanaliseerde data bevat en geen individuele inligting sal bekend gemaak word nie.

As u bereid is om deel te neem, voltooi asseblief die aangehegte toestemmingsvorm en besorg dit so gou as moontlik aan u kind se arbeidsterapeut terug. Indien u kind nie op die dag aan die evaluasie wil deelneem nie sal hy/sy nie gedwing word nie, al he tons u toestemming.

U is welkom om die navorser, Carli van Staden, by 083 406 0906 of die studieleier, Annamarie van Jaarsveld by 051 401 2829 te kontak indien u enige verdere inligting verlang. U samewerking word waardeer.

Vriendelike groete

Carli van Staden

**NAVORSER**

*Studieleier: Mev. A. van Jaarsveld, Departement Arbeidsterapie, Fakulteit van Gesondheidswetenskappe, Universiteit van die Vrystaat.*

**TOESTEMMING TOT DEELNAME AAN NAVORSING –  
OUER/VOOG/VERSORGER**

Titel: *Ouers, opvoeders en kinders: Persepsies oor dispraksie*

U en u kind is versoek om deel te neem aan bogenoemde navorsingstudie deur Carli van Staden. U kan haar kontak by 083 406 0906, sou u enige navrae in verband met die navorsing hê. U kan die Sekretariaat van die Etiekkomitee van die Fakulteit Gesondheidswetenskappe, UV by 051 – 405 2812 kontak indien u enige vrae oor u regte as 'n deelnemer aan die studie het. U deelname aan hierdie navorsing is vrywillig, en u sal nie gepeenaliseer word of voordele verbeur as u weier om deel te neem of besluit om deelname te staak nie. Alle inligting sal as vertroulik hanteer word.

Ek, \_\_\_\_\_ (titel, voorletters en van),  
ouer/versorger/voog van \_\_\_\_\_ (naam en  
van) stem vrywillig in om deel te neem. My kontaknommer vir 'n afspraak is  
\_\_\_\_\_. My kind se terapeut is \_\_\_\_\_.  
Die bevindinge van die PEGS kan per epos gestuur word na \_\_\_\_\_.

Ek gee ook toestemming dat die navorser my kind se opvoeder,  
\_\_\_\_\_ (titel, naam en van), by  
\_\_\_\_\_ (kind se skool) kontaknommer  
\_\_\_\_\_ mag skakel om 'n onderhoud te reël.

\_\_\_\_\_  
Geteken

\_\_\_\_\_  
Datum

*Gee asseblief aan u kind se Arbeisterapeut.*

Vir voltooiing deur die Arbeidsterapeut na toestemming deur ouer/versorger/voog  
verleen is:

Datum van SIPT evaluasie: \_\_\_\_\_

Heg asb. 'n afskrif van die WPS SIPT TEST REPORT aan.

# **APPENDIX D: INFORMATION DOCUMENT AND INFORMED CONSENT FORM – EDUCATORS**

---

Date: .....

Dear Educator

## **RESEARCH PROJECT ON PARENTS, EDUCATORS AND CHILDREN: PERCEPTIONS ON DYSPRAXIA**

Praxis can be described as the ability to figure out how to use your body in skilled tasks, such as playing with toys, using tools (e.g. pencil and fork), tidying of a room and engaging in many occupations, such as schoolwork and self-care.

Children with dyspraxia, or difficulty with praxis, are usually referred for occupational therapy due to the great number of functional problems they experience. Different role-players in the child with dyspraxia's life are aware of different problems. The teacher is often unaware of problems the child is experiencing with brushing teeth, but will emphasize the need to organise his desk at school, a skill that parents might not see as a priority and vice versa.

I am a qualified Occupational Therapist, registered with the HPCSA, and enrolled as a Master's degree student in Occupational Therapy, Faculty of Health Sciences at the University of the Free State. The Master's degree entails a complete research project that was approved by the Ethics Committee of the Faculty of Health Sciences at the University of the Free State (number 22/2010).

In this research study, the perceptions of the child, parent and educator regarding dyspraxia and occupational performance, specifically the child's participation in

activities that include self-care, school/productivity and leisure/play, will be investigated.

The child's perception of his participation in activities will be evaluated using the Perceived Efficacy and Goal Setting System (PEGS), consisting of cards showing children participating in activities. The child must indicate if he is like the picture of the child who is "more competent" or "less competent" in the activity. A discussion on activities the child would like to work on in therapy follows. The child's parents will comment on their perception of the child's participation in a structured interview, discussing similar activities as those the child responded on.

\_\_\_\_\_, a child in your class has been identified by his treating Occupational Therapist for participation in this research project. The child's parents have already given consent for participation, as well as permission that you may be contacted to request an interview.

You are hereby kindly requested to consent to a structured interview similar to the one arranged with the child's parents. Your perception of the child's participation in different activities will be completed on a questionnaire. This should not take more than 15 minutes. The researcher will make an appointment to see you at a place of convenience.

To ensure the reliability of the data gathered, 10% of study participants who have been randomly selected will be contacted one month after the initial appointment to repeat the interview and assessment. It is possible that you may be included in this group to be re-interviewed.

All information will be treated as confidential. Participation is voluntary and you can withdraw from the study at any time without any prejudice. There is no additional cost involved to participate and no remuneration either. A summary of the findings will be made available to the child's parents and treating occupational therapist after all data is collected.

The aim of this research is to find if the children's view adds an extra dimension to problems and goals identified to investigate the child's, parent's and educator's perceptions on dyspraxia, in order to identify comprehensive client-centred treatment goals. The importance of including all three group's perceptions in the planning of and goal-setting during therapy can ensure that all relevant problems in occupational performance can be addressed.

Research findings will be submitted for publication in an Occupational Therapy journal and presented at appropriate conferences. Findings will only include analysed data and no individual information will be made known.

If you are willing to participate, please complete the attached letter of consent and return it to the child's parents as soon as possible.

You are welcome to contact the researcher, Carli van Staden, at 083 406 0906 or the study leader, Annamarie van Jaarsveld at 051 401 2829 should any further information be required.

Yours faithfully

Carli van Staden

**RESEARCHER**

*Study Leader: Mrs. A. van Jaarsveld, Department of Occupational Therapy, Faculty of Health Sciences, University of the Free State.*

## EDUCATOR'S CONSENT TO PARTICIPATE IN RESEARCH

Title: *Parents, educators and children: Perceptions on dyspraxia*

You, as the educator of \_\_\_\_\_, a learner in your class, have been selected to participate in the above-mentioned research study by Carli van Staden. You may contact her at 083 406 0906 at any time, should you have any questions regarding the research. You may contact the Secretariat of the Ethics Committee of the Faculty of Health Sciences, UFS at 051 – 405 2812 should you have any questions regarding the rights of research subjects. Participation in this research is voluntary and all information will be treated as confidential.

I, \_\_\_\_\_ (title, initials and surname),  
educator of \_\_\_\_\_ (name and surname)  
hereby consent to participation in the research.

Name of school/crèche: \_\_\_\_\_

Contact telephone number: \_\_\_\_\_

\_\_\_\_\_  
Signed

\_\_\_\_\_  
Date

*Kindly return to the child's parents.*

**THANK YOU FOR YOUR COOPERATION**



Datum:.....

Beste Opvoeder

## **NAVORSINGSPROJEK OOR OUERS, OPVOEDERS EN KINDERS: PERSEPSIES OOR DISPRAKSIE**

Praksis kan beskryf word as die vermoë om uit te pluig hoe om jou liggaam te gebruik om vaardige take uit te voer, soos bevoorbeeld speel met speelgoed, die gebruik van 'n vurk en potlood en netjies maak van 'n kamer, en deel te neem aan verskeie aktiwiteite soos skoolwerk en selfsorg.

Kinders met dispraksie, oftewel probleme met praxis, word meestal vir Arbeidsterapie verwys weens die groot aantal funksionele probleme wat hulle ervaar. Verskillende rolspelers in die kind met dispraksie se lewe is bewus van verskillende probleme. Die onderwyser is meestal onbewus van probleme wat die kind tuis ervaar, byvoorbeeld met die borsel van tande, maar beklemtoon die belangrikheid van die orden van sy lessenaar by die skool, 'n vaardigheid wat die ouers nie noodwendig as belangrik beskou nie en vice versa.

Ek is 'n gekwalifiseerde Arbeidsterapeut, geregistreer by die HPCSA, en 'n ingeskrewe student vir 'n Meestersgraad in Arbeidsterapie by die Fakulteit van Gesondheidswetenskappe, Universiteit van die Vrystaat. Die Meestersgraad behels 'n volledige navorsingsprojek wat goedgekeur is deur die Etiekkomitee van die Fakulteit van Gesondheidswetenskappe by die Universiteit van die Vrystaat (nommer 22/2010).

In hierdie navorsingstudie word die persepsies van die kind, ouer/versorger/voog en opvoeder rakende dispraksie en "occupational performance", wat die deelname van die kind aan selfsorg -, skool-/produktiwiteit- en ontspannings/spel-aktiwiteite insluit, ondersoek.

Die kind se persepsie oor sy aktiwiteitsdeelname sal geëvalueer word met behulp van die Perceived Efficacy and Goal Setting System (PEGS), bestaande uit kaarte met prente van kinders wat aan aktiwiteite deelneem. Die kind moet aandui of hy/sy soos die prentjie is van die kind wat “meer vaardig” of “minder vaardig” in die aktiwiteit is. ‘n Bespreking van aktiwiteite waaraan die kind graag in terapie wil werk, volg. Die kind se ouers gee ook hul persepsie van die kind se aktiwiteitsdeelname tydens ‘n onderhoud, waarin na dieselfde aktiwiteite as die van die prente verwys word.

\_\_\_\_\_, ‘n kind in u klas, is deur sy/haar behandelende Arbeidsterapeut identifiseer vir deelname aan hierdie navorsing. Die kind se ouers het reeds toegestem tot deelname, en toestemming verleen dat u gekontak mag word vir ‘n onderhoud.

U word hiermee vriendelik versoek om deel te neem aan ‘n gestruktureerde onderhoud soortgelyk aan die onderhoud wat met die kind se ouers gevoer is. U persepsie oor die kind se deelname aan verskillende aktiwiteite sal aangeteken word. Die onderhoud sal nie meer as 15min. duur nie en ‘n afspraak sal gemaak word op ‘n plek wat vir u geleë is.

Om die betroubaarheid van data te verseker, sal 10% van deelnemers wat ewekansig gekies is een maand na die aanvanklike onderhoud gekontak word, om die onderhoud en evaluasie te herhaal. U mag moontlik by hierdie groep ingesluit word.

Alle inligting sal as vertroulik hanteer word. Deelname is vrywillig, u kan te enige tyd sonder gevolge van die studie onttrek en daar is geen risiko of persoonlike ongemak in deelname nie. Daar is geen ekstra koste of vergoeding vir deelname nie. Die bevindinge van die PEGS sal aan die kind se ouers en behandelende arbeidsterapeut beskikbaar gestel word na afloop van die studie.

Die doel van hierdie navorsing is om die kind, ouer en versorger se persepsie oor dyspraksie te ondersoek, ten einde omvattende kliënt-gefokusde behandelingsdoelwitte daar te stel. Die belang daarvan om al drie groepe se

persepsies tydens die beplanning en doelstelling van terapie in te sluit kan verseker dat alle toepaslike probleme in die uitvoering van take aangespreek kan word.

Navorsingsbevindings sal voorgelê word vir publikasie in 'n Arbeidsterapiejoernaal en voorgedra word by gepaste konferensies. Bevindings sal slegs geanaliseerde data bevat en geen individuele inligting sal bekend gemaak word nie.

As u bereid is om deel te neem, voltooi asseblief die aangehegte toestemmingsvorm en besorg dit so gou as moontlik aan die kind se ouers terug.

U is welkom om die navorser, Carli van Staden, by 083 406 0906 of die studieleier, Annamarie van Jaarsveld by 051 401 2829 te kontak indien u enige verdere inligting verlang.

U samewerking word waardeer.

Vriendelike groete

Carli van Staden

**NAVORSER**

*Studieleier: Mev. A. van Jaarsveld, Departement Arbeidsterapie, Fakulteit van Gesondheidswetenskappe, Universiteit van die Vrystaat.*

## OPVOEDER SE TOESTEMMING TOT DEELNAME AAN NAVORSING

Titel: *Ouers, opvoeders en kinders: Persepsies oor dispraksie*

U, as opvoeder van \_\_\_\_\_ is versoek om deel te neem aan bogenoemde navorsingstudie deur Carli van Staden. U kan haar kontak by 083 406 0906, sou u enige navrae in verband met die navorsing hê. U kan die Sekretariaat van die Etiekkomitee van die Fakulteit Gesondheidswetenskappe, UV by 051 – 405 2812 kontak indien u enige vrae oor u regte as 'n deelnemer aan die studie het. U deelname aan hierdie navorsing is vrywillig, en u sal nie gepenaliseer word of voordele verbeur as u weier om deel te neem of besluit om deelname te staak nie. Alle inligting sal as vertroulik hanteer word.

Ek, \_\_\_\_\_ (titel, voorletters en van),  
opvoeder van \_\_\_\_\_ (naam en van) stem  
vrywillig in om deel te neem.

Naam van school/crèche: \_\_\_\_\_

Kontaknommer: \_\_\_\_\_

\_\_\_\_\_  
Geteken

\_\_\_\_\_  
Datum

*Besorg asseblief terug aan die kind se ouers.*

**DANKIE VIR U SAMEWERKING**

## APPENDIX E: ASSENT FORM - CHILDREN

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**To be explained to the child by the researcher at the beginning of the assessment:**

My name is Carli. I am an Occupational Therapist just like \_\_\_\_\_ (child's treating Occupational Therapist's name). I would like to get to know you better by playing a card game with you. It is a new game you have never played before. Its name is PEGS. This game has a lot of cards showing children doing all kinds of things. The pictures show two children every time and I would like to know which child is most like you. There are no wrong or right answers.

Is there anything you would like to ask me at this point? We can discuss the pictures as we go along and you can ask me questions at any time.

Will you play the game with me?

(Ask child to indicate by writing his name on the assent form and coloring the picture (smiley face) of choice.)

DATE: \_\_\_\_\_

I, \_\_\_\_\_



Want to play the card game



Do not want to play the card game

**Word deur die navorser aan die kind verduidelik aan die begin van die evaluasie-sessie.**

My naam is Carli. Ek is 'n Arbeidsterapeut net soos \_\_\_\_\_ (behandelende Arbeidsterapeut se naam). Ek wil jou graag beter leer ken. Ons gaan 'n kaartspeletjie speel wat jy nog nooit vantevore gespeel het nie. Die speletjie se naam is PEGS. Die speletjie het 'n klomp kaarte met prentjies van kinders wat besig is om dinge te doen. Daar is elke keer twee prentjies van kinders. Jy moet vir my wys watter een van die kinders is die meeste soos jy. Daar is glad nie regte of verkeerde antwoorde nie.

Is daar enige iets wat jy nou vir my wil vra? Ons gaan gesels oor die prentjies soos ons aangaan en jy kan enige tyd vir my vrae vra.

Sal jy saam met my speel?

(Vra die kind om sy naam op die vorm te skryf en die gesiggie wat hy kies in te kleur.)

DATUM: \_\_\_\_\_

Ek, \_\_\_\_\_



Wil die kaartspeletjie speel



Wil nie die kaartspeletjie speel nie



## APPENDIX F: PEGS – CHILD INSTRUCTIONS AND SCORE SHEET

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An original of the attached score sheet will be used for every child, irrespective of the language used during the evaluation. The child will not be identified by name, but only by number.

The English statements to be used as a starting point for each discussion are printed on the cards for each activity. The following Afrikaans statements will be used for Afrikaans speaking children:

1. Hierdie kind vang maklik 'n bal.  
Hierdie kind sukkel om 'n bal te vang.
2. Hierdie kind het iemand nodig om sy kos te help sny.  
Hierdie kind sny maklik self sy kos.
3. Hierdie kind is goed in sport.  
Hierdie kind is nie goed in sport nie.
4. Hierdie kind is nie goed met tv-speletjies of playstation nie.  
Hierdie kind is goed met tv-speletjies of playstation.
5. Hierdie kind sukkel om skoolwerk betyds klaar te maak.  
Hierdie kind maak maklik skoolwerk betyds klaar.
6. Dit is vir hierdie kind moeilik om dinge te maak.  
Dit is vir hierdie kind maklik om dinge te maak.
7. Hierdie kind speel gewoonlik saam met speletjies en sport.  
Hierdie kind kyk gewoonlik speletjies en sport, in plaas van om self te speel.
8. Hierdie kind sukkel om skoenveters vas te maak.  
Hierdie kind kan maklik skoenveters vasmaak.
9. Hierdie kind is goed daarmee om prente met 'n skêr uit te sny.  
Hierdie kind sukkel om prente met 'n skêr uit te sny.

10. Hierdie kind hou nie daarvan om nuwe dinge op die speelgrond te probeer nie.  
Hierdie kind hou daarvan om nuwe dinge op die speelgrond te probeer.
11. Knope vasmaak is vir hierdie kind maklik.  
Knope vasmaak is vir hierdie kind moeilik.
12. Hierdie kind is goed daarmee om met die rekenaar te werk of speel.  
Hierdie kind is nie goed daarmee om met die rekenaar te werk of speel nie.
13. Hierdie kind kan maklik reguit op 'n bladsy te skryf.  
Hierdie kind is sukkel om reguit op 'n bladsy te skryf.
14. Hierdie kind kan baie goed fietsry.  
Hierdie kind kan nie baie goed fietsry nie.
15. Hierdie kind vat lank om aan te trek en sukkel partykeer daarmee.  
Hierdie kind trek maklik en vinnig aan.
16. Hierdie kind is nie goed met balspeletjies nie.  
Hierdie kind is goed met balspeletjies.
17. Hierdie kind skryf baie netjies.  
Hierdie kind skryf nie baie netjies nie.
18. Hierdie kind is goed met ritssluiters toetrek.  
Hierdie kind is nie baie goed met ritssluiters toetrek nie.
19. Hierdie kind se skooltafel is gewoonlik netjies.  
Hierdie kind se skooltafel is deurmekaar en dit is moeilik om iets daarop te kry.
20. Hierdie kind is nie baie goed met verf nie.  
Hierdie kind is goed met verf.
21. Hierdie kind se tekening is nie baie netjies nie.  
Hierdie kind se tekening is baie netjies.
22. Hierdie kind is nie goed met touspring nie.  
Hierdie kind is goed met touspring.
23. Hierdie kind is nie goed met balskop nie.  
Hierdie kind is goed met balskop.
24. Hierdie kind hardloop baie goed.  
Hierdie kind hardloop nie baie goed nie.

28. Met watter ander dinge is jy nog goed of sukkel jy mee?

Part 2: Jy het vir my gesê dat jy met hierdie dinge sukkel. Watter wil jy die graagste aan werk om dit beter te kan doen?



## Child Score Sheet

Child's Name \_\_\_\_\_ Age \_\_\_\_\_

Completed By \_\_\_\_\_ Date \_\_\_\_\_

**Part 1** Directions: Using the PEGS cards and placemats, administer each item to the child and record the child's responses on this score sheet.

Item	A Lot	A Little	A Little	A Lot
1. <input type="checkbox"/> Catching balls – good			3	4
<input type="checkbox"/> Catching balls – not good	1	2		
2. <input type="checkbox"/> Cutting food – not good	1	2		
<input type="checkbox"/> Cutting food – good			3	4
3. <input type="checkbox"/> Sports – good			3	4
<input type="checkbox"/> Sports – not good	1	2		
4. <input type="checkbox"/> Video games – not good	1	2		
<input type="checkbox"/> Video games – good			3	4
5. <input type="checkbox"/> Finishing schoolwork on time – has trouble	1	2		
<input type="checkbox"/> Finishing schoolwork on time – good			3	4
6. <input type="checkbox"/> Making things – not good	1	2		
<input type="checkbox"/> Making things – good			3	4
7. <input type="checkbox"/> Games and sports – usually plays			3	4
<input type="checkbox"/> Games and sports – usually watches	1	2		
8. <input type="checkbox"/> Tying shoes – difficult	1	2		
<input type="checkbox"/> Tying shoes – easy			3	4
9. <input type="checkbox"/> Scissors – good			3	4
<input type="checkbox"/> Scissors – not good	1	2		
10. <input type="checkbox"/> Playground – does not like to try new things	1	2		
<input type="checkbox"/> Playground – likes to try new things			3	4
11. <input type="checkbox"/> Buttoning – good			3	4
<input type="checkbox"/> Buttoning – not good	1	2		
12. <input type="checkbox"/> Computer – good			3	4
<input type="checkbox"/> Computer – not good	1	2		
13. <input type="checkbox"/> Organizing numbers – good			3	4
<input type="checkbox"/> Organizing numbers – not good	1	2		
14. <input type="checkbox"/> Bicycle – good			3	4
<input type="checkbox"/> Bicycle – not good	1	2		
15. <input type="checkbox"/> Dressing – takes longer	1	2		
<input type="checkbox"/> Dressing – quickly			3	4



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Item	A Lot	A Little	A Little	A Lot
16. <input type="checkbox"/> Ball games – not good	1	2		
<input type="checkbox"/> Ball games – good			3	4
17. <input type="checkbox"/> Printing – neat			3	4
<input type="checkbox"/> Printing – not neat	1	2		
18. <input type="checkbox"/> Zipping – good			3	4
<input type="checkbox"/> Zipping – not good	1	2		
19. <input type="checkbox"/> Desk – tidy			3	4
<input type="checkbox"/> Desk – messy	1	2		
20. <input type="checkbox"/> Painting – not good	1	2		
<input type="checkbox"/> Painting – good			3	4
21. <input type="checkbox"/> Drawing – not neat	1	2		
<input type="checkbox"/> Drawing – neat and clear			3	4
If the child <b>does not</b> typically use a wheelchair, walker, or crutches for mobility, <b>complete</b> Items 22–24, then <b>SKIP</b> to Item 28 and Part 2.				
If the child <b>does</b> typically use a wheelchair, walker, or crutches for mobility, <b>SKIP</b> to Items 25–28 and Part 2.				
22. <input type="checkbox"/> Skipping – not good	1	2		
<input type="checkbox"/> Skipping – good			3	4
23. <input type="checkbox"/> Kicking – not good	1	2		
<input type="checkbox"/> Kicking – good			3	4
24. <input type="checkbox"/> Running – good			3	4
<input type="checkbox"/> Running – not good	1	2		
If the child <b>does</b> typically use a wheelchair, walker, or crutches for mobility, <b>complete</b> Items 25–28 and Part 2.				
25. <input type="checkbox"/> Skipping – not able to take part	1	2		
<input type="checkbox"/> Skipping – able to take part			3	4
26. <input type="checkbox"/> Bathroom – needs help	1	2		
<input type="checkbox"/> Bathroom – independent			3	4
27. <input type="checkbox"/> Keeping up – able			3	4
<input type="checkbox"/> Keeping up – not able	1	2		
28. Using the blank cards, ask the child if there are any other activities he or she would like to discuss. Record the child's responses.				
Other things – good		Other things – tricky		
1. _____		1. _____		
2. _____		2. _____		
3. _____		3. _____		
4. _____		4. _____		

**Part 2** Directions: Review with the child each card on which he or she scored 1 ("a lot less competent"). Include cards with scores of 2 if less than 4 cards with scores of 1 were selected. Record the child's goals and the rationale for each goal.

Goals	Rationale
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____

# APPENDIX G: PEGS – PARENT QUESTIONNAIRE AND SCORE SHEET

---

An original of the attached questionnaire will be used for every child's parent/caregiver/guardian, irrespective of the language used during the interview.

The child will not be identified by name, but only by number.

## **ENGLISH**

As the researcher will complete the questionnaire during a structured interview with the parent/caregiver/guardian, the instructions will be as follows:

For each item, listen to both statements and identify the statement that best describes your child. Then indicate whether the description in the statement you selected is **a little** or **a lot** like your child.

Statements will then be read from the questionnaire.

## **AFRIKAANS**

For an Afrikaans speaking parent/caregiver/guardian, the following instructions and statements will be used:

Vir elke item, luister na albei stellings en identifiseer die stelling wat u kind die beste beskryf. Besluit dan of die beskrywing in die stelling wat u gekies het 'n **bietjie** of **baie** soos u kind is.

1. My kind vang maklik 'n bal raak.  
My kind sukkel om 'n bal te vang.
2. My kind het hulp nodig om sy/haar kos te sny, bv. vleis.  
My kind sny maklik self sy kos.
3. My kind is goed in sport.

- My kind is nie goed in sport nie.
4. My kind is nie goed met tv-speletjies of playstation nie.  
My kind is goed met tv-speletjies of playstation.
  5. My kind sukkel meestal om skoolwerk betyds klaar te maak.  
My kind maak gewoonlik maklik betyds klaar met skoolwerk.
  6. Dit is vir my kind moeilik om dinge met sy/haar hande te maak.  
My kind is goed daarmee om ding met sy/haar hande te maak.
  7. My kind neem gewoonlik aktief deel aan speletjies en sport.  
My kind kyk gewoonlik speletjies en sport, in plaas van om self te speel.
  8. My kind sukkel om skoenveters vas te maak.  
My kind kan maklik skoenveters vasmaak.
  9. My kind kan vorms netjies en akkuraat uitsny.  
My kind sukkel om met 'n skêr te sny.
  10. My kind hou nie daarvan om nuwe dinge op die speelgrond te probeer nie.  
My kind hou daarvan om nuwe dinge op die speelgrond te probeer.
  11. Knope vasmaak (hemp en broek) is vir my kind maklik.  
My kind kan nie knope vasmaak nie.
  12. My kind is goed daarmee om met die rekenaar te werk of speel.  
My kind is nie goed daarmee om met die rekenaar te werk of speel nie.
  13. My kind kan maklik georganiseer op 'n bladsy werk.  
My kind is sukkel om georganiseer op 'n bladsy te werk.
  14. My kind kan baie goed fietsry.  
My kind het gesukkel/sukkel om te leer fietsry.
  15. My kind vat lank om aan te trek en sukkel met sommige kledingstukke.  
My kind kan die meeste klere self aantrek teen 'n aanvaarbare spoed.
  16. My kind is nie goed met balspeletjies nie.  
My kind is goed met balspeletjies.
  17. My kind skryf netjies en leesbaar.  
My kind skryf nie baie netjies nie en dit is meestal moeilik om sy skrif te lees.
  18. My kind kan ritssluiters en vasmaakmiddels gemaklik hanteer.  
My kind sukkel met ritssluiters en vasmaakmiddels.
  19. My kind se lessenaar is redelik netjies en georganiseer.  
My kind se lessenaar is deurmekaar en hy/sy sukkel om iets daarop te kry.

20. My kind is nie baie goed met verf nie.

My kind is goed met verf.

21. My kind se tekening is nie baie netjies nie.

My kind se tekening is baie netjies.

22. My kind is nie goed met touspring nie.

My kind is goed met touspring.

23. My kind sukkel om 'n bal in die regte rigting te skop.

My kind kan 'n bal in die regte rigting skop.

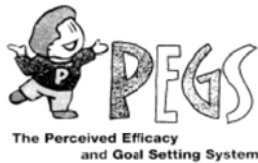
24. My kind hardloop baie goed.

My kind hardloop nie baie goed nie.

28. Watter ander items sukkel u kind mee?

Part 2: As u al die items hierbo, sowel as die wat u bygevoeg het in ag neem, in watter items sou u graag verbetering wou sien? U kan slegs vier opsies kies.





## Caregiver Questionnaire

Child's Name \_\_\_\_\_ Age \_\_\_\_\_

Completed By \_\_\_\_\_ Date \_\_\_\_\_

**Part 1** **Directions:** For each item, read both statements, identify the statement that best describes your child, and place a check in the corresponding box. Then, indicate whether the description in the statement you selected is **A Lot** or **A Little** like your child by checking the appropriate shape. A **square** always represents **A Lot**, and a **circle** always represents **A Little**.

Item	A Lot	A Little	A Little	A Lot
1. <input type="checkbox"/> My child is able to catch balls accurately. <input type="checkbox"/> My child finds it difficult to catch balls.				
2. <input type="checkbox"/> My child needs help to cut his/her food (e.g., meat). <input type="checkbox"/> My child can cut up his/her food (e.g., meat).				
3. <input type="checkbox"/> My child is good at sports. <input type="checkbox"/> My child is not good at sports.				
4. <input type="checkbox"/> My child has difficulty playing video games. <input type="checkbox"/> My child is good at playing video games.				
5. <input type="checkbox"/> My child often has trouble finishing his/her schoolwork on time. <input type="checkbox"/> My child usually finishes his/her schoolwork on time.				
6. <input type="checkbox"/> My child finds making things with his/her hands difficult. <input type="checkbox"/> My child is good at making things with his/her hands.				
7. <input type="checkbox"/> My child usually takes part actively in games and sports. <input type="checkbox"/> My child usually watches games and sports instead of playing them.				
8. <input type="checkbox"/> My child has problems tying shoes. <input type="checkbox"/> My child can tie shoes easily.				
9. <input type="checkbox"/> My child is able to cut out shapes accurately and neatly. <input type="checkbox"/> My child finds it difficult to cut with scissors.				
10. <input type="checkbox"/> My child does not like to try new playground activities. <input type="checkbox"/> My child likes to try new playground activities.				
11. <input type="checkbox"/> My child is good at buttoning pants and shirts. <input type="checkbox"/> My child is not able to manage buttons.				
12. <input type="checkbox"/> My child is good at working on the computer. <input type="checkbox"/> My child usually needs help using the computer.				
13. <input type="checkbox"/> My child is good at organizing numbers on the page when doing math problems. <input type="checkbox"/> My child finds it difficult to organize numbers on the page when doing math problems.				
14. <input type="checkbox"/> My child can ride a bike well. <input type="checkbox"/> My child had/is having difficulty learning to ride a bike.				
15. <input type="checkbox"/> My child takes a long time to get dressed and finds some clothes hard to put on. <input type="checkbox"/> My child gets dressed in a reasonable amount of time and can manage most clothes.				

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Item	A Lot	A Little	A Little	A Lot
16. My child finds playing ball games difficult. My child is good at playing ball games.				
17. My child's printing is neat and legible. My child's printing is not very neat and is often hard to read.				
18. My child is able to manage zippers and fasteners. My child cannot manage zippers and fasteners.				
19. My child's desk is reasonably neat and organized. My child's desk is messy and he/she has a hard time finding things in it.				
20. My child is not very good at painting. My child is able to paint well.				
21. My child is not able to draw well. My child is able to draw well.				
<b>If your child does not typically use a wheelchair, walker, or crutches for mobility, complete Items 22–24, then SKIP to Part 2.</b> <b>If your child does typically use a wheelchair, walker, or crutches for mobility, SKIP to Items 25–27 and Part 2.</b>				
22. My child finds skipping rope difficult. My child is good at skipping rope.				
23. My child usually cannot kick a ball with direction. My child is able to kick a ball with direction.				
24. My child is good at running. My child is slow and/or not very good at running.				
<b>If your child does typically use a wheelchair, walker, or crutches for mobility, complete Items 25–27 and Part 2.</b>				
25. My child is not able to participate in skipping rope. My child is able to participate in skipping rope.				
26. My child needs help to use the bathroom. My child is able to use the bathroom by himself/herself.				
27. My child is able to keep up with other kids. My child is not able to keep up with other kids.				

**Part 2** Directions: Answer the questions below.

Are there any additional items with which your child has difficulty? If so, please list them.

---



---



---



---

Think about all of the activities listed in this questionnaire and any additional activities you listed above. If you were to select just a few, which activities would you most like to see your child perform better?

1. 

---
2. 

---
3. 

---
4. 

---

# APPENDIX H: PEGS – EDUCATOR

## QUESTIONNAIRE AND SCORE SHEET

---

An original of the attached questionnaire will be used for every child's educator, irrespective of the language used during the interview.

The child will not be identified by name, but only by number.

### **ENGLISH**

As the researcher will complete the questionnaire during a structured interview with the educator, the instructions will be as follows:

For each item, listen to both statements and identify the statement that best describes the child. Then indicate whether the description in the statement you selected is **a little** or **a lot** like the child.

Statements will then be read from the questionnaire. Statements 2, 4, 11 and 14 are not applicable.

### **AFRIKAANS**

For an Afrikaans speaking educator, the following instructions and statements will be used:

Vir elke item, luister na albei stellings en identifiseer die stelling wat die kind die beste beskryf. Besluit dan of die beskrywing in die stelling wat u gekies het **'n bietjie** of **baie** soos die kind is.

1. Die kind vang maklik 'n bal raak.  
Die kind sukkel om 'n bal te vang.
- 2.
3. Die kind is goed in sport.  
Die kind is nie goed in sport nie.

- 4.
5. Die kind sukkel meestal om skoolwerk betyds klaar te maak.  
Die kind maak gewoonlik maklik betyds klaar met skoolwerk.
6. Dit is vir die kind moeilik om dinge met sy/haar hande te maak.  
Die kind is goed daarmee om ding met sy/haar hande te maak.
7. Die kind neem gewoonlik aktief deel aan speletjies en sport.  
Die kind kyk gewoonlik speletjies en sport, in plaas van om self te speel.
8. Die kind sukkel om skoenveters vas te maak.  
Die kind kan maklik skoenveters vasmaak.
9. Die kind kan vorms netjies en akkuraat uitsny.  
Die kind sukkel om met 'n skêr te sny.
10. Die kind hou nie daarvan om nuwe dinge op die speelgrond te probeer nie.  
Die kind hou daarvan om nuwe dinge op die speelgrond te probeer.
- 11.
12. Die kind is goed daarmee om met die rekenaar te werk of speel.  
Die kind is nie goed daarmee om met die rekenaar te werk of speel nie.
13. Die kind kan maklik georganiseer op 'n bladsy werk.  
Die kind sukkel om georganiseer op 'n bladsy te werk.
- 14.
15. Die kind vat lank om aan te trek en sukkel met sommige kledingstukke.  
Die kind kan die meeste klere self aantrek teen 'n aanvaarbare spoed.
16. Die kind is nie goed met balspeletjies nie.  
Die kind is goed met balspeletjies.
17. Die kind skryf netjies en leesbaar.  
Die kind skryf nie baie netjies nie en dit is meestal moeilik om sy skrif te lees.
18. Die kind kan ritssluiters en vasmaakmiddels gemaklik hanteer.  
Die kind sukkel met ritssluiters en vasmaakmiddels.
19. Die kind se lessenaar is redelik netjies en georganiseer.  
Die kind se lessenaar is deurmekaar en hy/sy sukkel om iets daarop te kry.
20. Die kind is nie baie goed met verf nie.  
Die kind is goed met verf.
21. Die kind se tekening is nie baie netjies nie.  
Die kind se tekening is baie netjies.

22. Die kind is nie goed met touspring nie.

Die kind is goed met touspring.

23. Die kind sukkel om 'n bal in die regte rigting te skop.

Die kind kan 'n bal in die regte rigting skop.

24. Die kind hardloop baie goed.

Die kind hardloop nie baie goed nie.

28. Watter ander items sukkel die kind mee?

Part 2: As u al die items hierbo, sowel as die wat u bygevoeg het in ag neem, in watter items sou u graag verbetering wou sien? U kan slegs vier opsies kies.



## Teacher Questionnaire

Child's Name \_\_\_\_\_ Date \_\_\_\_\_

Completed By \_\_\_\_\_

**Part 1** **Directions:** For each item, read both statements, identify the statement that best describes the child, and place a check in the corresponding box. Then, indicate whether the description in the statement you selected is **A Lot** or **A Little** like the child by checking the appropriate shape. A **square** always represents **A Lot**, and a **circle** always represents **A Little**. Do not answer Items 2, 4, 11, or 14.

Item	A Lot	A Little	A Little	A Lot
1. <input type="checkbox"/> This child is able to catch balls accurately. <input type="checkbox"/> This child finds it difficult to catch balls.				
2. <input checked="" type="checkbox"/> This child needs help to cut his/her food (e.g., meat). <input checked="" type="checkbox"/> This child can cut up his/her food (e.g., meat).				
3. <input type="checkbox"/> This child is good at sports. <input type="checkbox"/> This child is not good at sports.				
4. <input checked="" type="checkbox"/> This child has difficulty playing video games. <input checked="" type="checkbox"/> This child is good at playing video games.				
5. <input type="checkbox"/> This child often has trouble finishing his/her schoolwork on time. <input type="checkbox"/> This child usually finishes his/her schoolwork on time.				
6. <input type="checkbox"/> This child finds making things with his/her hands difficult. <input type="checkbox"/> This child is good at making things with his/her hands.				
7. <input type="checkbox"/> This child usually takes part actively in games and sports. <input type="checkbox"/> This child usually watches games and sports instead of playing them.				
8. <input type="checkbox"/> This child has problems tying shoes. <input type="checkbox"/> This child can tie shoes easily.				
9. <input type="checkbox"/> This child is able to cut out shapes accurately and neatly. <input type="checkbox"/> This child finds it difficult to cut with scissors.				
10. <input type="checkbox"/> This child does not like to try new playground activities. <input type="checkbox"/> This child likes to try new playground activities.				
11. <input checked="" type="checkbox"/> This child is good at buttoning pants and shirts. <input checked="" type="checkbox"/> This child is not able to manage buttons.				
12. <input type="checkbox"/> This child is good at working on the computer. <input type="checkbox"/> This child usually needs help using the computer.				
13. <input type="checkbox"/> This child is good at organizing numbers on the page when doing math problems. <input type="checkbox"/> This child finds it difficult to organize numbers on the page when doing math problems.				
14. <input checked="" type="checkbox"/> This child can ride a bike well. <input checked="" type="checkbox"/> This child had/is having difficulty learning to ride a bike.				
15. <input type="checkbox"/> This child takes a long time to get dressed and finds some clothes hard to put on. <input type="checkbox"/> This child gets dressed in a reasonable amount of time and can manage most clothes.				

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Item	A Lot	A Little	A Little	A Lot
16. This child finds playing ball games difficult. This child is good at playing ball games.				
17. This child's printing is neat and legible. This child's printing is not very neat and is often hard to read.				
18. This child is able to manage zippers and fasteners. This child cannot manage zippers and fasteners.				
19. This child's desk is reasonably neat and organized. This child's desk is messy and he/she has a hard time finding things in it.				
20. This child is not very good at painting. This child is able to paint well.				
21. This child is not able to draw well. This child is able to draw well.				
If the child <b>does not</b> typically use a wheelchair, walker, or crutches for mobility, <b>complete</b> Items 22–24, then <b>SKIP</b> to Part 2.				
If the child <b>does</b> typically use a wheelchair, walker, or crutches for mobility, <b>SKIP</b> to Items 25–27 and Part 2.				
22. This child finds skipping rope difficult. This child is good at skipping rope.				
23. This child usually cannot kick a ball with direction. This child is able to kick a ball with direction.				
24. This child is good at running. This child is slow and/or not very good at running.				
If the child <b>does</b> typically use a wheelchair, walker, or crutches for mobility, <b>complete</b> Items 25–27 and Part 2.				
25. This child is not able to participate in skipping rope. This child is able to participate in skipping rope.				
26. This child needs help to use the bathroom. This child is able to use the bathroom by himself/herself.				
27. This child is able to keep up with other kids. This child is not able to keep up with other kids.				

**Part 2** Directions: Answer the questions below.

Are there any additional items with which this child has difficulty? If so, please list them.

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---



---

Think about all of the activities listed in this questionnaire and any additional activities you listed above. If you were to select just a few, which activities would you most like to see this child perform better?

1. 

---

2. 

---

3. 

---

4. 

---

# APPENDIX I: PEGS – SUMMARY SCORE SHEET

## Summary Score Sheet

### Part 1 Item Ratings

**Directions:** For each of the items, specify the rating reported by the child, caregiver, and teacher by writing the rating on this Summary Sheet. Add the ratings for each column and record the total in the appropriate PEGS Summary Score box.

The value of the ratings for each item is as follows:

- 1 = a lot less competent when participating in this activity
- 2 = a little less competent when participating in this activity
- 3 = a little more competent when participating in this activity
- 4 = a lot more competent when participating in this activity

Item	Child's Rating	Caregiver's Rating	Teacher's Rating
1. Catching a ball			
2. Cutting food			
3. Sports			
4. Playing video games			
5. Finishing schoolwork			
6. Making things			
7. Playing/watching games and sports			
8. Tying shoes			
9. Cutting with scissors			
10. Trying new things on the playground			
11. Buttoning			
12. Working on the computer			
13. Organizing numbers on a page			
14. Riding a bicycle			
15. Dressing			
16. Playing ball games			
17. Printing			
18. Zipping			
19. Keeping desk neat			
20. Painting			
21. Drawing			
Items 22–24 should only be completed if the child <b>does not</b> use a wheelchair, walker, or crutches for mobility.			
22. Skipping rope			
23. Kicking a ball			
24. Running			
Items 25–27 should only be completed if the child <b>does</b> use a wheelchair, walker, or crutches for mobility.			
25. Skipping rope			
26. Using the bathroom			
27. Keeping up with others			
<b>PEGS Summary Scores*</b>	<b>/96*</b>	<b>/96*</b>	<b>/80*</b>

\* The PEGS Summary Scores **do not** represent standard score measures of the child's competency. The PEGS Summary Scores merely allow the therapist to get an overall impression of how the child's own overall rating compares to that of the caregiver and teacher.



## Part 2 Goal Setting

Directions: Write the goals selected by the child, caregiver, and teacher in the space provided below.

### Child's Goals:

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_
3. \_\_\_\_\_  
\_\_\_\_\_
4. \_\_\_\_\_  
\_\_\_\_\_

### Caregiver's Goals for the Child:

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_
3. \_\_\_\_\_  
\_\_\_\_\_
4. \_\_\_\_\_  
\_\_\_\_\_

### Teacher's Goals for the Child:

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_
3. \_\_\_\_\_  
\_\_\_\_\_
4. \_\_\_\_\_  
\_\_\_\_\_

### Comments and Interpretations:

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# APPENDIX J: BACKGROUND QUESTIONS FOR STRUCTURED INTERVIEW AND DATA SHEET

## QUESTIONS FOR STRUCTURED INTERVIEW & DATA SHEET

### To be completed by the researcher

1. Date of interview

d	d	m	m	y	y
---	---	---	---	---	---

2. Person being interviewed:

1	Mother
2	Father
3	Both mother and father
4	Other: .....

3. What is the child's age?

y	y	m	m
---	---	---	---

4. What is the child's gender?

Male (1)	Female (2)
----------	------------

5. What is the child's home language?

1	Afrikaans
2	English
3	Sesotho
4	Other: .....

### For office use

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 1-2

--	--	--	--	--	--

 3-8  
d d m m y y

--

 9

--	--	--	--

 10-13  
y y m m

--

 14

--

 15

6. How many siblings does the child have?

16

7. What is the birth order of the child?

1
2
3
4
5

Eldest

Second

Third

Fourth

Other:

-----

17

8. What is the father's occupational group?

1
2
3
4
5
6
7
8

Executive/ Advanced professional

Business-manager/ lower professional/ teacher

Administrative/small business owner

Clerical/sales/technical

Skilled manual

Unskilled manual

Unemployed

Other:

-----

18

9. What is the father's highest qualification level?

1
2
3
4
5
6

Grade 12

Diploma

Bachelors or honours degree

Master's degree

Doctors degree

Other:

-----

19

10. What is the mother's occupational group?

1	Executive/ Advanced professional
2	Business-manager/ lower professional/ teacher
3	Administrative/small business owner
4	Clerical/sales/technical
5	Skilled manual
6	Unskilled manual
7	Unemployed
8	Other: .....

	20
--	----

11. What is the mother's highest qualification level?

1	Grade 12
2	Diploma
3	Bachelors or honours degree
4	Master's degree
5	Doctors degree
6	Other: .....

	21
--	----

12. Who does the child live with?

1	Mother
2	Father
3	Both parents
4	Grandparents
5	Other: .....

	22
	23

13. How many people sleep in the house?

		persons ten years and older
		children younger than 10 years

		24-25
		26-27

14. How many sleeping rooms does the house have?

--	--

		28-29
--	--	-------

15. In what grade is the child?

1	Grade 0
2	Grade R
3	Grade 1
4	Grade 2
5	Grade 3
6	Not attending school
7	Other: .....

	30
--	----

16. Has the child repeated any grade?

Yes (1)	No (2)
---------	--------

	31
--	----

17. If yes, please indicate which.

1	Grade 0
2	Grade R
3	Grade 1
4	Grade 2
5	Grade 3

	32
	33
	34
	35
	36

18. Who looks after the child after school hours?

1	Afternoon care at school
2	Nanny
3	Parent/grandparent
4	Other: .....

	37
	38
	39
	40

19. Does the child take part in extra-mural activities?

Yes (1)	No (2)
---------	--------

	41
--	----

20. If yes, tick all that apply.

1	Team sport school
2	Individual sport
3	Music
4	Playball/ Monkeynastix, etc.
5	Computer classes
6	Art classes
7	Chess
8	Other: .....

.....

.....

.....

.....

	42
	43
	44
	45
	46
	47
	48
	49

21. Who referred the child for Occupational Therapy?

Tick all that apply.

1	GP
2	Pediatrician
3	Educator
4	Day-care giver
5	Parents
6	Other -----

.....

.....

.....

.....

	50
	51
	52
	53
	54
	55

22. How many OT treatment sessions has the child had?

--	--

		56-57
--	--	-------

23. Is the child currently receiving any other therapy?

Yes (1)	No (2)
---------	--------

	58
--	----

24. If yes, please indicate which.

1	Physiotherapy
2	Speech therapy
3	Play therapy
4	Psychology
5	Biokinetics
6	Other .....

	59
	60
	61
	62
	63
	64

.....

.....

.....

.....

25. If yes, please indicate how many treatment sessions each the child had?

		Physiotherapy
		Speech therapy
		Play therapy
		Psychology
		Biokinetics
		Other .....

		65-66
		67-68
		69-70
		71-72
		73-74
		75-76

.....

.....

.....

.....

26. Has the child previously received any other therapy:

Yes (1)	No (2)
---------	--------

	77
--	----

27. If yes, please indicate which.

1	Physiotherapy
2	Speech therapy
3	Play therapy
4	Psychology
5	Biokinetics
6	Occupational Therapy
7	Other _____

	78
	79
	80
	1
	2
	3
	4

28. If yes, please indicate how many treatment sessions each the child had previously?

		Physiotherapy
		Speech therapy
		Play therapy
		Psychology
		Biokinetics
		Occupational therapy
		Other _____

		5-6
		7-8
		9-10
		11-12
		13-14
		15-16
		17-18



29. Has the child been diagnosed with any medical conditions?

Yes (1)	No (2)
---------	--------

	19
--	----

30. If yes, please describe:

---



---



---

		20-21
		22-23
		24-25

31. Are you aware of any other factors that can influence the child's perceptions of his abilities?

Yes (1)	No (2)
---------	--------

	26
--	----

32. If yes, please describe:

---



---



---

		27-28
		29-30
		31-32

**Questions 33-36 to be completed using WPS SIPT-report**

33. What diagnostic prototype is identified by the SIPT

Test item scores? Mark all applicable

1	Low Average Bilateral Integration and Sequencing
2	Visuodyspraxia
3	Somatodyspraxia

	33
	34
	35

34. If Low Average Bilateral Integration and Sequencing, what are the relevant test item scores?

Opr			.		
SPr			.		
BMC			.		
GRA			.		
SWB			.		
(PPr)			.		

		.			36-40
		.			41-45
		.			46-50
		.			51-55
		.			56-60
		.			61-65

35. If Visuodyspraxia, what are the relevant test item scores?

DC			.		
CPr			.		
SV			.		
Mac			.		
(FI)			.		

		.			66-70
		.			71-75
		.			76-80
		.			1-5
		.			6-10

36. If Somatodyspraxia, what are the relevant test item scores?

PPr			.		
SPr			.		
Opr			.		
(FI)			.		
(GRA)			.		
(SWB)			.		
(KIN)			.		
(LTS)			.		

		.			11-15
		.			16-20
		.			21-25
		.			26-30
		.			31-35
		.			36-40
		.			41-45
		.			46-50

37. Date SIPT assessment was started

d	d	m	m	y	y
---	---	---	---	---	---

--	--	--	--	--	--

d d m m y y

**Questions 38-63 from child score sheet**

- 1 A lot like less competent picture**
- 2 A little like less competent picture**
- 3 A little like more competent picture**
- 4 A lot like more competent picture**

38. Catching balls (item 1)

57

39. Cutting food (item 2)

58

40. Sports (item 3)

59

41. Playing video games (item 4)

60

42. Finishing schoolwork on time (item 5)

61

43. Making things (item 6)

62

44. Playing/watching games and sports (item 7)

63

45. Tying shoes (item 8)

64

46. Cutting with scissors (item 9)

65

47. Trying new things on the playground (item 10)

66

48. Buttoning (item 11)

67

49. Working on a computer (item 12)

68

50. Working organised on a page (item 13)

	69
--	----

51. Riding a bicycle (item 14)

	70
--	----

52. Dressing (item 15)

	71
--	----

53. Playing ball games (item 16)

	72
--	----

54. Printing (item 17)

	73
--	----

55. Zipping (item 18)

	74
--	----

56. Keeping desk neat (item 19)

	75
--	----

57. Painting (item 20)

	76
--	----

58. Drawing (item 21)

	77
--	----

59. Skipping rope (item 22)

	78
--	----

60. Kicking a ball (item 23)

	79
--	----

61. Running (item 24)

	80
--	----

62. Other activities:


		1-2
		3-4
		5-6
		7-8

63. Goals (item number)


		9-10
		11-12
		13-14
		15-16

**Questions 64-89 from parent questionnaire**

- 1 A lot like less competent statement**
- 2 A little like less competent statement**
- 3 A little like more competent statement**
- 4 A lot like more competent statement**

64. Catching balls (item 1)

	17
--	----

65. Cutting food (item 2)

	18
--	----

66. Sports (item 3)

	19
--	----

67. Playing video games (item 4)

	20
--	----

68. Finishing schoolwork on time (item 5)

	21
--	----

69. Making things (item 6)

	22
--	----

70. Playing/watching games and sports (item 7)

	23
--	----

71. Tying shoes (item 8)

	24
--	----

72. Cutting with scissors (item 9)

	25
--	----

73.	Trying new things on the playground (item 10)	<input type="checkbox"/>	26
74.	Buttoning (item 11)	<input type="checkbox"/>	27
75.	Working on a computer (item 12)	<input type="checkbox"/>	28
76.	Working organised on a page (item 13)	<input type="checkbox"/>	29
77.	Riding a bicycle (item 14)	<input type="checkbox"/>	30
78.	Dressing (item 15)	<input type="checkbox"/>	31
79.	Playing ball games (item 16)	<input type="checkbox"/>	32
80.	Printing (item 17)	<input type="checkbox"/>	33
81.	Zippering (item 18)	<input type="checkbox"/>	34
82.	Keeping desk neat (item 19)	<input type="checkbox"/>	35
83.	Painting (item 20)	<input type="checkbox"/>	36
84.	Drawing (item 21)	<input type="checkbox"/>	37
85.	Skipping rope (item 22)	<input type="checkbox"/>	38
86.	Kicking a ball (item 23)	<input type="checkbox"/>	39
87.	Running (item 24)	<input type="checkbox"/>	40

88. Other activities:


		41-42
		43-44
		45-46
		47-48

89. Goals (item number)


		49-50
		51-52
		53-54
		55-56

**Questions 90 - 111 from educator questionnaire**

- 1 A lot like less competent statement**
- 2 A little like less competent statement**
- 3 A little like more competent statement**
- 4 A lot like more competent statement**

90. Catching balls (item 1)

	57
--	----

91. Sports (item 3)

	58
--	----

92. Finishing schoolwork on time (item 5)

	59
--	----

93. Making things (item 6)

	60
--	----

94. Playing/watching games and sports (item 7)

	61
--	----

95. Tying shoes (item 8)

	62
--	----

96. Cutting with scissors (item 9)

63

97. Trying new things on the playground (item 10)

64

98. Working on a computer (item 12)

65

99. Working organised on a page (item 13)

66

100. Dressing (item 15)

67

101. Playing ball games (item 16)

68

102. Printing (item 17)

69

103. Zipping (item 18)

70

104. Keeping desk neat (item 19)

71

105. Painting (item 20)

72

106. Drawing (item 21)

73

107. Skipping rope (item 22)

74

108. Kicking a ball (item 23)

75

109. Running (item 24)

76

110. Other activities:

<input type="text"/>	<input type="text"/>
----------------------	----------------------

77-78



79-80
1-2
3-4

5-6
7-8
9-10
11-12



## VRAE VIR GESTRUKTUREERDE ONDERHOUD EN DATAVORM

### Word deur navorsers voltooi

1. Datum van onderhoud

d	d	m	m	y	y
---	---	---	---	---	---

2. Persoon met wie onderhoud gevoer word

1	Moeder
2	Vader
3	Beide moeder and vader
4	Ander: .....

3. Hoe oud is die kind?

y	y	m	m
---	---	---	---

4. Wat is die kind se geslag?

Manlik (1)	Vroulik (2)
------------	-------------

5. Wat is die kind se huistaal?

1	Afrikaans
2	Engels
3	Sesotho
4	Ander: .....

6. Hoeveel broers en susters het die kind?

--

### Vir kantoorgebruik

--	--

 1-2

--	--	--	--	--	--

 3-8  
d d m m y y

--

 9

--	--	--	--

 10-13  
y y m m

--

 14

--

 15

--

 16

7. Wat is die geboorte-orde van die kind?

1	Oudste
2	Tweede
3	Derde
4	Vierde
5	Ander .....

--

 17

8. Wat is die vader se beroepskategorie?

1	Uitvoerend/Gevorderd professioneel
2	Besigheidbestuurder/laer professioneel/onderwyser
3	Administratief/klein besigheidseienaar
4	Klerklik/verkope/tegnies
5	Opgeleide handearbeid
6	Onopgeleide handearbeid
7	Werkloos
8	Ander .....

--

 18

9. Wat is die vader se hoogste kwalifikasie?

1	Graad 12
2	Diploma
3	B of honneurs graad
4	Meestersgraad
5	Doktersgraad
6	Ander: .....

--

 19

10. Wat is die moeder se beroepskategorie?

1	Uitvoerend/Gevorderd professioneel
2	Besigheidbestuurder/laer professioneel/onderwyser
3	Administratief/klein besigheidseienaar
4	Klerklik/verkope/tegnies
5	Opgeleide handearbeid
6	Onopgeleide handearbeid
7	Werkloos
8	Ander .....

	20
--	----

11. Wat is die moeder se hoogste kwalifikasie?

1	Graad 12
2	Diploma
3	B of honneurs graad
4	Meestersgraad
5	Doktersgraad
6	Ander: .....

	21
--	----

12. By wie woon die kind?

1	Moeder
2	Vader
3	Beide ouers
4	Grootouers
5	Ander .....

	22
	23

13. Hoeveel persone slaap in die huis?

		persone tien jaar en ouer
		Kinders jonger as 10 jaar

		24-25
		26-27

14. Hoeveel vertrekke geskik vir slap het die huis?

--	--

		28-29
--	--	-------

15. In watter graad is die kind?

1	Graad 0
2	Graad R
3	Graad 1
4	Graad 2
5	Graad 3
6	Woon nie skool by
7	Ander .....

	30
--	----

16. Het die kind enige grade herhaal?

Ja (1)	Nee (2)
--------	---------

	31
--	----

17. Indien ja, dui asb. aan watter:.

1	Graad 0
2	Graad R
3	Graad 1
4	Graad 2
5	Graad 3

	32
	33
	34
	35
	36

18. Wie kyk buite skool-ure na die kind?

1	Middagsorg by skool
2	Versorger (nanny)
3	Ouer/grootouer
4	Ander: .....

	37
	38
	39
	40

19. Neem die kind deel aan buitemuurse aktiwiteite?

Ja (1)	Nee (2)
--------	---------

	41
--	----

20. Indien ja, merk almal wat toepaslik is.

1	Spansport by skool
2	Individuele sport
3	Musiek
4	Playball/ Monkeynastix, ens.
5	Rekenaarklasse
6	Kunsklasse
7	Skaak
8	Ander: .....

.....

.....

.....

.....

	42
	43
	44
	45
	46
	47
	48
	49

21. Wie het die kind vir Arbeidsterapie verwys?

Merk almal wat toepaslik is:

1	Algemene praktisyn (GP)
2	Pediater
3	Onderwyser
4	Dagsorggewer
5	Ouers
6	Ander: .....

.....

.....

.....

.....

	50
	51
	52
	53
	54
	55

22. Hoeveel Arbeidsterapie-behandelingsessies het die kind reeds gehad?

--	--

		56-57
--	--	-------

23. Ontvang die kind huidiglik enige ander terapie?

Ja (1)	Nee (2)
--------	---------

	58
--	----

24. Indien ja, dui asb. aan watter:

1	Fisioterapie
2	Spraakterapie
3	Spelterapie
4	Sielkundige behandeling
5	Biokinetika
6	Ander .....

	59
	60
	61
	62
	63
	64

25. Indien ja, dui aan hoeveel behandelingssessies die kind reeds by elk gehad het?

		Fisioterapie
		Spraakterapie
		Spelterapie
		Sielkundige behandeling
		Biokinetika
		Ander .....

		65-66
		67-68
		69-70
		71-72
		73-74
		75-76



26. Het die kind voorheen enige ander terapie ontvang?

Ja (1)	Nee (2)
--------	---------

	77
--	----

27. Indien ja, dui asb. aan watter:

1	Fisioterapie
2	Spraakterapie
3	Spelterapie
4	Sielkundige behandeling
5	Biokinetika
6	Arbeidsterapie
7	Ander .....

	78
	79
	80
	1
	2
	3
	4

28. Indien ja, dui aan hoeveel behandelingssessies die kind voorheen by elk gehad het?

		Fisioterapie
		Spraakterapie
		Spelterapie
		Sielkundige behandeling
		Biokinetika
		Arbeidsterapie
		Ander .....

		5-6
		7-8
		9-10
		11-12
		13-14
		15-16
		17-18

29. Is daar enige mediese toestand by die kind  
gediagnoseer?

Ja (1)	Nee (2)
--------	---------

	19
--	----

30. Indien ja, beskryf asb.

---



---



---

		20-21
		22-23
		24-25

31. Is u bewus van enige ander faktore wat die kind se  
persepsie van sy vermoens kan beïnvloed?

Ja (1)	Nee (2)
--------	---------

	26
--	----

32. Indien ja, beskryf asb.

---



---



---

		27-28
		29-30
		31-32

**Questions 33-36 to be completed using WPS SIPT-report**

33. What diagnostic prototype is identified by the SIPT

Test item scores? Mark all applicable

1	Low Average Bilateral Integration and Sequencing
2	Visuodyspraxia
3	Somatodyspraxia

	33
	34
	35

34. If Low Average Bilateral Integration and Sequencing, what are the relevant test item scores?

Opr			.		
SPr			.		
BMC			.		
GRA			.		
SWB			.		
(PPr)			.		

		.			36-40
		.			41-45
		.			46-50
		.			51-55
		.			56-60
		.			61-65

35. If Visuodyspraxia, what are the relevant test item scores?

DC			.		
CPr			.		
SV			.		
Mac			.		
(FI)			.		

		.			66-70
		.			71-75
		.			76-80
		.			1-5
		.			6-10

36. If Somatodyspraxia, what are the relevant test item scores?

PPr			.		
SPr			.		
Opr			.		
(FI)			.		
(GRA)			.		
(SWB)			.		
(KIN)			.		
(LTS)			.		

		.			11-15
		.			16-20
		.			21-25
		.			26-30
		.			31-35
		.			36-40
		.			41-45
		.			46-50

37. Date SIPT assessment was started

d	d	m	m	y	y
---	---	---	---	---	---

--	--	--	--	--	--

d d m m y y

**Questions 38-63 from child score sheet**

- 1 A lot like less competent picture**
- 2 A little like less competent picture**
- 3 A little like more competent picture**
- 4 A lot like more competent picture**

38. Catching balls (item 1)

 57

39. Cutting food (item 2)

 58

40. Sports (item 3)

 59

41. Playing video games (item 4)

 60

42. Finishing schoolwork on time (item 5)

 61

43. Making things (item 6)

 62

44. Playing/watching games and sports (item 7)

 63

45. Tying shoes (item 8)

 64

46. Cutting with scissors (item 9)

 65

47. Trying new things on the playground (item 10)

 66

48. Buttoning (item 11)

 67

49. Working on a computer (item 12)

 68

50. Working organised on a page (item 13)

	69
--	----

51. Riding a bicycle (item 14)

	70
--	----

52. Dressing (item 15)

	71
--	----

53. Playing ball games (item 16)

	72
--	----

54. Printing (item 17)

	73
--	----

55. Zipping (item 18)

	74
--	----

56. Keeping desk neat (item 19)

	75
--	----

57. Painting (item 20)

	76
--	----

58. Drawing (item 21)

	77
--	----

59. Skipping rope (item 22)

	78
--	----

60. Kicking a ball (item 23)

	79
--	----

61. Running (item 24)

	80
--	----

62. Other activities:


		1-2
		3-4
		5-6
		7-8

63. Goals (item number)


		9-10
		11-12
		13-14
		15-16

**Questions 64-89 from parent questionnaire**

- 1 A lot like less competent statement**
- 2 A little like less competent statement**
- 3 A little like more competent statement**
- 4 A lot like more competent statement**

64. Catching balls (item 1)

	17
--	----

65. Cutting food (item 2)

	18
--	----

66. Sports (item 3)

	19
--	----

67. Playing video games (item 4)

	20
--	----

68. Finishing schoolwork on time (item 5)

	21
--	----

69. Making things (item 6)

	22
--	----

70. Playing/watching games and sports (item 7)

	23
--	----

71. Tying shoes (item 8)

	24
--	----

72. Cutting with scissors (item 9)

	25
--	----

73.	Trying new things on the playground (item 10)	<input type="checkbox"/>	26
74.	Buttoning (item 11)	<input type="checkbox"/>	27
75.	Working on a computer (item 12)	<input type="checkbox"/>	28
76.	Working organised on a page (item 13)	<input type="checkbox"/>	29
77.	Riding a bicycle (item 14)	<input type="checkbox"/>	30
78.	Dressing (item 15)	<input type="checkbox"/>	31
79.	Playing ball games (item 16)	<input type="checkbox"/>	32
80.	Printing (item 17)	<input type="checkbox"/>	33
81.	Zippering (item 18)	<input type="checkbox"/>	34
82.	Keeping desk neat (item 19)	<input type="checkbox"/>	35
83.	Painting (item 20)	<input type="checkbox"/>	36
84.	Drawing (item 21)	<input type="checkbox"/>	37
85.	Skipping rope (item 22)	<input type="checkbox"/>	38
86.	Kicking a ball (item 23)	<input type="checkbox"/>	39
87.	Running (item 24)	<input type="checkbox"/>	40

88. Other activities:


		41-42
		43-44
		45-46
		47-48

89. Goals (item number)


		49-50
		51-52
		53-54
		55-56

**Questions 90 - 111 from educator questionnaire**

- 1 A lot like less competent statement**
- 2 A little like less competent statement**
- 3 A little like more competent statement**
- 4 A lot like more competent statement**

90. Catching balls (item 1)

	57
--	----

91. Sports (item 3)

	58
--	----

92. Finishing schoolwork on time (item 5)

	59
--	----

93. Making things (item 6)

	60
--	----

94. Playing/watching games and sports (item 7)

	61
--	----

95. Tying shoes (item 8)

	62
--	----



96.	Cutting with scissors (item 9)	<input type="checkbox"/>	63
97.	Trying new things on the playground (item 10)	<input type="checkbox"/>	64
98.	Working on a computer (item 12)	<input type="checkbox"/>	65
99.	Working organised on a page (item 13)	<input type="checkbox"/>	66
100.	Dressing (item 15)	<input type="checkbox"/>	67
101.	Playing ball games (item 16)	<input type="checkbox"/>	68
102.	Printing (item 17)	<input type="checkbox"/>	69
103.	Zippering (item 18)	<input type="checkbox"/>	70
104.	Keeping desk neat (item 19)	<input type="checkbox"/>	71
105.	Painting (item 20)	<input type="checkbox"/>	72
106.	Drawing (item 21)	<input type="checkbox"/>	73
107.	Skipping rope (item 22)	<input type="checkbox"/>	74
108.	Kicking a ball (item 23)	<input type="checkbox"/>	75
109.	Running (item 24)	<input type="checkbox"/>	76

110. Other activities:


		77-78
		79-80
		1-2
		3-4

111. Goals (item number)


		5-6
		7-8
		9-10
		11-12

## APPENDIX K: SUMMARY AND KEY TERMS

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Dyspraxia is a developmental condition in which the ability to ideate, plan and execute new and novel actions is impaired (Bundy, Lane & Murray, 2002:477-478).

The aim of this study was to investigate the child's, parent's and educator's perceptions on dyspraxia, in order to identify comprehensive client-centred treatment goals. This study was carried out in order to further the understanding of the complexities surrounding a child with dyspraxia, as it pertains to the occupational performance areas of school, play and leisure, and self-care. A lack of literature on the use of a family-centred approach in assessment and treatment of children by South African occupational therapists and the growing emphasis on including the voice of the child in decision-making that affects them, gave relevance to this undertaking.

A descriptive, cross-sectional study was done. The study population consisted of children aged 5 years 4 months to 8 years 2 months, living in Bloemfontein and surrounding areas, and diagnosed with dyspraxia as per the criteria of the Sensory Integration and Praxis Test (SIPT) (Ayres, 1989). The study sample further consisted of the parent(s) of the child who were involved in the occupational therapy process, as well as the educator of the child concerned.

The PEGS (Missiuna, Pollock & Law, 2004) was used as the measuring instrument to obtain the perceptions regarding dyspraxia from the child, parent and educator. The PEGS's assessment for children consists of 24 pairs

of cards showing children participating in activities from the occupational performance areas of self-care, school/productivity and leisure/play. The child had to indicate if he is like the picture of the child who is "more competent" or "less competent" in the activity. During separate interviews with the parents and educators, the researcher asked the parent(s) and educators to rate the child's competency on the same activities as those of the child's cards of the PEGS. The child, parent and educator respectively also chose activities as goals to be addressed during occupational therapy intervention. Demographic information was also obtained from the parent(s) during a structured interview. The data analysis was done by Department Biostatistics, Faculty of Health Sciences, UFS.

Findings indicated that dyspraxia reached across all functional spheres. Play and leisure was perceived by all to be the occupational performance area children with dyspraxia were the least competent in, with skipping with a rope perceived by all as the most troublesome activity. The perceptions of the parent, child and educator regarding the child's competence in specific activities differed. Children were able to express their perceived efficacy and made themselves out to be both less and more competent in some items the adults did not agree with. A statistical significant difference was found between the child and educator's summary score percentages of their perceptions of the child's competence as it relates to the OPA of school/productivity.

Parents, children and educators selected different combinations of items as goals, with almost half of the total number of goals selected by all participants related to the OPA of leisure. Printing, playing ball games that require hitting a ball, such as tennis and cricket, skipping with a rope and

cutting with scissors were the specific goals selected by the greatest number of participants.

In conclusion, recommendations towards child-centred practice were made. These included realising the extent of the influence of dyspraxia on all areas of the child's functioning, considering all environments and all role-players in the child's life when planning intervention and providing the child with an opportunity to express his perceptions of his abilities and goals for therapy. The limitations of the study were acknowledged and recommendations were made for future research.

*(600 words)*

#### **KEY WORDS**

Dyspraxia, perception, children, parent, educator, occupational performance area (OPA), goal setting, child-centred practice

## APPENDIX L: OPSOMMING EN SLEUTELWOORDE

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Dispraksie is 'n toestand wat tydens die kinderjare geïdentifiseer word, waartydens die vermoë om nuwe motoriese aksies uit te dink, te beplan en uit te voer beperk is (Bundy, Lane & Murray, 2002:477-478).

Die doel van hierdie studie was om die kind, ouer en opvoeder se persepsies oor dispraksie te ondersoek, ten einde omvattende, kliënt-gefokusde behandelings-doelwitte te kan identifiseer. Hierdie studie is uitgevoer om die probleme wat 'n kind met dispraksie ervaar, soos dit verband hou met die aktiwiteitsverrigtingsareas van skool, spel/ontspanning en selfsorg, beter te verstaan. 'n Gebrek aan literatuur wat handel oor die familie-gerigte benadering tot die evaluering en behandeling van kinders deur Suid-Afrikaanse arbeidsterapeute, en die toenemende klem op die insluiting van die kind in besluite wat hom raak, het toepaslikheid aan hierdie studie verleen.

'n Beskrywende, dwarsnit-navorsingsontwerp is gevolg. Die studiepopulasie het uit kinders tussen die ouderdomme 5 jaar 4 maande en 8 jaar 2 maande, woonagtig in Bloemfontein en omgewing, en gediagnoseer met dispraksie volgens die kriteria van die *Sensory Integration and Praxis Test (SIPT)* (Ayres, 1989), bestaan. Die studiepopulasie het verder die ouer(s) van die kind, asook die kind se opvoeder, ingesluit.

Die *Perceived Efficacy and Goal Setting System (PEGS)* (Missiuna, Pollock & Law, 2004) is as meetinstrument gebruik om die kind, ouer en onderwyser se

persepsies van dispraksie te bepaal. Die PEGS assessering vir kinders bestaan uit 24 pare kaarte met prente van kinders wat deelneem aan aktiwiteite wat deel vorm van die aktiwiteitsverrigtingsareas selfsorg, skool en ontspanning/spel. Die kind moet aandui of hy soos die kind op die "meer bekwame" of "minder bekwame" prentjie is wanneer hy daardie aktiwiteit uitvoer. Tydens afsonderlike onderhoude moes die kind se ouer(s) en opvoeder die kind se bekwaamheid in soortgelyke aktiwiteite beoordeel. Elk van die kind, ouer en opvoeder het dan ook aktiwiteite as doelwitte vir arbeidsterapie-intervensie gekies. Demografiese inligting is van die ouer(s) verkry tydens gestruktureerde onderhoude. Die data-analise is deur Departement Biostatistiek, Fakulteit Gesondheidswetenskappe aan die UV gedoen.

Resultate het getoon dat die invloed van dispraksie oor al die funksionele sfere strek. Almal het die persepsie gedeel dat die aktiwiteitsverrigtingsarea waarin kinders met dispraksie die minste bekwaam is, spel en ontspanning was, met tusspring as die aktiwiteit wat deur almal as die grootste uitdaging vir die kind met dispraksie beskou is. Die kind, ouer en opvoeder se persepsies oor die bekwaamheid van die kind in die uitvoer van die verskillende aktiwiteite, het verskil. Kinders was in staat om persepsies rondom hul vermoëns uit te druk en het in sommige aktiwiteite aangedui dat hulle hulself as meer bekwaam ag as die volwassenes se mening, maar in ander gevalle het hul 'n persepsie van onbekwaamheid aangedui wat die volwassenes nie van bewus was nie. 'n Statisties beduidende verskil is gevind tussen die kind en opvoeder se persentasies van hul persepsies oor die kind se bekwaamheid in skool-aktiwiteite.

Ouers, kinders en opvoeders het verskillende kombinasies van aktiwiteite as doelwitte gekies, met bykans die helfte van alle doelwitte wat deel vorm van die aktiwiteitsverrigtingsarea spel/ontspanning. Handskrif, balspele waartydens 'n bal geslaan word soos tennis en krieket, touspring en knip met 'n skêr was spesifieke doelwitte wat die meeste deur deelnemers gekies is.

Ter afsluiting is voorstelle omtrent kind-gerigte arbeidsterapie gemaak. Begrip vir die omvang van die invloed van dispraksie op alle fasette van die kind se lewe, inagneming van alle aktiwiteitsverrigtingsareas en rolspelers in die kind se lewe wanneer terapie beplan word, en die bied van 'n geleentheid aan die kind om sy persepsie van sy vermoëns, asook sy doelwitte, uit te druk, is beklemtoon. Beperkinge van die studie is aangedui en voorstelle vir toekomstige navorsing is gemaak.

*(600 woorde)*

#### **SLEUTELWOORDE**

Dispraksie, persepsie, kind, ouer, opvoeder, aktiwiteitsverrigtingsarea, doelwitstelling, kind-gerigte praktyk