

The contribution of sensory integration to children with autistic spectrum disorders

Eva Mastrodimou, Chrisoula Halikia, Harikleia Tsakalou, Dr. Ekaterini P. Stavrou

Abstract

The present thesis deals with the theory of sensory integration in preschool children with Autistic Spectrum Disorders. Autistic Spectrum Disorders are autism, Asperger's Syndrome, Rett Syndrome, Child Disruptive Disorder and Diffuse developmental disorder not otherwise specified. Initially, basic concepts are presented such as autism's definition; a brief historical review of the term, the epidemiological characteristics and information on the etiology of the disorder. Early childhood symptoms, as well as detection tools for early diagnosis, are also reported, with the ultimate goal of initiating intervention. Subsequently are presented the most common, well-known and widely accepted, therapeutic approaches to deal disorder, focusing on Sensory Integration, which aims to cope with the difficulties encountered in autistic children's everyday life and focuses on the development of the respective skills. Our research was aimed at recording and evaluating the sensory problems faced by children with Autism Spectrum Disorder (ASD). For this purpose, the Sensory Profile Questionnaire, a Sensory Profile Test based tool, was provided to parents of children with ASD. In the majority of cases, the results of this research confirm the corresponding international literature, according to which children with ASD appear to have difficulties in processing information they receive from the environment.

Keywords

Sensory Integration, Children on Autistic Spectrum, Questionnaire

1. Introduction

Sensory integration is based on the theories of neuroscience, neuropsychology and neurophysiology, which refer to the plasticity and hierarchy of the central nervous system, brain function, the development of aesthetic integration, the interaction of sensory integration and adaptive behavior, and finally in the internal motivation of the person to participate in activities with sensory-kinetic experiences (Sianny,2001).

Sensory Integration was developed by Jean Ayres, who claimed to be a neurobiological process, and refers to the administration of specific sensory stimuli to the individual, which processes the Central Nervous System, and through this process an adaptive response-response is produced. The sensory stimuli that reach the brain come from the earpiece, the optic, the vestibular, the proprioceptive and the haptic system.

In contrast, sensory integration dysfunction is a disorder in which sensory data is not properly organized in the brain, and this can cause various problems in the development, processing of information and in the behavior of the individual. Therefore, the stimuli from the vestibular, the proprioceptive and the haptic system have a strong effect on the regulatory mechanisms of the nervous system, Ayers' sensory integration uses these senses to facilitate the development of adaptive behavior (Watling & Dietz, 2007).

Ayres, J. concluded that an important role, is to obtain process and interpret the information that the child receives from the environment with the help of his sensory systems. These processes that the brain does, are known as "Sensory Integration".

More specifically, the vestibular system incorporates the information received from the inside of the ear (labyrinth) and is what detects body movement in the space and changes in the position of the head. The haptic system is responsible for the coordination of sensory information through the sensation of touch, it enables us to palpate objects to be able to distinguish them without using our vision, and tactical defensiveness is a situation in which the individual is overly sensitive to the simple touch. Finally, the proprioceptive system incorporates the sensory information obtained through the joints and muscles and provides the individual with the unconscious perception of the location of the body members in the site (Willis, 2009; Talay – Ongan & Wood, 2010). Most of the time the sensory systems work together to send all the information to the brain and in turn to regulate them. When these can not co-operate to help regulate the nervous system, then the child may experience a sensory disorder integration (Willis, 2009).

1.1. The types of dysfunction of Sensory Integration (SI)

The types of SI Dysfunction or Sensory Disorder according to Ayres studies and other researches areas as follows: Sensory Configuration Disorder is one of the most basic sensory processing disorders, where the central nervous system cannot regulate the messages it receives from sensory stimuli and classify them in terms of their nature, degree and intensity (Parham & Blanche, 2000). The resulting disorders can be related either to sensory aversions, sensory sensitivities, or sensory preferences they can pursue (Miller et al., 2007; Foss- Feig, et al., 2010). The main types of children with autism, are three: the hypersensitive type, the submissive type and the type of sensory search. For more details:

- a. *The hypersensitive type:* The children in this category are over-stimulated by a variety of sensory information that responds and responds sensitively to sensory stimuli.
- b. *The subconscious type:* The children in this class are under-stimulated by various sensory stimuli and are distinguished for the apathy they exhibit in sensory stimuli.
- c. *The type of sensory search:* The children who are constantly seeking sensory stimulation through various stimuli in order to satisfy them. The Sensory Disorder, which is defined as the difficulty in distinguishing the sensory stimuli they receive, to understand their properties and to perceive their diversity. They perceive the stimulus but have difficulty understanding what they are. Disorders in this area, may cause motor or learning disabilities. (Miller et al., 2007)
- d. *Dyspraxia - Handicaps:* People's difficulty in capturing, following and executing new data. They are struggling to determine the location of their body in the room, and often have visual and kinetic difficulties. (Miller et al., 2007).

2. The procedure of occupational therapy intervention

There are a variety of approaches that are used by occupational therapists, which expose the child to various sensory stimuli (touch etc.) and aim to address the difficulties encountered in children with autism in their daily life activities, their social interaction, play and their educational skills, (Miller - Kuhaneck, 2004). Approaches should be used in combination rather than individually, as treatments will be more effective and adaptable to the needs of each child. Furthermore, it is important to cooperate with the interdisciplinary team and the teachers who come

into contact with the child as well as the participation of the parents in the treatment (Case - Smith, 2005).

Occupational therapists, who work with children who are in the range of autism spectrum disorder should have full knowledge of the characteristics of this diagnostic category. These children exhibit a wide range of skills and difficulties, and the occupational therapy process is extremely important and sometimes complicated (Miller- Kuhaneck, 2004).

In addition, occupational therapists must recognize the specific developmental skills that children with autism present and their impact on their physical and social needs. The assessment process should take into account the context in which the child is located, the requirements of activities as well as the physical, cognitive and environmental factors that affect the child (Case - Smith, 2005). The process begins with data collection, organization and interpretation. Objectives are then set based on the difficulties and capabilities of the child with autism for more effective intervention (Atchison & Dirette, 2007). According to the American Association of Occupational Therapists, Occupational Therapy is defined as "*a procedure for obtaining and interpreting data necessary for the understanding of the person, system or condition*"(American Occupational Therapy Association [AOTA], 1998). When evaluating a child with autism, the occupational therapist should be creative and flexible to get as much information as possible. This information relates to:

- Areas of execution of a project
- Requirements for activities
- Individual characteristics
- Execution frameworks (eg social, physical, etc.)
- Elements - execution templates
- Requirements for activities as well as the functions and malfunctions of the child (AOTA, 2002).

2.1. Objectives of the survey

- 1) In the recording and study of sensory disorders in children with autism spectrum disorder, especially at preschool age, to identify areas where children with autism spectrum disorder have the most sensory problems.
- 2) The correlation of the results with the data gathered during the bibliographic research on autistic spectrum disorders.

3) The gathering of data that can serve as the basis for a next survey, which will examine the effectiveness of interventions and, above all, the intervention of sensory integration.

2.2. Methodology

We consider an appropriate method is the parental questionnaires (parent reports)¹, which are a reliable and yet practical way of obtaining valid information about the communication skills of very young children. Parent questionnaires are balanced psychometric tools that include carefully structured and articulated questions about various communicative and linguistic behaviors that, according to psychological and psycholinguistic research, are indicators of the development of small children's communication (DST, 2015).

2.3. Research tool - Research process

The Sensory Profile Questionnaire (SPQ) was used to collect the data. This is easy to use during both completion and scoring and has been widely used for research purposes, especially during the last decade, when the study of sensory disorders was developed.

The questionnaire consists a total of 125 questions-variables related to three areas: Sensory Function, Sensory Regulation, Behavioral and Emotional Reactions, which consist of questions-statements. More specifically:

Sensory Function, a section consisting of the following sections:

- Acoustic function
- Optical operation
- Vestibule function
- Slick operation

¹ Early on, Vineland's Social Maturity Scale, Doll, argued that adaptive behavior is multidimensional and is better evaluated using an outside informant (parent / carer) in addition to the individual and an outside informant. In the same spirit, Sparrow, the co-creator of the Vineland Adaptive Behavior Scale, said that the most reliable method for obtaining accurate information about adaptive behavior is through a semi-structured interview with a parent or carer (Kimbell, 2017).

- Multi-sensory function
- Stomach function

Sensory Regulation, a section consisting of the following sections:

- Resistance-related sensory function
- Adjustment related to body position and movement
- Set motion to achieve action level all text with lower case and 1.5 pitch
- Set sensory stimulus to achieve emotional effectiveness.
- Adjustment of visual stimulus to achieve emotional response and action level

Behavioral and emotional reactions, section consisting of the following sections:

- Emotional / Social Reactions
- Emotional outflows of sensory function
- Issues related to the starting point for reaction.

Questions use the 5-fold Likert Scale, where the value 1 corresponds to Always, the value 2 in the Frequently, the value 3 in the Sometimes option, the 4 value in the Rare option, and the value 5 in Never.

Participants

The survey sample consists of 33 parents who completed the questionnaire for their child respectively. Twenty two (22) of the children were boys and eleven (11) were girls. The children were aged 4-14 years old. Of these, 28 belonged to the first age group, that is 4-9 years old, and the remaining 5 belonged to the second age group, that is 10-14 years old. All the children who participated in the research were diagnosed with ASD and more specifically, a large proportion of these children were diagnosed with autism.

The survey was conducted in the year 2017. More specifically, the questionnaires were launched in March 2017 and their collection was completed in April 2017.

The analysis of the sample was done with the IBM SPSS Statistics Version 21.0 Social Science Statistical Package.

Reliability

In order to establish the credibility of the tool, Cronbach's statistical reliability index² was calculated. Questions groups in each field exhibit high internal reliability values in this sample, as shown in tables 4.1, 4.2, 4.3.

In particular, for the field of sensory function (Table 4.1), the Cronbach a reliability factor is high in each case, as a value of index greater than 0.6 in the case of factors (sub climates) is considered to be reliable. This means that for the present survey the set of questions per factor can be used as well as all the factors are reliable.

The only case with marginally lower reliability is the 3rd factor (cronbach a = 0.587). However, the value of internal reliability is marginally lower and is characterized as moderate to strong. Consequently, all subchannels are presented in the context of this research with the above assumption.

For the Control sector (Table 4.2), the Cronbach a reliability factor is high in each case. The only case with less reliability concerns the 5th factor (cronbach a = 0,307). However, all sub channels are presented in the context of this research with the above assumption.

For the Behavioral and emotional responses field (Table 4.3), the Cronbach a credibility factor is high in the first two groups. The less reliable case concerns the 3rd factor (cronbach a = 0.027). However, all sub channels are presented in the context of this research with the above assumption.

The tool generates 9 factors based on its structure. These factors are:

- Sensory search
- Emotional reaction
- Low strength / Tone
- Sensitive sensation
- Disturbance disorder
- Low recording
- Sensitive sensitivity
- Sitting

² The Cronbach Alpha index is one of the widely used indexes and was calculated by Cronbach in 1951. It includes values from -continuum to 1. It is understood that only the positive values are meaningful and a value greater than 0.6 is required to substantiate the barely acceptable reliability.

- Thin Motion / Recruitment

5. Results of the survey

Sensory Function

A. Acoustic function

Considering the average values of the eight questions, (Table 5.1) the general trend is to evaluate the parameters close to the value 4 and hence in the Rare category.

In particular, questions 1 and 8 indicate an average value corresponding to the Rare option. Question 6 appears with MT 2.9 and is therefore ranked in the Sometimes option while question 7 between Options Sometimes and Seldom.

Cumulatively the mean value of group A. HEADING is $\mu = 30.42$. The cut scores of the variable are 40-30 standard yield, 29-26 probable difference and -25 net difference.

Therefore, the average score is at the limit of the potential difference and standard performance groups, namely the lower limit of the standard performance.

Therefore, with respect to AUDIO MODE, the sample profile is ranked at the lower limit of the standard performance.

B. Optical operation

Considering the average values of the six questions (Table 5.2), the general trend is to evaluate the parameters above value 3 and hence between the categories Sometimes and Never.

In particular, questions 10, 14 and 15 are declared MT only slightly above the value 4 corresponding to the option Rare.

Cumulatively the mean value of group B. optical operation is $\mu = 36.72$. The cut scores of the variable are 45-32 standard yield, 31-27 probable difference and -26 net difference.

Therefore, with regard to B. Optical operation, the sample profile is ranked in the standard performance group.

C. Vestibular function

Considering the average values of the 11 questions (Table 5.3), the general trend is to evaluate the parameters above value 3 and thus between the categories Sometimes and Never.

The trend that occurs is questions 18 through 23 and hence between questions 18 and 20 show average values very close to the upper end of the scale and hence to Never. The rest of the questions, in questions 24 to 28, show average values above the moderate position but between the values 3 and 4 and thus, between the Sometimes and Rare options.

Cumulatively, the mean value of group C. Vestibular function is $\mu = 46.09$. The cut scores of the variable are 55-48, typical yield, 47-45 probable difference and -44 net difference.

Therefore, with regard to C. Vestibular function, the sample profile is grouped into the potential difference group.

D. Tactual function

Considering the average values of the eighteen questions (Table 5.4), the general trend is to evaluate the parameters above value 3 and hence between the categories Sometimes and Never. In particular, question 30 shows an average of 2.8, and therefore the average answer is ranked between the Choices Often and Sometimes. Questions 31, 35, 36, 39, 41, 42 and 46 are ranked among the Rarely and Never answers. Finally, question 43 shows the highest average value that approaches the upper end of the scale and is therefore close to Never.

Aggregately, the mean value of group D. Tactual function is $\mu = 74.69$.

The cut scores of the variable are 90-73, standard yield, 72-65 probable difference and -64 net difference.

Therefore, with respect to D. Tactual function, the profile of the sample is ranked in the standard performance group.

E. Multi-sensory function

Considering the average values of the seven questions (Table 5.5), the general trend is to evaluate the parameters above the value 3 and thus between the categories Sometimes and Never.

In particular, question 48 shows an average of 2.97 and is ranked in the Sometimes option. Question 53 shows an average value that ranks it between the Sometimes and Rare options. Finally, Questions 52 and 51 show average values equal to or greater than 4 and are therefore classified as Rare and Never.

Aggregate the mean value of group E. Multi-sensory function is $\mu = 25.0$.

The cut scores of the variable are 35-27, standard performance, 26-24 probable difference and -23 net difference.

Therefore, with regard to E. Multi-sensory function, the sample profile is ranked in the potential difference group.

F. Somatosensory function

Considering the average values of the twelve queries (Table 5.6), the general trend is to evaluate the parameters near the value 3 and therefore in the category Sometimes.

In particular, questions 55, 56, 57, 62 and 65 show average values slightly lower than 3 and close to Sometimes with a lower trend.

Questions 58 and 64 show average values greater than 3 and between Sometimes and Seldom.

Cumulatively, the mean value of group F. Somatosensory function is $\mu = 39.63$. The cutoff rates of the variable are 60-46, standard yield, 45-40 probable difference and -39 net difference.

Therefore, the average score is between the lower limit of the probable difference and the upper limit of the net difference, and F. Somatosensory function The sample profile is grouped in the net difference.

Adjustment

G. Sensory function related to resistance

Considering the average values of the nine questions (Table 5.7), it is a general trend to evaluate the parameters close to value 4 and hence in the Rare category.

Aggregate: the mean value of group G. Sensory function related to resistance is $\mu = 36.87$. The cut scores of the variable are 45-39 standard performance, 38-36 probable difference and -35 net difference.

Consequently, with respect to G. Sensory function related to resistance, the profile of the sample is grouped into the potential difference group.

H. Regulation related to body position and movement

Considering the average values of the nine questions (Table 5.8), the general trend is to evaluate the parameters above the value 3 and especially around the value 4. and thus around the Rare option. Cumulatively the mean value of group H. Regulation related to body position and movement is $\mu = 38.81$.

The cut scores of the variable are 50-41 standard yield, 40-36 probable difference and -35 net difference. Therefore, the average score is between 40 and 36.

Consequently, with regard to the H. Regulation related to body position and movement, the sample profile is ranked in the probable difference group.

I. Motion adjustment to achieve level of action

Considering the average values of the 7 questions (Table 5.9), the parameter evaluation approximates the value 3. As regards questions 86 and 89, the average values are slightly lower than the value 3 and are therefore classified in the Sometimes Voltage select Frequently. Question 90 is ranked in the "Sometimes" option. Cumulatively the mean value of group I. Motion adjustment to achieve level of action, is $\mu = 20,24$. The cut scores of the variable are 35-23, typical performance, 22-19 probable difference and -18 net difference.

Consequently, with respect to I. Motion adjustment to achieve level of action, the sample profile is grouped into the potential difference group.

J. Adjustment of sensory stimulus to success emotional reaction

Considering the average values of the four questions (Table 5.10), the general trend is to evaluate the parameters above value 3 and values between values 3 and 4 and thus between the Sometimes and Never options.

Cumulatively, the mean value of group J. Adjustment of sensory stimulus to success emotional reaction is $\mu = 14.3$.

The cut scores of the variable are 20-16, typical performance, 15-14 probable difference and -13 net difference. Therefore, the average score is marginally above the lower limit of the probable difference.

Therefore, with regard to J. Adjustment of sensory stimulus to success emotional reaction, the sample profile is grouped into the potential difference group.

L. Visual stimulus adjustment to achieve emotional reaction and level of action

Considering the average values of the four questions (Table 5.11), the evaluation of the parameters approaching the value 4 is a general trend.

Cumulatively the mean value of Group L. Visual stimulus adjustment to achieve emotional reaction and level of action is $\mu = 15.3$.

The cut scores of the variable are 20-15, standard performance, 14-12 probable difference, and -11 net difference.

Therefore, as regards L. Visual stimulus adjustment to achieve emotional reaction and level of action the sample is ranked in the standard performance group.

Behavioral and emotional reactions

M. Emotional/social reactions

Considering the average values of the 17 questions (Table 5.12), it follows:

Questions 100,104,105,106,111,112,113,114,115,116 as a general trend show average values above the value 3 and hence above the selection Sometimes.

In contrast, to questions 102, 103, 107, 108, 109, 110, they show average values between the values 2 and 3 and hence between the options Often and sometimes.

Cumulatively the mean value of Group M. Emotional/social reactions are $\mu = 56.75$.

The cut scores of the variable are 85-63 standard yield, 62-55 probable difference and -54 clear difference.

Consequently, with regard to M. Emotional/social reactions the sample profile is grouped into the potential difference group.

M. Emotional outputs of sensory operation

Considering the average values of the 6 questions (Table 5.13), it appears that 2 questions 118 and 119 show values between the options Often and sometimes the rest of them sometimes and rarely.

Cumulatively the mean value of Group M. Emotional outputs of sensory operation is $\mu = 18.09$.

The cut scores of the variable are 30-22 standard performance, 21-19 probable difference and -18 net difference.

Therefore, the average score is identical to the upper limit of the net difference and is below the lower limit of the probable difference, therefore, with respect to M. Emotional outputs of sensory operation the sample profile is ranked in the net difference group.

N. Issues related to references for reaction

Looking at the average values of the three questions (Table 5.14), we get the moderate score 123 and the scores between the Rare and Never for questions 124 and 125.

Cumulatively the mean value of Group N. Issues related to references for reaction is $\mu = 12.03$.

The cut scores of the variable are 15-12, typical yield, 11-10 probable difference and -9 net difference.

Consequently, as regards the N. Issues related to references for reaction the sample profile is ranked in the standard performance group.

Table 5.15: Concentration of Average Price and Sample Rating Group

Factors

By examining the mean values of the nine factors resulting from the tool structure (Table 5.16), it is derived by factor:

1. Sensory search: the mean value of the agent is $\mu = 58.93$.

The cut scores of the variable are 85-63, standard yield, 62-55 probable difference and -54 net difference.

Therefore, with regard to Sensory search, the sample profile is grouped into the potential difference group.

2. Emotional reaction: the mean value of the agent is $\mu = 51.24$.

The cut scores of the variable are 80-57, typical performance, 56-48 probable difference and -47 net difference.

Consequently, with regard to Emotional reaction, the sample profile is ranked in the probable difference group.

3. Low resistance / tone: the mean value of the factor is $\mu = 36.87$.

The cut scores of the variable are 45-39, standard performance, 38-36 probable difference and -35 net difference.

Therefore, with respect to Low resistance / tone, the profile of the sample is ranked in the group of the possible difference.

4. Oral sensitivity: the mean value of the agent is $\mu = 29.39$.

The cut scores of the variable are 45-33, standard performance, 32-27 probable difference and -26 net difference.

Therefore, with respect to the Oral sensitivity, the sample profile is grouped into the potential difference group

5. Attention disorder: the mean value of the agent is $\mu = 21.54$.

The cut scores of the variable are 35-25, typical performance, 24-22 probable difference and -21 net difference.

Consequently, with respect to the Attention disorder, the sample profile is marginal to the upper end of the net difference

6. Low record: the mean value of the factor is $\mu = 33.36$.

The cut scores of the variable are 40-33, standard yield, 32-30 probable difference and -29 net difference.

Therefore, with respect to the Low record, the sample profile is ranked in the standard performance group

7. Sensory sensitivity: the mean value of the agent is $\mu = 16.93$.

The cut scores of the variable are 20-16, typical performance, 15-14 probable difference and -13 net difference.

Therefore, with respect to Sensory sensitivity, the sample profile is ranked in the standard performance group

8. Immobility: the mean value of the factor is $\mu = 12.33$.

The cut scores of the variable are 20-12, typical performance, 11-10 probable difference and -9 net difference.

Therefore, with regard to Immobility, the sample profile is ranked in the standard performance group

9. Motor movement: the mean value of the agent is $\mu = 8.63$.

The cut scores of the variable are 15-10, standard performance, 9-8 probable difference and -7 net difference.

Therefore, with respect to the Motor movement the sample profile is ranked in the probable difference group.

6. Conclusions

The main object of this research was to record and evaluate the sensory problems faced by children with autism spectrum disorders. According to the results of this study sensory disorders perceived by parents are present in most cases in every sensory function. Disturbances that may not in themselves lead to the diagnosis of autistic spectrum disorders are important, since they are discrete symptoms and their effects are of crucial importance, as we have seen in detail in Chapter 1 of the Functionality section.

The biggest sensory problems appear to be found in the "Behavioral and emotional reactions" field where a clear and likely difference is recorded. Parents' responses ranged between "often" and "sometimes" to say that the child is sensitive to criticism, has poor tolerance of frustration, it has clear fears, it is stubborn or uncooperative, it has anger, it is crying easily, it is serious and has difficulty making friends. Parents also reported that the child "sometimes" speaks to himself during an activity, has difficulty accepting routine changes, or changes in plans and expectations, uses inefficient ways to do things, it has immature behavior.

The above deficits in emotional, social functioning can be characterized as expected in the case of children with ASD, as dysfunction in emotional, social reciprocity, abnormal social approach and failure to express or respond to social circumstances are diagnostic criteria of ASD (APA, 2013), while difficulties in behavior, communication, sociability and social understanding are referred in surveys (Katsidridou, Syriopoulou & Agaliotis, 2015).

Impression causes the result "seldom" to the question of nightmares, while the literature reports studies that find that sleeping problems are often in children with autistic spectrum disorders.

Also, a possible difference is recorded in almost all areas of the "regulation" field. Deviations from the standard performance were also recorded in the sensory function associated with child resistance and the adjustment of body position and movement and the adjustment of movement to achieve action as well as the ability of the child to use his senses to cause emotional reactions. This differentiation is obviously related to the probable difference found in vestibular function, that is, in the category of questions in the field of sensory function, which examine the reactions of children in motion.

Interesting is the fact that the questions "avoids playground accessories or moving games", and "he does not like being in a moving car", the answers of all parents ranged only between the prices rarely and never, suggesting that the disorder is less in vestibular function. However, the average response rates in terms of rocking, twisting and searching for all types of traffic to a point where daily activities are difficult to suggest, there is clearly a difference in traffic.

These results are consistent with other relevant studies that people with ASD may experience difficulties in controlling movement, balance, fine motor activities (Miller et al., 2007), as well as stereotypical movements of the body and general clumsiness (Kientz & Dunn, 1997; Watling & Dietz, 2007. (Katsidridou, Syriopoulou & Agaliotis, 2015).

Contemporary research has, moreover, concluded that autism spectrum disorder is a neurodevelopmental disorder in which the brain that has the responsibility of regulating the messages it receives from sensory systems affects the regulation of activity and body while sensory dysfunctions contribute to (Willis, 2009; Talay-Ongan & Wood, 2010). (Katsidridou, Syriopoulou & Agaliotis, 2015).

Finally, in the field of sensory function, in addition to vestibular function, a possible differentiation from standard performance and multisensory function, as well as individual characteristics that concern in the categories concerning the senses of vision, hearing and touch, are recorded.

In relation to visual sensory dysfunction, the sample is ranked in the standard performance group, as parents were basically moved above the value of 3

("sometimes") and 4 "rarely". Typical performance is also observed in the field of visual stimulus regulation related to the child's ability to use visual elements to establish contact with others.

In particular, the majority of parents responded "never" to the characteristic of the preference of darkness and "rarely" to the feature of avoiding intense lights. Parents also reported that children are watching every person in the same area as they respond "seldom" to the feature of not observing people entering the room, but at the same time stating that they "seldom" penetrate the look on faces or objects. Particularly, with regard to the characteristic of avoidance of eye contact, which is considered to be characteristic of the disorder, the average is between the value of 3 "sometimes" and 4 "rarely", which confirms that there is an issue, but perhaps not as large as it has recorded in the consciousness of the world.

These results partly confirm research that refers to difficulties in the processing of visual stimuli in the context of general difficulties in the processing and integration of sensory information and to a smooth response to this information (Leekam et al., 2007; Schaaf et al., 2013). Nevertheless, (Faisty, 2003; Willis, 2009; Talay-Ongan & Wood, 2010; Hilton, 2011) (Katsidridou, Syriopoulou & Agaliotis, 2015) in the present study, results that are consistent with the characteristics of the sub-sensitive type appear to be recorded.

In relation to acoustic sensory dysfunction, the Tomchek & Dunn (2007) research concluded that children with ASD show significant differences in acoustic filtration compared to standard developmental children and that hearing difficulties appear to be the most prevalent sensory disorder in people with ASD. (Katsidridou, Syriopoulou & Agaliotis, 2015)

In the present study, however, the sample is ranked in the standard performance group, as the parents moved basically, as for visual function, between value 3 ("sometimes") and value 4 "seldom". Of particular interest is the average of 2.9 (at the limit of "often" and "sometimes"), in the statement "does not seem to hear you say" indicating a particular feature of people with ASD. Besides, speech processing, which by its nature is fast and transient, is difficult for people with disorder, especially if the environment is dominated by noise. However, parents in the sample said that "rarely" children find it difficult to complete work when there is noise (e.g., open radio).

Also, with regard to the separation into the hypersensitive and sub-sensitive types of acoustic dysfunction reported by the investigations (Willis, 2009; Wiggins et al., 2009; Talay-Ongan & Wood, 2010; Tan, Xi et al. present research seems to record results that are consistent with the characteristics of the sub-sensitive type. Parental responses mostly refer to children with sensory sub-response as they do not record negative reactions to loud noises or behaviors that children use to

protect themselves against loud noises and which, according to the above surveys, are characteristic of the "hypersensitive type".

Regarding the tactile sensory function, the majority of parents in the present study report that children do not have discomfort or negative / aggressive behavior in relation to touch, with the exception of stress expression in personal care, for which the average response rate ranks between 'Often' and 'Sometimes'. Parents, for example, in this study, consider "rare" the expression of discomfort or sensitivity to specific tactile stimuli (eg fabrics), the avoidance of wearing shoes, the need to touch people or objects to an excessive extent, the reduced sensitivity to pain or heat.

Accordingly, according to the parents' answers, the children of the sample in relation to tactile sensory function do not have features of the sub-sensitive type, such as reduced sense of pain or heat, refusal to wear shoes. They also do not have features of the hypersensitive type, such as aggressive touching, excessive sensitivity to textures or materials, rubbing the point of contact with another person, discomfort while grooming and discomfort when it is close to other people. The above conclusion seems perfectly reasonable, since according to the mean value of the haptic function group the sample is ranked in the standard performance group.

However, in the research conducted by Tomchek and Dunn (2007) to investigate differences in sensory processing in children aged 3 to 6 years with autism diagnosis with a SSP (Short Sensory Profile) tool, participants reported over-sensitivity to stimuli had to do with the touch and that caused them anxiety. (Mantzic, 2016)

Based on the results, in the field of taste and smell, all participants agree that children with ADIs have particularities with regard to taste and food, and agree less on the specifics of smell.

In terms of flavor, the average price between "often" and "sometimes" in most of the answers shows the preference of children with DAP on specific flavors and foods, their selectivity in eating, avoiding tastes that typically eat children, and therefore the existence of peculiarities. The results confirm research that suggests that eating and flavor characterizing a large proportion of people with autism spectrum disorder, resulting in significant dietary limitations, eating specific foods and the difficulty of tasting new flavors (Faherty, 2003).

On the other hand, in relation to the aesthetic function of the smell, the majority of parents did not report the existence of problems in different situations, stating that "seldom" children tend to smell objects, or to have a particular preference for certain odors. However, research suggests that some odors may cause irritation or anxiety in people with disorder, while others may be pleasant (Faherty, 2003).

Finally, in the field of children's reactions to activities that triggered a combination of sensory experiences (multisensory function), a potential difference was also found as parents reported problems that occurred more often or rarely. Parents in the present study therefore replied that children "seldom" are easily lost, even in unknown places, and that they "rarely" leave their clothes wrinkled in their bodies. But they also said that "sometimes" children seem indifferent to an activity observed in their environment or jump from one activity to another by blocking the game. The biggest problem, however, is the child's difficulty in showing attention, as the average response rate varies in "often".

The majority of research reports that distraction is mainly due to the presence of many stimuli mainly of acoustics, while sensory disorders in the acoustic field as reported by Lane et al. (2010) have been associated with difficulties in the dedication of children with DOS and often these children are characterized by hypersensitivity and lack of attention. It follows from the above that a stimulus environment works negatively on children with ADI. And, of course, because of their difficulty in processing changing and unpredictable stimuli, people with DAF are attracted to simple repetitive stimuli in their effort to keep their environment as predictable as possible (Katsidridos, Syriopoulou & Agaliotis, 2015).

In summary, the findings of this research show that children with an autistic spectrum disorder have overall more symptoms of sensory problems than typical children. These symptoms, however, vary in intensity and mode of manifestation, and are distinguished in the behavior of a person with autism from little to too many autistic features. It is characteristic that almost each of the questions recorded answers covering the whole scale, from 1 "always" to 5 "never". Autism therefore occurs differently in each individual, each child is a separate case, which is appropriately represented by the use of the term "spectrum."

It was also found that sensory peculiarities (a domain that was chronic but not included in the diagnostic criteria in the past) are well-founded and may be a diagnostic symptom of Autism Spectrum Disorder. They were rightfully included among the symptoms mentioned in the revised diagnostic manual DSM-5.

Finally, it was found that sensory difficulties are associated with the behavioral problems of people with autism spectrum disorder and affect to a greater or lesser extent the quality of life of the individual. Therefore, it is imperative to "improve the sensory processing of individuals in the spectrum so that they can" record "and regulate more sensory input, and form simple adaptive responses through which they can be assisted in learning and organizing behavior, "as the pioneer of AJ sensory integration has said Ayres, (1979). In order to do this, however, it is necessary to carry out more research on the processing of sensory information.

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Table 1

Internal consistency – for sensory function sector

	Cronbach's Alpha
A. Auditory Processing	,843
B. Visual Processing	,753
C. Vestibular Processing	,587
D. Touch Processing	,734
E. Multisensory Processing	,714
F. Oral Sensory Processing	,826

Table 2

Internal consistency- for regulation sector

	Cronbach's Alpha
G. Sensory Processing Related to Endurance/Tone	,905
H. Modulation Related to Body Position and Movement	,677
I. Modulation of Movement Affecting Activity Level	,621
J. Modulation of Sensory Input Affecting Emotional Responses	,606
K. Modulation of Visual Input Affecting Emotional Responses and Activity Level	,307

Table 3

Internal consistency for Behavioral and emotional reactions sector

	Cronbach's Alpha
L. Emotional/Social Responses	,851
M. Behavioral Outcomes of Sensory Processing	,764
N. Items Indicating Thresholds For Response	,027

Table4

Comparative presentation of positioning and scattering measures for the variables of the module

A. Auditory Processing	N	min	Max	AV	SD ³
a1. Responds negatively to unexpected or loud noises	33	1	5	3,82	1,357
a2. Hold hands over ears to protect ears from sound	33	1	5	3,97	1,104
a3. Has trouble completing tasks when the radio is on	33	2	5	4,09	1,042
a4. Is distracted or has trouble functioning if there is a lot of noise around	33	1	5	3,76	1,251
a5. Can't work with background noise	33	2	5	4,52	,870
a6. Appears to not hear what you say	33	1	5	2,91	1,259
a7. Doesn't respond when name is called but you know the child's hearing is OK	33	1	5	3,52	1,417
a8. Enjoys strange noises/seekes to make noise for noise's sake	33	1	5	3,85	1,202
A. Auditory Processing	33	13,00	40,00	30,4242	6,61924

Table 5.2

Comparative presentation of positioning and scattering measures for the variables of the module

B. Visual Processing	N	min	Max	AV	SD
b9. Prefers to be in dark	33	4	5	4,88	,331
b10. Expresses discomfort with or avoids bright lights	33	1	5	4,12	1,053
b11. Happy to be in the dark	33	4	5	4,94	,242
b12. Becomes frustrated when trying to find objects in competing backgrounds	33	2	5	4,00	1,146
b13. Has difficulty putting puzzles together	33	1	5	3,52	1,460
b14. Is bothered by bright lights after others have adapted to the light	33	2	5	4,24	,902
b15. Covers eyes or squints to protect eyes from light	33	2	5	4,15	,870
b16. Looks carefully or intensely at objects/people	33	1	5	3,09	1,308

b17. Has a hard time finding objects in competing backgrounds	33	2	5	3,79	1,166
B. Visual Processing	33	26,00	45,00	36,7273	5,32255

Table 5.3

Comparative presentation of positioning and scattering measures for the variables of the module

C. Vestibular Processing	N	Min	max	AV	SD
c18. Becomes anxious or distressed when feet leave the ground	33	3	5	4,39	,747
c19. Dislikes activities where head is upside down	33	3	5	4,55	,754
c20. Avoids playground equipment or moving toys	33	4	5	4,76	,435
c21. Dislikes riding a car	33	4	5	4,94	,242
c22. Holds head upright, even when bending over or leaning	33	3	5	4,79	,545
c23. Becomes disoriented after bending over sink or table	33	3	5	4,73	,674
c24. Seeks all kinds of movement and this interferes with daily routines	33	1	5	3,12	1,409
c25. Seeks out all kinds of movement activities	33	1	5	3,30	1,334
c26. Twirls/spins self frequently throughout the day	33	1	5	3,73	1,098
c27. Rocks unconsciously	33	2	5	3,97	1,212
c28. Rocks in desk/chair/on floor	33	1	5	3,82	1,236
C. Vestibular Processing	33	37,00	55,00	46,0909	4,65271

D. Touch Processing	N	min	max	AV	SD
d29. Avoids getting "messy"	33	1	5	3,70	1,425
d30. Expresses distress during grooming	33	1	5	2,82	1,550
d31. Prefers long-sleeved clothing when it is warm or short sleeves when it is cold	33	1	5	4,52	1,034

d32. Expresses discomfort at dental work or toothbrushing	33	1	5	3,85	1,302
d33. Is sensitive to certain fabrics	33	2	5	4,33	,854
d34. Becomes irritated by shoes or socks	33	1	5	4,27	1,153
d35. Avoids going barefoot, especially I sand or grass	33	1	5	4,39	1,029
d36. Reacts emotionally or aggressively to touch	33	2	5	4,18	,950
d37. Withdraws from splashing water	33	1	5	4,27	1,069
d38. Has difficulty standing in line or close to other people	33	1	5	3,70	1,159
d39. Rubs or scratches out a spot that has been touched	33	3	5	4,55	,666
d40. Touches people and objects to the point of irritating others	33	2	5	4,36	,994
d41. Displays unusual need for touching certain toys, surfaces, or textures	33	2	5	4,12	,960
d42. Decreased awareness of pain and temperature	33	2	5	4,27	,911
d43. Doesn't seem to notice when someone touches arm or back	33	2	5	4,73	,626
d44. Avoids wearing shoes, loves to be barefoot	33	1	5	3,79	1,317
d45. Touches people and objects	33	2	5	4,55	,754
d46. Doesn't seem to notice when face or hands are messy	33	1	5	4,30	1,132
D. Touch Processing	33	55,00	88,00	74,6970	8,25184

Table 5.4

Comparative presentation of positioning and scattering measures for the variables of the module

E. Multisensory Processing	N	min	max	AV	SD
e47. Gets lost easily	33	1	5	4,30	,951
e48. Has difficulty paying attention	33	1	5	2,97	1,045
e49. Looks away from tasks to notice all actions in the room	33	1	5	3,30	1,237
e50. Seems oblivious within an active environment	33	1	5	3,36	1,084

e51. Hangs on people, furniture, or objects even in familiar situations	33	2	5	4,24	,830
e52. Walks on toes	33	1	5	4,00	1,275
e53. Leaves clothing twisted on body	33	1	5	3,42	1,370
E. Multisensory Processing	33	18,00	35,00	25,6061	4,78892

Table 5.5

Comparative presentation of positioning and scattering measures for the variables of the module

F. Oral Sensory Processing	N	min	max	AV	SD
f54. Gags easily with food textures or food utensils in mouth	33	1	5	3,97	,951
f55. Avoids certain tastes or food smells that are typically part of children's diets	33	1	5	2,88	1,317
f56. Will only eat certain tastes	33	1	5	2,76	1,415
f57. Limits self to particular food textures/temperatures	33	1	5	2,88	1,453
f58. Picky eater, especially regarding food textures	33	1	5	3,15	1,372
f59. Routinely smells nonfood objects	33	1	5	4,42	1,173
f60. Shows strong preference for certain smells	33	1	5	4,09	1,182
f61. Shows strong preference for certain tastes	33	1	5	3,12	1,576
f62. Craves certain foods	33	1	5	2,79	1,556
f63. Seeks out certain tastes or smells	33	1	5	3,30	1,468
f64. Chews or licks on nonfood objects	33	1	5	3,36	1,388
f65. Mouth objects	33	1	5	2,91	1,378
F. Oral Sensory Processing	33	16,00	59,00	39,6364	9,58781

Table 5.6

Comparative presentation of positioning and scattering measures for the variables of the module

G. Sensory Processing Related to Endurance/Tone	N	min	max	AV	SD
g66. Moves stiffly	33	1	5	4,03	1,045
g67. Tires easily, especially when standing or holding particular position	33	1	5	3,82	1,158
g68. Locks joints	33	1	5	4,09	1,156
g69. Seems to have weak muscles	33	1	5	3,97	1,185
g70. Has a weak grasp	33	1	5	3,97	1,132
g71. Can't lift heavy objects	33	1	5	4,36	1,055
g72. Props to support self	33	1	5	4,27	1,098
g73. Poor endurance/tires easily	33	1	5	4,15	1,176
g74. Appears lethargic	33	2	5	4,21	1,023
G. Sensory Processing Related to Endurance/Tone	33	18,00	45,00	36,8788	7,57363

Table 5.7

Comparative presentation of positioning and scattering measures for the variables of the module

H. Modulation Related to Body Position and Movement	N	min	max	AV	SD
h75. Seems accident-prone	33	1	5	3,58	1,091
h76. Hesitates going up or down curbs or steps	33	2	5	3,88	1,111
h77. Fears falling or heights	33	1	5	3,94	1,171
h78. Avoids climbing/jumping or avoids bumpy/uneven ground	33	1	5	4,06	1,171
h79. Holds onto walls or banisters	33	1	5	3,42	1,324
h80. Takes excessive risks during play	33	1	5	3,82	1,310
h81. Takes movement or climbing risks during play that compromise personal safety	33	1	5	3,67	1,242
h82. Turns whole body to look at you	33	3	5	4,39	,704
h83. Seeks opportunities to fall without regard to personal safety	33	2	5	4,15	1,004

h84. Appears to enjoy falling	33	1	5	3,91	1,355
H. Modulation Related to Body Position and Movement	33	28,00	50,00	38,8182	5,88140

Table 5.8

Comparative presentation of positioning and scattering measures for the variables of the module

I. Modulation of Movement Affecting Activity Level	N	min	max	AV	SD
i85. Spends most of the day in sedentary play	33	1	5	3,27	1,153
i86. Prefers quiet, sedentary play	33	1	5	2,61	,998
i87. Seeks sedentary play options	33	1	5	3,21	1,083
i88. Prefers sedentary activities	33	2	5	3,24	1,032
i89. Becomes overly excitable during movement activity	33	1	5	2,82	1,236
i90. "On the go"	33	1	5	3,00	1,392
i91. Avoids quiet play activities	33	1	5	2,09	1,128
I. Modulation of Movement Affecting Activity Level	33	10,00	31,00	20,2424	4,45835

Table 5.9

Comparative presentation of positioning and scattering measures for the variables of the module

J. Modulation of Sensory Input Affecting Emotional Responses	N	min	max	AV	SD
j92. Needs more protection from life than other children	33	1	5	3,52	1,253
j93. Rigid rituals in personal hygiene	33	1	5	3,55	1,348
j94. Is overly affectionate with others	33	1	5	3,45	1,121
j95. Doesn't perceive body language or facial expressions	33	1	5	3,79	1,269
J. Modulation of Sensory Input Affecting Emotional Responses	33	9,00	20,00	14,3030	3,38641

Table 5.10

Comparative presentation of positioning and scattering measures for the variables of the module

K. Modulation of Visual Input Affecting Emotional Responses and Activity Level	N	min	max	AV	SD
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k96. Avoids eye contact	33	1	5	3,67	1,137
k97. Stares intensively at objects or people	33	2	5	4,15	,834
k98. Watches everyone when they move around the room	33	1	5	3,61	1,197
k99. Doesn't notice when people come into the room	33	1	5	3,94	,998
K. Modulation of Visual Input Affecting Emotional Responses and Activity Level	33	10,00	19,00	15,3636	2,39555

Table 5.11

Comparative presentation of positioning and scattering measures for the variables of the module

L. Emotional/Social Responses	N	min	max	AV	SD
l100. Seems to have difficulty liking self	33	2	5	3,67	1,109
l101. Has trouble "growing up"	33	1	5	3,00	1,118
l102. Is sensitive to criticisms	33	1	5	2,88	1,111
l103. Has definite fears	33	1	5	2,82	1,103
l104. Seems anxious	33	2	5	3,42	1,062
l105. Displays excessive emotional outbursts when unsuccessful at a task	33	1	5	3,15	1,149
l106. Expresses feeling like a failure	33	2	5	3,79	1,193
l107. Is stubborn or un cooperative	33	1	4	2,70	1,075
l108. Has temper tantrums	33	1	5	2,91	1,042
l109. Poor frustration tolerance	33	1	5	2,88	1,293
l110. Cries easily	33	1	5	2,70	,984
l111. Overly serious	33	2	5	3,70	,951
l112. Has difficulty making friends	33	1	5	3,58	1,480
l113. Has nightmares	33	2	5	4,00	,866
l114. Has fears that interfere with daily routine	33	1	5	3,79	1,139
l115. Doesn't have a sense of humor	33	2	5	3,85	1,034
l116. Doesn't express emotions	33	1	5	3,94	1,248

L. Emotional/Social Responses	33	37,00	80,00	56,7576	10,37133
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Table 5.12

Comparative presentation of positioning and scattering measures for the variables of the module

M. Behavioral Outcomes of Sensory Processing	N	min	max	AV	SD
m117. Talks self through tasks	33	1	5	3,36	1,141
m118. Writing is illegible	33	1	5	2,85	1,460
m119. Has trouble staying between the lines when coloring or when writing	33	1	5	2,27	1,281
m120. Uses inefficient ways of doing things	33	1	5	3,06	1,298
m121. Has difficulty tolerating changes in plans and expectations	33	1	5	3,18	1,357
m122. Has difficulty tolerating changes in routines	33	1	5	3,36	1,342
M. Behavioral Outcomes of Sensory Processing	33	9,00	29,00	18,0909	5,35236

Table 5.13

Comparative presentation of positioning and scattering measures for the variables of the module

N. Items Indicating Thresholds For Response	N	min	max	AV	SD
n123. Jumps from one activity to another so that it interferes with play	33	1	5	3,09	1,234
n124. Deliberately smells objects	33	3	5	4,48	,795
n125. Does not seem to smell strong odors	33	2	5	4,45	,971
N. Items Indicating Thresholds For Response	33	9,00	15,00	12,0303	1,77632

Table 5.14

Section Raw Scores/Classifications

Section	Section Raw Score Total	Classification
A. Auditory Processing	30,42	Typical Performance

B. Visual Processing	36,72	Typical Performance
C. Vestibular Processing	46,09	Probable Difference
D. Touch Processing	74,69	Typical Performance
E. Multisensory Processing	25	Probable Difference
F. Oral Sensory Processing	39,63	Definite Difference
G. Sensory Processing Related to Endurance/Tone	36,87	Probable Difference
H. Modulation Related to Body Position and Movement	38,81	Probable Difference
I. Modulation of Movement Affecting Activity Level	20,24	Probable Difference
J. Modulation of Sensory Input Affecting Emotional Responses	14,3	Probable Difference
K. Modulation of Visual Input Affecting Emotional Responses and Activity Level	15,3	Typical Performance
L. Emotional/Social Responses	56,75	Probable Difference
M. Behavioral Outcomes of Sensory Processing	18,09	Definite Difference
N. Items Indicating Thresholds For Response	56,75	Typical Performance

Factor Raw Scores/Classifications

Factors	N	min	max	Factor Raw Score Total	SD
1. Sensory Seeking	33	31,00	78,00	58,9394	10,71488
2. Emotionally Reactive	33	32,00	75,00	51,2424	11,90596
3. Low Endurance/Tone	33	18,00	45,00	36,8788	7,57363
4. Oral Sensory Sensitivity	33	11,00	45,00	29,3939	8,35890
5. Inattention/Distractibility	33	11,00	30,00	21,5455	4,55584
6. Poor Registration	33	25,00	40,00	33,3636	4,14441
7. Sensory Sensitivity	33	10,00	20,00	16,9394	3,41814
8. Sedentary	33	5,00	20,00	12,3333	3,74722
9. Fine Motor/Perceptual	33	3,00	15,00	8,6364	3,47147

Graph 5.1

Comparative 95% of the average of group parameters

A. Auditory Processing

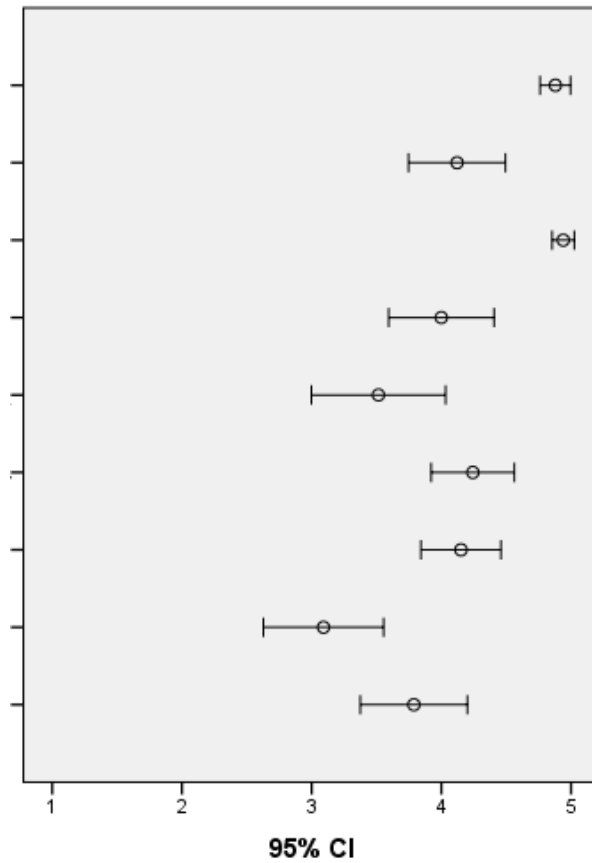
- a1. Responds negatively to unexpected or loud noises
- a2. Hold hands over ears to protect ears from sound
- a3. Has trouble completing tasks when the radio is on
- a4. Is distracted or has trouble functioning if there is a lot of noise around
- a5. Can't work with background noise
- a6. Appears to not hear what you say
- a7. Doesn't respond when name is called but you know the child's hearing is ok
- a8. Enjoys strange noises/ seeks to make noise for noise's sake

Graph 5.2

Comparative 95% of the average of group parameters

B. Visual Processing

- b9. Prefers to be in dark
- b10. Expresses discomfort with or avoids bright lights
- b11. Happy to be in the dark
- b12. Becomes frustrated when trying to find objects in competing backgrounds
- b13. Has difficulty putting puzzles together
- b14. Is bothered by bright lights after others have adapted to the light
- b15. Covers eyes or squints to protect eyes from light
- b16. Looks carefully or intensely at objects/people
- b17. Has a hard time finding objects in competing backgrounds

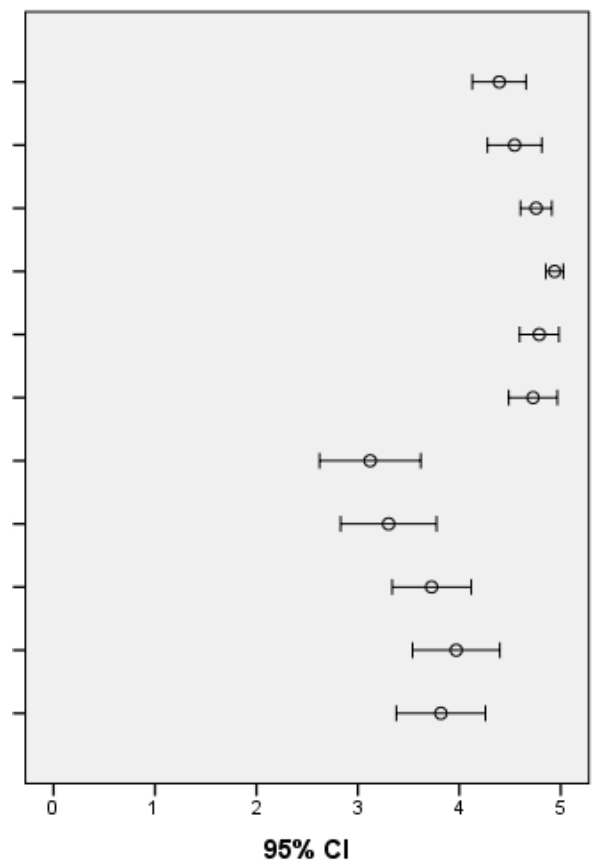


Graph 5.3

Comparative 95% of the average of group parameters

C. Vestibular Processing

- c18. Becomes anxious or distressed when feet leave the ground
- c19. Dislikes activities where head is upside down
- c20. Avoids playground equipment or moving toys
- c21. Dislikes riding a car
- c22. Holds head upright, even when bending over or leaning



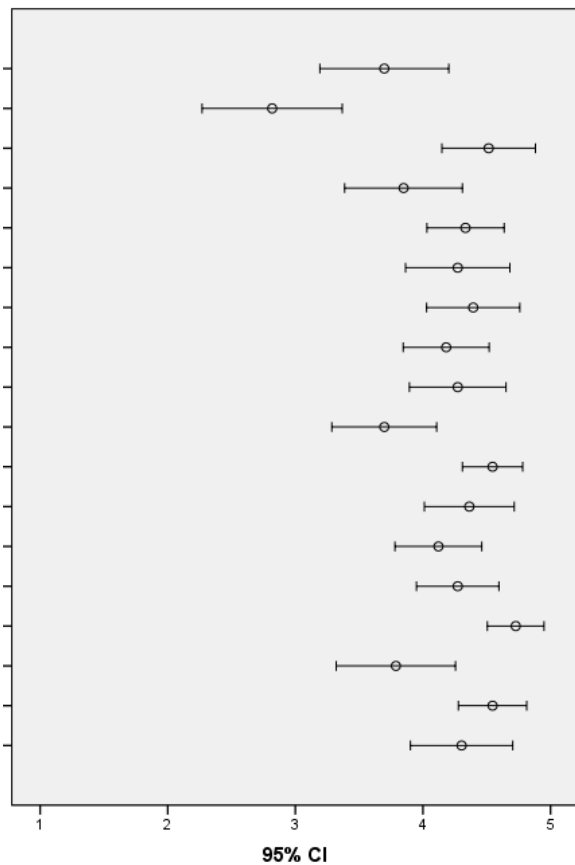
- c23. Becomes disoriented after bending over sink or table
- c24. Seeks all kinds of movement and this interferes with daily routines
- c25. Seeks out all kinds of movement activities
- c26. Twirls/spins self frequently throughout the day
- c27. Rocks unconsciously
- c28. Rocks in desk/chair/on floor

Graph 5.4

Comparative 95% of the average of group parameters

D. Touch Processing

- d29. Avoids getting “messy”
- d30. Expresses distress during grooming
- d31. Prefers long-sleeved clothing when it is warm or short sleeves when it is cold
- d32. Expresses discomfort at dental work or tooth brushing
- d33. Is sensitive to certain fabrics
- d34. Becomes irritated by shoes or socks
- d35. Avoids going barefoot, especially I sand or grass
- d36. Reacts emotionally or aggressively to touch
- d37. Withdraws from splashing water
- d38. Has difficulty standing in line or close to other people
- d39. Rubs or scratches out a spot that has been touched
- d40. Touches people and objects to the point of irritating others
- d41. Displays unusual need for touching certain toys, surfaces, or textures
- d42. Decreased awareness of pain and temperature
- d43. Doesn't seem to notice when someone touches arm or back



d44. Avoids wearing shoes, loves to be barefoot

d45. Touches people and objects

d46. Doesn't seem to notice when face or hands are messy

Γράφημα 5.5:

E. Multisensory Processing

e47. Gets lost easily

e48. Has difficulty paying attention

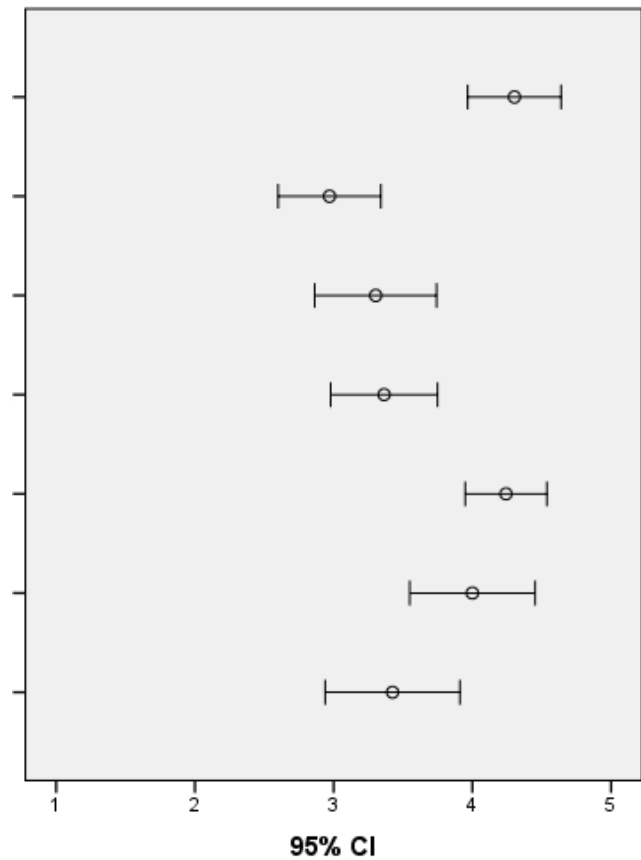
e49. Looks away from tasks to notice all actions in the room

e50. Seems oblivious within an active environment

e51. Hangs on people, furniture, or objects even in familiar situations

e52. Walks on toes

e53. Leaves clothing twisted on body



Graph 5.6

Comparative 95% of the average of group parameters

F. Oral Sensory Processing

f54. Gags easily with food textures or food utensils in mouth

f55. Avoids certain tastes or food smells that are typically part of children's diets

f56. Will only eat certain tastes

f57. Limits self to particular food textures/temperatures

f58. Picky eater, especially regarding food textures

f59. Routinely smells nonfood objects

f60. Shows strong preference for certain smells

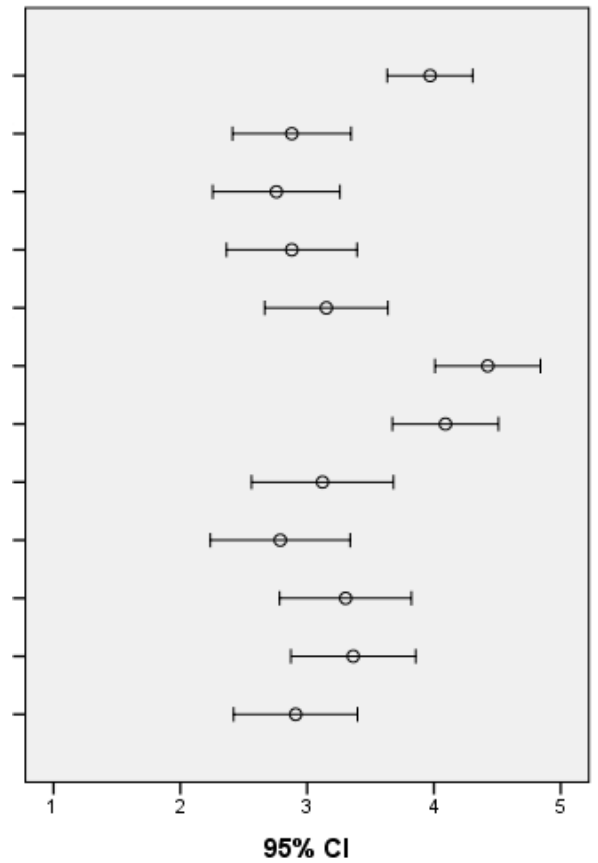
f61. Shows strong preference for certain tastes

f62. Craves certain foods

f63. Seeks out certain tastes or smells

f64. Chews or licks on nonfood objects

f65. Mouth objects



Graph 5.7

Comparative 95% of the average of group parameters

G. Sensory Processing Related to Endurance/Tone

g66. Moves stiffly

g67. Tires easily, especially when standing or holding particular position

g68. Locks joints

g69. Seems to have weak muscles

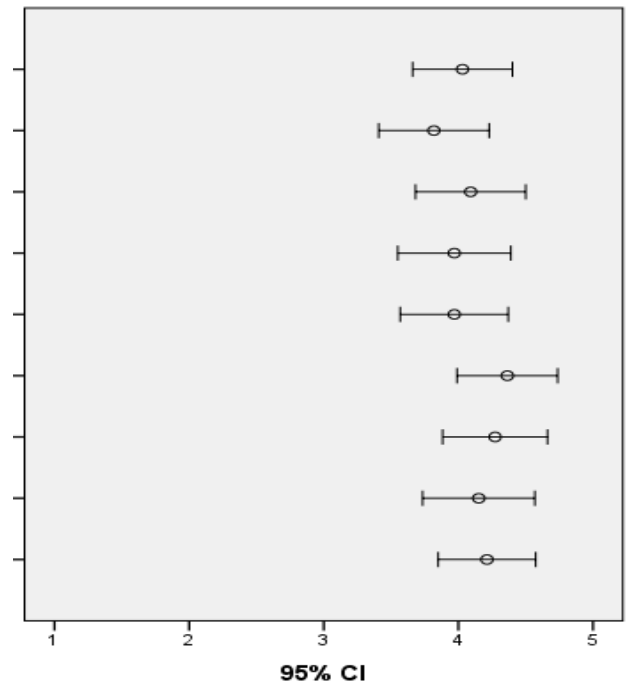
g70. Has a weak grasp

g71. Can't lift heavy objects

g72. Props to support self

g73. Poor endurance/tires easily

g74. Appears lethargic



Graph 5.8

Comparative 95% of the average of group parameters

H. Modulation Related to Body Position and Movement

h75. Seems accident-prone

h76. Hesitates going up or down curbs or steps

h77. Fears falling or heights

h78. Avoids climbing/jumping or avoids bumpy/uneven ground

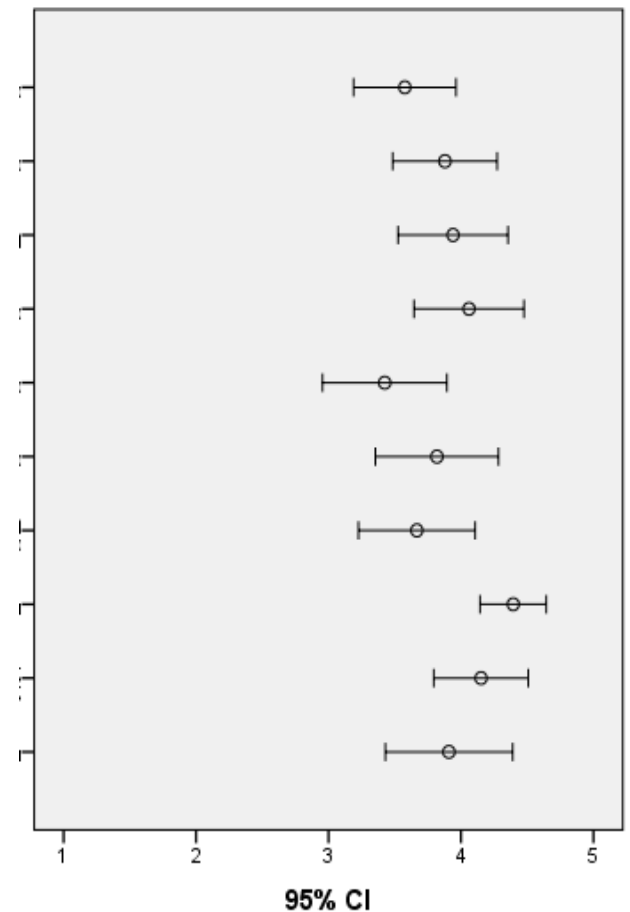
h79. Holds onto walls or banisters

h80. Takes excessive risks during play

h81. Takes movement or climbing risks during play that compromise personal safety

h82. Turns whole body to look at you

h83. Seeks opportunities to fall without regard to personal safety



h84. Appears to enjoy falling

Graph 5.9

Comparative 95% of the average of group parameters

I. Modulation of Movement Affecting Activity Level

i85. Spends most of the day in sedentary play

i86. Prefers quiet, sedentary play

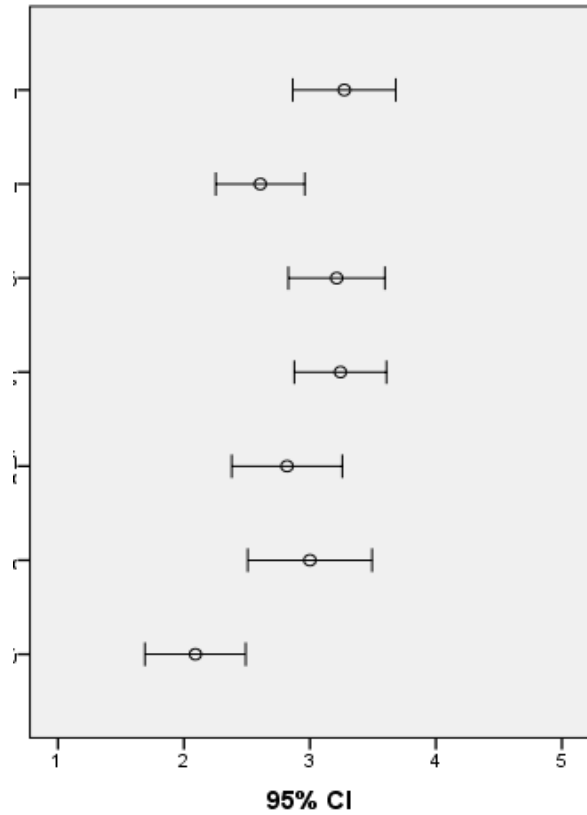
i87. Seeks sedentary play options

i88. Prefers sedentary activities

i89. Becomes overly excitable during movement activity

i90. "On the go"

i91. Avoids quiet play activities

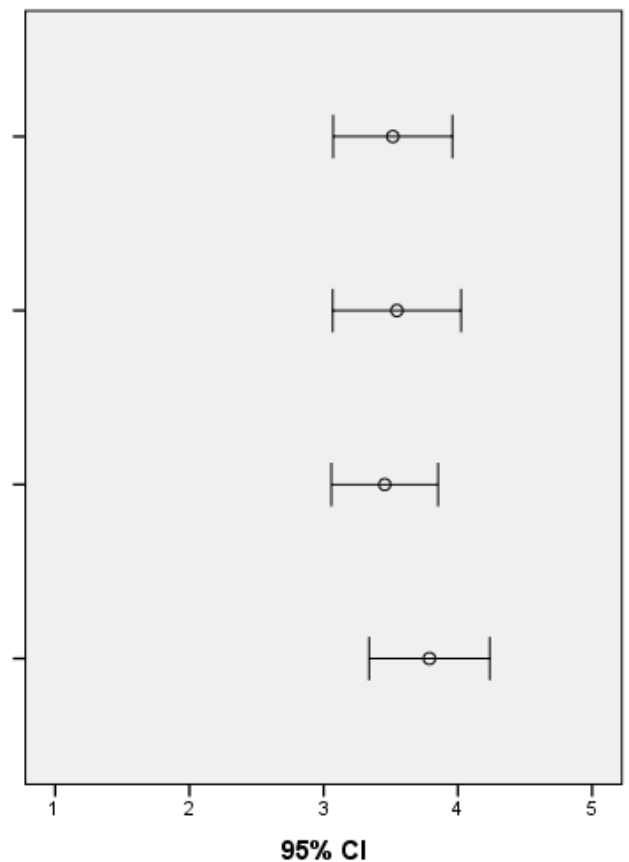


Graph 5.10

Comparative 95% of the average of group parameters

J. Modulation of Sensory Input Affecting Emotional Responses

j92. Needs more protection from life than other children



- j93. Rigid rituals in personal hygiene
- j94. Is overly affectionate with others
- j95. Doesn't perceive body language or facial expressions

Graph 5.11

Comparative 95% of the average of group parameters

K. Modulation of Visual Input Affecting Emotional Responses and Activity Level

- k96. Avoids eye contact
- k97. Stares intensively at objects or people
- k98. Watches everyone when they move around the room
- k99. Doesn't notice when people come into the room

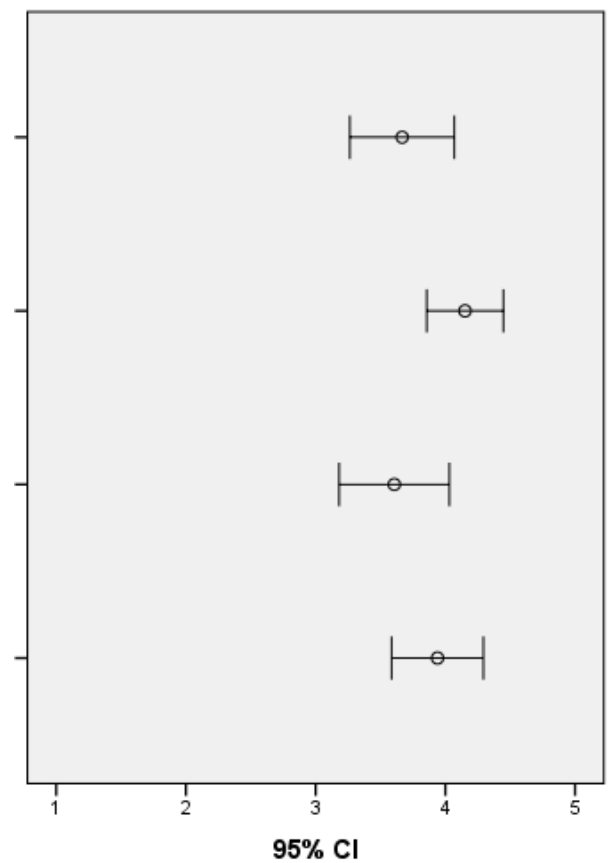


Chart.12: L. Emotional/Social Responses- Comparative 95% CI of the average of group parameters

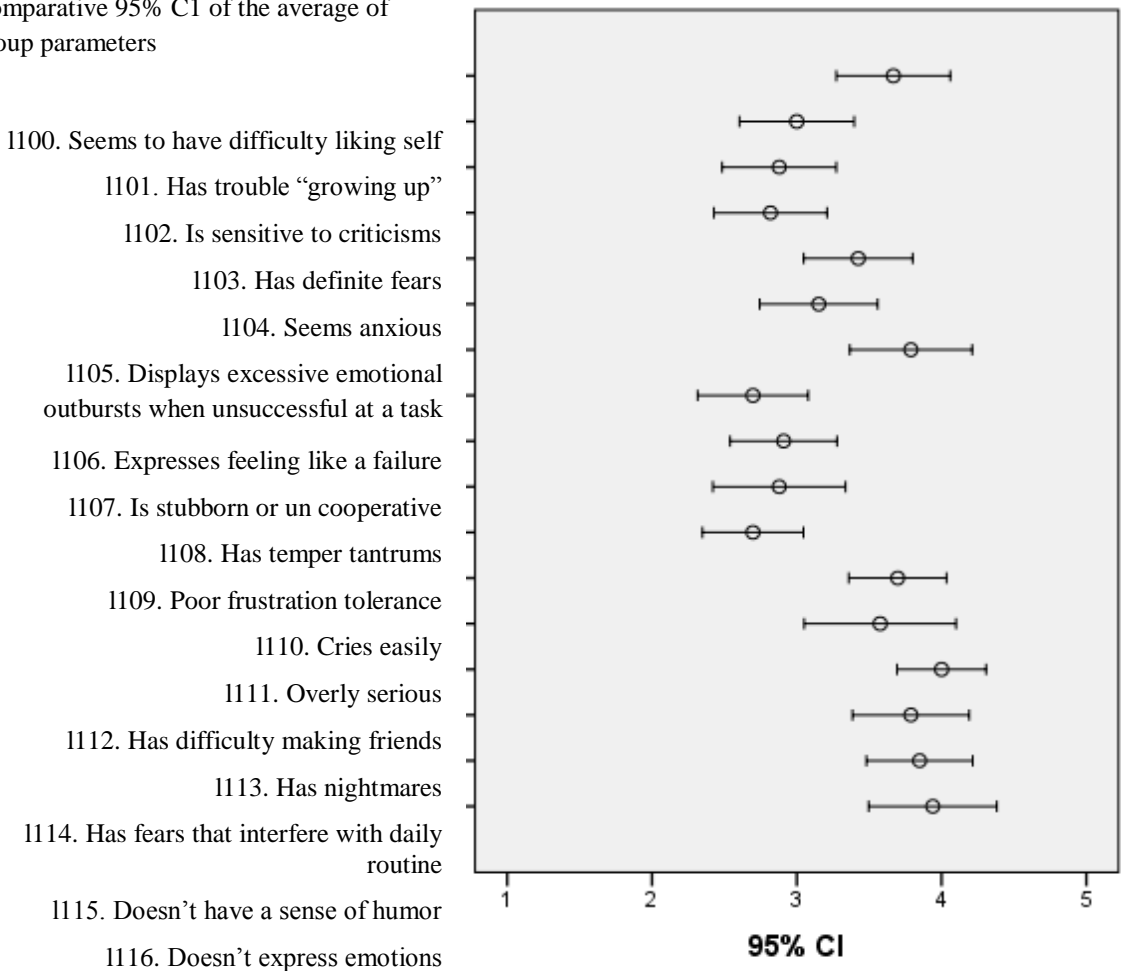


Chart.13: M. Behavioral Outcomes of Sensory Processing - Comparative 95% CI of the average values of the group parameters

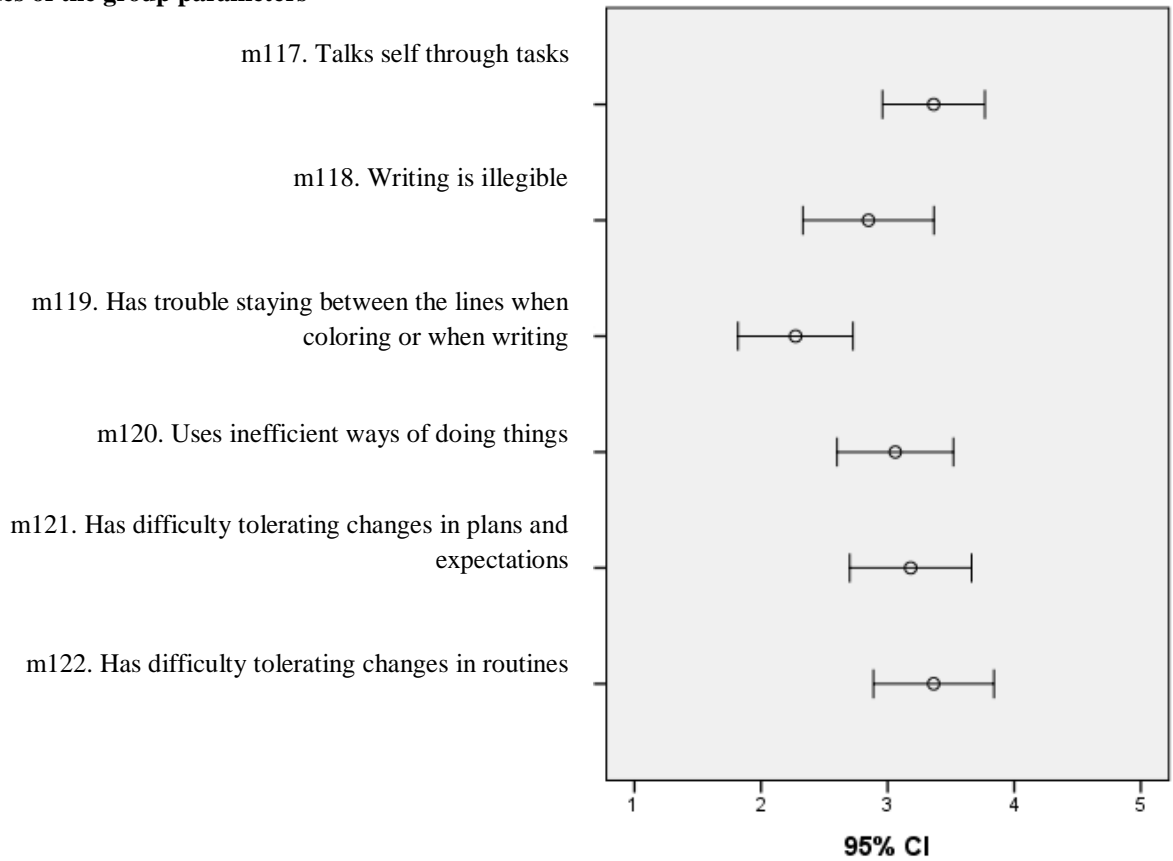
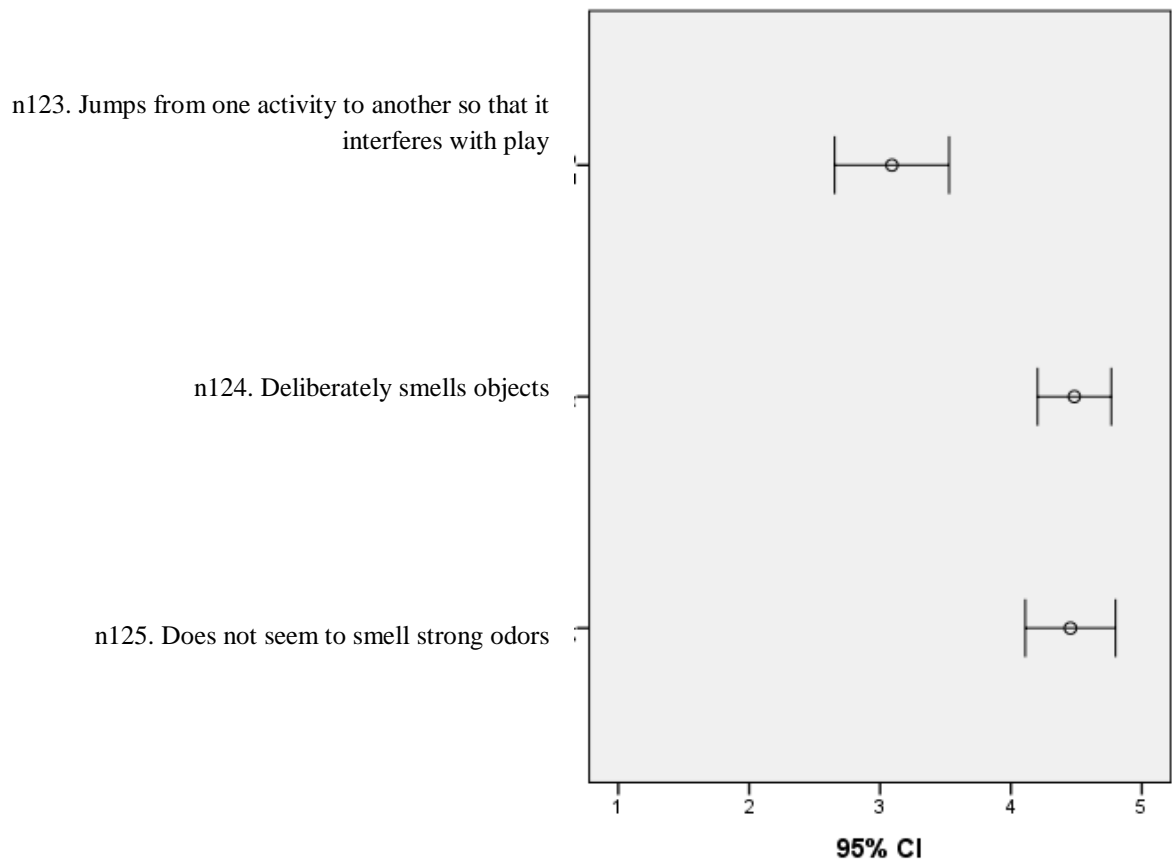
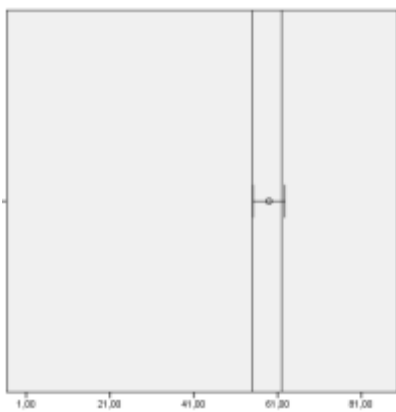


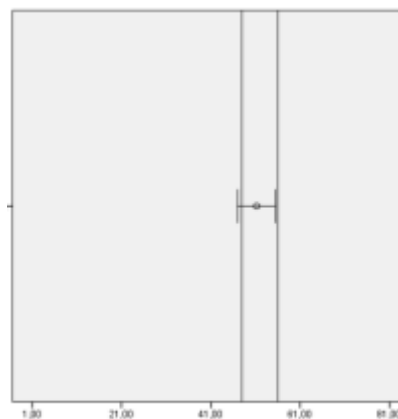
Chart 14: N. Items Indicating Thresholds For Response - Comparative 95% CI of the average values of the group parameters



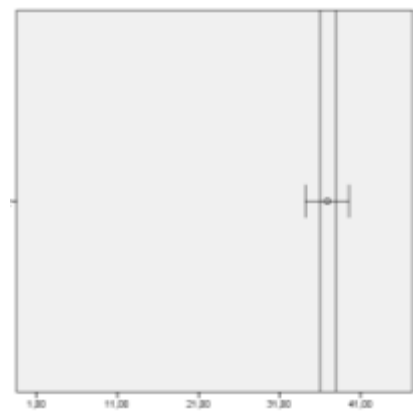
Charts 5.15-5.23: 95% CI of the mean value of the total composite variable of the nine factors with the cutscores per factor



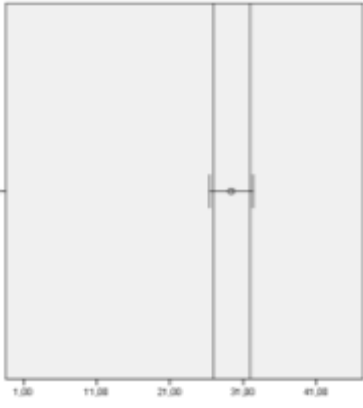
95 % CI 1. Sensory Seeking



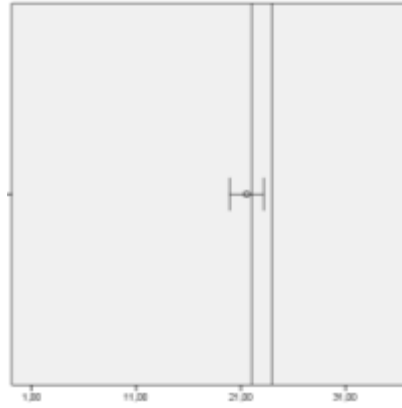
95 % CI 2. Emotionally Reactive



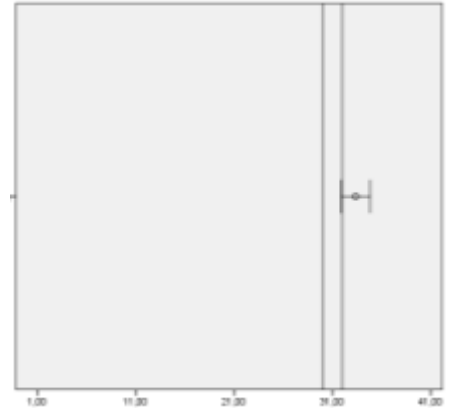
95 % CI 3. Low Endurance/Tone



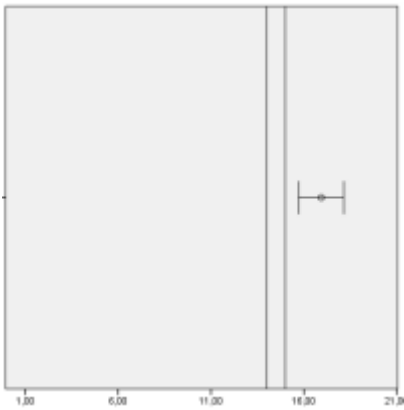
95 % CI 4. Oral Sensory Sensitivity



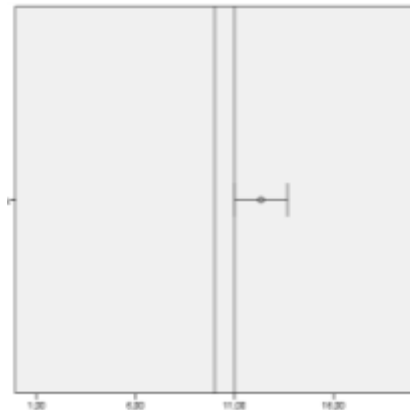
95%CI 5. Inattention/Distractibility



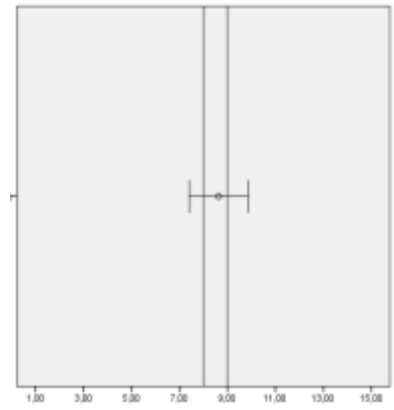
95% CI 6. Poor Registration



95% CI 7. Sensory Sensitivity



95% CI 8. Sedentary



95% CI 9. Fine Motor/Perceptual