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Adaptive Behavior Of Greek Low-Functioning Autistic Children And Adolescents

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Abstract: The aim of the present study is to investigate the adaptive behavior of 37 low or medium functioning autistic children and adolescents and 37 non-autistic children and adolescents, aged from 6 to 16 years old, attending various schools in Greece. The Vineland Adaptive Behavior Scale (VABS) (Sparrow, Balla, & Cicchetti, 1984) was used in order to assess the adaptive behavior of the participants. The scores of the autistic children on the sub-domains and on the overall adaptive behavior were very low compared with the scores of non-autistic children. A statistically significant association was found between the variables of autistic children's and adolescents' overall adaptive behavior and chronological age; between the variables of communication, social skills, daily living skills and chronological age; and between the variables of overall adaptive behavior and the socio-economic status of the family. The findings of this study are expected to contribute to a smoother school and social adaptation of autistic children and to their long-term effective integration in the fabric of the society.

Key words: adaptive behavior, Greek children and adolescents, low-functioning autism.

INTRODUCTION

The term "adaptive behaviour" is multidimensional (Oswald & DiSalvo, 2003) and includes all these skills which contribute to the self-sufficiency and social adequacy (Sparrow, Cicchetti, & Balla, 2005). Adaptive behaviour is related to the attempt of a person to adapt to the demands of his environment (Denrell, 2007). As far as children are concerned, adaptive behaviour includes important skills, such as self-care, communication with peers and social interaction.

According to Welsh and Bierman (1998), social adequacy includes the social, emotional and cognitive skills and behaviours that children need for successful social adaptation and efficacy. The term refers to the ability of a person to develop and maintain positive, mutual and satisfactory relationships and avoid victimization by others.

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Thus, social adequacy of a child depends on its social skills, its social awareness and its confidence. Studies show that children, who have a wide range of social skills, usually have a satisfactory social adequacy.

Overall, the adaptive behavior of a person includes daily living skills (walking, speaking, dressing up, etc.), communication skills, social skills and motor skills (Sparrow, Balla, & Cicchetti, 1984; Sparrow, Cicchetti, & Balla, 2005). If children develop their daily living skills successfully, their functioning becomes better as the time passes (Carothers & Taylor, 2004). Adaptive behavior has an evolutionary nature and becomes more complicated and complex while the chronological age of the person is increasing.

The ability of the child to express its adaptive behaviour successfully helps him/her towards decision making, choice-making and self-determination (Sparrow, Cicchetti, & Balla, 2005), as well as towards the maintenance of a healthy relationship with the environment (Boudreau & Newman, 1993, as cited in Reimer et al., 2011). Adaptive behavior depends on the demands, the measures and the rules of the social environment (Sparrow, Balla, & Cicchetti, 1984).

People with Pervasive Developmental Disorders have communication difficulties (Kjelgaard & Tager-Flusberg, 2001), as well as difficulties in social interaction. Thus, it is possible that most of the behavior problems observed in autistic people, are related to the domain of communication. This happens because the person with autism often experiences confusion and frustration due to his deficits in communicating effectively with others, in order to express his needs and to understand the demands of his social environment.

By expressing repetitive and stereotyped behaviors, the autistic person tries to face and to reduce the pressure and the stress during the process of information and external stimuli, which are perceived as continuously changing and unfamiliar to him/her (Frith, 2003). The deficits of autistic people in the domains of communication and socialization also influence their social functioning, which is at lower levels in relation to their linguistic and cognitive abilities (Renty & Roeyers, 2006).

Studies have shown that children with autism usually have difficulties in their adaptive behavior (American Psychiatric Association, 2000; Paskiewicz, 2009; Rodrigue, Morgan, & Geffken, 1991) or in the sub-domains (Boltë & Poutska, 2002). The deficits concern mostly the domains of communication, of social skills and of daily living skills (American Psychiatric Association, 2000; Dyches et al., 2004; Ventola et al., 2014) and they become more obvious, as the child grows up (Klin et al., 2007). The problems in daily living skills for autistic children are more than those of non-autistic children or of children with other developmental disorders (Klin et al., 2007).

Moreover, adaptive behavior of autistic children is not consistent with their intellectual

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level and this lack of correspondence between intelligence and communication or social skills is observed more in autistic people compared with people with intellectual disability (Ventola et al., 2014). The findings of the study by Klin et al. (2007) reveal that the levels of adaptive behavior are very low in autistic children despite the level of their cognitive skills.

According to Akshoomoff and Stahmer (2006) the deficits in the development of the adaptive behavior of an autistic child could lead to the expression of maladaptive and undesirable behavior. In their study, Ray-Subramanian, Huai and Weismer (2011) showed that the impairment in adaptive skills could be observed at a very early age (when the child is 2 years old). The problems in adaptive behavior and specifically in social skills influence the daily life and the independent living of autistic people (Kenworthy et al., 2010).

The assessment of adaptive behaviour is very important, because it contributes to a more precise role determination of the person in everyday life and to a better ability to face everyday challenges (Liss et al., 2001). The results of the assessment of the child's adaptive behavior could be used in order to develop an educational program plan and to assess the efficiency of an intervention program applied to a child.

Intervention programs for children with Pervasive Developmental Disorders are mostly developmental, educational and behavioral, due to the lack of a single treatment approach for people with autism (Bogdashina, 2006; Gray & Leigh White, 2002). The success of these programs is based on an early (Liss et al., 2001) and intensive intervention plan (Bogdashina, 2006; Gray & Leigh White, 2002). However, it is still very difficult to assess the effectiveness of these interventions for autistic people due to some research limitations (Smith et al., 2007).

The successful development and application of an individualized treatment program is very important and it should be based on the special needs of the autistic child, his strengths and weaknesses, his developmental disorders, his functioning level, his everyday life and also on the support of the family and of the social environment. Specifically, an effective intervention program, aiming at the domain of communication for children with Pervasive Developmental Disorders, should include an early instructional approach, repeated teaching opportunities and involvement of the family (Ogletree, Oren, & Fischer, 2007).

The various intervention programs could possibly be accompanied by the provision of medical care or by the development of a speech-language therapy program and of an occupational therapy program. However, the support and the help of the family have the most important role for their successful application. According to Renty and Roeyers (2006), a supportive social network, an effective needs assessment and a professional intervention are positively related to the quality of life of a person with Pervasive Developmental Disorders.

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METHODOLOGY

Participants

The sample of this study consisted of 37 low or medium functioning autistic children and adolescents and of 37 non-autistic children aged from 6 to 16 years old. Among the autistic children, 59,5% (n=22) of them were boys and 40,5% (n=15) of them were girls (Table 1).

In order to evaluate the degree of the participants' functioning we used in the present study:

1. Information from the personal file of each participant which were related both to the history of each child or adolescent and the diagnosis of KEDDY or child guidance centers,
2. Information which derived from the semi-structured interview with teachers and parents of these children and adolescents.

The control group (non-autistic children and adolescents), which was included, had equal characteristics with those of autistic children and adolescents expect for the condition of autism.

In the present study, three categories were created as for the socio-economic level from which participants derived (high, medium, low). Participants of experimental and of control group were divided in these three categories according to the employment status of the father.

In the category of high socio-economic level, children and adolescents whose father worked as a doctor, a university professor, a teacher, a lawyer, an engineer or a bank director, were included. Participants, whose father worked as an electrician, a salesman, a cook and a florist, were included in the medium socio-economic level. Finally, children and adolescents, whose father worked as a farmer, a worker, a guard and a house painter, were included in the category of low socio-economic level.

As for the socio-economic level of the family, 21,6% of participants (n=8) derived from low socio-economic level, 54,1% (n=20) of them derived from medium socio-economic level and 24,3% (n=9) derived from high socio-economic level (Table 1).

Participants were also divided in two groups according to their chronological age. Children aged from 6 to 11 years old were included in the first group and adolescents, whose age ranged from 12 to 16 years old, were included in the second group. 51,4 % (n=19) of participants were included in the first age group and 48,6% (n=18) were included in the second age group (Table 1).

Table 1: Demographic characteristics of participants (N=37).

	N	Percentage
Chronological Age		
6-11 years old	19	51,45%
12-16 years old	18	48,6%
Sex		
Boys	22	59,5%
Girls	15	40,5%
Socio-economic level		
Low	8	21,6%
Medium	20	54,1%

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High	9	24,3%

Instrument

In the first stage of the study, a questionnaire was completed by parents and teachers of children, in order to collect some necessary demographic data and information about the participants. Except from the basic information given by the adults about children (such as sex, date of birth, etc.), the questionnaire also included some questions about the employment of the father.

The Vineland Adaptive Behavior Scale (VABS) (Sparrow, Balla, & Cicchetti, 1984) was alsoused, in order to assess the adaptive behavior of the children.

The scale 'Vineland Adaptive Behavior Scale (VABS)' was also used successfully in some studies conducted in Greece which focused on populations of individuals with disabilities (Papadopoulos et al., 2011, Metsiou et al., 2011, Metsiou, 2008).

The scale VABS (Sparrow, Balla, & Cicchetti, 1984) aims to evaluate the personal and the social self-sufficiency of participants from birth to adulthood (18 years, 11 months). As for the low-functioning people with disabilities, the scale is extended through adulthood (Sparrow, Balla, & Cicchetti, 1984).

The Survey Form of the questionnaire evaluates the adaptive behavior of the person according to four domains and their sub-domains: a) communication (receptive, expressive and written), b) daily living skills (personal, domestic and community), c) socialization (interpersonal relationships, play, leisure time and coping skills) and d) motor skills (fine and gross) (Sparrow, Balla, & Cicchetti, 1984).

The scoring is based on the chronological age of each participant. The base of the Survey Form is set, when the score of the person is 2 at seven continuous questions and the maximum limit is set, when the score of the person is 0 at seven continuous questions.

After the administration of the scale (Sparrow, Balla, & Cicchetti, 1984), raw scores are converted to derived scores which have a uniform meaning for all age groups as for the domains and the sub-domains of the scale.

The Survey Form consists of 297 items. Each item is rated on a 0-2 scale (2=usually or yes, 1=sometimes, 0=never) and there are also two additional choices, when there is no opportunity to test the given behavior (N= no opportunity) or when the interviewer does not know if the person expresses the given behavior (DK= don't know). Except for the score of each domain, there is a total score on all the domains of the adaptive behavior which presents the overall adaptive behavior of the person (Adaptive Behavior Composite) (Sparrow, Balla, & Cicchetti, 1984).

The overall adaptive behavior is a total assessment of the participant's scores on the various domains and the sub-domains and, as it is expected, it is heterogeneous. Consequently, the scores on each domain should be investigated separately, in order to evaluate the strengths and

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the weaknesses of the person and to design a suitable intervention program according to them.

In the Vineland Adaptive Behavior Scale (VABS) the standard score ranges for each adaptive level are five (high, moderately high, adequate, moderately low and low). In the present study, these descriptive categories were coded -for ease of use- using the numbers from 1 to 3 in the following way: 3=high level (standard score:131-160), 2.5=medium high level (standard score:116-130), 2=adequate level (standard score:85-115), 1.5=medium low level (standard score:70-84) and 1=low level (standard score:20-69). The same coding was also used by Papadopoulos, Metsiou and Agaliotis (2011) and by Metsiou, Papadopoulos and Agaliotis (2011).

In this study, motor skills of the participants were not investigated, because the administration of the questions assessing the specific domain of skills is optional in children older than 6 years old.

The Vineland Adaptive Behavior Scale (VABS) is a valid psychometric instrument which is used in various studies, which addresses people with Pervasive Developmental Disorders (Fenton et al., 2003; Kenworthy et al., 2005; Mazefsky, Williams, & Minshew, 2008; Valenti et al., 2012) or people with other forms of disability (Chadwick, Cuddy, Kusel, & Taylor, 2005; Hassal, Rose, & McDonald, 2005; Metsiou, Papadopoulos, & Agaliotis, 2011; Ottenbacher et al., 1999; Papadopoulos, Metsiou, & Agaliotis, 2011; Vig & Jedrysek, 1995).

The Procedure of Assessment

The assessment of the adaptive behavior of children and adolescents was based on the responses given by parents or teachers who knew the children well and participated in the structured interview (Vineland Adaptive Behavior Scales) (Sparrow et al., 1984). The interviewers were the researchers of the present study and the Interview Survey Form was used individually for each interview. All questionnaires were assigned a code number in order to reassure the anonymity of participants' identity.

Limitations

One of the limitations of the present study is the sample size which is very small and does not permit the generalization of the findings. Moreover, the form of the questionnaire is not standardized for students who attend regular schools or inclusive classes in regular schools but for children attending boarding schools.

RESULTS AND DISCUSSION

SPSS (Statistical Package for Social Sciences) version 20.0 software was used to analyze the data. The statistical tests which were used in order to test our research hypotheses were T-Test for Independent Samples, One-way analysis of variance test (One-Way ANOVA) and Multiple Linear Regression.

In order to investigate the relationship between the dependent variable of autistic children's and adolescents' adaptive behavior and the independent variables of sex and of

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chronological age, we used T-test for independent samples. T-test for independent samples was also used in order to investigate the relationship between each sub-domain of adaptive behavior (communication, socialization, daily living skills) -which was considered as the dependent variable- and the independent variable of chronological age.

One-way analysis of variance test (One-Way ANOVA) was used in order to investigate the relationship between the dependent variable of autistic children's and adolescents' adaptive behavior and the independent variable of socio-economic level of the family. In order to investigate the regression of overall adaptive behavior in sex variables, chronological age and socioeconomic status of the family we used Multiple Linear Regression, because our goal was to predict the value of a dependent variable based on the values of a set of independent variables.

The sample is normally distributed (the total of observation units is N=37). The descriptive data of the autistic and non-autistic children and adolescents are shown in Table 2 and Table 3.

Table 2: Means and standard deviations of autistic children's and adolescents' adaptive behavior

	N	M	SD	Min	Max
Communication	37	1.66	.40	1	2
Socialization	37	1.66	.40	1	2
Daily liv. skil.	37	1.77	.25	1.50	2
Com. Ad. Beh*.	37	1.64	.32	1.17	2
Composite Adaptive Behavior*					

Table 3: Means and standard deviations of non-autistic children's and adolescents' adaptive behavior

	N	M	SD	Min	Max
Communication	37	2.63	.52	1	3
Socialization	37	2.55	.65	1	3
Daily living skills	37	2.47	.58	1	3
Com. Ad.Behav.*	37	2.55	.49	1.5	3
Composite Adaptive Behavior*					

The results showed that there was no statistically significant association between the variable of autistic children's and adolescents' adaptive behavior and the variable of sex ($p > .05$). However, there was statistically significant association between the variable of autistic children's and adolescents' overall adaptive behavior and the variable of chronological age ($p < .05$), as shown in Table 4. Other studies (Parsons, 1987; Sparrow et al., 1984) have also proved that the chronological age of children is related to adaptive behavior.

Table 4: Association between the variables of composite adaptive behavior and chronological age

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Group Statistics

	Age	N	Mean	S.D.	Std.M. Er.
Composite Adaptive Behavior	1.00	19	1.43	.26	.06
	2.00	18	1.86	.22	.05

Investigating the relation between the dependent variables of communication, socialization, daily living skills and the independent variable of chronological age, the results showed that there was a statistically significant association between each sub-domain and the chronological age ($p<.05$). Bivariate Correlation Analysis showed that there is a high positive association between the variables of chronological age and communication ($r=.681$, $p<.01$), the variables of chronological age and socialization ($r=.681$, $p<.01$) and the variables of chronological age and daily living skills ($r=.789$, $p<.01$). Thus, each time the values of one variable "observe" the values of the other variable and they change together. As the low-functioning autistic child grows up, communication skills, social skills and daily living skills are improved. A statistically significant association was also found between the overall adaptive behavior and the socio-economic level of the family, $F(2,34)=143.09$, $p<.05$.

Next, multiple linear regression analysis was used in order to investigate the degree of prediction of the dependant variable of autistic children's and adolescents' adaptive behavior in relation to the independent variables of sex, chronological age and socio-economic level of the family. Results showed that the predictors contributed statistically significantly to the prediction of the values of autistic children's and adolescents' adaptive behavior. It was found that the percentage of variance of the dependent variable, which is explained by the total of the predictors, is 60% (Table 5).

Table 5 also shows the predictors and the degree of prediction of each predictor. The independent variables, which were included and had statistically significant contribution, were the chronological age of low-functioning autistic children and adolescents and the socio-economic level of the family but not the variable of sex. The independent variable of socio-economic level of the family had the highest and the most positive contribution to the prediction of the values of adaptive behavior and secondly the independent variable of chronological age (Table 5).

Table 5: Regression Analysis of autistic children's and adolescents' adaptive behavior in chronological age, sex and socio-economic level of the family

Predictors	β	t	p
Sex	.08	.72	n.s
Chronological age <.05	.38		3.43
Socio-economic level <.05	.73		6.50

R=.78, R square=.60, $F(3,33)=17,11$, $p<.05$

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The aim of the present study was to investigate the adaptive behavior of autistic and non-autistic children and adolescents aged from 6 to 16 years old. In Greece, there are no significant studies related to the adaptive behavior of autistic children and adolescents. The findings of the study show that the scores of low-functioning autistic children and adolescents on the overall adaptive behavior and on the sub-domains are significantly lower compared with the scores of non-autistic children (control group).

Specifically, comparing the performance of the experimental group and of the control group as for the adaptive behavior and its sub-domains, we found that the experimental group demonstrated a mediocre low level of performance. In contrast, the control group (non-autistic children and adolescents) demonstrated a mediocre high level of performance, according to the assessment of the adaptive behavior using this scale.

Autistic children and adolescents had the lowest scores on the sub-domain of communication (1.66 compared with the maximum high score 3) and on the sub-domain of socialization (1.66 compared with the maximum high score 3). This finding is expected according to the literature and it is based on the special characteristics of these children and adolescents.

Children with disabilities are more likely to be socially excluded due to the reduced positive feedbacks that they receive at the beginning of a social contact and due to their reduced desire for social interaction (Celeste & Grum, 2010). In their study, Rodrigue, Morgan and Geffken (1991) showed that children with autism had deficits in the development of social skills, but they had better skills of adaptive behavior compared with children with Down syndrome and with non-autistic children who participated in the same study.

Liss et al. (2001) proved that both groups of autistic children (high and low functioning) who participated in the study, had lower performance than the performance of the control group as for the domains of socialization and of daily living skills, but not as for the domain of communication.

Consequently, this finding should be considered during the development of individualized intervention programs for autistic children and adolescents, which should focus on these sub-domains. The importance of communication and socialization is obvious and specifically in the life of a low-functioning autistic child. Moreover, the development of daily living skills should not be ignored, because they are necessary for an independent way of living.

The findings of this study also revealed that there was no statistically significant association between the variable of autistic children's and adolescents' overall adaptive behavior and the variable of sex. The differences between girls and boys were not significant in all domains of adaptive behavior.

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However, a statistically significant association was found between the variables of autistic children's and adolescents' adaptive behavior and the socio-economic level of the family. The impact of socio-economic level of the family on the personal development of children is expected.

Moreover, a statistically significant association was found between the variables of autistic children's and adolescents' overall adaptive behavior and of chronological age. This finding confirms that the adaptive behavior is closely related to the age and it has a developing nature. Specifically, older children had higher scores (M=1.86, SD=.22) on the scale compared with children of younger chronological age (M=1.43, SD=.26). In the sub-domains of adaptive behavior older participants also had higher scores (communication, socialization: M=1.94, SD=.23, daily living skills: M=1.97, SD=.11) compared with participants of younger chronological age (communication, socialization: M=1.39, SD=.35, daily living skills: M=1.57, SD=.18).

According to Akshoomoff and Stahmer (2006), the seriousness of the symptoms which concern the adaptive behavior, is different for each child and these symptoms change, as the child grows up. The previous results confirm the findings of the study conducted by Parsons (1987), showing that children with visual impairment of younger chronological age had lower scores on the domains of socialization, of daily living skills and on overall adaptive behavior, compared with the scores of children of older chronological age.

This finding also confirms partially the results of the study conducted by Papadopoulos, Metsiou and Agaliotis (2011), investigating the adaptive behavior of 46 children and adolescents with visual impairment. The findings of this study show the impact of chronological age on the overall adaptive behavior, but also on the domains of communication, of socialization and of daily living skills as for the visually impaired participants. Our findings are also consistent with the findings of the study conducted by Papadopoulos, Metsiou and Agaliotis (2008), investigating the adaptive behavior of 49 participants with visual impairment and showing that the chronological age is the basic variable which influences the performance of the participants on the domains of adaptive behavior.

CONCLUSION

Pervasive Developmental Disorders accompany the person during his entire life. Thus, it is very important to enhance the skills which could improve its functioning and its quality of life. Education has a great role in the life of autistic people and it should be expanded beyond adulthood, aiming at the maintenance and at the enrichment of skills which are already obtained and at the achievement of new goals which are related to the increasing demands of adult life. The aim of all those involved with children with

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autism, and disabilities in general, should be to train them in a 'School for All' (Unesco, 1994), despite the problems and obstacles that may exist in this direction and which derive not only from the specific nature of cases of these children, but are also related to the lack of proper infrastructure and the often rigid attitude of human resources.

According to the findings and the limitations of the present study, future research should be conducted, which would focus on the investigation of the adaptive behavior of low and high functioning autistic children and adolescents, on a far larger scale. Moreover, in future studies the adaptive behavior could be measured in a sample of autistic adults or a longitudinal study could be conducted for the assessment of the adaptive behavior of children with Pervasive Developmental Disorders.

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