Parent-teacher interactions, family stress, well-being, and parental depression as contributing factors to parental involvement mechanisms in education of children with autism

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Parental involvement (PI) in education contributes to numerous positive outcomes in children, including educational outcomes and social competence. The goal of the present study was to examine differences in PI mechanisms between parents of children with autism spectrum disorder (ASD) and parents of typically developing (TD) children. An additional goal was to examine factors affecting PI mechanisms in education in parents of children with ASD. The sample for this study consisted of 50 parents of children with ASD and 50 parents of TD children. The results of this study indicate that parents of children with ASD had lower levels of PI mechanisms in education than parents of TD children. The strongest predictors of PI mechanisms in education in parents of children with ASD were subjective well-being and child's emotional reactivity. Implications for future research and practice are discussed.

Keywords: children with autism spectrum disorder; parental involvement; educational process; typically developing children

Introduction

The role of parents in educational processes of their children has significantly changed over time. Partnerships of families and schools were an exception rather than a norm prior to 1980s (Spann *et al.* 2003). Gradually, from that period on, parental involvement (PI) in education of their children started to increase. From the role of pure consumers, parents have become some of the main stakeholders, decision makers, and advocates on behalf of their children and other parents (Blackmore and Hutchison 2010). Global, national, and local policies started to promote the importance of PI and advocated for a greater role of parents in education in order to enhance academic outcomes of their children (Englund *et al.* 2004). One such policy example comes from Individuals with Disabilities Education Act (IDEA 1997) which mandates that parents of children with disabilities need to be included in their children's education, have access to children's school records and participate in the creation of Individualized Educational Programs. PI in education is regarded as a multidimensional construct. However, determining the exact dimensions of PI is not an easy task. Some researchers view PI through home-based activities (such as help in doing homework, conversations about the school) and through school-based activities (participation in parents' conferences and school activities) (Green *et al.* 2007). Other authors add additional dimensions such as cognitive-intellectual involvement (going to the library, movies, theater plays) and personal involvement (being informed about all school activities) (Grolnick and Slowiaczek 1994). In addition to these dimensions, PI also includes contacting the school requesting various supports (Eccles and Harold 1996, O'Toole *et al.* 2019), as well as decision making and collaborating with the community (Epstein 2010). These dimensions are constituent parts of PI.

A widely used theoretical framework of PI is postulated by Hoover-Dempsey and Sandler (1995). Their model of PI is composed of five levels: First level – parents' basic involvement decision; Second level –

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parents' involvement forms; Third level – mechanisms of PI; Fourth level – tempering/mediating variables; and Fifth level – students' outcomes (Walker *et al.* 2005). Hoover-Dempsey and Sandler identified four basic mechanisms of PI – encouragement, modeling, reinforcement, and instruction (Hoover-Dempsey and Sandler 1995), through which parents, by increasing their own involvement can affect children's educational outcome. The importance of mechanisms lies in the fact that they can explain the relationship between parents' behavior and children's outcomes (Hoover-Dempsey *et al.* 2005). Encouragement is defined as an explicit affective support that parents provide to their children in order to increase children's interest in learning and school activities. Modeling is viewed through the examples parents give to their children while simultaneously inspiring a child's school engagement. Reinforcement is a mechanism that parents use to increase the frequency of a child's desirable behavior. Finally, through instruction, parents help children gain knowledge in accordance with their affinities and abilities, and take responsibility for learning process and decision making. Through these mechanisms parents strive to affect children's attitudes and behaviors (Hill and Taylor 2004). Studies have also shown that mechanisms of PI have many positive effects on children's educational outcomes (Patall *et al.* 2008).

PI mechanisms in home-based education in parents of children with autism spectrum disorder

Autism spectrum disorder (ASD) is a neurodevelopmental disorder emerging early in childhood and is manifested by deficits in social communication as well as in repetitive and stereotypical patterns of behavior (American Psychiatric Association 2013). Symptom severity, outcomes and behavioral patterns differ widely in persons with ASD (Howlin and Magiati 2017). In line with this, it is common that families of children with ASD receive various support services at home and outside the home (Garbacz *et al.* 2016). Beginning of formal schooling means new forms of PI and these forms can broadly be divided into direct support – e.g. providing support with homework and indirect support through parental relations with school professionals and developing partnerships with schools (Clarke *et al.* 2010).

Research has shown that parents of children with developmental disabilities often feel incompetent to provide homework support to their children, lack information regarding the curriculum, and need specialized trainings to assist them in using appropriate strategies and mechanisms (Kay *et al.* 1994). In addition to this, studies have also shown that parents' trainings in providing instruction and homework tasks have positive effects in children's academic achievements (Hampshire *et al.* 2011, Haine-Schlagel *et al.* 2020).

Factors affecting the level of PI

Research has identified several factors affecting the level of PI. These factors can be divided into three groups: parent-related factors, school-related factors, and child-related factors (Jafarov 2015). For example, parents with higher levels of education and higher income levels tend to spend more time attending to their children's education (Guryan *et al.* 2008, Stevenson and Baker 1987, Welsch and Zimmer 2008). On the other hand, factors such as overwhelming stress related to parenthood and increased depressive mood tend to have a negative effect on PI in educational processes of their children (Kohl *et al.*, 2000, LaForett and Mendez, 2010). School-related factors may involve some strategies that schools use to increase PI such as providing various incentives to parents who regularly attend monthly meetings with school staff (Gonzalez *et al.* 2013). With regard to child-related factors, it has been reported that as a child's age increases, PI seems to be decreasing (Hornby and Lafaele 2011). On the other hand, when we talk about PI mechanisms, it seems that they are related with parents' beliefs and expectations regarding their role in learning of their child and their own sense of self-efficacy (Hoover-Dempsey *et al.* 2001). Mental health of parents, along with low-levels of subjective well-being can have a negative effect on PI mechanisms and engagement with their child's education (LaForett and Mendez 2010).

However, literature on the factors affecting PI mechanisms in children with ASD is scarce. Research has shown that a child with ASD can impact family relationships and routines which, in turn, can have important implications for PI (Kim *et al.* 2016, Yorke *et al.* 2018, Zaidman-Zait et al. 2017). We have already mentioned that stress and mental health play an important role on the level of PI. A plethora of research shows that parents of children with ASD have higher stress levels than parents of typically developing (TD) children (Hall and Graff 2011, Hayes and Watson 2013, Sanders and Morgan 1997, Sivberg 2002), higher risk of depression (Ingersoll *et al.* 2011, Meltzer 2011, Padden and James 2017), and lower levels of subjective well-being (defined as maternal feelings of pessimism, quality of their relationship with their child, self-reported depressive symptomatology) and lower levels family quality of life (defined as family interactions, parenting, emotional, physical, material well-being, etc.) (Abbeduto *et al.* 2004, Dizdarevic *et al.* 2020). Parental mental states, especially depression, have a negative effect on PI of parents of children with ASD (LaForett and Mendez 2010). It has been noted that the more severe symptoms parents have, the less they are involved in the educational support (Benson *et al.*

2008). Another important variable related to PI is the partnership, communication, and collaboration between parents and teachers (Syriopoulou-Delli & Polychronopoulou 2017). This partnership is also related to parental stress and family quality of life (Hsiao *et al.* 2017). From this short overview, it is obvious that many factors and their interplay have an effect on PI in education.

PI in education of children with ASD remains an understudied area (Zablotsky *et al.* 2012), especially in relation to factors that affect mechanisms of PI. Also, there is no conclusive data on the differences between parents of children with ASD and parents of TD children in the level of PI mechanisms and whether the PI mechanisms differ in these two groups of parents. We also do not know how and whether ASD severity levels affect PI mechanisms.

The purpose of this study

In this study, we focused on the third level of Hoover-Dempsey and Sandler model of PI mechanisms, namely on the mechanisms of PI in home-based educational processes. Existing research on Hoover-Dempsey and Sandler model of PI mechanisms has been conducted mainly in developed countries, with very few reports from developing countries. In addition to this PI mechanisms have not been examined in parents of children with ASD. Hoover-Dempsey and Sandler model of PI mechanisms indicates that parental strategies (mechanisms) – encouragement, modeling, reinforcement, and instruction are very important for the achievements of TD children but no such studies are conducted in population of parents of children with ASD. Likewise, researchers and practitioners often advise parents of children with ASD on the importance of implementing strategies such as – encouragement, modeling, reinforcement, and instruction into their everyday routines. Parents of children with ASD are successful in implementing these strategies (Kashinath *et al.* 2006). Thus, we wanted to examine Hoover-Dempsey and Sandler model on parents of children with ASD in home-based educational processes.

Given the importance of parental strategies, we found it useful to examine the factors affecting mechanisms of PI in education in Serbia, and hope that the identified factors will help in creating better programs for increasing PI and therefore improve the educational outcomes of their children.

In this study, we set out to answer the following research questions – Are there differences in the level of PI mechanisms in education between parents of children with ASD and parents of TD children? Do factors such as parent – teacher interactions, family stress, subjective well-being and parental depression contribute to PI mechanisms in education in parents of children with ASD and do they differ for parents of TD children? Is ASD severity related to PI mechanisms in education?

Table 1. Demographic data for parents of children with ASD and TD.

	Parents					
	Children with ASD		TD children			
Age	*M*	*SD*	*M*	*SD*	*t*(98)	*p*
Parents' age	41.1	6.6	40.1	6.2	.78	.43
Child's age	10.6	2.1	10.1	2.2	1.0	.30
Education Level	*N* %		*N* %		χ^2	*p*
University	23	46	32	64	3.3	.07
High school	27	54	18	26		
Marital Status						
Married	36	72	40	80	.88	.35
Not married	14	28	10	20		
Child Gender						
Male	42	84	30	60	7.3	**<.01**
Female	8	16	20	40		

bold value signifies exact *P* value is .008.

Methods

Participants

A total of 100 parents participated in the study – 50 parents of children with ASD (42 mothers, 8 fathers; all children in this group attended public special schools) and 50 parents of TD children (37 mothers and 13 fathers; all children in this group attended regular public schools). Criteria for inclusion of parents of children with ASD were: (1) Child has an ASD diagnosis made by child psychiatrist (information on the diagnosis was obtained from the parents through the questionnaire); (2) Child attends elementary school; (3) Parents accepted to participate in the study and agreed that teachers provide us with information about their child. Parents of children with other developmental disabilities and parents of children who did not have a formal diagnosis of ASD made by child psychiatrist were not included in this study. Criteria for inclusion of parents of TD children: (1) Child does not have developmental disability and is free of any neurologic or psychiatric condition; (2) Child attends elementary school; and (3) Parents accepted to participate in the study and agreed that teachers provide us with information about their child.

Demographic data for both groups are presented in Table 1.

As shown in Table 1, groups were similar in relation to their mean age, child's age, and marital status. Trends in education level differed between the groups, with a higher percentage of parents with a university degree in the group of parents of TD children. However, these differences were not statistically significant. The only statistically significant difference was in the number of boys and girls in different groups. However, this is not unexpected as the data suggest higher prevalence of ASD in boys than in girls, with

Table 2. Level of functioning of children with ASD.

Level of functioning	N	%
Level 1 – Minimal support	1	2
Level 2 – Substantial support	34	68
Level 3 – Very substantial support	15	30

the ratio of at least 3:1 (Loomes *et al.* 2017, Maenner *et al.* 2020).

For the assessment of autism severity, we used Gilliam Autism Rating Scale-Third Edition (GARS-3; Gilliam, 2013). The autism index ranged from 66 to 122. In Table 2, we presented functioning levels of children with ASD.

From these data, we can conclude that almost all children (except one) have substantial or very substantial support needs.

Procedures

The research was approved by the Ethics Committee of the Faculty of Special Education and Rehabilitation at the University of Belgrade. The research was conducted in the school year 2019–2020, in four regular public elementary schools and four public special schools in the city of Belgrade, Serbia. According to the current Law on elementary education (Zakon o osnovnom obrazovanju i vaspitanju 2017) in Serbia, all children are entitled to free and quality education in public schools. Parents, according to this legislature, have the right to choose whether their child will attend public or private school. Also parents have the option to choose special schools if they believe it is in the best interest of their child. However, regardless of the school parents choose, regular or special, if the child has developmental disabilities, he/she is entitled to Individualized Education Program.

The special schools (centers) are located in the city and have approximately 100 students in total. Programs in these schools support preschool children and elementary school children with developmental disabilities. Besides offering educational services, these schools offer individual support services (e.g. sensory therapy, speech, and language therapy, physiotherapy), as well as extracurricular activities (puppet and art workshops, sports activities, environmental sections, etc.). Unlike regular schools which have approximately 25–30 students in a class, these schools have 6–10 students in their classes.

First, we had meetings with headmasters and staff of regular and special schools where we explained the objectives and asked for their permission to conduct the study. Next, teachers were asked to distribute the questionnaires to parents and explain the objectives of the study to them. Parents were told that participation in the study was on a voluntary basis and that the data would be used anonymously, solely for the purpose of this study. Teachers provided the questionnaires for parents of children in all grades (first to eighth grade). We collected a total of 100 questionnaires (50 from each group).

Parents completed the questionnaires and scales regarding the assessment of PI in education, relationship between parents and teachers, and family stress. One parent (i.e. either the mother or father) completed the questionnaires for one child. Special education teachers who had known children with ASD for at least 6 months completed the GARS-3 scale.

Instruments

Demographic data

This questionnaire consisted of questions regarding the parent's age, educational level, child's age and gender, type of disability, school and grade of the child.

The PI mechanism model – parent's report of involvement mechanisms (Hoover-Dempsey and Sandler 1995)

This instrument consists of 51 items, divided into four subscales (*Note.* all values of Cronbach's alpha in brackets were obtained in the original research of the author of the scale): Encouragement (13 items, α=.92, items such as *We encourage this child when he or she doesn't feel like doing schoolwork*), Modeling (14 items, α=.94, items such as *We show this child we like to learn new things*), Reinforcement (13 items, α=.96, items such as *We show this child we like it when he or she wants to learn new things*) and Instruction (15 items, α=.92, items such as *We teach this child to go at his or her own pace while doing schoolwork*). The answers were provided on a six-point Likert scale from 1. *Not at all correct* to 6. *Fully correct*. Internal consistency of the whole scale in this study, as measured by Cronbach alpha, was .97. In this study, we used a total raw score (sum of four subscales).

Parent-teacher relationship scale-II (PTRS-II; Vickers and Minke 1995)

PTRS consists of 24 items examining different aspects of parent-teacher interactions. The items assess the sense of belonging and support from the teachers, reliability, and availability of parents, joint expectations about the child and sharing information regarding the child. The scale consists of two subscales: Joining (19 items) and Communication (5 items). Joining refers to affiliation, support, shared expectations between parents and teachers (items such as *We trust each other*). Communication refers to expressing parents' and teachers' need to each other (items such as *I tell this teacher when I am concerned.*). Answers were given on a five-point Likert scale ranging from 'almost never' to 'almost always'. Internal consistency of the subscales was high, Joining scale (α=.98) and Communication

Table 3. Mean scores, SD, and *t* test values of all dependent variables in parents of children with ASD and parents of TD children.

	Parents of children with ASD		Parents of TD children			
Variable	*M*	*SD*	*M*	*SD*	*T test*	*p*
Parental involvement	252.7	29.5	269.7	28.6	2.9	**.004**
Parent-teacher relat.	82.2	7.9	79.2	8.5	−1.8	.073
Stress_level	14.1	7.9	12.2	6.3	1.3	.19
Depression_level	29.8	21.5	18.9	14.2	−3.0	**.003**
Subjective well-being	26.1	6.6	29.1	6.5	2.3	**.02**

scale (α=.86). In this study, we used a total raw score (sum of two subscales).

Family inventory of life events and changes (FILE; McCubbin et al., 1983)

FILE is a scale measuring the level of family stress and family vulnerability (items such as *There is an increasing number of arguments between spouses*). The inventory consists of 71 items assessing the life events and changes that happened in the previous year. The items are grouped into nine subscales (Intrafamily, Marital, Pregnancy, Finance and business, Work-family transitions, Illness and family care, Losses, Transitions 'in and out', and Legal). Studies have shown that internal consistency of the whole scale, as measured by Cronbach alpha, was high .81 (McCubbin *et al.* 1983). In this study, internal consistency was slightly higher, with Cronbach alpha at .83. Again, for the purpose of this study, we used a total raw score (sum of nine subscales).

Depression scale (SD scale; Novović et al. 2009)

SD scale consists of 20 items measuring depressive mood, cognitive processes, and behavioral and motivational disturbances related to depression (items such as *I feel worse than I usually feel*). The answers are provided on a five-point Likert scale (from 'not at all' to 'very') to the sentences describing their current affective state. The SD scale was originally developed in Serbian and has high internal consistency, with Cronbach alpha ranging from .90 to .94 (Novović *et al.* 2009). In this study, internal consistency was even higher at α=.97. In this study, we used a total raw score.

Scale for assessing subjective well-being (Jovanović and Brdarić 2008)

This instrument consists of eight items examining pleasant emotions (items such as *I feel great*) and positive attitude toward life (items such as *Life is beautiful*). According to the authors, the scale has high internal consistency (α= .87) In this study, internal consistency was also very high (α=.94). Again, we used a total raw score.

GARS-3 (Gilliam autism rating scale-third edition; Gilliam 2013)

GARS-3 is a 57-item scale assessing behaviors associated with autism, grouped into six subscales: Restricted/Repetitive Behaviors (13 items; items such as *If left alone, he/she will spend most of the time in stereotypical/repetitive activities*), Social Interaction (14 items; items such as *Does not initiate conversations with peers and other persons*), Social Communication (9 items; items such as *Has difficulties understanding jokes*), Emotional Responses (8 items; items such as *Has problems in transitional activities*), Cognitive Style (7 items; items such as *Uses a speech that is too precise*), and Maladaptive Speech (7 items; as *Repeats words in an echolalia way*). Items on the GARS-3 are based on the 2013 diagnostic criteria for ASD adopted by the APA (2013). An examiner needs to determine what statement best describes the child's behavior on a scale from 0 to 3. The scale has high internal consistency α=.94. In this study, Cronbach alpha was .91. We used scaled subscales scores and a total score as predictors of PI.

All instruments were administered in Serbian, which is a native language for all participants. A double-blind translation and back-translation were done for all non-native language scales. All questions across six questionnaires were culturally appropriate according to the review made by local experts.

Data analysis

For the first research question, we presented mean scores and standard deviations for all variables. Independent *t* tests were used to calculate the difference in mean scores of parents of children with ASD and parents of TD children. For the second research question, we performed a stepwise regression with PI as the outcome measure and parent-teacher interactions, family stress, subjective well-being, and parental depression as the predictors. To better understand relationship between education level and PI mechanisms in two groups of parents we performed a two-way analysis of variance. We next calculated correlation between autism severity and PI mechanisms. In addition, we performed a regression analysis by adding the GARS subscale Emotional reactivity to the model explaining PI in parents of children with ASD. For the last research question, we compared the mean scores of PI

mechanisms in parents of children with substantial needs and parents of children with very substantial needs on measures of PI. An alpha level of .05 was used for all statistical tests. Statistical analysis were performed with computer program SPSS v.27 (IBM 2020).

Results

We conducted descriptive statistics (mean scores, standard deviations) and *t* test to analyze all dependent variables in parents of children with ASD and parents of TD children (Table 3).

Parents of children with ASD differed from parents of TD children in the level of PI, depression level and subjective well-being level. Interestingly, there were no statistically significant differences in the stress level and parent-teacher relations. As can be seen in Table 3, parents of children with ASD had a significantly lower level of PI mechanisms than parents of TD children.

Next, we wanted to examine whether the same predictors affected PI mechanisms in education in parents of ASD children and parents of TD children. We built two models predicting PI mechanisms using the following independent variables: parents' gender, child's gender, parents' education level, SD scale scores, PTRS-II scores, FILE scores, and Scale for assessing subjective well-being scores. We performed two stepwise backward regressions and present the significant models (Table 4).

Table 4. Regression analysis predicting parental involvement.

(A) Parents of ASD Children			
Variable	***B***	***SEB***	*β*
Subjective well-being	2.0	.58	.44**
(B) Parents of TD Children			
Variable	*B*	*SEB*	*β*
Subjective well-being	2.9	.45	.22*
Parent education	9.1	.41	.67**

Note. *$p<.05$; **$p<.01$; $^{(A)}R^2 = .20$ ($N = 50$); $^{(B)}R^2 = .53$ ($N = 50$).

As can be seen in Table 4, subjective well-being was a significant predictor for both models. Subjective well-being was the only significant predictor in parents of ASD children and the model explained 20% of the variance in the PI mechanisms scores. The model for parents of TD children included two significant factors, subjective well-being and parental education and that model explained much more variance ($R^2 = 0.53$) than the model for parents of children with ASD.

Interestingly, parental education had an effect on PI mechanisms in parents of TD children but not in parents of children with ASD. We thus performed a two-way analysis of variance to explore this relationship in more detail (Figure 1).

According to the two-way ANOVA, the model was statistically significant $F = 3.2$, $p = .011$. The interaction effect of education and parents was statistically significant ($p = .039$). As can be seen in Figure 1, parents with higher level of education were more involved in supporting their children in school tasks, but that was only valid for the category of parents of TD children. Parents who finished high school had almost equal levels of PI mechanisms for both children with ASD and TD children.

Lastly, we were interested in examining whether autism-related variables, as measured with GARS-3, were associated with PI mechanisms. We will first present correlations of PI mechanisms and GARS-3 variables (Table 5).

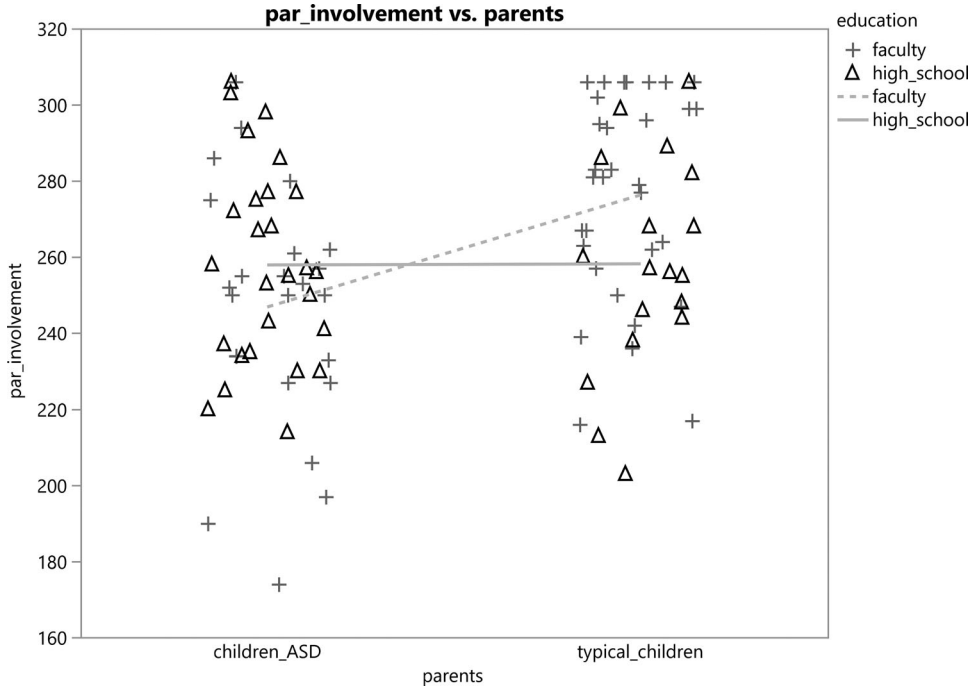

Figure 1. Two-way interaction of education level and parent group on PI mechanisms scores.

Table 5. Correlation between PI mechanisms and GARS variables.

	PI	AI	SB	SI	SC	ER	CS	MS
PI	1	–	–	–	–	–	–	–
AI	−.22	1	–	–	–	–	–	–
SB	−.17	.61	1	–	–	–	–	–
SI	−.21	.39	.40	1	–	–	–	–
SC	−.02	.62	.22	.38	1	–	–	–
ER	**−.37***	.71	.46	.37	.22	1	–	–
CS	−.08	.46	−.02	−.37	.11	.16	1	–
MS	.09	.57	.09	−.31	.33	.10	.64	1

Note. *$p < .01$; PI – parental involvement mechanisms; AI – autism index; SB – stereotypical behavior; SI – social interaction; SC – social communication; ER – emotional reactions; CS – cognitive styles; MS – maladaptive speech.

Table 6. Effects of subjective well-being and emotional reactivity on PI.

Variable	*B*	*SEB*	*β*
Subjective well-being	1.7	.56	.39**
GARS-3 – ER	−2.5	1.1	−.30*

Note. R^2=.28; R^2(adjusted)=.25; **p<.01; *p=.022; ER – emotional reactions.

Table 5 showed that the only autism-related variable that was statistically significantly related to PI was Emotion reaction. We next wanted to explore whether the addition of emotional reactions would improve our model of predicting PI mechanisms in parents of children with ASD. These results are shown in Table 6.

As shown in Table 6, subjective well-being and emotional reactions explained 28% of variation of PI mechanisms in parents of children with ASD, improving the model by 8% by including the factor of emotional reactions. The presented model is highly statistically significant F (2, 47)=9.2, p<.001. Subjective well-being had an effect size of ω^2 =.13, and Emotional reactions of ω^2 =.07, representing large and medium effect sizes according to Cohen's criteria (Cohen 2013).

Lastly, we compared the level of PI mechanisms in relation to autism severity and level of needed support. There were two groups of participants, parents of children with substantial needs (34 participants) and parents of children with very substantial needs (15 participants). One participant was a parent whose child had minimal support needs and was thus excluded from this analysis. These results are shown in Figure 2.

As can be seen in Figure 2, parents of children with substantial needs had statistically significantly higher PI mechanisms than parents of children with very substantial needs, indicating that ASD severity has a negative impact on PI mechanisms.

Discussion

The goal of this study was to examine whether there were any differences in PI mechanisms in education of parents of children with ASD and parents of TD children. Additionally, we examined what factors contributed to PI mechanisms in education, and whether autism severity had an effect on PI mechanisms in education. In relation to the first research question, our results showed that parents of children with ASD had lower levels of PI mechanisms in education than parents of TD children. In practical terms, this means that parents of ASD children were less involved in encouragement, modeling, supporting, and providing instructions to their children in the school context than parents of TD children.

Topic of PI mechanisms in home-based education of parents of children with ASD is lacking in scientific literature and thus the results of our study cannot be directly compared with existing research. On the other hand, studies that examined behavior of parents of children with ASD during homework activities did not have a control group of parents of TD children (Hampshire and Allred 2018, Hampshire *et al.* 2016). These studies dealt with the effects of parental trainings in using certain strategies such as reinforcement, prompting, and encouragement. Given the lack of studies that directly compared the level of PI mechanisms between parents of children with ASD and parents of TD children, we believe that results of this study are an important contribution to the existing literature. We offer several potential explanations for obtained results. First, it might be the case that parents of children with ASD do not believe their engagement will have a significant effect on their child's learning and are thus reluctant to engage. This explanation is in line with the one provided by Bubić and Tošić (2016). Second, it has been shown that difficulties accompanying ASD have a negative effect on parent-child interactions (Solomon *et al.* 2008) and thus possibly affect the level of PI. The next factor is related to the amount of conversations that parents have with their children regarding education; the more discussions regarding school the greater PI (Desforges and Abouchaar 2003). Given that children with ASD have notable communication deficits, lack of communication between parents and children can have a negative effect on PI. Also, studies have shown that parents of children with ASD have a lower level of responsive interactional behaviors toward their children (Ceyhun *et al.* 2015) and this probably affects PI mechanisms as well.

Another, equally likely, explanation is that children feel exhausted after school and lack energy and motivation to interact with parents in doing homework, and thus need rest and time alone to prepare for the new school day. It is equally possible that parents do not know how to initiate communication with their children in order to provide them with educational support (Lawrence 2017). Some researchers have also proposed that parents of children with ASD are more concerned with children's everyday functional skills than with academic skills and thus pay less attention to the

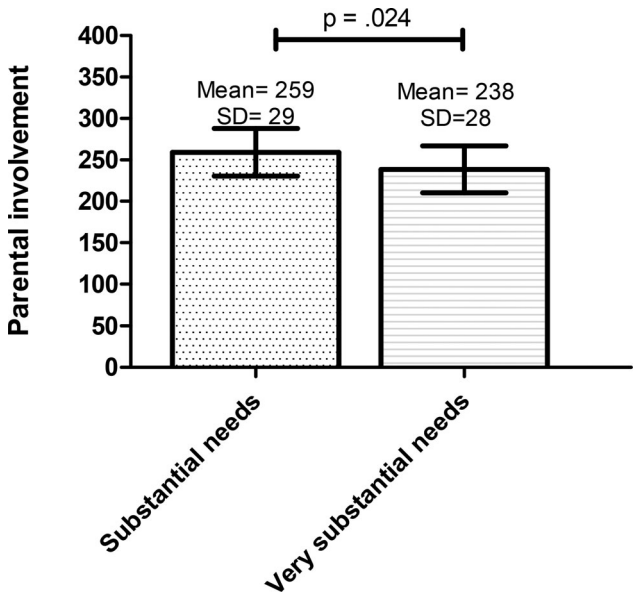

Figure 2. Comparison of parents of children with substantial needs and parents of children with very substantial needs on measures of PI.

educational segment of their child's life (Huang 2013). Also, it has been shown that parents of children with disabilities are less likely to include children in everyday decision making, and are less likely to promote independence in everyday tasks and in doing tasks through trials and errors (Zhang 2005). This is explained by the fact that parents are often overprotecting their children and do not have an objective picture of their strengths. Other authors postulated that parents of children with ASD do not want to be involved in a traditional way and that future studies should be directed on methods of how to best involve these parents in the educational process (Goldman and Burke 2019).

The second goal of this study was to examine the factors contributing to PI mechanisms in both parents of children with ASD and parents of TD children. Although numerous studies (Adams and Christenson 2000, Kohl *et al.* 2000, LaForett and Mendez 2010) have identified factors such as depression levels, stress, parent-teacher relationship as the ones contributing to PI mechanisms, our study did not confirm these findings. In our study, subjective well-being was found to be the only factor that significantly affected PI mechanisms in both groups of parents. Subjective well-being reflects a person's cognitive and affective evaluations of his or her life (Diener *et al.* 1999). We also found that higher subjective well-being was related to higher PI mechanisms in education. However, it is difficult to establish a causal link. It might equally be the case that higher PI mechanisms lead to better subjective well-being. A plethora of studies have examined this line of relational direction, e.g. how various activities impact subjective well-being. For example, leisure activities, physical activities, out-of-home activities, have all been examined in relation to subjective well-being and found to have a positive impact (Brajša-Žganec *et al.* 2011, Ettema *et al.* 2010, Stathi *et al.* 2002).

Level of education played a role in explaining PI mechanisms in parents of TD children but not in parents of children with ASD. Previous studies have indicated that parents' higher education is related to higher PI in education (Guryan *et al.* 2008, Hill *et al.* 2004, Stevenson and Baker 1987, Welsch and Zimmer 2008). This relationship is probably mediated by the values parents with higher education place on educational attainment which subsequently leads them to be more involved in children's education (Sayer *et al.* 2004). In this study, we confirmed the positive effect of higher parental education level on PI mechanisms in education for parents of TD children, but not for parents of children with ASD. Similar findings about the lack of relationship in parents with ASD and education level regarding PI were discovered by other authors as well (Garbacz *et al.* 2016). It might be the case that we were unable to detect the effect of education level on PI mechanisms in parents of children with ASD due to small sample size. Also, we only had two educational categories, so there could be different trends of PI mechanisms in parents of children with ASD who have lower level (elementary school) or higher level (graduate and postgraduate level) of education.

In the group of parents of children with ASD we found that only one factor, child's emotional reactions, was significantly related with PI mechanisms. Items contained in the ER scale assess whether a child has temper tantrums, is easily disturbed and frustrated etc. It is not surprising that this factor was the major autistic

symptom related to PI mechanisms. Parents whose children have challenges with emotional reactions probably spend more time trying to soothe their child, which exhausts their coping mechanisms leaving them little or no time to be more involved in their child's education. It also reduces their motivation to be more meaningfully involved in education. Similar results were obtained by Benson et al. (2008) pointing to the fact that mothers of children with ASD who also have significant behavioral difficulties are less involved in education and more engaged with behavioral management (Benson *et al.* 2008).

This is further confirmed in our study by comparing parents of children with ASD in relation to autism severity. Parents of children with more significant needs were significantly less involved in education compared with parents of children with somewhat milder symptoms.

Given the importance of PI in education, and lower levels of PI mechanisms in parents of children with ASD, schools should initiate some concrete plans in order to empower these parents to be more involved (Zablotsky *et al.* 2012). Professionals who work with children with ASD need to establish open and good relationships with parents and to be fully supportive of their needs regarding PI (Garbacz *et al.* 2016). It has been shown that good relationships between professionals and parents have the potential to facilitate individual and family outcomes (Keen 2007). Plans to increase PI mechanisms should be respective of family's characteristics, as well as child's characteristics. Parents should be provided with basic training in behavior management so they can employ these strategies in supporting their children outside the school context. It is of utmost importance to have everyday exchange of information between parents and teachers about school and home events. In this way, professionals will gain an even broader picture of the child's functioning and thus be able to better support them through individualized educational programs.

Limitations

This study is not without limitations. The first one is the small, convenient sample of participants which limits the generalizability of these results. Additionally, all findings were based on parent perceptions, which also limit the generalizability of the findings. Next, we did not sample parents of children with ASD who attend regular schools and children with milder symptoms of ASD, whose PI mechanisms might be affected by other factors, and whose level of PI mechanisms might be higher. Finally, an important variable which we did not assess in relation to PI mechanisms is parents' satisfaction with educational options available to their children. It is very likely that satisfaction with educational and treatment options is related to greater PI mechanisms.

Directions for future research

Future studies should also include teachers' perceptions on relationships and communication they have with the parents and also teachers' views on PI mechanisms. Second, although the GARS-3 can be a very efficient measure, future studies should employ more valid, direct observational measures such as the ADOS. Future studies should compare PI mechanisms in parents of children with ASD who attend regular schools and parents of children with ASD who attend special schools. Next, it would be beneficial that both parents complete the questionnaire as that would increase the reliability of applied measures. Further research could be extended in terms of the sample – to include parents of children with other developmental disabilities, but also in terms of applied instruments (by choosing instruments that measure some other PI constructs or instruments designed to measure PI in parents of children with disabilities and others components of PI more common for parents of children with ASD) and inclusion of additional variables, such as socio-economic status. Due to the lack of literature related to developing countries, the literature related to America has been widely used in this paper. Accordingly, cultural and contextual factors related to PI mechanisms should be considered in future research.

Implications for practice

The results of this study indicate that the sampled parents of children with ASD have lower levels of PI mechanisms in comparison with parents of TD children. Therefore, it is of crucial importance that teachers and other professionals at schools talk to parents about their priorities regarding their child. These talks will also help in establishing more trusting rapports between parents and teachers. Good and trusting rapports between teachers and parents and will enable teachers to explain why is it important for parents to be involved in educational processes of their children, to encourage them and to increase their competencies and sense of self-efficacy. School staff can also provide parents with concrete strategies and techniques to cope more efficiently with the challenges they face in educational and everyday settings. School staff can also organize trainings for parents to better cope with child's behavioral difficulties, which in turn will make parents more open to collaborate with school professionals.

Conclusion

The results of this study showed that parents of children with ASD had lower levels of PI mechanisms than parents of TD children. Factors contributing to PI mechanisms in children with ASD are subjective well-being and child's emotional reactions. Parents of children with higher support needs are less involved in

education than parents of children with ASD with less severe support needs. Based on all the results and given recommendations, the conclusion is that PI mechanisms planning should be a mandatory part of the overall planning of education of students with ASD.

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