

PARENT-CHILD INTERACTION DURING EARLY CHILDHOOD: COMPARATIVE ANALYSIS OF PARENT RESPONSIVENESS PROFILE AMONG DYADS WITH TYPICALLY AND ATYPICALLY DEVELOPING CHILDREN

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The paper presents the results of the empirical study that aims to build an average group profile of parent responsiveness (PR) for parents with typically and atypically developing children before 3 years of age and to compare average PR profiles between these groups. Seventy parents with typically developing children and 32 parents with atypically developing children (autism, Down syndrome, intellectual disabilities) between 10 and 36 months of age participated in the present study. The first sample was divided into two sub-groups: parents with typically developing children younger than 12 months of age (infants), and parents with typically developing children between 12 and 36 months of age (toddlers). Parents with atypically developing children were set as one group. The study used the PATTERN technology that employs video observations. Parent responsiveness was assessed on 4 scales (Dominance, Apathy, Sensitivity, and Support); group and individual PR profiles were constructed according to these scales. Sample comparison was conducted using Student's t-test and Mann-Whitney U test. It has been shown that the PR to typically developing children differs compared to atypically developing children. Parents of atypically developing children are more inclined to dominate and are also characterized by greater psychological apathy. The age of typically developing children influences the nature of PR.

Keywords: parental responsiveness, video-based observations, The Observer XT, early childhood, mother-child interaction, mother-child dyad, free play, PATTERN technology.

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ДЕТСКО-РОДИТЕЛЬСКОЕ ВЗАИМОДЕЙСТВИЕ В ПЕРИОД РАННЕГО ДЕТСТВА: СРАВНИТЕЛЬНЫЙ АНАЛИЗ ПРОФИЛЕЙ РОДИТЕЛЬСКОЙ ОТЗЫВЧИВОСТИ В ДИАДАХ С ТИПИЧНО И АТИПИЧНО РАЗВИВАЮЩИМИСЯ ДЕТЬМИ

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Представлены результаты эмпирического исследования, цель которого построить усредненный групповой профиль родительской отзывчивости (РО) для родителей с типично развивающимися детьми и для родителей с детьми, имеющими нарушения в развитии в возрасте до 3-х лет; провести сравнительный анализ профилей РО в этих группах. В исследовании приняли участие 70 родителей с типично развивающимися детьми и 32 родителя с детьми, имеющими нарушения в развитии (аутизм, синдром Дауна, умственная отсталость) в возрасте от 10 до 36 месяцев. Первая выборка была разделена на две подгруппы в зависимости от возраста ребенка: родители нормотипичных детей до 12 месяцев и родители детей 12—36 месяцев. Родители детей раннего возраста с нарушениями в развитии были объединены в одну группу. В исследовании применялась технология PATTERN, предусматривающая видеонаблюдение. Проявления родительской отзывчивости оценивались по 4 шкалам (Доминирование, Апатичность, Чуткость, Поддержка), по которым были построены групповые и индивидуальные профили родительской отзывчивости (РО). Сопоставление выборок проводилось с использованием статистических критериев Стьюдента и Манна—Уитни. Показано, что РО по-разному проявляется по отношению к детям, развивающимся типично и атипично. Родители атипичных детей в большей степени проявляют стремление к доминированию, а также характеризуются большей психологической апатией. Возраст нормотипичных детей оказывает влияние на характер РО.

Ключевые слова: родительская отзывчивость, видеонаблюдение, The Observer XT, ребенок раннего возраста, взаимодействие матери с ребенком, диада «мать-ребенок», спонтанная игра, технология PATTERN.

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According to Lev Vygotsky and his followers, parental scaffolding such as parental responsiveness and stimulation of the child's cognitive activity constitute one of the significant factors in the development of both typically and atypically developing children [21]. A significant body of research identifies the correlation between parent social functioning, parental responsiveness and the risks of the child developing an autistic spectrum disorder [19]. It has also been shown that parent verbal responsiveness (PVR) predicts the child's communication [12]. Moreover, parent verbal responsiveness (responding to the child's focus of attention and verbal communication acts) is related to the child's verbal development during early childhood [11; 18]. There is evidence to suggest that children, whose parents exhibit high parental responsiveness and respond to the child's focus of attention on an object of interest, manifest faster verbal development. The reverse relation has also been observed: when parents detract children from an activity of interest, the child's ability to match the parent's words to his/her own actions decreases [17].

Scientists believe that parent-child interaction is not the cause of the child's atypical development, but could become an important risk- or aggravating factor, on the one hand, or, on the other hand, become a support or alleviating factor in the development and manifestation of behavioral, emotional or cognitive characteristics of such a child [8]. There has been an increased interest among researchers and practitioners to the period of early childhood as a fundamental one in the child's development [1], and early diagnostics of developmental disorders allows for a more effective treatment [7; 9]. For this reason, understanding particularities of parent interaction with typically and atypically developing children during early childhood becomes important. It has been observed that parents of children at high risk of autism spectrum disorder (ASD) exhibit higher directivity and lower responsiveness than parents of children at low risk of ASD [10]. A number of studies draw attention to the fact that directivity is often observed in the interaction of a parent and a child with a low level of cognitive functioning [20]. Attempts have been made to conduct cross-cultural studies of the parental responsiveness of family members, including mothers, fathers and grandparents in underdeveloped countries, where a large number of children with developmental disabilities are registered [16].

A literature review of interventional studies aimed at increasing parental responsiveness emphasizes their significance and effectiveness, especially in cases with atypically developing children. The results of interventional programs show that increasing parental responsiveness to children with/at-high risk for ASD, who demonstrate a deficit in emotional ex-

change with and attention to other people, improves their developmental trajectory [17].

Despite the great scientific and practical significance of research within this field, there remains a gap in understanding the differences in parental responsiveness in relation to typically developing children and children with or at-risk for developmental disorders during early childhood. We discussed the role of parental responsiveness in the child's neurocognitive and socio-emotional development [13]. In our previous studies we developed the methodology to analyze parental responsiveness based on the child's age [2; 3; 14]. For the purpose of a more detailed understanding of the role of parental responsiveness during early childhood, we isolated parental responsiveness indicators that were grouped into 4 scales: Dominance, Apathy, Sensitivity and Support [3].

The purpose of the present study is to build an average profile of parental responsiveness (PR) for groups of parents with typically and atypically developing children and to conduct a between-groups comparative analysis of average PR profiles.

In accordance with this purpose, we aimed to further specify PR indicators for qualitative analysis of parent-child communication.

Research hypothesis. We hypothesize that there are differences in parental responsiveness towards typically and atypically developing children. Such differences could be identified by building average PR profiles and by isolating typical features that describe parental behavior during interaction with typically and atypically developing children. We also hypothesize differences in PR based on age. Given that atypically developing children were above 12 months of age (toddlers), their parents were included in group 3, and parents of typically developing children formed two groups — those with children above 12 months of age (toddlers) and those with children younger than 12 months of age (infants). The comparison between three groups allows the analysis of differences based on age, on the one hand, and the type of development, on the other.

Methods

Evaluation of Child-Parent Interaction (ECPI) Methodology. In the present study PR was evaluated using Evaluation of Child-Parent Interaction (ECPI) [2; 4], a methodology for conducting video-based observational studies, which we developed. ECPI methodology underwent a professional expert assessment [5] of the consistency in assessing parent behavior by

professionals performing the coding. ECPI includes theoretical justification of PR indicators, a video recording manual for specialists and a manual for parents.

The Observer XT-15 Behavioral Coding Software. The analysis of data collected through video recordings was conducted using the Observer XT-15 behavioral coding software that allows for visualization of the dynamics of participants' behavioral characteristics. Parent behavior paired indicators developed in our previous studies were used for coding video-based observations [2; 3; 4]. Each of the paired PR indicators could appear with a positive (positive indicator) or a negative score (negative indicator). When no PR indicator is observed, a 'neutral' score is assigned for that time period.

The PATTERN parent-child interaction diagnostic and intervention technology based on video observations. We developed the PATTERN technology as a comprehensive parent-child interaction diagnostic and intervention tool based on video observations of parent-child interaction. The name of the technology is an abbreviation formed by the first letters of the names of key steps in a video-based observations' processing.

1. Profiling — data collection via video-based observations and video-content processing for PR profile development;
2. Adjusting — choosing parameters for PR indicators analysis (ECPI) in accordance with the study purpose;
3. Translating — coding data using the Observer XT-15 software;
4. Tracking — visualizing PR indicator dynamics graphically and conducting statistical analysis of quantitative characteristics of PR using The Observer XT-15;
5. Evaluating — converting the video content into a binary sequence of zeros and ones using the dichotomization procedure (Pattern+ software), building a PR profile and isolating qualitative characteristics of the PR profile;
6. Recommending — devising recommendations, either together with a parent in the form of a counseling session, or, in the absence of such an opportunity, in the form of written recommendations based on the interpretation of the results by a researcher;
7. Navigating — organizing follow-up support, including the opportunity to repeat the previous steps (performed upon the parent's request or in a longitudinal study).

This technology is unique, for it does not reduce the analysis of communication as an activity to formal quantitative behavioral characteristics, but encompasses the analysis of the content of communication and the

needs and motivations supporting it [6]. For this purposes, we developed the Parental Responsiveness indicators used by the experts to encode parent behavior [2—4] in the Observer XT-15. Nevertheless, the results of video processing with the Observer XT-15 allow the use of a limited number of statistical methods. Therefore, the dichotomization procedure was applied: markers of the point of occurrence and lengths for the analyzed PR indicators were converted into a sequence of zeros and ones.

For the purpose of conducting dichotomization, the Pattern+ script was developed. The conversion algorithm of primary standard video encoded in the Observer XT-15 is as follows: the entire video session is divided into 1000 time points, where each of the indicators is ascribed characterized as '1' in case of its presence in the parent behavior according to the experts' opinion, and '0', if otherwise. Thus, for each of the PR indicators we get a sequence of zeros and ones (time series). This time series could then be processed using various methods, including traditional methods of time series analysis.

The results of processing video content could be presented graphically in several ways:

- 1) In an image of the PR indicator dynamics during the session, obtained using The Observer XT software;
- 2) In a figure, in which for all the numerical binary sequences obtained using the Pattern+ software are located one below the other.

By presenting the obtained binary sequences one below the other we get a *pattern* reflecting the PR during a 15-minute session of interaction with a child. We presume the uniqueness of this pattern for each parent. Based on the methods of multidimensional statistics, the indicators are grouped into scales. The parental responsiveness profile for each participant consists of a set of indicators corresponding to these scales. The higher the scale indicator, the farther the top is from the center on the corresponding scale and vice versa, if the type of parent behavior related to a certain scale is not observed, then this top is close to the center.

The resulting PR profile, as well as a graphic representation of the dynamics of the PR indicators during the session, are discussed with parents in the form of a consultation, where the parent is on equal terms with the psychologist and develops recommendations for improving his/her interaction with the child [2; 4].

Sample. The study sample consisted of 70 parents with typically developing children and 32 parents with atypically developing children (autism, Down syndrome, intellectual disability) between 10 and 36 months of age. The family income was above average for Russia. All of

the participants live in large cities of Russia: Moscow, Yekaterinburg, Salikhard, Krasnoyarsk. Refer to Table 1 for the description of the sample demographics.

Table 1

Sample demographics

Descriptive statistics and frequencies	Typically developing infants (younger than 12 months of age) (n=46)	Typically developing toddlers (12 to 36 months of age) (n=24)	Atypically developing toddlers (12 to 36 months of age) (n=32)
Child, Age (months)			
Average, M	10.04	23.25	29.97
Standard Deviation, SD	.92	10.38	11.45
Child, Gender			
Male, n	18	11	20
Female, n	28	13	12
Parent, Age (years)			
Average, M	31.17	29.42	35.56
Standard deviation, SD	6.11	5.18	7.87
Parent, Gender			
Male, n	9	3	7
Female, n	37	21	25
Parent, Education Level			
Higher, n	43	20	28
Secondary, n	3	4	4
Parent, Marriage Status			
Married, n	45	22	31
Single, n	1	1	1
Divorced, n	0	1	0

Research procedure. The participants were invited via the advertisement on the Moscow State University of Psychology & Education (MSUPE) website and other online sources, perinatal centers, Early Child Development Centers and Family Education Centers in the cit-

ies of Moscow, Yekaterinburg, Salekhard and Krasnoyarsk. Those who expressed interest and provided their contact details received additional information about the research procedure. Every parent signed an informed consent, which allows us to make the study available to the professional community.

In accordance with the PATTERN technology, the research was conducted in stages.

The first stage included data collection, namely an interview with the parents and filming the child-parent interaction. Following the parent's choice and resources, the first stage took place either in a dedicated and fully equipped laboratory or at a Family Education Centre they had been attending. Moreover, some parents were allowed to undergo the procedure at their own homes. After that video recordings were uploaded to The Observer XT software.

The second stage consisted of choosing the PR indicators in accordance with the ECPI methodology that addressed the present study's hypothesis. In accordance with the purpose of the present study the PR indicators were specified.

The third stage included data encoding using The Observer XT-15 software. During the fourth stage, graphs showing the dynamics of the PR indicators were built and used to provide the participants with the feedback.

During the fifth stage, all the data collected for all the indicators was reduced to a binary sequence of 1000 encoded time points and used as a basis for forming the average parental responsiveness profiles for each of three groups.

This research does not elaborate on the final (sixth and seventh) steps of the PATTERN technology, however it should be mentioned that every parent was eventually provided with the professional advice based on the results of the study. In certain cases Parental Consultations were also held.

Results

The Parent Responsiveness (PR) Scales and their qualitative characteristics. In the present study, based on video-content analysis we identified the need to further specify and expand some of the earlier PR indicators. In this study we expanded 9 pairs (18 indicators) of the PR indicators obtained in our previous study [3] to 13 pairs (26 indicators) (Appendix). In particular, we have modified the following indicators:

— ‘Verbal emotional reactions’ indicator was divided into two indicators: ‘emotional interjections, exclamations’ and ‘verbal emotional comments’, which allowed for a more detailed analysis of the verbal component of the parent-child communication, the ratio of the number of words and exclamations in this indicator, the qualitative characteristics of the verbal communication;

— ‘Synchrony, distance’ indicator was divided into two indicators: ‘physical distance’ and ‘movement coordination, which allowed for a more precise analysis of parent-child synchrony in movement and distance that either brought joy/comfort or was uncomfortable for both parties;

— ‘Support of child’s exploration’ was specified and modified into two indicators: ‘pace’ and ‘information’, which aided the analysis of the correspondence between the pace of parent’s activity to the pace of child’s activity and the justification of information about threat, if such was observed during the child’s exploration;

— ‘Communication activity’ indicator was divided into two indicators: ‘non-directivity/directiveness’ and ‘comments on the child’s actions, genuine praise’.

In our previous study all 1000 measurements were divided into 4 sub-sequences of 250 measurements each, and for each period the fraction of units was calculated (corresponding to the parent’s behavior). A comparative analysis of these 4 periods showed significant stability of each indicator and the general scales formed by these indicators characterizing parental activity. In addition, certain theoretically justified relationships between the scales were identified [3], and it was also shown that by the end of the video session, activity across all scales significantly decreased. It is for this reason that the average indicator of PR was calculated on the basis of the first 750 points (proportion of points in this segment of the sequence). Due to the increase in the sample size and further specification of PR indicators, factor analysis was re-conducted and PR indicators within each scale were refined.

The principle component analysis method (PCA) with orthogonal rotation (Varimax) was used to factor general categories (factors), characterizing parent responsiveness (since the components isolated with the oblique rotation during the trial stage did not correlate between each other). As a result, 4 factors (principle components) jointly defining parent responsiveness and explaining 41.4% of the total variance were defined. Table 2 contains the pattern matrix of factor loadings showcasing the composition of each factor — Parent Responsiveness Scale.

Table 2
Parental responsiveness pattern matrix of factor loadings

Indicators of Parental Responsiveness	Dominance	Apathy	Sensitivity	Support
Contribution of each factor to total variance	15.3%	9.1%	8.8%	8.3%
14 Joint Attention -	.941	.013	-.003	-.029
26 Play -	.907	-.074	.010	.038
24 Communicative activity Directivity -	.822	.107	.005	-.103
16 Support of child's exploration Pace -	.774	-.038	.000	-.121
12 Movement Coordination -	.653	.204	-.058	.106
06 Emotional interjections, exclamations -	.072	.773	-.015	-.032
18 Support of child's exploration Information -	-.054	.725	-.051	.041
20 Parent's response to the child's needs -	.261	.593	-.247	.179
10 Physical distance -	.086	.552	-.140	-.183
05 Emotional interjections, exclamations +	-.064	.469	.368	.257
09 Physical distance +	-.180	-.060	.677	.091
13 Joint Attention +	-.214	-.022	.608	-.049
01 Non-verbal +	-.057	.067	.605	.371
15 Support of child's exploration Pace +	.104	-.032	.597	.185
03 Verbal emotional comments+	.067	-.141	.322	.025
17 Support of child's exploration Information +	.119	-.021	.244	-.062
21 Communicative activity Comments +	-.001	.009	.194	.167
11 Movement Coordination+	-.016	-.138	-.094	.765
19 Parent's response to the child's needs +	-.284	.166	-.172	.695
23 Communicative activity Non-directivity +	.280	-.324	-.175	.390
25 Play +	-.094	.090	.181	.352
02 Non-verbal -	.158	.069	-.259	-.345
22 Communicative activity Comments -	-.034	-.016	-.097	-.284
07 Mirroring +	.174	.139	.176	.277
08 Mirroring -	-.074	.090	-.090	-.159

Note. Significant factor loadings are in bold.

The score on each scale is calculated as factor scores on each factor. Since factor scores have a standard normal distribution (mean is 1, standard deviation is 0), for convenience of interpretation, the results were transformed into Sten scores (normal distribution with indicators lying in the range from 1 to 10, an average of 5.5 and standard deviation of 2).

Interpretation of the Parent Responsiveness (PR) Styles. The following is a concise description of the PR styles based on the identified scales, each of which contains a specific set of behavioral indicators, the qualitative characteristics of which are described in Appendix.

Dominance. The average scores on the Dominance scale suggest the Domineering PR Style. “A parent knows how to play with the child to ensure developmental benefits.” The parent-child interaction usually happens in the context of an educational game, which entails the use of instructions and directions from the parent. The parent directs the child, does not follow the child’s attention, instead tries to switch his/her attention to objects that, from the parent’s point of view, are more beneficial for the child’s learning purposes. The pace of the parent’s activity does not match the pace of the child’s activity.

The high scores on the Dominance scale suggest the Imposing PR Style, reflecting parent’s intention to ‘train at all costs’. The parent often criticizes the actions of the child, and praising a child is more likely to be formal in nature without emotional coloring. There is a lack of synchrony of movements in the dyad. The parent behavior scoring high on this scale can be defined as overbearing and not enduring objections. The child must obey the parent’s instructions. When asking questions or giving instructions to the child, the parent does not allow time to respond. The parent tries to give the child as much information as possible and does it too quickly.

Apathy. The average scores on the Apathy scale correspond to the Apathetic PR style. This style entails the following characteristics of the parent’s behavior: the parent feels bored, ‘serves time’ next to the child and fulfills the obligation to be with the child. For this type of PR style, the emotional context of parent-child communication is generally negative. The parent demonstrates opposite emotions in response to the child’s emotional reactions and ignores his/her feelings and needs.

At times, the parent can ‘tune in’, demonstrating presence, which explains the appearance of the Emotional Interjections + indicator in the behavior.

The high scores on the Apathy scale signify the Suppressing PR style, when figuratively speaking, the parent ‘keeps the child on a tight leash’, threatens, forbids and forces certain behavior. The parent is not sensitive

to the child's needs (basic needs, the need for affection, activity, etc.). The parent restrains the child's movements, prevents the child's exploration, and scares the child by emphasizing danger or threat, which does not correspond to reality.

Sensitivity. The average scores on the Sensitivity scale correspond to the Sensitive PR Style, in which the parent 'follows the intentions, emotions and physical state of the child'. This style has the following typical features: the parent maintains a positive attitude throughout communication, demonstrates positive non-verbal reactions; accompanies the child's emotions and actions with positive comments without criticism, often praises the child, addresses him/her by name; shares the child's attention, encourages and supports exploration. There is synchrony in movements and a comfortable distance during communication in the parent-child dyad. The pace of the parent's activity corresponds to the pace of the child's activity. When asking questions, the parent gives the child time to respond.

The high scores on the Sensitivity scale suggest the Symbiotic PR Style. The parent sees the world through the child's eyes, which is normal in communication with an infant, but should be taken with caution in communication with a toddler as it could be a sign of interdependence (up to complete merger), which could lead to the loss of identity of both parties.

Support. Unlike in the above style, where the parent follows the child's state, the main feature of this PR style is following the child's activity. The average scores on the Support scale correspond to the Supporting PR style, when the parent provides support to the child during play and actually enjoys it. For this type of PR style, free play is typical for parent-child interaction. The parent is sensitive to the child's signals: he/she mirrors the child's emotions and movements, voices his/her own emotions and the emotions of the child. The parent responds to the needs of the child in a timely and adequate manner. There is synchrony in the parent-child movements.

The high scores on the Support scale characterize the Partnership PR Style, in which the parent 'plays seriously, not for fun!' and demonstrates involvement in the game. The opposite end of the scale ('unsupportive style') is formed by the indicators 'Non-verbal -' and 'Communicative activity Comments -'.

Building Parent Responsiveness Profiles. As a result of the scale scores standardization and their conversion into the Sten scores, every respondent was characterized on each of the four scales in Sten scores. These indicators were compared between each other and used to make a conclusion about the parent's prevailing PR style based on a set of scales. For all three groups of parents, the average PR profiles were constructed (Fig.).

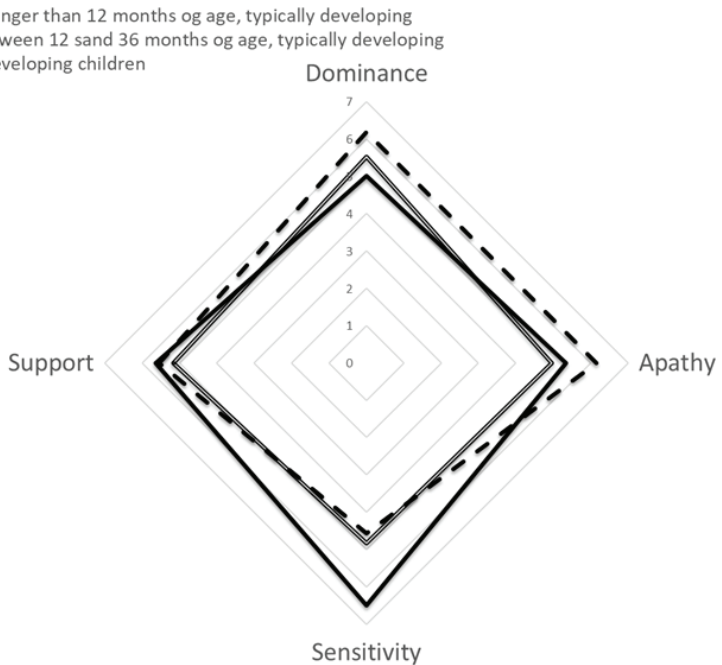


Fig. Average Parent Responsiveness Profiles for three groups

The resulting profiles reflect the trends in Parent Responsiveness styles in different groups. The statistical significance of the differences in average PR profiles was tested using one-way variance analysis. It was confirmed for Dominance, Sensitivity and Apathy. The largest variance was observed on the Dominance scale for the parents with atypically developing children. The greatest uniformity of behavior (the smallest variance) was observed in the group of parents of toddlers (12–36 months of age) on the Apathy scale. Nevertheless, there were also participants who demonstrated both the Apathetic PR style and the absence of thereof. Table 3 shows descriptive statistics of PR scale scores in three groups of parents.

Discussion

The present study focused on parents with typically and atypically developing children. The analysis of the sample results suggests that the parents

Table 3

**Descriptive statistics of the Parental Responsiveness Scales
in three groups obtained in Sten Scores**

Scale	Minimum	Maximum	Average	Standard deviation	Asymmetry	Excess
Group 1 — parents with children younger than 12 months of age, typically developing						
1 Dominance	3.33	9.60	5.01	1.20	1.57	3.45
2 Apathy	3.38	9.52	5.33	.95	1.72	7.40
3 Sensitivity	3.35	10.00	6.49	1.62	.10	-.54
4 Support	2.14	10.00	5.58	1.58	.58	.83
Standard deviation					.35	.69
Group 2 — parents with children from 12 to 36 months of age, typically developing						
1 Dominance	3.38	10.00	5.43	1.80	1.19	.81
2 Apathy	2.54	7.13	4.96	.90	.05	2.57
3 Sensitivity	1.42	8.47	4.83	2.04	.10	-.82
4 Support	2.33	10.00	5.05	1.89	.74	.41
Standard deviation					.47	.92
Group 3 — parents with atypically developing children						
1 Dominance	3.54	10.00	5.96	2.15	.92	-.42
2 Apathy	3.58	10.00	5.77	1.66	1.28	1.03
3 Sensitivity	1.09	8.55	4.56	1.81	.27	.19
4 Support	1.25	10.00	5.49	1.92	.19	.05
Standard deviation					.41	.81

who participated in the study are genuinely interested in their child's development. This is true for the parents with typically and atypically developing children. We believe that the parents who made a decision to participate in a study that included video-based observations possessed courage to share

the privacy of their interaction with the child. Such an attitude is most likely explained by their desire to do everything possible for the development of their child. The study participants were required to invest time and physical energy, both in case of commuting with a small child to the Laboratory or to a special center for child development, or in case of having equipment set up if video recording took place at the participant's home. In addition to that, our research required that a parent conducted a 1.5-hour session with a researcher, which included preparation time for both the parent and the child for a video-recording session, a 15-minute video recording, and a personal feedback session for the parent based on the PATTERN technology. Hence, it is reasonable to conclude that our sample is homogeneous in terms of participant's motivation to take part in the study regardless of the child's developmental status.

The comparison of PR profiles between groups with typically developing infants and toddlers did not register significant differences on the scales on Dominance, Apathy and Support. Both groups scored at the medium of these scales. It suggests that PR towards typically developing infants and toddlers is characterized by moderate parent dominance, when the parent teaches, instructs and guides the child, and support, when the parent follows the child's attention, activity and engages in the child's free play. These groups also show medium scores on the Apathy scale, which could be explained by the parent's tiredness, which is normal for a parent of a small child. This phenomenon was described in the previous study when we built a dynamic model of parent responsiveness [3]. We can presume that this score might be higher (more normal) for a different sample. Significant differences were discovered for the Sensitivity scale. The parents with infants showed high scores in Sensitivity, which we consider a norm in the context of the parent-infant interaction.

The comparison of PR profiles between groups of parents with typically and atypically developing toddlers identified no significant differences on the Support and Sensitivity scales. This could be explained by the sample particularities outlined above. All the participants of the present study regardless of the child's health status reveal Sensitive and Supportive Style of parent responsiveness. Significant differences have been identified on the Apathy and Dominance scales. The group of parents with atypically developing children registered higher scores on both scales.

In accordance with the interpretation of the PR scales, the average PR profile of parents with atypically developing children is characterized by Imposing and Suppressing PR styles. It is noteworthy that parents of such

children try to compensate developmental disorders with intense training, which has been shown especially effective during early childhood period [7; 8; 17]. This could lead to accentuation of PR styles. While early childhood training plays a crucial role in the child's development, the qualitative characteristics of the Imposing PR style are more likely to significantly decrease the effects of such training [8; 10; 11]. The differences between average PR profiles of parents with typically developing children and parents with atypically developing children on the Apathy scale are expected because the parents with atypically developing children experience a higher degree of exhaustion during their interaction with the child. This exhaustion could have an accumulating effect as a result of constant psychological and physical pressure, which is significantly higher for the parents with atypically developing children than for the parents with typically developing children [2; 3; 15].

Study limitations. Since our sample is very specific, in making generalizations we must understand that the parents who took part in our study are characterized by greater support to their children. It was on the Support scale that no significant differences were obtained between the three groups.

Conclusion

Parent responsiveness during interaction with children is defined by a number of indicators grouped into four scales. It is reasonable to suggest that a change of each indicator from moderate to high entails a change in the PR style. As an example, at medium scores on the Dominance scale, parent responsiveness is characterized by the parent's focus on the child's education, instruction of the child's activity, while the high scores on this scale suggest the Imposing PR style. While the medium scores on the Apathy scale are interpreted as sluggishness, emotional restraint, the high scores on this scale signify the Suppressing style of PR. On the Sensitivity scale, the medium scores characterize the parent's sensitivity towards the child's communication signals, while the high scores suggest the risk of developing Symbiotic PR style, including a psychological merger between the parent and the child. On the Support Scale medium scores are shared by the parents who express emotional support, while high scores signify the parent's involvement in the child's activity (the Partnership PR Style). Low scores on the PR scales suggest weak patterns to be attributed to any trends.

As a result of standardization of scale indicators and their conversion into the Sten scores, we built averaged PR profiles for three groups of participants. Each group is characterized on each of the four PR scales in Sten scores (Dominance, Apathy, Sensitivity and Support). Comparing these indicators between each other in the group profile, we can talk about a typical PR style for a certain group, defined by a set of indicators in each of the PR scales. However, it should be noted that in each of the groups we can observe respondents with significantly higher or lower scores on the PR scales in comparison with the average PR profile corresponding to this group. Thus, we can talk about individual PR styles and their corresponding profiles.

Parent responsiveness differs between groups with typically and atypically developing children. The parents with atypically developing children to a larger extent demonstrate domineering tendencies and psychological indifference, as they possibly get tired more when interacting with their children.

The age of children also affects the nature of parent responsiveness. The parents with infants (younger than 12 months of age) score significantly higher on the Sensitivity scale.

Future research. In our further studies we plan to: first of all, understand and explain steady measurements obtained with the PATTERN technology (retest reliability), explore PR features based on the child's gender; compare PR profiles between mothers and fathers; analyze individual cases from the sample presented in this paper using all stages of the PATTERN technology; study cross-cultural differences in PR during early childhood entailing a longitudinal study design.

**Qualitative Characteristics of Behavioral Indicators
of Parental Responsiveness**

№	Positive parental responsiveness indicators	Features	№	Negative parental responsiveness indicators	Features
1	Non-verbal +	Positive emotional response expressed by facial expressions, looks, voice alterations, gestures	14	Non-verbal -	Negative emotional response expressed by facial expressions, looks, voice alterations, gestures
2	Verbal emotional comments +	Statements corresponding to the real feelings; Commenting on the parent/child emotional condition	15	Verbal emotional comments -	Statements contradicting the parent's real feelings; Criticism of the child's emotional condition
3	Emotional interjections, exclamations +	Exclamations, interjections, corresponding to the real feelings, the voice accompaniment	16	Emotional interjections, exclamations -	Exclamations, interjections not corresponding to the real feelings, situation, the child's or the parent's emotional condition
4	Mirroring +	An instant mimicking of the child's reactions: facial expressions, sounds, words, gestures (gross and fine motor)	17	Mirroring -	Inconsistent emotional reactions (for example, a parent responding to a child's cry with laughter)

№	Positive parental responsiveness indicators	Features	№	Negative parental responsiveness indicators	Features
5	Physical distance +	The distance is satisfactory for both child and parent	18	Physical distance -	An uncomfortably close distance; manipulations aimed at bringing the child closer
6	Movement coordination +	Synchronized, complementary child-parent movements	19	Movement coordination -	Unsynchronized, child-parent movements; The parent manipulating the child's hand by force trying to teach them handling items; Parent's gestures and motions are uneasy
7	Joint attention +	Follows the child's focus of attention	20	Joint attention -	Scant attention to the child's object of interest; Insists the child focuses attention on a more useful item
8	Support of child's exploration Pace +	Provides the child with an opportunity to explore; When asking questions or giving instructions gives the child a reasonable amount of time to react	21	Support of child's exploration Pace -	Restrains the child's physical activity; the pace of the parent's activity doesn't match the child's one

№	Positive parental responsiveness indicators	Features	№	Negative parental responsiveness indicators	Features
9	Support of child's exploration Information +	Information about threat given by a parent is relevant	22	Support of child's exploration Information -	Information about threat given by a parent is irrelevant
10	Parent's response to the child's needs +	Responds to physical and emotional needs, need for activity, etc.	23	Parent's response to the child's needs -	Ignores physical and emotional needs, need for activity, etc.
11	Communicative activity Comments (on the child's actions, genuine praise) +	Verbalized careful attention to the child's object of interest; Commenting on the child's actions; Showing confidence in the child's capability; Genuine praise	24	Communicative activity Comments (on the child's actions, genuine praise) -	Criticism of the child's actions; Insincere praise
12	Communicative activity Non-directivity +	Non-governing position, namely showing respect for a child by providing them with a choice of activity	25	Communicative activity Directivity -	A governing position: instructions, guidance, orders
Assessment of the interaction — play					
13	Play +	Enjoys the process of play and creates a positive game scenario	26	Play -	

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