Progress of psychomotor development of infant twins in the context of PEN factors of their mothers

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Abstract

Socio-emotional functioning is a sphere of human life, on which it may depend whether and in what way an individual will make use of his/her abilities in his aspiration to adaptive balance. Following the assumptions of social theories of human development, I looked for reasons in psycho-motor functioning of twins in their early childhood in basic dimensions of personality (PEN) of their mothers. The resulting differences in the quality of care taken of the infant will develop in the child individual methods of regulating and expressing its own emotions in contact with other people, which will secondarily determine its psycho-motor development.

Key words: PEN dimensions of personality, psycho-motor development of premature infants

Introduction

Man develops not only among people, but also thanks to them. The necessary condition for correct development of man in each sphere: physical, cognitive and emotional – is the correct social development. Achievements of the first year of life provide foundations for further development in successive phases of life. First relationship with an adult, its content and quality has an enormous influence on later competence in terms of independent functioning, determines the attitude of a child towards the outside reality and itself, determines foundation for coping with different situations, creates first standards of emotional behaviour. Birth is the first contact of a child with the outside world, the act of establishing relationship between a mother and her child. The heavy stress of birth can have, for both of them, a very important (positive or negative) effect on further development of the child. During pregnancy, the union with the organism of its mother gives a child the feeling of security and unity with the outside world. Birth compels the child to establish contact with factors which can be threatening (passage through the birth canal, light, temperature), but at the same time they allow its further development, impossible in intrauterine conditions. Therefore, birth is a chance for a child to establish a relationship with its minder, who most often is the child’s mother. She provides the child with everything it needs in a given phase of its life (development). She not only nurses it, that is cares for its safety, but above all, during the interaction of providing care, has influence on its emotional, social and intellectual development.

The relationship of attachment in prognosis of psychic development

During infancy, the most important developmental objective is to form attachment – a peculiar bond between the child and its most important minder [9]. It is, according to Bowlby [3]: a condition for correct psychic development in subsequent phases of the child’s life. Bowlby [3] maintains that the ontogenesis of such closeness is accompanied by joy and the feeling of security. Coming into this world, man can initiate social interactions and significantly affect formation of ties with other people. The child’s perception and reflex apparatus is focused on the world of people who are indispensable in the further process of its development.

Establishing an emotional bond through growing attachment is accomplished in stages. The minder becomes a secure sanctuary, making it possible for the child to explore its environment, including its body, gradually to achieve its independence and to form a partnership with its minder, to form the, so called, figure of attachment. The core of attachment is formed during attachment chains, when behaviour of the mother receiving signals sent by the infant in the form of extreme expression (crying, screaming) is an interference involving lowering of the child’s tension through decoding and satisfying its needs (feeding, cuddling, changing a nappy). The repeated cycles: distress-relief are, in the opinion of Czub [9], attachment chains of behaviours, equivalent to different intensities of the child’s attachment in its contacts with its minder.
Social mechanism of psychomotor development of a child

Schaffer [22] emphasizes that the development of a child is the result of interaction between internal and external factors. The former group is the inborn equipment of the child, which it brings when it is born to this world. Whereas, the exogenous factors are the entire social environment, under the influence of which, there is progress in the psychomotor development of a child. Development is not, as it was generally believed, the effect of maturing of nervous structures. Because it turns out that certain nervous structures are not responsible for the activities which are not determined at the moment of birth. It is the system of dependence on experience. What situations does a child participate in, what kind of influence it is the subject of, leads to creating specific links between neurons in this particular system. And this, in turn, depends on adults. Wygotski [32] stresses the role of the environment for development of a child. In his opinion, development occurs from the interpersonal trend to the intrapersonal trend, therefore a child acquires new competence due to the presence of its minders. This position is supported by Schaffer [25], who maintains that “all skills and knowledge are first experienced in the process of social interaction, and only then they are internalized and subjected to decontextualization”, and this leads to transferring the child to a higher level of functioning. Therefore, the psychomotor development of a child is not only the consequence of maturing nervous systems, but also the consequence of the child’s own experiences with its minder, but also the consequence of its individual experiences with the minder, the source of which is the developing bond between mother and child.

Social exchange in the adult-child interaction

In the opinion of Brzezińska et al. [4], without entering into mutual interactions with people from its closest environment a child is unable to recognise either the people, or physical objects, or the language, or in the end its own self. Because the other one (the adult, in the early period of the child’s life it is mostly its mother) is the person who introduces the baby into the social world and the world of physical objects. During the process of this mutual exchange, which constantly takes place between a child and other people, there is a constant process of adaptation of the child to the model of behaviour of its minders and, at the same time, the process of adaptation of the minders to the model of activity and behaviour of the child. Both parties are active in this interaction, both parties form each other’s behaviours and each other’s expectations.

The process of adaptation is evident in numerous aspects of behaviour of adults towards their children. The best documented data refer to the nature of speech directed to a child. Complexity of speech gradually changes depending on the child’s age, and the changes concern syntax, length of utterances, the scope of vocabulary, etc. The younger a child, the simpler language environment is created by its mother. The situation is similar when it comes to the way of speaking. Stern [29] provides detailed descriptions of situations where the mother of an infant slows down her speed of speaking: she makes pauses between phrases, which are much longer when adults talk to each other, uses excessive gesticulation and pulls faces and very often repeats her actions and words.

There is no doubt that the cognitive development of a child takes place in its social environment. It is evident on two levels of contacts: cultural and interpersonal. Most researchers view contacts with an adult as the most important and the only situation, at least in the beginning, in which a baby can experience contact with the language and exercise its linguistic skills. Schaffer [22] called these contacts, taking place between two (or more) individuals, when both participants engaged in the situation focus their attention on something and perform a definite task together, mutual involvement episodes (MIE). During such meetings, a child’s behaviour is more diversified and complex than at any other time. In other words, MIE trigger off optimal and the most developmentally advanced behaviours of a child. Development of psychological functions, considered during the long period of ontogenesis, depends mainly on participation in MIE. The more such encounters a child experiences, the better it develops. These suggestions are a clear echo of Wygotski’s conceptions, particularly of the statement on the sphere of the most imminent development, the sphere of developing mental activity, defined as the difference between the level of independent functioning of a child and the level achieved in cooperation with a more competent person who is in charge.

Characteristics of mothers and the quality of care

Czub [9] maintains that the proper caring for offspring demands coordination of different psychological competence. It involves numerous dimensions of psychological functioning of mothers. Belsky [2] proved that matrons who developed a safe model of attachment, had a higher level of their own value. Apart from that, they
more often described themselves as cheerful, loving and self-confident. What is more, they were characterised by a more forceful ego, which resulted in their higher emotional stability, ability to control their nervousness and lack of the strong tendency to abandon any activity if it allows avoiding responsibility. It was also revealed that such mothers achieved higher psychological ratings [16]. On the other hand, a higher incidence of safeguarded models of behaviour was found in the children of the group of mothers suffering from mood disturbances such as depression or affective bipolar disorder [19]. In the case of severe affective bipolar disorders only 21% of children developed the safe model of attachment. Whereas, when mothers were suffering from acute depression, only 53% of their offspring were so attached. If the depression was moderate, the percentage reached 70%. It was not so much the result of psychological disorders as the result of characteristic tendency in behaviours. The mothers were sad, volatile, irritable, emotionally rigid. Hence, their psychological condition affected quality of their care and, consequently, the quality of their relationships with children, which resulted in safeguarded models of attachment.

Belsky [2] and Bowlby [3], assume that the decisive role in development of the feeling of closeness and, consequently, also the sense of security, rests with the sensitivity of the minder. It is the major factor determining quality of care. Actually, one can say that when the mother is not responsive, it affects the development of a child more negatively than if her behavior were pathological. A number of researchers admit that a responsive minder plays a significant role in the early years of a child’s development, especially social development, but also in development of personality. Because all psychological functions develop under the influence of harmonized activities of the minders, it remains harmonized only when a parent is sensitive to the needs, skills and interests of his/her child. The intellectual level of development of children from three months to three to three years of age has been correlated with the degree of responsiveness of their minder. A sensitive minder correctly interprets messages of a child and enters into interactions with the child taking into account not his/her own needs, but the needs of the child. “The term motherly sensitivity refers to the entire set of cognitive, emotional and social competences of the minder” [9]. Therefore, the term includes such properties as the ability of not imposing oneself, empathy, sensitivity to signals coming from other people. A responsive mother can receive messages expressed by the behaviour of her child and interpret them correctly. Her activities take place at a definite time and are adequate to the directions of the child and are maintained at the appropriate level of intensity. In the research on interactions, mothers and children showed that even in the most limited situations like controlling behaviour of their children mothers watch them closely and sensitively adapt their behaviour to those of their children. A responsive mother does not impose herself on the passive child. On the contrary, her method of modification of her offspring’s behaviour always depends on its state [25]. Another sign of sensitivity is the degree of synchronization in the relationship with the child. Belsky [2] stresses the sensitivity of a child’s mother to its signals. Maternal behaviour can be described in terms of their relation to the needs of a child. They can be divided into three groups. The first group contains proper behaviours that show in the behaviour of the minder, which does not infringe the child’s autonomy. The next group, compulsive behaviours, are characterised by excessive intensity, whereas the insufficient behaviours do not fully satisfy the needs of an infant. The first type of behaviours dominates among mothers of children with the safe model of attachment, then anxious-ambivalent mothers with insufficient behaviours, and the compulsive behaviours were linked with the evasive model. There is still one more trait that has effect on the caring activities undertaken by the mother, and it is directive behaviour. It is a tendency to manage behaviour of a child as well as control it. It is manifested by asking questions, changing subjects irrespective of the child’s interest, giving commands, which are used to organise the interaction according to a model. It comes down to triggering off definite behaviours of a child, controlling the subject and the course of the interaction. The research proves that parents of disturbed children show more directive behaviours than the minders of those developing correctly. High level of directive behaviour can have negative effect especially on cognitive development of a child. It brings positive effects when it is accompanied by responsiveness of the child’s mother. It can be assumed that sensitivity and directive behaviours of the mother determine, to a large extent, the quality of care. Not much is known, however, about other traits of the minders, which can affect the caring activities they undertake, and what is more, on the psychomotor development of their children.

In this research project it is assumed that it can concern the personality reserves of mothers. Assuming after Eysenck [15] that personality is a reasonably durable combination of character, temperament, intellect and
physical properties which determine specific ways of adaptation to the environment, the objective research has been focussed on the three dimensions of personality distinguished by Eysenck [15]: extraversion-introversion, neuroticism and psychosis, which are regarded by the author as traits of the most general level including all forms of behaviour.

The intensity of extraversion is expressed by correlation bonds between such primary traits as: briskness, assertiveness, sociability, activity, audacity, serenity, domination, irritability, seeking new experiences [12]. The authors attribute extraverts lower caution in their conclusion, irritability, seeking new experiences [12]. The state of agitation positively influences their activities. They need external stimulation. They like performing practical tasks. Failures are not much of a problem for them. Extraverts have a large group of friends and they spend their free time with them. They display tendency to be aggressive and irritable. Very often they are unable to control their emotions and behaviour [30]. Introverts, on the other hand, control themselves. They are oriented inwardly, quiet and reflexive. They prefer routine activities, contrary to the extraverts, who treat stressful situations as a challenge. They prefer reading on their own to an opportunity to meet people. They carefully select their closest environment using very strict criteria. Ethical values are much more important to them than to extraverts. They tend to make plans for the future and dislike excitement. They treat everyday life very seriously [30]. Contrary to the introverts, extraverts are more resistant to pain. They can perform tiring tasks for longer time. They prefer changes, contrary to the introverts, who prefer a well ordered lifestyle. They do better at school and they usually achieve better results in their studies. Whereas, introverts prefer working on their own. They are more rarely appointed to managerial positions, too. Extraverts more often experience positive emotions and they are more self-assured in expressing them. Moreover, they find it easier to understand facial and pantomime expressions of other people. They have a positive attitude towards the future. Introverts are usually more stressed than extraverts before public appearances. They are more negative in assessment of their own situation and experience more negative emotions. Introverts more rarely have dates and have fewer sexual partners. Generally they are described as less active sexually. The primary description of introverts and extraverts was not made on the grounds of diametric opposition. Apart from that, Eysenck did not devote much of his attention to ambiverts, who are the most numerous group. They possess part of the traits of introverts and part of the traits of extraverts.

The dimension of neuroticism is made up of: anxiety, depression, sense of guilt, tension, low self-esteem, emotionalism, timidity, irrationality and glumness [28]. Eysenck and Eysenck [12] place personality in the standard level of balance of which is different than zero on one pole and an emotionally unstable personality on the other. Whereas Sanocki [20] thought that the extreme ends of the dimension are occupied emotionally unstable people on one side and by the people characterised by deficit of emotional sensitivity. High level of neuroticism is connected with the tendency for emotional lability and with complaints of different kinds of pain. Emotionally unstable people often feel anxious and restless. They are irritable and prone to nervous breakdowns [8]. They react very quickly to stressful situations and their level of arousal drops more slowly than in people emotionally stable. They are emotionally excitable and react too intensively to stimuli, even to the weak ones [30]. They also find it difficult to regain their balance after a period of excitement. Generally, strong emotions disturb a neurotic often giving rise to inadequate reactions.

High level of psychoticism is based on such traits as: increased tendency to aggression, impersonal attitude even towards people from one’s closest environment, emotional coolness and tendency to antisocial behaviour. Such people are often egocentric, lack of empathy. They are callous and often act on an impulse. All these traits are often accompanied by unconventional behaviour, which may create favourite conditions for creativity [12]. This hyperfunction includes tendency for adventurousness, often at any cost, regardless of threatening danger. Machiavellianism, obstinacy, lack of diligence and conciliatory manner are the traits attributed to people who score high results on this scale [1]. Psychoticism shows connections with domination – leadership – subordination and lack of superego. People defined as psychotic are often described as distrustful, unfriendly and weird, unable of auto-analysis. Quite frequently, they also experience persecution complex, loneliness, lack of empathy and they do not appear to have a sense of guilt [18]. The opposite pole on the psychotic scale is determined by the following traits: community spirit, altruism, empathy. High intensity of psychotic traits has been diagnosed in schizophrenics, alcoholics, prisoners, drug addicts and children displaying asocial behaviours [10]. There is also a high degree of probability of high scores on the scale achieved by close relatives of the people described above.
As it was mentioned above, the three dimensions of personality described by Eysenck are developed under the influence of interactions between genetic and environmental factors. They display connections with psychophysical and psycho-physiological. The intensity of the three super-factors is the same in all individuals throughout their lives in spite of flow of the years and diverse experiences. What is more, many data indicate that they have been identified in different cultures [13]. It is therefore assumed that the discussed dimensions of personality can be found across cultures and ethnic groups [14].

Material and method of research

The longitudinal research on the subject was a pilot study and it was carried out on three pairs of twin monozygotic infants: GG, BB, GB (G = girl; B = boy) and their mothers. All twins had, characteristic for infants born from multi-foetal pregnancies, traits of prematurity and the prenatal traits disadvantageously prognosticating for their development. It was assumed that the personality traits of mothers – from the point of view of Eysenck – could have a modifying influence on the rate and rhythm of psychomotor development of the children.

The Brunet-Lezine Psychomotor Development Test [7] was used for describing the level of psychomotor development of the twins in the following scales: locomotion and posture control (P), vision-motor coordination (C), speech (L) and social reactions (S). Neuroticism (N) – of mothers of the twins was determined on the grounds of the Eysenck Personality Questionnaire – Revised by Eysenck, Eysenck and Barrett, EPQ-R [13].

Results

The picture of psychoticism, extraversion and neuroticism of the examined twins

As shown in Fig. 2, all the studied children had progress in motor development diagnosed. However, none of the studied children reached the norm in this sphere of development either in the twelfth or in the fifteenth month of their lives. One twin of the GG pair was deeply disabled in its twelfth month of life. The situation did not change three months later. The other twin was considerably disabled in this respect.

On the grounds of the acquired results listed in Fig. 1, the mother of the pair BB can be characterised as ambivert, whereas the mother of GG and the mother of GB are extraverts.

It is possible to think that they are more sociable and open than the third examined mother. They are more likely to be attributed traits like jauntiness and assertiveness, their functioning requires external stimulation. They like being active and look for experiences. They are more impulsive than the mother of BB, whose emotional life is to a larger extent controlled by intellect. They are accompanied by more positive emotions, however. The experience of failure has the strongest influence on the mother of BB, the other two probably do not bother with failures. They are optimistic about the future. The state of arousal does not disturb their course of actions, to the contrary, it has a positive effect. Hence, they treat stressful situation as challenges and therefore they feel less stressed before public appearances. They are able to perform tiring tasks longer that the BB mother. It is easier for them to read facial and pantomimic expressions of their partners in an interaction. Moreover, the GG mother and the GB mother more strongly reveal domination attitudes than the third mother under investigation. The results of the neuroticism scale of the single-sex twins can be said to be emotionally balanced, whereas the results of the third mother reveal what can be described as moderate emotional balance. Which can make one think that she is less immune to the influence of stress generating factors. Furthermore, her emotions are stronger and last longer than in the other two mothers. The level of her arousal falls more slowly than in the cases of the other women, this is why it is more difficult for her to regain her balance. The other mothers, on the contrary, are less submissive to moods and are less sensitive or prone to yield to anxiousness. Frequency of changing moods is the highest in the mother of the GB twins. In terms of psychoticisms the highest score was achieved by the mother of the BB twins, which allows determining her as a more psychotic than the other two.

The level of psychomotor development of the studied twins

As shown in Fig. 2, all the studied children had progress in motor development diagnosed. However, none of the studied children reached the norm in this sphere of development either in the twelfth or in the fifteenth month of their lives. One twin of the GG pair was deeply disabled in its twelfth month of life. The situation did not change three months later. The other twin was considerably disabled in this respect.
Fig. 2. The level of psychomotor development of the studied twins
Fig. 3. Extraversion and the level of psychomotor development of twins
Fig. 4. Neuroticism of mothers and the level of psychomotor development of twins
Fig. 5. Psychoticism of mothers and the level of psychomotor development of twins.
On the other hand, mild disability in motor ability was observed in one of the twins of the BB pair, but in the fifteenth month of his life there was a slight improvement. The other twin turned out to be much better. In the twelfth month of his life the child was slightly disabled in terms of locomotion and posture control, but the measurement made in the 15th month of life revealed that his disability was only slightly lower than the norm. In the twelfth month of life of the mixed-sex twins, a slightly disabled locomotion was diagnosed. Whereas three months later, the quotient of locomotion development was lower.

In the development of visual-motor coordination of the studied twins, two pairs: GG and GB made progress in development. On the other hand, regress was diagnosed in one of the boys and in the other development was blocked. In the twelfth month of life, none of the studied children reached the norm in terms of the visual-motor coordination. Mild disability was diagnosed in one of the GG twins and lower level of development was diagnosed in the other. The pair BB was in identical situation, while lower level of visual-motor coordination was diagnosed in the pair GB in both the twelfth and the fifteenth month of life.

In social development, apart from one girl from the pair GG who was diagnosed to have regress in social development, all the other children were diagnosed to have made progress in development in the field of social reactions. In the twelfth month of their lives, none of the examined children could be attributed correct development in the field of social reactions. One twin from the GB pair was found to have considerable disability, while the other twin had only medium disability. Similar diagnosis was made to each of the twins from the BB pair. Whereas, light disability in the field of social reactions was found in children from the GB pair.

The mixed-sex twins and one boy from the BB pair attained the norm in this sphere in the fifteenth month of their lives. The other boy was slightly disabled, whereas the pair GG was disabled in a moderate degree.

In the twelfth month of their lives none of the studied children reached the correct level of development of communication skills. The pair BB was considerably disabled, as was one twin from the GG pair. The other twin was disabled to a slight degree, however, and so was the pair of mixed-sex twins. After three months slight progress in the development of speech was observed in all children apart from one twin from the BB pair, who was deeply disabled in the sphere and one twin from the GG pair whose disability was moderate.

Extraversion of mothers and the level of psychomotor development of twins

As results from Fig. 1, the mother of BB twins was diagnosed as an ambivert person. On the other hand, the results concerning intellectual sphere attained by the twins are evidence of very slow progress of development. The other examined women were characterised as extravertive. It was their children who could be attributed with higher harmoniousness and faster progress in motor and social development. Whereas the most intensive speed of development in terms of locomotion and posture control was observed in the mother who less extravertive.

It can be assumed that extraversion of the mothers favours the psycho-motor development of the children in all spheres of development. Only one twin from the GG pair was diagnosed to display regress in the intellectual sphere, but it is probably connected with her diagnosed neurological damages.

Neuroticism of mothers and psychomotor development of twins

The graph in Fig. 4 shows that neuroticism of mothers influences the psychomotor development of their children. The interesting thing is that moderate emotional balance has probably positive influence on the development of their children in each of its spheres. Significant progress in motor, social and intellectual development was observed in the GB pair of twins. Children of mothers diagnosed as emotionally well balanced also displayed progress in development, but it was not as rapid as that in the pair of twins of mixed sex. What is more, very few results achieved by these twins showed any symptoms of inhibition or regress in intellectual development.

Psychoticism of mothers and psychomotor development of twins

Results of the examination listed in Fig. 5 inform that psychoticism diagnosed in the mother negatively influences development, especially the intellectual development, of her children. The higher the intensity of this trait of personality was found in the analysed cases, the worse results the children obtained in the fields of visual-motor coordination and communication skills. The progress of their development was slower and rather disharmonious. No influence of mother’s moderate intensity psychoticism on motor and social development of her children was observed.

Discussion

The obtained results confirmed the hypothesis that mothers’ traits of personality can be recognised as modi-
fiers of motor, social and intellectual development of their children. Mother’s extraversion favourably influences psychomotor development of the child. If a parent possesses the trait, he or she is expected to engage in common activities with his/her child more easily. It is possible due to the fact that extraverts do not have any problems in establishing contact with people in general, which is connected with their developed ability to decode facial and pantomime messages. It probably makes it easier for extravert mothers to establish interaction with the child.

Easy reception and interpretation of non-verbal messages seems to be connected with the increased sensitivity to other people. This trait is, in turn, the necessary condition for a mother to be able first to notice and then to react correctly to the needs manifested by her child. Hence, it can be assumed that the episodes of shared involvement between extravertive mothers and their children occur more frequently and they result in progress in psychomotor development of the latter. Extravertive mothers probably undertake definitely more attempts to establish interactions with their children, and during the interactions they provide their children with help and support, for example by playing with them. It is connected with the need for activity attributed to the extraverts. It is necessary to stress the fact that in spite of unfavourable prenatal factors, there was progress of development observed in children of extravertive mothers. Therefore, the statement that extraversion of the minder modifies the influence of wrong biological factors on social and motor development seems justified. Moderate psychoticism diagnosed in a mother means her increased predisposition to aggressive behaviour towards the children and also emotional coldness in her interactions with them. They are not as warm and empathic as mothers with low intensity of the trait. It is the moderately psychotic mother that happens to undertake impulsive action towards her child, inconsiderate of its needs. In her interactions with the child, there will be a small number of episodes of common involvement that are necessary for the child to develop properly. It is partly confirmed by the obtained results of the research. Inhibition, or even regress in intellectual development was observed in children of the mother who was diagnosed to have a moderate intensity of this trait of personality. In spite of that, the children developed quite intensively in the motor and social spheres, which is perhaps a result of the fact that the influence of this trait of their mother’s on her caring activities is equalised by her other properties. The results of research concerning neuroticism turned out to be surprising. The most intensive and the most harmonious social, intellectual and motor developments were diagnosed in children of the mother moderately stable emotionally.

References
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