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**Regulation of Children-Parent  
Interactions and Psychomotor  
Development of Prematurely Born  
Children: A Review**

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## **Regulation of Children-Parent Interactions and Psychomotor Development of Prematurely Born Children: A Review**

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### **Abstract**

The number of extremely premature babies saved has been increasing in recent years. However, the babies in the group are at the highest risk of developmental disorders, and their parents experience the interruption of psychological processes, which are supposed to prepare them for having a child at a particularly early stage and in a dramatical manner. Therefore, the consequences of premature birth concern not only the baby, but also the whole family. As far as infants and babies are concerned, premature birth means, in particular, an increased risk of damaging the white and grey matter of the brain, negative health and developmental consequences, exposure to stimuli being not adapted qualitatively to the developmental stage of the central nervous system in the baby, prolonged hospitalisation, associated procedures and treatment necessary to save its life and health, causing pain and discomfort, as well as the specificity of contacts with others, i.e. both medical staff and other people. As to the parents, whose babies were born prematurely, they go through many crises, experience uncertainty, and hopelessness in responding to their parental role. From their perspective, premature birth is associated with experiencing a situation threatening to their child's life, the feeling of hopelessness, guilt, harm, as well as hope and the fear of having hope. The fear for the baby does not disappear at the moment when discharged from hospital; it often continues to exist for a much longer period. A premature baby tends to be a more difficult partner in interaction, as compared with a baby born at term. Similarly, a parent with a premature baby is generally a more difficult partner in interaction, as compared with a parent, whose baby was born at term. Improper interactive behaviour concerning one partner or both partners in interaction results in improper interactive regulation of the parent-child dyad. For babies born prematurely, it constitutes an additional and considerable factor interrupting their proper psychomotor development. This paper is demonstrative. It aims at the presentation of current research results concerning the specificity of interactive regulation in the parent-premature baby dyad as well as its connection with psychomotor development in premature babies. In addition, an attempt has been made to isolate protective factors for the formation of proper interactive regulation between parents and premature babies, and to draw conclusions relevant to the practice of early psychological intervention.

**Key Words:** interactive regulation, premature babies, psychomotor development, parents, review

## Introduction

Preterm birth is considered a traumatic event both from the child's and the parent's perspectives, which is connected with a new phenomenon of keeping alive a growing number of children born before the 28th week of pregnancy and with a very low body weight, i.e. below 1500g.<sup>1</sup>

From the child's perspective, preterm birth is mostly connected with the risk of brain damage, neurodevelopmental disorders, changes in the eyes and ears. Moreover, preterm children are exposed to environmental stimuli, which are not adapted to the development of their nervous system. Long-term hospitalisation as well as life-saving medical procedures do not only induce pain and discomfort, but also influence the specificity of their first contacts with other persons, including their parents.

From the parents' perspective, on the other hand, the trauma of preterm birth is connected with a sense that the child's life is at risk. They are accompanied by a sense of helplessness, guilt, grievance, hope and anxiety before hope. According to A. Libera (2009), factors which determine the perception of preterm birth as a traumatic event by parents also include the sudden disruption of psychological processes, which prepare the mother for the new baby's arrival, which may influence adaptation processes after the birth and early relations between the mother and the child.<sup>2</sup> Preterm children's parents exhibit elevated stress levels for a long period of time after the child's birth. Stress levels in mothers and fathers do not decrease the moment the child is discharged from the hospital. High levels of stress often persist for months and even years.<sup>3</sup>

It results from the research conducted so far that biological and mental consequences of the preterm birth trauma are connected with the specificity of interactive functioning of preterm children and their parents. It particularly applies to parents, who are described as more intrusive or, on the contrary, excessively withdrawn in their interactions with the child.<sup>4</sup> There are reports,

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<sup>1</sup>Vizziello, G. M. et al. 1995. Mothers' representation of children to be adopted and preterm one. [in:] Bitzer, J., and Stauber M. (ed.). *Psychosomatic Obstetrics and Gynaecology*, Bazylea: Monduzzi Editore. 223-229; Beresford, D. 1998. Parental adaptation to a baby with bronchopulmonary dysplasia. The psychological process. *Journal of Neonatal Nursing*. 4, 3, 13-16; Sjezer, M., and Barbier, C. 2000. Reflections on the notion of traumatism at birth. *International Journal of Prenatal and Perinatal psychology and Medicine*. 12, 1, 127-132.

<sup>2</sup>Libera, A. 2009. Poród przedwczesny. [in:] Makara- Studzińska, M., and Iwanowicz- Palus, G. (ed.). *Psychologia w położnictwie i ginekologii*. Warszawa, PZWL, 173-177.

<sup>3</sup>Jackson, K. et al. 2003. From alienation to familiarity: Experiences of mothers and fathers of preterm infants. *Journal of Advanced Nursing*. 43, 2, 120-129.

<sup>4</sup>Heidt – Kozisek, E., Pipp-Siegel, S., Easterbrooks, M. A., and Harmon, R. J. 1997. Knowledge of self, mother, and father in preterm and full-term toddlers. *Infant Behavior and Development*. 20,3, 311-324; Minde, K. 2000. Prematurity and serious medical conditions in infancy: Implications for development, behavior, and intervention. [in:] Zeanach, J (ed.). *Handbook of infant mental health*. New York: Guilford Press, 2, 176-194; Kmita, G. 2002. Trauma przedwczesnych narodzin: procesy radzenia sobie rodziców a rozwój dziecka (niepublikowana praca doktorska). Wydział Psychologii, Uniwersytet Warszawski; Kmita, G. 2003. Psychologiczna pomoc w traumie wcześniactwa. [w:] Kościelska, M and Aouil (red.).

however, which show more positive reactions of mothers of preterm children at a high risk of developmental disorders as compared to mothers of preterm children from the low-risk group and mothers of children born at term.<sup>1</sup> Numerous authors showed that the process of dealing with the mental trauma by the parents is connected with the dynamics and character of their first contacts with the child and, as a result, influences the development and quality of their bond.<sup>2</sup> Undoubtedly, a preterm child is often a more difficult partner for interactions than a child born at term. A lot of studies show difficulties of preterm children in attention<sup>3</sup> and emotion regulation.<sup>4</sup>

This paper is demonstrative. It aims at the presentation of current research results concerning the specificity of interactive regulation in the parent-premature baby dyad as well as its connection with psychomotor development in premature babies. In addition, an attempt has been made to isolate protective factors for the formation of proper interactive regulation between parents and premature babies, and to draw conclusions relevant to the practice of early psychological intervention.

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Człowiek niepełnosprawny. Sprawność w niepełnosprawności, Bydgoszcz, Wydawnictwo Akademii Bydgoskiej, 90-100; Feldman, R. 2007. Parent-infant synchrony and the construction of shared timing: Psychological precursors, developmental outcomes and risk conditions. *Journal of Child Psychology and Psychiatry*. 48, 3 / 4, 329-354; Hsu, H. C. and Jeng, S.F. 2008. Two-month-olds' attention and affective response to maternal still face: A comparison between term and preterm infants in Taiwan. *Infants Behavior and Development*. 31, 194-206.  
<sup>1</sup>Greenberg i Crric, 1988, after: Landry, 1990; S. H. Chabieski, L. Richardson, M., Palmer J., and Hall, S. 1990. The effects of specific medical complications associated with low birth weight on 3 years old's social competence. *Child Development*. 61, 1605-1616.

<sup>2</sup>Minde, K. 2000. Prematurity and serious medical conditions in infancy: Implications for development, behavior, and intervention. [in:] Zeanach, J (ed.). *Handbook of infant mental health*. New York: Guilford Press, 2, 176-194. Brisch, K. H., Bechinger, D., Betzler, S., and Heinemann, H. 2003. Early preventive attachment-oriented psychotherapeutic intervention program with parents of a very low birthweight premature infants: Results of attachment and neurological development. *Attachment and Human Development*. 5, 2, 120-235; Kmita, G. 2004. Wczesna interwencja psychologiczna wobec dzieci urodzonych przedwcześnie i ich rodzin w warunkach oddziały intensywnej opieki noworodkowej i patologii noworodka. [w:] Kmita, G., and Kaczmarek, T. (red). *Wczesna interwencja. Miejsce psychologa w opiece nad małym dzieckiem i jego rodziną*. Warszawa, Wydawnictwo EMU, 45-64.

<sup>3</sup>Als, H., and Glikerson, L. 1997. The role of relationship-based developmentally supportive newborn intensive care in strengthening outcome of preterm infants. *Seminars in Perinatology*. 21, 3, 178-189; Nadeau, L, Tessier, R., Boivin, M., Lefebore, F., and Robaey, P. 2003. Extremely premature and very low birthweight infants: A double hazard population? *Social document*. 12, 2, 235-248; Kmita, G. 2007. Przedwczesne narodziny: o odkrywaniu radości z bycia razem i rozwoju regulacyjnych funkcji [w:] Kmita, G. (red). *Małe dziecko i jego rodzina. Z teorii i praktyki wczesnej interwencji psychologicznej*. Warszawa, Wydawnictwo EMU, 71-80; Frye, R. E., Landry, S. H., Swank, P. R., and Smith, K., E. 2009. Executive dysfunction in poor readers born prematurely at high risk. *Developmental Neuropsychology*. 34, 3, 254-271.

<sup>4</sup>Feldman, R. 2007. Parent-infant synchrony and the construction of shared timing: Psychological precursors, developmental outcomes and risk conditions. *Journal of Child Psychology and Psychiatry*. 48, 3 / 4, 329-354.

## **Influence of Preterm Birth on the Parents-Child Relationship. Mutual Regulation Model**

The mutual regulation model assumes that the mother and her child form a dyadic system, and their interaction is mutually regulated in an active manner, owing to the mutual adjustment of their own reactions to the partner's behaviour within short time intervals.<sup>1</sup> Thus, the interactive exchange involves integration of two mutually connected processes, which occur in a parallel manner: interactive regulation and self-regulation.<sup>2</sup> Interactive regulation is co-created by both parties and even very small children take part in it, e.g. by focusing their attention on the partner or diverting their attention.<sup>3</sup> The notion of self-regulation refers to a person's ability to modulate, control and adapt one's own behaviours, emotions and attention to internal and external requirements and goals. The effectiveness of interactive regulation is determined by both the mother's and the infant's self-regulation abilities and the skill to adequately respond to the partner's behaviours.<sup>4</sup> However, the younger the child is, the greater the role of the adult as the partner, who somehow creates conditions for the occurrence of interaction.

Interactive regulation processes play a significant role in the child's social and emotional development<sup>5</sup>, as initially, the regulation of emotions, attention and behaviours occurs in a dyad and the child's capability of self-regulation begins to form with its development.<sup>6</sup> Factors likely to interfere with interactive regulation include depression symptoms in the mother, the child's sex and the context, in which the interaction occurs.<sup>7</sup> Hence, it seems that premature birth influences interactive regulation due to different perinatal experience of preterm children and their parents.

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<sup>1</sup>Beebe, B. 2003. Brief mother – infant treatment: Psychoanalytically informed video feedback. *Infant Mental Health Journal*. 24, 1, 24-52; Beebe, B. 2005. Mother- infant research informs mother-infant treatment. *Psychoanalytic Study of the Child*. 60, 7-46.

<sup>2</sup>Beebe, B., Jaffe J., Lachmann, F., Feldstein, S., Crown, C., and Jasnow, M. 2000, Systems models in development and psychoanalysis: The case of vocal rhythm coordination and attachment. *Infant Mental Health Journal*. 21, 1 / 2, 99-122.

<sup>3</sup>Beebe, B. 2006. Co-constructing mother-infant distress in face-to-face interactions: Contributions of microanalysis. *Infant Observation*. 9, 2, 151-164.

<sup>4</sup>Weinberg, M. K., Olson, K. L., Beeghly, M., and Tronick, E. Z. 2006. Making up is hard to do, especially for mothers with high levels of depressive symptoms and their infant sons. *Journal of Child Psychology and Psychiatry*, 47, 7, 670-683.

<sup>5</sup>Weinberg, M. K., Olson, K. L., Beeghly, M., and Tronick, E. Z. 2006. Making up is hard to do, especially for mothers with high levels of depressive symptoms and their infant sons. *Journal of Child Psychology and Psychiatry*, 47, 7, 670-683.

<sup>6</sup>Sroufe, 1995, after: Zeanah, C. H., Larrieu, J.A., Heller, S.S., and Valliere, J. 2000. Infant-parent relationship assessment. [w:] Zeanah, C. H. (ed). *Handbook of infant mental health*. New York: Guilford Press. 222-235.

<sup>7</sup>Weinberg, M. K., Olson, K. L., Beeghly, M., and Tronick, E. Z. 2006. Making up is hard to do, especially for mothers with high levels of depressive symptoms and their infant sons. *Journal of Child Psychology and Psychiatry*, 47, 7, 670-683.



Moreover, the motherly representation of a preterm child has its specificity.<sup>1</sup>

The results of the research conducted so far show that the first contacts of parents with preterm children are often disturbed due to perinatal complications, newborn babies' health problems, separation resulting from hospitalisation.<sup>2</sup> Feldman et al. (2003)<sup>3</sup> point out that the necessity of the child's staying in the incubator is the reason for disrupting the natural process of forming a bond between the child and the mother. The mother-child separation after the birth has a negative influence not only on the newborn child's physiology and behaviour,<sup>4</sup> but also on the woman's mental state. According to Lambrenos et al., the mere fact of giving birth to a preterm baby as well as information about the risk may influence the way the child's behaviour is perceived by the parents.<sup>5</sup>

According to M. Kosno (2010),<sup>6</sup> difficulties in the formation of emotional bonds between the parent and their preterm child are caused by the child at an earlier stage of development, so they may not be ready to receive sound or images coming from the parents; the child is at risk of neurological disorders, which can be connected with the appearance of difficult or abnormal behaviours; the period after the birth may be a source of enormous stress for parents and influence changes in their behaviour towards the child; various physical limitations (e.g. the child's stay in the intensive care unit); the child's too high or too low stimulation response threshold; low levels of attention concentration and excitement, the newborn baby's irritability.

It should be emphasised that so far, the results of research on the intensity of emotional bonds between parents and their preterm children

<sup>1</sup>Keren, M., Feldman, R., Eidelman, A. I., Sirota, L., and Lester, B. 2003. Clinical Interview for High-risk Parents of Premature Infants (CLIP) as a predictor of early disruptions in the mother-infant relationship at the nursery. *Infant Mental Health Journal*. 24, 2, 93-110.

<sup>2</sup>Brisch, K. H., Bechinger, D., Betzler, S., and Heinemann, H. 2003. Early preventive attachment-oriented psychotherapeutic intervention program with parents of a very low birthweight premature infants: Results of attachment and neurological development. *Attachment and Human Development*. 5, 2, 120-235; Kmita, G. 2004. Wczesna interwencja psychologiczna wobec dzieci urodzonych przedwcześnie i ich rodzin w warunkach oddziału intensywnej opieki noworodkowej i patologii noworodka. [w:] Kmita, G., and Kaczmarek, T. (red). *Wczesna interwencja. Miejsce psychologa w opiece nad małym dzieckiem i jego rodziną*. Warszawa, Wydawnictwo EMU, 45-64.

<sup>3</sup>Feldman, R., Weller, A., Sirota, L., and Eidelman, A. 2003. Testing a family intervention hypothesis: The contribution of mother infant skin-to-skin contact (kangaroo care) to family interaction, proximity and touch. *Journal of Family Psychology*. 1, 94-107.

<sup>4</sup>Hofer, 1995 za Feldman, R., Weller, A., Sirota, L., and Eidelman, A. 2003. Testing a family intervention hypothesis: The contribution of mother infant skin-to-skin contact (kangaroo care) to family interaction, proximity and touch. *Journal of Family Psychology*. 1, 94-107.

<sup>5</sup>Lambrenos, K., Calm, R. M., Weindling, A. M., Cox, A. D., Klenker, H., and Gregg, J. 1990. Does the pressure of neurological abnormality affect the way a mother perceives her preterm baby? *Journal of Reproductive and Infant Psychology*. 8, 291-292.

<sup>6</sup>Kosno, M. 2010. Kształtowanie się więzi między rodzicami a noworodkiem w pierwszych godzinach po porodzie, [w:] E. Lichtenberg –Kokoszka E., Janiuk E., Dzierżanowski J., (red), *Dziecko, aktywny uczestnik porodu. Zagadnienia interdyscyplinarne*, Kraków, Oficyna Wydawnicza „Impuls”.

are not consistent. Research by Feldman et al. (2003)<sup>1</sup> show that the relationship between a mother and her preterm child is characterised by less tenderness than the relationship between a mother and her child born at term. Israeli measurements of the intensity of the emotional bond in the case of preterm births show that mothers, as compared with fathers, are more often involved in interactions with the child and more often declare that newborns cause more problems to them than average children. Preterm birth causes the same sense of disappointment and anxiety in both parents. During the stay at hospital and a few weeks after discharge, the parents continued to signal greater difficulties in taking care of the child.<sup>2</sup> Further analyses showed similarities between both parents' statements concerning more difficult care of preterm children.<sup>3</sup> Levy-Shiff et al. (1990)<sup>4</sup> noticed that the frequency of preterm children's parents visit at the hospital was positively correlated with their positive perception of the child and with entering into broader and more positive relations with the child. European research proved, on the other hand, that mothers of preterm children and children born at term perceive their children in a similar manner; however, mothers of preterm children indicated significant difficulties in expressing their feelings towards their newborns.<sup>5</sup> A lower birth weight and long hospitalisation affect the delay in the mother's positive feelings towards her newborn baby.<sup>6</sup>

The mother's depression is connected with a high sense of stress and poses a significant threat to the development and the quality of the mother-child bond.<sup>7</sup> Research results show that the emotional state of preterm children's mothers does not depend on their children's health and is always different from the emotional state of mothers of children born at term.<sup>8</sup> Swedish research by Ulla Albertsson-Karlgren showed that 10 months after the birth, mothers hospitalised due to postpartum depression showed less tenderness in interactions with their children as compared to mothers hospitalised due to a somatic disease. Research conducted in Finland on a group of 125 mothers, who gave birth to children with the birth weight

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<sup>1</sup>Feldman, R., Weller, A., Sirota, L., and Eidelman, A. 2003. Testing a family intervention hypothesis: The contribution of mother infant skin-to-skin contact (kangaroo care) to family interaction, proximity and touch. *Journal of Family Psychology*. 1, 94-107.

<sup>2</sup>Bielawska-Batorowicz, E. 1995. *Determinanty spostrzegania dziecka przez rodziców w okresie poporodowym*. Łódź, Wydawnictwo Uniwersytetu Łódzkiego.

<sup>3</sup>Levy-Shiff and Mogliner, 1989, after: Bielawska-Batorowicz, E. 1995.

<sup>4</sup>Bielawska-Batorowicz, E. 1995.

<sup>5</sup>Bennett and Slade, 1991, after: Bielawska-Batorowicz, E. 1995.

<sup>6</sup>Gennaro, 1988, later: Bielawska, E. 1995.

<sup>7</sup>Murray, I. 1992. The impact of postnatal depression on infant development. *Journal of Child Psychology and Psychiatry*. 33, 541-561; Korja, R., Savonlahti, E., Ahlqvist – Björkroth, S., Stolt, S., Haataja, L., Lapinleimu, H. Piha, J., and Lehtonen, L., PIPARI study group. 2008. Maternal depression in associated with mother-infant interaction in preterm infants. *Acta Paediatrica*. 7, 724-730.

<sup>8</sup>Gennaro, 1988, after: Bielawska, E. 1995.

below 1500g in the 32nd week of pregnancy showed that 12.6% of them suffered from depression.<sup>1</sup>

Despite the fact that the majority of research pertaining to experience and feelings of preterm children's parents focused on mothers only,<sup>2</sup> more and more studies include both parents.<sup>3</sup> In research by T. LÖhr et al. (2000),<sup>4</sup> parents, as opposed to mothers, experienced less negative emotions in connection with the birth of a preterm child. They did feel insecure in their new role, but their first contacts with the children were dominated by positive feelings, such as tenderness, joy, surprise, curiosity. Mothers and fathers felt the same amount of anxiety about the child's life, health and proper development in the future. It turned out that mothers and fathers handle the stress connected with their child's prematurity in a different manner. Apart from looking for and mobilising a network of emotional and social support, mothers also used less adaptive strategies, such as blaming themselves and those around for the child's preterm birth. Fathers, on the other hand, had a smaller sense of guilt or grievance in connection with the child's preterm birth and generally adapted to the difficult situation more quickly than mothers. According to P. W. Fowlie (2004),<sup>5</sup> mothers look for support and focus on their experience more, while fathers prefer to focus on providing support to their wives rather than on confronting their own difficult experience.

The experience of both parents related to preterm birth can influence partnership relations and relations between the parents and the child. In

<sup>1</sup>Korja, R., Savonlahti, E., Ahlqvist – Björkroth, S., Stolt, S., Haataja, L., Lapinleimu, H. Piha, J., and Lehtonen, L., PIPARI study group. 2008. Maternal depression is associated with mother-infant interaction in preterm infants. *Acta Paediatrica*. 7, 724-730.

<sup>2</sup>McCluskey-Fawcett, K., O'Brien, M., Robinson, P, and Asay, J. H. 1992. Early transitions for the parents of premature infants: Implications for intervention. *Infant Mental Health Journal*. 13, 20, 147-156; Nyström, K, and Axelsson, K. 2002. Mothers' experience of being separated from their newborns. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*. 31, 275-282; Holditch-Davies, D., Bartlett, T. R., Blickman A. L. and Miles, M. S. 2003. Posttraumatic stress symptoms in mothers of premature infants. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*. 32, 161-171; Jotzo, M., and Poets, C. F. 2005. Helping parents cope with the trauma of premature birth: An evaluation of a trauma-preventive psychological intervention. *Pediatrics*, 115, 911-915.

<sup>3</sup>Lau, R. G. L. 2001. Stress experiences of parents with premature infants in a special care nursery (nieopublikowana praca doktorska). Department of Human Movement, recreation and Performance, Faculty of Human Development, Victoria University, Melbourne, Australia; Jackson, K., Ternstedt, B. M., and Schollin, J. 2003. From alienation to familiarity: Experiences of mothers and fathers of preterm infants. *Journal of Advanced Nursing*. 43, 120-129; Lau, R., and Morse, C. A. 2003. Stress experiences of parents with premature infants in a special care nursery. *Stress and Health*. 19, 69-78; Carter, J. D., Mulder, R. T., Bartram, A. F., and Darlow, B. A. 2005. Infants in a neonatal intensive care unit parental response. *Archives of Disease in Childhood: Fetal and Neonatal Edition*. 90, F97-F113; Shaw, R. J. Deblois, T., Ikuta, L., Ginzburg, K., Fleisher, B., and Koopman, C. 2006. Acute stress disorder among parents of infants in the neonatal intensive care nursery. *Psychosomatics*. 47, 206-212.

<sup>4</sup>LÖhr, T., Von Gontard, A., and Roth, B. 2000. Perception of premature birth by fathers and mothers. *Archives of Women's Mental Health*. 3, 41-46.

<sup>5</sup>Fowlie, P.W., and McHaffie, H. 2004. Supporting parents in the neonatal unit. *British Medical Journal*. 329, 1336-1338.

general, the support from their husbands has a significant influence on women's well-being<sup>1</sup> and indirectly has a beneficial influence on the quality of contacts between mothers and their children.<sup>2</sup> There are reports, however, that assuming the role of the representative of the mother's and child's interests in contacts with medical personnel, and especially replacing the mother for the child by the father, does not only increase the risk of depression in the mother deprived of priority in contacts with her newborn and may also have a negative effect on the dynamics of relationships between the parents and their preterm child for a long time (cf. Pacak, 2013).<sup>3</sup>

Research on interactions between fathers and their preterm children show that preterm children's fathers were more involved in taking care of the child and participated in a larger number of positive interactions with the child than fathers of children born at term. Additionally, fathers' involvement was observed during at least the first three years of the child's life.<sup>4</sup> However, fathers, who were strongly involved in taking care of and playing with their preterm children, reduced their involvement as soon as the child's behaviour ceased to differ from the population of peers born at term and without any medical complications.<sup>5</sup> In summary, it must be emphasised that there are reasons, which allow us to assume that the prematurity experience modifies fathers' behaviour and may have a significant influence on the father's relationship with the child, at least during the infancy and post-infancy periods. In view of the results obtained in some studies, prematurity (as the child's quality) is even regarded as a separate factor regulating or determining the degree of paternal involvement.<sup>6</sup> However, there are not enough studies focusing only on preterm children's fathers however, those appearing to be clinical observations on the beginnings of fatherhood can be generalised to the statement that preterm children's fathers enter parenthood with different experiences and competences than fathers of children born at term.<sup>7</sup> It seems that their experience may create specific grounds for the emotional

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<sup>1</sup>O'Brien, Asay and McCluskey-Fawcett, 1999, after: Lee, T.Y., Miles, M.S., Holditch-Davies, D. 2006. Fathers' support to mothers of medically fragile infants. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*. 35, 46-55.

<sup>2</sup>Holditch-Davies et al., 2004, Traustadottir, 1991, after: Lee et al., 2006.

<sup>3</sup>Pacak, A. 2013. Przedwczesne narodziny dziecka: z badań nad doświadczaniem wcześniactwa w przeżyciach ojców I umysłową reprezentacją więzi ojca z dzieckiem. [w:] Kmita, G. (red.). Dziecko urodzone przedwcześnie i jego rodzice. Warszawa, Wydawnictwo PARADYGMAT.

<sup>4</sup>Harrison, 1990, Yogman, 1987, later: Kmita, G. 2002. Trauma przedwczesnych narodzin: procesy radzenia sobie rodziców a rozwój dziecka (niepublikowana praca doktorska). Wydział Psychologii, Uniwersytet Warszawski.

<sup>5</sup>Marton et al., 1981, Tzu-Ying Lee et al. 2006, after: Lee, T.Y., Miles, M.S., Holditch-Davies, D. 2006. Fathers' support to mothers of medically fragile infants. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*. 35, 46-55.

<sup>6</sup>Harrison, 1990, after Kmita, 2002; Marton, Minde and Perrotta, 1981, after: Lee et al., 2006.

<sup>7</sup>Kaarensen, P. I., Ronning, J. A., Ulvund, S.E., and Dahl, L.B. 2006. A randomized, controlled trial of the effectiveness of an early-intervention program in reducing stress after preterm birth. *Pediatrics*. 118, 9-19.

bond with the child. The issue of the influence of the specificity of the experience of preterm children's fathers on the father-child relationship, especially in the long run.

A lot of studies on parents' experience and psychological consequences of prematurity for family relationships do not go beyond the period of hospitalisation. Their results however deserve special attention due to the possible long-term effects of prematurity for the whole family. Stress of a preterm child's parents does not often end at discharge from hospital as the preterm child's developmental specificity<sup>1</sup> contributes to the fact that families of some preterm children (especially of extremely immature children with low birth weight and serious complications) for the first years of the child's life face problems similar to those experienced by families of chronically ill children.

In extreme cases, parents' difficulties in first contact with their prematurely born child may be later transformed into serious disorders of relationships, such as negligence and even violence against the child.<sup>2</sup>

First research on the formation of bonds between parents and preterm children was conducted by Marshall and Kennelaa from the Cleveland University proved to be terrifying "In the United States, 39% of all children ruthlessly maltreated by their parents were preterm children kept in incubators for the first weeks of their life" (cf. Chrzan-Dętkoś, 2012).<sup>3</sup>

Other research, also by M.S. Miles and D. Holditch-Davies (1997)<sup>4</sup> point out that parents in the child's third year of life show an attitude which can be called "compensation parenthood". This attitude is characterised by increased simulation and attention, protection of children and difficulties with setting boundaries which is also connected with the child being perceived as exceptional, on the one hand, and as average, on the other hand. It is not known how far the mother's tendency to perceive the child through the prism of "the preterm child's stereotype"<sup>5</sup> or parents' tendency to treat the child as "normal", and still - despite the lapse of time - as requiring special protection and care<sup>6</sup> can have a beneficial or negative

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<sup>1</sup>Helwich, E. (red). 2002. Wcześnień. Warszawa, Wydawnictwo Lekarskie PZWL; Kornacka, M. K. (red). 2003. Noworodek przedwcześnie urodzony-pierwsze lata życia. Warszawa, Wydawnictwo Lekarskie PZWL; Linden, D.W., Paroli, E. T., i Dordon, M. W. 2007. Wcześnień. Pierwsze 6 lat życia. Warszawa, Wydawnictwo Lekarskie PZWL.

<sup>2</sup>Sullivan and Knutson, 2000, after: Browne, J.V. 2003. New perspectives on premature infants and their parents. *Zero To The Three Journal*. 24, 4-12.

<sup>3</sup>Chrzan-Dętkoś, M. 2012. Wcześnieńki. Rozwój psychoruchowy w pierwszych latach życia. Gdańsk, Wyd. Harmonia Universalis.

<sup>4</sup>Miles, M.S., and Holditch-Davies, D. 1997. Parenting the prematurely born child: Pathways of influence, *Seminars in Perinatology*. 21, 3, 254-256.

<sup>5</sup>Stern and Karraker, 1989, after: Stern, M., Karraker, K.H., Sopko, A. M., and Norman, S. 2000. The prematurity stereotype revisited: Impact on mothers' interactions with premature and full-term infants. *Infant Mental Health Journal*. 21, 495-509.

<sup>6</sup>Miles and Holditch-Davies, 1997, after: Kmita, G. 2002. Trauma przedwczesnych narodzin: procesy radzenia sobie rodziców a rozwój dziecka (niepublikowana praca doktorska). Wydział Psychologii, Uniwersytet Warszawski.

influence on the nature of parents-child relationships and on the child's development.

Preterm birth is not only connected with improperly shaped parent-child relationships and it may have a disadvantageous influence on the formation of children-parents relations.

A significantly higher percentage of anxiety-based attachment occurs among preterm children from the group of higher risk of medical complications. In stressful situations, when deprived of their mothers' support, preterm children do not handle nervous tension as well as children born at term.<sup>1</sup>

Numerous authors emphasise that mothers of preterm children must be more sensitive to their reactions and be more active in contacts with them, as preterm children are less sensitive to their parents' behaviours, less alert and also show fewer positive emotions, lower activity and willingness to explore and a tendency to greater closeness to the mother.<sup>2</sup>

Existing research in the assessment of interactive regulation processes in mother-preterm infant dyads shows that they are characterised by a lower level of synchronisation, which is both connected with the mother and the child.<sup>3</sup> Mothers of preterm infants more rarely initiated face-to-face contacts,<sup>4</sup> they are less willing to talk to the infant and touch them less frequently.<sup>5</sup> As a result, they are more passive and withdrawn.<sup>6</sup> Other reports show, on the other hand that they can be overly active and intrusive, which compensates for the infant's low involvement.<sup>7</sup>

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<sup>1</sup>Cox, S.M. at al. 2000. Attachment in preterm infants and their mothers: neonatal risk status and maternal representations. *Infant Mental Health Journal*. 21, 6, 464-480; Brish, K. H., at al. 2005. Attachment quality in very low-birthweight premature infants in relation to maternal attachment representations and neurological development. *Parenting: Science and Practice*. 5, 4, 311-331.

<sup>2</sup>Field, T. 1987. Interaction and attachment in normal and atypical infants. 55, 6, 853-859; Golderg, W. A. 1988. Risk factors in infant-mother attachment, *Canadian Journal of Psychology*. 42, 173-188.; Davis, D. at.al. 2003. Mother- infant interaction in premature infants at three months after nursery discharge, *International Journal of Nursing Practice*. 9, 374-381.

<sup>3</sup>Feldman, R. 2007. Parent-infant synchrony and the construction of shared timing: Psychological precursors, developmental outcomes and risk conditions. *Journal of Child Psychology and Psychiatry*. 48, 3 / 4, 329-354.

<sup>4</sup>Cox, S. M., Hopkins, J., and Hans, S. L. 2000. Attachment in preterm infants and their mothers: Neonatal risk status and maternal representations. *Infant Mental Health Journal*, 21, 6, 464-480.

<sup>5</sup>Keren, M., Feldman, R., Eidelman, A. I., Sirota, L., and Lester, B. 2003. Clinical Interview for High-risk Parents of Premature Infants (CLIP) as a predictor of early disruptions in the mother-infant relationship at the nurse. *Infant Mental Health Journal*. 24, 2, 93-110.

<sup>6</sup>Schmucker, G., Brich, K. H., Kohntop, B., Betzler, S., Osterle, M., Pohlandt, F., Pokorny, D., Lauch, M., Kachele, H., and Buchheim, A. 2005. The influence of prematurity, maternal anxiety and infant's neurobiological risk on mother-infant interactions. *Infant Mental Health Journal*. 26, 5, 423-441.

<sup>7</sup>Minde, K. 2000. Prematurity and serious medical conditions in infancy: Implications for development, behavior, and intervention. [in:] Zeanach, J (ed.). *Handbook of infant mental health*. New York: Guilford Press, 2, 176-194.

Relationships between the parents and their preterm child may depend on the child's sex and birth weight. Mothers more often communicate verbally and more expressively with high-risk girls than with boys.<sup>1</sup> Mothers have more positive relationships with children with higher birth weight.<sup>2</sup>

Also, the parent's qualities, such as age, education, ethnicity, received social support, marriage quality, personality traits, influence relationships with the child.

Afro-American mothers of preterm children showed less warmth towards their children aged 1 to 3, which was manifested by the fact that they talked to the child less, they touched the child less often and used more negative control strategies as compared to white mothers.<sup>3</sup> Children of Afro-American fathers, on the other hand, not only developed better than children of white fathers, but they were also more attached to them.<sup>4</sup>

Preterm children's mothers giving birth at an older age are more emotionally responsive towards children 6 to 36 months old as compared to younger mothers.<sup>5</sup>

Structured telephone interviews with 20 British mothers of preterm children with GA of 23-24 weeks after discharge from the neonatal ward showed that mothers feel insecure and anxious when in contact with their own children. Moreover, they perceived their children as drowsy and non-responding to their signals. Women needed information about contacts with the infant and forms of play.<sup>6</sup>

Preterm children are more difficult partners in interactions than children born at term as they have difficulties in regulation attention<sup>7</sup> and emotions.<sup>8</sup>

Preterm children have problems with face-to-face interactions as their attention is more difficult to stimulate and keep.<sup>1</sup> As mentioned above,

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<sup>1</sup>Chao et al, 2004, after: Holditch-Davies, D., Bartlett, T. R., Blickman A. L. and Miles, M. S. 2003. Posttraumatic stress symptoms in mothers of premature infants. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*. 32, 161-171.

<sup>2</sup>Feingold, C. 1994. Correlates of cognitive development in low-birth-weight infants from low-income families. *Journal of Pediatric Nursing*. 9, 91-97.

<sup>3</sup>Holditch – Daves, D., Schwartz, T., Black, B., and Scher, M. 2007. Correlates of mother-premature infants interaction. *Research in Nursing and Health*. 30, 333-346.

<sup>4</sup>Yogman, M., Kindlon, D., and Earls, F. 1995. Father involvement and cognitive behavioral outcomes in preterm infants. *Journal of The American Academy of Child and Adolescent Psychiatry*. 34, 58-66.

<sup>5</sup>Engelke, M.K., Engelke, S.C. 1992. Predictors of the home environment of high –risk infants. *Journal of Community Health Nursing*. 9, 171-181.

<sup>6</sup>Nicolaou, M., Rosewell, R., Marlow, N., Glazebrook, C. 2009. Mothers' s experiences of interacting with their premature infants. *Journal of Reproductive and Infant Psychology*. 27, 2, 182-194.

<sup>7</sup>Als, H., and Glikerson, L. 1997. The role of relationship-based developmentally supportive newborn intensive care in strengthening outcome of preterm infants. *Seminars in Perinatology*. 21, 3, 178-189.

<sup>8</sup>Smith, L., and Ulvrund, S. E. 2003. The role of joint attention in later development among preterm children: Linkages between early and middle childhood. *Social Development*, 12, 2, 222-234.

mothers also find face-to-face contacts difficult and withdraw from the contact.<sup>2</sup> They are reports showing that preterm children have difficulty in divisibility of attention<sup>3</sup> and also in the attention orientation function.<sup>4</sup>

Difficulties in regulating emotions of preterm children are preceded by problems in regulating excitement states.<sup>5</sup> In the long term, preterm children exhibit negative emotions more frequently than children born at term,<sup>6</sup> they are characterised by a lower activity in interactions and greater immaturity in signalling their needs as well as in responding to social stimuli.<sup>7</sup> As a result, mothers may find it difficult to notice an interaction partner in the child and interpret their signals incorrectly (cf. Kmita 2013).<sup>8</sup>

In summary, parent-preterm child interactive difficulties are caused by various interfering factors connected with the preterm birth trauma. Authors emphasise the importance of the child's early separation from their parents, which is caused by the necessity of staying in an incubator and next, at the intensive neonatal care and the context, in which the first contacts occur. Stress experienced by parents, and, in particular, mothers' depression, as well as children's biological immaturity manifested by difficulties in processing

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<sup>1</sup>Landry, Schmidt and Richardson, 1986 za: Smith, L., and Ulvrund, S. E. 2003. The role of joint attention in later development among preterm children: Linkages between early and middle childhood. *Social Development*, 12, 2, 222-234.

<sup>2</sup>Feldman, R. 2007. Parent-infant synchrony and the construction of shared timing: Psychological precursors, developmental outcomes and risk conditions. *Journal of Child Psychology and Psychiatry*. 48, 3 / 4, 329-354.

<sup>3</sup>Smith, L., and Ulvrund, S. E. 2003. The role of joint attention in later development among preterm children: Linkages between early and middle childhood. *Social Development*, 12, 2, 222-234.

<sup>4</sup>Weijer-Bergman, E., Wijnrox, L., Jongmans, M. J. 2007. Attention development in infants and preschool children born preterm: A review. *Infant Behavior and Development*. 31, 333-351.

<sup>5</sup>Kmita, G. 2007. Przedwczesne narodziny: o odkrywaniu radości z bycia razem i rozwoju regulacyjnych funkcji [w:] Kmita, G. (red). Małe dziecko i jego rodzina. Z teorii i praktyki wczesnej interwencji psychologicznej. Warszawa, Wydawnictwo EMU, 71-80; Hsu, H. C. and Jeng, S.F. 2008. Two- months-olds attention and affective response to maternal still face: A comparison between term and preterm infants in Taiwan. *Infants Behavior and Development*. 31, 194-206.

<sup>6</sup>Feldman, R. 2007. Parent-infant synchrony and the construction of shared timing: Psychological precursors, developmental outcomes and risk conditions. *Journal of Child Psychology and Psychiatry*. 48, 3 / 4, 329-354.

<sup>7</sup>Heidt-Kozisek, E., Pipp-Siegel, S., Easterbrooks, M.A., and Hormon, R. J. 1997. Knowledge of self, mother, and father In preterm and full-term toddlers. *Infant Behavior and Development*. 20, 3, 311-324; Kmita, G. 2002. Trauma przedwczesnych narodzin: procesy radzenia sobie rodziców a rozwój dziecka (niepublikowana praca doktorska). Wydział Psychologii, Uniwersytet Warszawski; Kmita, G. 2007. Przedwczesne narodziny: o odkrywaniu radości z bycia razem i rozwoju regulacyjnych funkcji [w:] Kmita, G. (red). Małe dziecko i jego rodzina. Z teorii i praktyki wczesnej interwencji psychologicznej. Warszawa, Wydawnictwo EMU, 71-80.

<sup>8</sup>Kmita, G. and Majewska, M. 2013. Regulacja interakcyjna w diadach matka-niemowlę urodzone przedwcześnie. [w:] Kmita, G. (red). Dziecko urodzone przedwcześnie i jego rodzice. Wybrane zagadnienia psychologiczne. Warszawa, Wydawnictwo PARADYGMAT, 105-124.



information, keeping attention and organising behaviours are further significant factors (cf. Mieszkowska 2013).<sup>1</sup>

### **Psychomotor Development of Preterm Children in the Context of Parent-Child Relationships**

The child's proper development is determined not only by their condition at birth and genetic or paragenetic factors, but also environmental factors are also very important here. We now have more knowledge on the importance of mother-child relationships for the child's proper psychomotor development.<sup>2</sup> As regards preterm children, there is definitely much less research evaluating the connection between the parent-child relationship (especially father-child) and psychomotor development at further stages of ontogenesis. However, the research conducted shows that the mother-child interaction influences the child's development.<sup>3</sup> Also, Nicolaou et al. think that positive mother-child interactions are important for the child's development, especially in the case of preterm children.<sup>4</sup> Research by Affleck et al. (1983)<sup>5</sup> on a group of mothers with high-risk children, the majority of whom experienced developmental delays, showed that infants perceived by their mothers as more active had a tendency for greater flexibility and were characterised by a lesser extent of developmental delays. Furthermore, mothers of these children more frequently entered in interactions and were more responsive.

### **Implications for Psychological Intervention**

In the light of the quoted research results, intervention targeted at parent-preterm child interactions is highly justified. It seems that it can be a very significant method for preventing or reducing at least some developmental

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<sup>1</sup>Mieszkowska, A. 2013. Gotowość do podejmowania perspektywy dziecka i wzorce regulacji interakcyjnej w diadzie matka-niemowlę urodzone przedwcześnie[w:] Kmita, G. (red). Dziecko urodzone przedwcześnie i jego rodzice. Wybrane zagadnienia psychologiczne. Warszawa, Wydawnictwo PARADYGMAT, 65-81.

<sup>2</sup>Bowlby, J. 1972; Bullova, M. (ed). 1979; Gracka, M. 1991; Stern, D. N. 1985, after: Kmita, G. 2002. Trauma przedwczesnych narodzin: procesy radzenia sobie rodziców a rozwój dziecka (niepublikowana praca doktorska). Wydział Psychologii, Uniwersytet Warszawski;

<sup>3</sup>Stern i Karraker, 1990, Forcada-Guex at all, 2006, Smith at al., 2006 za Holditch-Davies, D., Bartlett, T. R., Blickman A. L. and Miles, M. S. 2003. Posttraumatic stress symptoms in mothers of premature infants. *Journal of Obsteric, Gynecologic, and Neonatal Nursing*. 32, 161-171.

<sup>4</sup>Nicolaou, M., Rosewell, R., Marlow, N., Glazebrook, C. 2009. Mothers' s experiences of interacting with their premature infants. *Journal of Reproductive and Infant Psychology*. 27, 2, 182-194.

<sup>5</sup>Affleck, G., Allen, D., McGrade, B.J., and McQueeney, M. 1983. Maternal and child characteristics associated with mother' s perceptions of their high risk/ developmentally delayed infants. *The Journal of Genetic Psychology*. 142, 171-180.

effects of preterm birth. According to G. Kmita and M. Majewska (2013)<sup>1</sup>, it should be available for such children's families at various stages of the child's development, according to their individual developmental path and the specificity of patterns of the parent-child interaction.

In psychological intervention for the parents of preterm children, attention should be paid to the following issues: providing help to both mothers and fathers; allowing the parents to reflect on both their own and the child's experience and on their bond; building a fuller image of the child, e.g. perceiving them not only through the prism of anxiety connected with hospital experience, prematurity, the risk of disability, but also through their resources; supporting the parents in reading the child's signals correctly and responding to them in a sensitive manner and in creating opportunities for the child's own spontaneous activity; increasing the awareness of experience, behaviours and their influence on mutual relations; supporting parents in their ability to cope with stress as well as in parental attitudes.<sup>2</sup>

While working with the child, the therapist should make himself/herself available as an involved person so that the child can enter interactions with him/her. In this way, the building of closeness and attachment is modelled, i.e. a way of being with another person, which assumes an attempt to understand their state of mind and needs. It is particularly important in a situation when the parent, due to their emotional experience - a high level of anxiety, depression, stress, was not able to respond to the child's signals. Another important issue involves helping the child to regulate internal states by adjusting to their needs and responding to them, e.g. waiting for vocalisation or the child's non-verbal response in the case of younger infants, while play has an important regulatory role in older infants or children.<sup>3</sup>

Psychological intervention should be based, on the one hand, on analysing and supporting the partners' interactive behaviours, and on releasing parental representation from the trauma, always in the context of the child's individual developmental path.

## Summary

The research results presented show the necessity of further observations of the mother-preterm child interactive regulation and mostly father-preterm child in the context of the child's psychomotor development and undertaking

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<sup>1</sup>Kmita, G., and Majewska, M. 2013. Regulacja interakcyjna w diadach matka-niemowlę urodzone przedwcześnie. [w:] Kmita, G. (red). Dziecko urodzone przedwcześnie i jego rodzice. Wybrane zagadnienia psychologiczne. Warszawa, Wydawnictwo PARADYGMAT, 105-124.

<sup>2</sup>cf. Kmita, G., and Majewska, M. 2013. Regulacja interakcyjna w diadach matka-niemowlę urodzone przedwcześnie. [w:] Kmita, G. (red). Dziecko urodzone przedwcześnie i jego rodzice. Wybrane zagadnienia psychologiczne. Warszawa, Wydawnictwo PARADYGMAT, 105-124.

<sup>3</sup>Chrzan-Dętkoś, M. 2012. Wcześnieiki. Rozwój psychoruchowy w pierwszych latach życia. Gdańsk, Wyd. Harmonia Universalis.

therapeutic activities. Long-term observations are of particular importance here.

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