

THE EGO UNDER OBSERVATION

**Childpsychiatric Study of 40 three year old low birthweight children and 40
three year old full term and normal birthweight children.**

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....."I say that a man must be serious with the serious, and not the other way about. God alone is worthy of supreme seriousness, but man is made God's plaything and that is the best part of him. Therefore every man and woman should live accordingly, and play the noblest games, and be of another mind of what they are at present. For they deem war a serious thing, though in war there is neither play nor culture worthy of the name, (ὄυτ δυν παιδία... ὄυτ ἄν παιδεία) which are the things we deem most serious. Hence all must live in peace as well as they possibly can. What, then, is the right way of living? Life must be lived as play, playing certain games, making sacrifices, singing and dancing, and then a man will be able to propitiate the gods, and defend himself against his enemies, and win in the contest".

Plato, the Laws, 803-4.

Voor mijn ouders.
Voor Steffie, voor Marieke en Merlijn,
en voor Joost.

LIST OF ABBREVIATIONS

LBW	= Low Birth Weight: < 2500 g.
VLBW	= Very Low Birth Weight: usually in the literature: < 1500 g.
SFD	= Small-for-Date
SGA	= Small for gestational age
AGA	= Appropriate for gestational age
\bar{X}	= mean value

CONTENTS

INTRODUCTION	11
CHAPTER I PROBLEM DEFINITION/THEORETICAL ORIENTATION/DESIGN	13
1. The developmental task	14
2. The Ego	15
3. The Ego and the child of low birth weight	16
CHAPTER II EXPLORATORY STUDY	19
CHAPTER III THE EGO UNDER OBSERVATION	25
1. Observing without interpreting	26
2. The Ego as a precondition of socialization	27
3. The Ego on the treshold of the oedipal phase	27
4. The Ego as organizer and mediator	28
4.1. <i>The separation-individuation process: The I-consciousness</i>	28
4.2. <i>The aims of integration</i>	28
4.3. <i>The essential developmental step from action toddler to language toddler</i>	29
4.4. <i>The child's play and its relation to Ego development</i>	30
a. <i>Winnicott on play</i>	31
b. <i>Erikson on play</i>	32
c. <i>Bruner on play</i>	33
d. <i>Piaget on play</i>	34
CHAPTER IV METHOD	37
1. Study design	37
2. Child-psychiatric testing procedure	43
3. Operationalization of	

<i>Ego Items</i>	44
<i>Play Items</i>	47
4. Protocol for the data	50
5. Scale analysis "Guttman"	51
CHAPTER V CONSTRUCTION OF GUTTMAN SCALES	55
A. Ego scale	55
B. Play scale	57
C. Ego-play scale	58
CHAPTER VI HYPOTHESES AND PREDICTIONS	61
CHAPTER VII RESULTS	65
Part I : Child psychiatric results	65
A. <i>Ego score on the ego scale</i>	67
B. <i>Play score on the play scale</i>	73
C. <i>Ego-play score on the ego-play scale</i>	78
D. <i>Comparison of the "matched pairs"</i>	83
Part II : Intelligence test	84
Part III: Degree of correlation between "perinatal risk factors" and the results at three years of age	88
CHAPTER VIII DISCUSSION OF THE RESULTS	97
I. Summary of the results	97
II. Evaluation of the results	98
III. Relevance of observations	100
IV. Comparisons of the results with data from the literature 101	
A. <i>General comments</i>	101
B. <i>Specific comparisons</i>	103
Part 1: <i>Child psychiatric results</i>	103
1. <i>Ego functions and competence</i>	103
2. <i>Play results</i>	108
3. <i>Differences between LBW boys and LBW girls</i>	110
Part 2: <i>IQ results in the research literature on LBW children</i> 112	
a. <i>General comments</i>	112
b. <i>Some studies for comparison</i>	113
Part 3: <i>Comparisons with the research data in the literature as regards "perinatal risk factors" and their impact on development</i>	115

a. <i>General points</i>	115
b. <i>Specific comparisons</i>	117
1. <i>The significance of birth weight in relation to gestational age</i>	118
2. <i>Respiratory Distress Syndrome</i>	118
3. <i>Artificial Respiration</i>	119
4. <i>Acidemia</i>	120
5. <i>Duration of Admission</i>	120
6. <i>Birth Weight</i>	121
V. Explanatory model of the findings from a developmental standpoint	123
1° <i>Explanation of the differences found between the LBW-children and the reference children</i>	123
A. <i>A general developmental sequence as an explanatory model</i>	123
B. <i>Development of visual attention and visually guided reaching</i>	124
C. <i>A more specific developmental sequence as an explanatory model</i>	125
D. <i>Differences in behavioural states in neonates: LBW babies versus full-term, full-birth-weight babies</i> ...	126
E. <i>Consequences for the LBW child and for the Mother-Child-Relationship</i>	128
2° <i>Explanation of the differences found between boys and girls in favour of the girls</i>	131

CHAPTER IX APPLICATIONS: THE LIFE CYCLE OF THE LOW-BIRTH-WEIGHT CHILD	139
1. Antenatal	139
2. Perinatal	141
3. Postnatal	144
1. <i>"A syndrome of transient dystonia"</i>	145
2. <i>"A vulnerable child syndrome"</i>	148
3. <i>"Failure to thrive"</i>	149
4. <i>"A battered child syndrome"</i>	151
5. <i>Two extra-vulnerable psychological functions</i>	151
I. <i>Auditory Directedness - "Early childhood language delay"</i>	151
II. <i>Visual Orientation - "Visual disorders"</i>	153

APPENDIX

- Computer output of the Guttman Scalogram Analysis	156
-Examples of child psychiatric reports	159
SUMMARY	165
SAMENVATTING	171
REFERENCES	177
POSTSCRIPTUM	185
CURRICULUM VITAE	188

*"But I, that am not shaped for sportive tricks
nor made to court an amorous looking-glass;
I, that am rudely stamped, and want love's majesty
to strut before a wanton ambling nymph;
I, that am curtailed of this fair proportion,
cheated of feature by dissembling Nature,
deformed, unfinished, sent before my time
into this breathing world scarce half made up,
and that so lamely and unfashionable
that dogs bark at me as I halt by them -
Why, I, in this weak piping time of peace,
have no delight to pass away the time,
unless to spy my shadow in the sun
and descant on mine own deformity".*

(Shakespeare, Richard III: I, 1, 14-27)

INTRODUCTION

This comparative child-psychiatric study of a group of three-year-old children of low birth weight and a control group of full-term children had its origins in the co-operation which exists between the department of paediatrics and the department of child psychiatry in Sophia Children's Hospital in Rotterdam.

Thanks to an increasing paediatric competence which finds expression in the highly specialized neonatal intensive care unit, the low-birth-weight child has an ever better prognosis as regards chances of surviving without serious physical sequelae (leaving aside the group with extremely low birth weights).

The "Lancet" article of March 1971 entitled "Changeing prognosis for infants of very low birth weight" (Rawlings et al.) is, as it were, the exponent of this great medical progression. Alongside this, clinical experience had already taught paediatricians and child psychiatrists, via a lot of casuistics, that the overall development of the low-birth-weight child - its development not merely from a somatic but also from an affective and cognitive viewpoint - is not always satisfactory.

This gave rise to the question whether, from the standpoint of developmental psychology, children of low birth weight constituted a risk group. In order to acquire more comprehensive information than was to be found in most of the available literature, it was decided to undertake a combined intelligence and child-psychiatric study.

The study has been restricted to a group of children tested at the age of three years. We are aware that this has its limitations: some researchers are more interested in development during the first year of life; others prefer to base their opinions on the low-birth-weight child during or after puberty, because it is only in adolescence that identity and character are definitively established.

This study, therefore, claims to do no more than answer the following question: based on the group investigated, how far has the low-birth-weight child come at three years of age with his developmental task compared with his full-term contemporary, and what does he have to contend with in terms of vulnerability?

We hope that - independently of what, as an answer of this question, the study proves - our dissertation will contribute to what Anna Freud (1978, p. XI) so beautifully called "the profile of the vulnerable child" and that it will do so to the benefit of the low-birth-weight child. Let it not be a piece of steel from which can be fashioned a prognostic sword of Damocles to be aimed at the child of low birth weight. After all, in Erikson's (1950, p. 274) epigenetic diagram "hope" belongs with "basic trust".

May the versus of Heinrich Heine, cited by Sigmund Freud (1914, p. 85) in his "Zur Einführung der Narzismus", be an alternative to the picture of wounded deformity drawn by Richard the Third:

*"Krankheit ist wohl der letzte Grund
Des ganzen Schöpferdrangs gewesen;
Erschaffend konnte ich genesen
Erschaffend wurde ich gesund."*

CHAPTER I
**PROBLEM DEFINITION, THEORETICAL
ORIENTATION AND DESIGN**

The decision to set up a comparative child-psychiatric study of 40 three-year-old children of low birth weight and 40 three-year-old full-term children matched in pairs was based on the question to what extent low-birth-weight children are high-risk children, i.e. to what extent, in spite of ever better perinatal care (paediatric high care), do they have problems with their affective and intellectual development? In other words, the aim of the study is to determine, from a clinical child-psychiatric viewpoint, what these vulnerabilities are.

An exploratory study (see chapter II) showed that a scrupulous comparison with contemporaries in whom this risk factor is absent is a good method of getting to know the clinically relevant problems in these children. Scattered remarks in the paediatric literature in this area indicated that experts from the paediatric world (Drillien, 1972; Saint-Anne Dargassies, 1979) also considered 3 years to be a suitable age for evaluating the low-birth-weight child. A distinction can already be made at this age between "major handicaps" (i.e. neurological defects, serious sensory defects or an IQ < 70-85, or a combination of these factors) and "minor handicaps". The latter are those "minor" problems experienced by the low-birth-weight child which are related to the concerns expressed by many parents during consulting hours, to difficulties at primary school, etc.

The main purpose of this study is, using the psycho-analytic developmental model as a frame of reference, to describe as scrupulously as possible how far the group of three-year-old, low-birth-weight children have progressed with their development and how far the reference group of three-year-old, full-term children have progressed. From this systematic comparison, such vulnerabilities as the low-birth-weight children have will become apparent.

I am aware that, in the main, I have chosen in favour of the psycho-analytic model. This model has, however, proved to be the most relevant in child psychiatry for clinical work, though without losing

sight of biological and environmental factors. Taking this line of thought we can now ask ourselves what, in terms of psycho-dynamic concepts, is of importance for the three-year old.

First, one has the concept of the developmental task of the young child. In considering this, the concept of the ego will prove indispensable in our model. Secondly, there is the question how these concepts can be so used that the study remains sufficiently focused on the problem of the low-birth-weight child that justice is done to the clinically specific aspects.

This brings us to:

1. The concept of the developmental task of the young child;
2. The concept of the ego;
3. Child-psychiatric clinical practice: the ego and the low-birth-weight child.

1. The Developmental Task

In wanting to evaluate the developing personality - a personality in statu nascendi - of a three-year-old child, the child psychiatrist places himself in a challengeable position. One might ask whether valid statements can be made about three-year-old children who were examined by a child psychiatrist for a limited period of about one hour in his strange and threatening office in the surroundings of a huge children's hospital.

This is distinctly a stress situation for children, and the warning applies which Anna Freud gave (1965) about "the ubiquity of ego regressions in the child's normal life", among other things in stress situations. The concept of Ernst Kris (quoted by Anna Freud, 1965, p. 102) concerning "the rate of regression" is surely applicable here. The younger the child, the shorter is the period during which his performance keeps at the optimum level.

If it is true that play, free phantasy life, school achievements, stability of object relations and social adaptation are not such "vital functions" for the child (Anna Freud, 1965, p. 123) - i.e. not of such decisive importance for evaluation - as the ability to love and to work are for the adult (according to the famous words of Freud himself), then where are we to look?

Anna Freud states that in the light of this question only one factor is important, namely the child's capacity to move forward in progressive steps until maturation.

If we are guided by this criterion - moving forward in progressive

steps until maturation - the question automatically poses itself: which developmental steps may be expected of a three-year-old child? Anne Freud herself (1965) concluded that: *"The ego of the young child has the developmental task to master on the one hand orientation in the external world and on the other hand the chaotic emotional states which exist within himself. It gains its victories and advances whenever such impressions are grasped, put into thoughts or words, and submitted to the secondary process."* (p. 32). This statement was chosen in order to arrive at a more operational point of view, which eventually enabled us to adapt and present our clinical material.

2. The Ego

We should like to explain here how the psycho-analytic concept "ego" will be used in this study.

In doing so it is not our intention to enter into a detailed discussion of the concept itself as a theoretical abstraction.

Ego is a theoretical concept which refers to that part of the developing person which gradually organizes itself, in contrast to the unorganized "id" (Rycroft, 1968, p. 38). The ego, therefore, is defined on the basis of its functions (Ladee, 1976, p. 54). These functions include: control of senses and motility, development of memory, observing, expressing thoughts in language, combining acts with an object in view (e.g. carrying out a task, elaborating a play theme). In this study we shall focus principally on what are known as the executive ego functions (van Dijk, 1980, p. 372), because they can be observed very well in an examination period of restricted duration. These ego functions, however, are of great clinical importance, because they imply so much:

- During the examination we observe functions, attainments, but each of them is in itself the expression, the result, of a developmental process. As Freud (1914, p. 77) said: "The Ego cannot exist in the individual from the start, the Ego has to be developed".
- To acquire these ego functions the child makes use of "ego mechanisms" such as imitation, identification and introjection. And these "ego mechanisms", as Anna Freud asserts (1965, p. 173), are based "on the child's libidinal ties to the environment", or, in other words, on a sufficiently good affective bond with the parents. From this viewpoint, it is understandable that Anna Freud says (1965, p. 156): "the child imitates and recreates mother's attitude in its own

Ego". The entire process of interaction between mother and child, the quality of the mother's helmsmanship, is reflected in the child's ego.

- It is important not to lose sight of the fact that the development of the ego functions also requires a body - one thinks first and foremost here of the sensorimotor apparatus, guided by the C.N.S. - which is sufficiently intact and sufficiently ripe.

- Finally, it is with this ego development that the child becomes a socially behaving person, enabling the three-year-old to attend the pre-kindergarten class and later kindergarten.

We shall return to this ego and its implications in a theoretical chapter (III), focusing as much as possible on the age of roughly 3 years.

We shall also refer to non-psychoanalytic authors who have performed pioneering work in the field of developmental psychology by providing penetrating descriptions of the young child. These authors often implicitly pinpoint important ego functions of the young child, and it is by its functions that the ego is defined.

3. The Ego and the child of low birth weight

Based on encounters with low-birth-weight children and their parents over a period of many years, we feel that we have stayed very close to the human problems out of which this study evolved by concentrating on the progression of children's ego functions. These ego functions are, by definition, a form of mastery.

Does this study not concern children who were immature at birth and not yet equipped to start life without extra care? Did their mothers not start with an acute and deeply rooted feeling of anxiety and failure because they did not have their babies at term and their babies were not of normal size?

Did this vulnerable child not leave the intensive care department with doctors and parents fearing for a possible "failure to thrive"? Fearing it would not be able to cope with differences in temperature, with infections or with insufficient input of food? Fearing future difficulties in school "in accordance with the literature"?

Do parents not usually express educational problems on the part of their children in terms of competence or failure? "He can't sit still", "She can't listen", "I can't get him to do anything", "She can't play by herself" or "I can't comfort him". In other words, the question about "The Growth of Competence" (Bruner and Connolly, 1974) is asked with regard to low-birth-weight children in the families as well as by paediatricians and by mental health services.

Are these children at risk and, if so, to what extent? Isn't the question "Do they catch up?" meant to be followed by "in competence, in skill, in mastery"?

For competence and knowledge create confidence for the environment and give self-confidence to the individual. Competence and self-confidence are intimately related; conversely, "a sense of defeat" may have serious consequences for the child's emotional development.

According to Bruner (1974, p. 5) there are not only intellectual but also emotional skills: self-confidence is an important example of the latter. Self-confidence is not usually referred to as such but is seen as an attitude towards oneself. It is, however, also a skill.

It involves learning that one can do things with a certain likelihood of being able to run the course again should one fail. If this learning process is endangered, the implications can be serious.

Bruner states that work on conditioned helplessness in human beings and animals alike indicated that when an organism comes to believe that its repertoire of reactions is no longer adequate to meet the challenges and tasks imposed upon it, it enters a passive phase in which it no longer tries, but simply learns to take the consequences of failure.

After this global exposition of the problem and its theoretical context, we should like to briefly state what the next steps will be.

As has already been mentioned, chapter II describes an exploratory study and its influence on the design of the main study.

Chapter III links up with this by taking a more theoretical approach to the concept of the young child's ego. Chapter IV describes the method employed in this study. Notably:

- the groups selected and their comparability;
- the procedure used in the child-psychiatric examination;
- the derivation of more operationalized items from the concept "ego";
- the evaluation of the data obtained, employing three evaluators in order to increase its reliability;
- the systematic processing of the data obtained.

Chapter V explains how the Guttman scale analysis was used as an ordering principle in describing the differences between the test group and the reference group.

Chapter VI gives the specific predictions to be tested concerning possible differences between the two groups.

The results are presented in chapter VII. This is followed in chapter VIII by a discussion of the results and of points of agreement with and divergence from data in the literature. The chapter ends with a tentative explanation of the findings.

Chapter IX ("Applications") discusses what we have learnt from this study of the low-birth-weight child, hopefully in such a way that it will also be of use to paediatricians and general practitioners.

CHAPTER II

EXPLORATORY STUDY

A group of 32 three-year-old children of low birth weight who had been examined by us earlier was used for the exploratory study. Unsurprisingly, a number of aspects of the young low-birth-weight child emerged which have helped to orient the main study.

At the same time the study gave us a picture in vivo of the functioning of the three-year-old. It enabled us to acquire proficiency and experience in handling the examination situation and in recording the behaviour observed. As A. Jolly (1974, p. 5) affirms in regard to the ethological study of the development of young apes: "Developmental testing does not seem to be a mechanical science but a craft learned by practice and apprenticeship". It is our experience that the same is true of young children.

We should like here to explain and summarize how the exploratory study served to orient the main study.

During the child-psychiatric examination, on which later a short report was written, frequently recurring observations began at a certain moment to acquire a more coherent pattern and stimulated reading. Anticipating a total impression which would only gradually gain "Gestalt" during this exploratory study, we provisionally summarized the group picture of the low-birth-weight child at three years of age as follows: "The three-year-old LBW child is a still rather pale and slender, *frail* and shy creature who *has not yet properly mastered language*; the child is still *vague* in its actions, it lacks conviction and resolution which grow with physical self-confidence. Its sensorimotor *skill is still not sufficiently smooth*. The child lacks *organization*, the impression it gives is of being *still unripe*. This picture seems to be much more pronounced in boys than in girls". It might be asked which observations and concepts contributed to this provisional overall impression, how it was arrived at.

One misses self-assurance in the children. When one has seen a number of them one begins to listen more closely for the word "I". In writing the report one has to admit that one does not know for certain whether it was used.

The investigator notes down "still a vague little person" and begins to notice that when they see a toy car during the examination they say "car" instead of "a car", or, in the case of a puppet, "princes" instead of "a princess". "Determinate-indeterminate as a category does not yet play much of a part. His whole person still makes such a global impression" is the comment on one report.

As far as play is concerned, you note that after the examination you find it difficult to describe precisely and in detail what they did with the lorry they were playing with. Next time you listen better and you watch better and you note that they call the lorry "car" too. And about the child's play it is difficult to say more than: "drives to the door and enjoys it". There are some, however, who do call a police car or a lorry by its proper name.

You also begin to compare them more with other three-year-olds that you see in the course of your work as a child psychiatrist. And you note that a three-year-old who happens to be brought to you because of fits of temper and sleeping fears says of the police car: "It's got a (red) light".

Whereupon he immediately turns the light and tries whether it will come off. After a while it gets through to you: a red light of that sort is "specific" to a police car and "turning" is a characteristic function. Just as the tipper is characteristic for a lorry. And you note that straightaway some three-year-olds try whether the lorry can really tip.

Sometimes they will give you a significant look or briefly smile at their mother as they do so.

After a few observations something else strikes you: this type of communicative looking, full of content and expression, is less pregnant and directed in the case of the LBW child and also less frequent. You know of the importance of this for the input of language between mother and child, in the words of the linguists. In your mind you link this with the perinatal treatment of the LBW child. No visual contact was possible then between this "incubator baby" and its mother. But do many mothers not visit every day? And visiting facilities have been increased? And mothers are encouraged to look at their baby, to turn their head for visual contact? To touch their child through the opening of the incubator? In this way interest is aroused for "minimum or optimum threshold values" which are needed for a function to establish itself properly. You have noted that it takes much longer for LBW babies to look in a directed and alert way and that they

easily relapse into "vague looking and peering" (you catch yourself using the word "vague" again).

The neonatologist Brazelton, of Harvard, who is known for his baby test, also emphasized the regulation of the state of consciousness which is especially difficult for an LBW child. OF Erikson and Spitz you know that they suspect that "looking" is the young child's "dominant perceptual modality", important for both "the affective contact" between mother and child and cognitive organization leading to a "perceptual Gestalt". You begin to see more points of contact between your observations of a three-year-old LBW child and of an LBW baby: the three-year-old had so much difficulty in smoothly and directedly placing a block in a puzzle.

It is so difficult to hold the lorry with one hand, tip the back with the other and at the same time look at your mother and say "Look!". If he tries to do too much at a time his muscles become tense; and he becomes more awkward still in the use of his hands. Just the same, much earlier in it's development, it is so hard for an LBW child to accomplish the precision grip or to achieve good capito-caudal control.

All of this led to the working notion that the following general line of development presents difficulties for the LBW child:

From	To
Vague and Diffuse	Sharply Limited and <i>Differentiated</i>
Global	<i>Detailed</i>
Unstable and fluctuating	Stable and Constant
general	<i>Specific</i>
Undirected	Goal-directed
Unfinished	Organised
Clumsy	Precise, Accurate
Trial and Error	Smooth <i>Pattern</i>
Indeterminate	Determinate

This course of development is actually more a general basis. Hart de Ruyter (1972) begins his manual "Hoofdlijnen van de Kinderpsychiatrie" (Outline of Child Psychiatry) with it. The underlined words in the diagram occur in italics in the opening pages of that book. It is the same biological pattern that one has come across in studying histology: "the vague, omnipotent, embryonal cell can differentiate to become the liver cell with a well-defined structure and function".

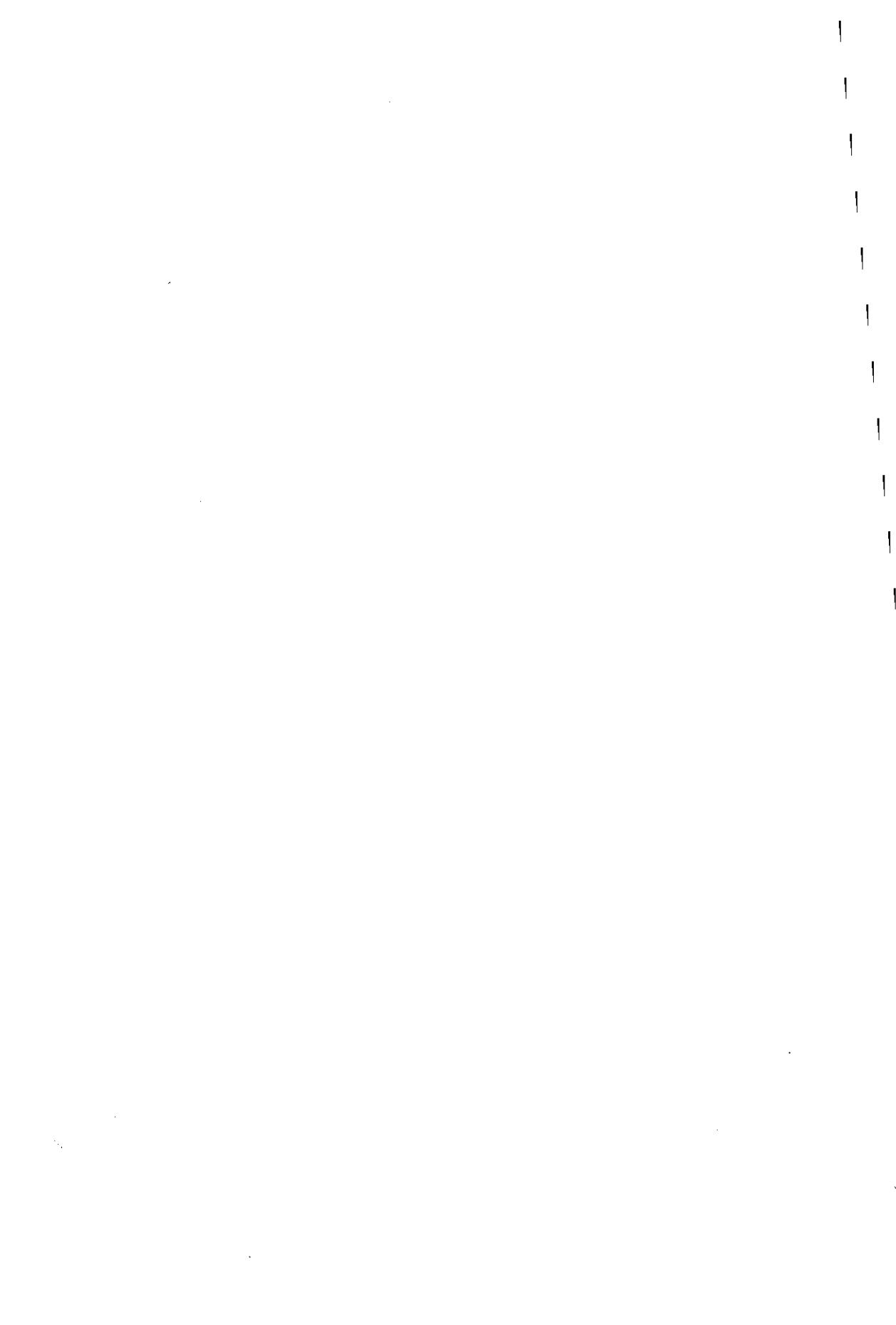
Similarly, from a psycho-analytic standpoint Hartmann asserts that the ego functions are gradually born through differentiation of an undifferentiated and diffuse stage. Of great importance here is the balance in the child between the "weak", still more or less undifferentiated aspects and the 'strong", more differentiated aspects: together these determine the structural equilibrium that the child has already acquired. The firmer this is, the stronger is the synthetic function of the ego; and, as Anna Freud so often emphasizes, this function is of such great importance for the manner in which the child deals with life's vicissitudes (which the layman rightly calls "inevitable" and the child psychiatrist developmental interferences).

In summary: on the basis of the data obtained from the exploratory study, the main study will be directed more specifically at the following points:

1. It will be directed especially at the differentiating aspect of the ego of the child which leads to competence and skill. In this it will pay attention to the balance between the "strong" and the "weak" aspects of the child's personality.
2. Many characteristics of the LBW child do not come clearly into relief until a close comparison is made with its full-term contemporaries. A reference group is therefore desirable.
3. The boys seem to have more developmental difficulties than the girls. This is also strongly in evidence in listening to what mothers say about their worries and expectations regarding their child. We wish to determine in our study whether this difference is present. We shall also pay more attention to possible differences in the perinatal data.
4. In this exploratory situation it has once more become clear how important the play function - the emotional barometer "par excellence" - is for a child. Play takes place in the protection of an imaginary *play space* marked out by the child (which demands organization); if a child begins to play of its own accord, this implies that it is already *capable* of rendering or inventing a particular *theme* and *giving "shape" to it*, which means that it is capable of bringing several elements together to form a *whole*. In its play the child can demonstrate its functional *skills*. At the same time the ego can create a practice ground where dangerous impulses and fears are present but so *brought together* that the game goes on.

Concentration is also necessary, to start and develop the game and to bring it to an end. And, again, as all games end ("the end of the game") a *time element* is built into it. And finally: this game - this creative act of your own - shows to what extent you are already capable of being occupied *on your own* in the presence of the *other*, to what extent you can admit or involve the other in your game.

Play involves so many aspects of the organizing and unifying ego that play and its aspects ought to be given a major place in the study.



CHAPTER III

THE EGO UNDER OBSERVATION

In the psycho-analytic model employed in this study the development of the child is seen as a gradual evolution (via "developmental steps") from the almost complete dependence of the baby on its mother (its "care-giver") to the mature independence of the adult (Anna Freud, 1965, p. 64).

Our concern is with this progression in the development of the child. With bodily skill and mastery over the world; with the cognitive recognition and ordering of the things of the everyday world, enabling the child to comprehend and feel at home in it; with language, through which the child makes itself known to the other and grows in self-awareness, in its bond with the other, but also in its helmsmanship over itself.

Each time a child takes such a developmental step and masters it sufficiently that the attainment comes to form part of the equipment of its person, its "ego" grows. If a child possesses a skill that accords with its age and has acquired sufficient stability in this function, we shall speak of "**strong ego aspects**". If a child is at a level appropriate to a younger developmental stage as regards a particular skill, or if it has a highly variable mastery of the skill and is thereby prevented from attaining a level of adaptation which is adequate for its age, we shall use the description "**weak ego aspects**". As the child's play is one of the main expressions of its person and on the other hand, as explained in the exploratory study, provides so much insight into the structure and development of the ego, a systematic study of the ego and its functions - by which it is defined - should also include the child's play. In this, we shall be guided by four play theorists: Winnicott first and foremost because he sees play not only as a creative act of the moment but also as an expression of the basic trust attained in the mother-child relationship.

Bruner because he is a cognition theorist who, drawing on ethological literature, describes how the anthropoid ape and, to an even greater extent, the human child grow in and through play.

Erikson, because it is he who most explicitly describes play as both an

ego function and the royal road to the child's unconscious. Finally, Piaget because in our view he had made the greatest contribution to ranking play, using as his criterion the mental complexity underlying it. In this sense play structure can also be seen as an expression of the organizational level that the ego had attained. Though a choice was unavoidable, the selection of these authors means, we believe, that many facets for this underestimated area, the child's play, are nonetheless dealt with.

1. "Observing without interpreting"

It is impossible to investigate thoroughly in an hour the developmental process that the child has already gone through when it presents itself for examination at three years of age. This process involves among other things mechanisms such as imitation, identification and introjection (see p. 15).

If, for example, a child cleans and dusts the sides of the doll's house it will not be easy to discover whether the underlying process is imitation or identification. In the case of imitation, a mechanism which begins earlier in the developmental sequence, the child places itself in the role of the admired and powerful figures (Anna Freud, 1965, p. 174). In case of identification, a mechanism which emerges somewhat later in the child's development, there is a permanent change of the "self" towards the parental model (Anna Freud, 1965, p. 174).

It is often equally difficult to say with which person the child is identifying or who it is imitating. Again, it is sometimes difficult to determine whether a child that carries out a task does so primarily from fear of the examiner or because it has made its parents' command "you must do what the gentleman says" its own (= introjection of parental authority: Anna Freud, 1965, p. 174) and takes a healthy pride in showing what it can do. It is possible for both mechanisms, fear and "introjected duty", to be at work in the carrying out of a task. One may or may not have strong suspicions on the subject during the examination, but according to the psycho-analytic model one can acquire greater certainty only in the setting of psycho-analytic therapy.

What one can, however, observe in an hour is the ego as it reveals itself in its functions, its skills. This can be done, as Anna Freud says, without too much psycho-analytic interpretation, which belongs in psycho-analytic therapy (Anna Freud, 1965, p. 22).

2. The Ego as a precondition of socialization

At three, children have reached an age at which, according to the cultural pattern, the first early phase of dependency on their mother has more or less come to an end. They have arrived at a new phase, which is a big step forward in their socialization, characterized among other things by going to a kindergarten, a nursery school, etc.

For a child to be able to take these first steps into society, an initial equipment of his personality is required. "The development of Ego functions as a precondition of socialization" (A. Freud, 1965, p. 172-173).

Parents themselves are often implicitly aware of this in view of their questions at this age, such as whether their child is ready for it, or what the matter is because the child isn't fitting into the group.

Clinically it is important to know that the child must already have taken some steps along the difficult road from the pleasure to the reality principle; the child must already have left the most primitive childish stages behind him. His manual skill and locomotor control must be great enough for him to participate; his thought and also his naming capacity must be great enough to permit the child to survive in the group without having to have recourse too often to arguing with hands and feet (acting out), which could result in his being excluded. The child's sense of reality must be large enough that he can/wishes to take part in the goal-oriented tasks and games.

Finally, a sufficient measure of organization and integration must have been achieved before one can be a three-year-old who counts and can manage for himself to a certain extent.

3. The ego on the threshold of the oedipal phase

At the age of three children are at the beginning of a crucial developmental phase. Their previous phases of development have to be seen against this background (A. Freud, 1971, p. 82).

It is not with their balance of victories and imperfections in the Ego sphere - which at approximately three years of age is starting to organize into a "Central Psychic Constellation" (Neubauer et al., 1975) - that three-year-olds not only meet their peers but also, and more particularly, enter the oedipal phase, i.e. approach their parents as boys or girls with a need for esteem and a promise for the future? Erikson (1950, p. 258) points out that "at any rate, the oedipal stage results not only in the oppressive establishment of a moral sense restricting the horizon of the impossible; it also sets the direction

toward the possible and the tangible which permits the dreams of early childhood to be attached to the goals of an active adult life.” In order to be able to profit fully from this oedipal stage for the enlargement of his person, in order to be able to draw a life project from it, based on “Me too” (like father and mother), as Hart de Ruyter (1972) says, the child must already have developed sufficient differentiation (e.g. distinction between “me” and “not me”).

4. The Ego as organizer and mediator

The ego in its stronger and weaker aspects indicates to what extent and with what degree of stability developmental milestones have been reached by the child. The Ego viewpoint thus makes it possible to bring in important aspects from various developmental theories. The theoretical concepts which have guided us here are the following:

4.1. The separation-individuation process: the I-consciousness

At the age of three the child has gone through a separation-individuation process, as a result of which it has developed a personality of its own and is aware of itself (I) as distinct from the other. It has thus acquired a degree of independence: the child has gone through a process of psychological birth by stepping out of the mother-child dyad and distinguishing itself from its mother, thus entering reality (Mahler, 1975).

*4.2. The aims of integration**

The aim of the organizing function in the child is to unify the available elements of the inner and the outer world (“Fitting together”, “Zusammenpassung”: Hartmann, 1939, p. 40).

From its many motor actions and perceptions the child has built up a *body ego* with which it approaches the world. Its numerous experiences in the family find expression in the *mental representation* of the most important of the affective key figures.

Gradually the child acquires knowledge of the *world of immediate experience*: it recognizes and names what has become familiar to it from experience. It has acquired a clearer and clearer picture of the world it lives in. The impetus behind this is its *Funktionslust* (Bühler), its interest in the new (“Neo-philia”, Morris) and its love affair (Greenacre) with the world.

* The concepts printed in italics in 4.2. are taken from Frankl (1961, p. 149-150)

The child's growing cognitive discrimination, together with its becoming conscious of the bodily self, finally develop into a new unity: sexual *identity*.

4.3. *The essential developmental step from action toddler to language toddler*

By about the end of the second year of life the child's sensorimotor developmental phase comes to an end. It will now gradually develop from an action toddler into a language toddler. What Erikson (1950, p. 274) has described as the "intrinsic relation between ego and language" is so essential that psycho-analysis regards the development of language, which must regulate the impulses, as the basis of civilization. This is briefly and succinctly summarized in the winged "word": "The man who first hurled a word of abuse at his enemy instead of a spear was the founder of civilization" (S. Freud, 1893, p. 36).

According to Anna Freud (1936, p. 132), getting a grip on the affects and impulses by linking them to word representations is "one of the most general, earliest and most necessary acquirements of the ego."

- Anny Katan (1961, p. 184) pays special attention to the part played by the verbalization of feelings in the development of the young child. She warns against retardation of language development and even against the risks if this were to be caught up: "When the child has later acquired the art of verbalizing he will still cling to the earlier method of acting upon his feelings instead of mastering them through verbalization. This uninhibited discharge may bring him into conflict with his environment or too early feelings of guilt.

If this process of acting upon feelings continues for a considerable time, the results will be fully evident. The child's ego will become fixated upon acting upon his feelings rather than attempting an adequate means of mastery. In such children the ego becomes weak, for it is repeatedly overwhelmed by affects." (Katan, 1961, p. 186; see also A. Freud, 1965, p. 231).

- Language not only provides grasp and mastery over affects and impulses, it also organizes the entire realm of experience. De Hirsch (1975, p. 99) asserts that at 3 to 4 years of age normal children are quite familiar with the small connective words, the number, space and time markers that provide a net of relations and are the framework for the organization of experience. The child who lacks understanding of such words lives in a confusing universe - and this confusion may in

turn interfere with the organization of his inner and outer cosmos. He is limited to the Here and Now. His world has few shades and few signposts.

- Finally, we should like to point out the intimate ties that exist between language and attention, an essential function for the child with regard to its future "mastery", for example at school.

Bruner (1974, p. 36) asserts that the development of language moves in the direction of becoming itself free of context and accompanying action. Language frees the attention of the user for what is being said: for the selective aspects of the environment which are under discussion and presented through words. As the language of the child must free itself step by step from direct action and perception, we have made use in our categories of the following aspects presented by the Russian linguistic psychologists Luria and Yudovich (1977, p. 61):

1. Synpraxic speech (connected with direct action)
2. Planning speech
 - a. within the boundaries of a situation
 - b. anticipatory
3. Narrative speech
 - a. connected with a situation
 - b. not connected with a situation

(2b and 3b are in the category of "Speech transcending the boundaries of a situation").

4.4. The child's play and its relation to Ego development

The significance of play in relation to the development of the ego has already been noted in a number of psycho-analytic articles (among others Waelder, 1933; Peller, 1954). Peller once more underlined the central importance of play for the gradual assimilation of fear and injuries, which, according to the standpoint taken, is a major task for the ego or, on the basis of the result, a characteristic of the resilience of the ego.

In play, ego and id are on good terms. In later life the mature Ego will have to act as mediator between the demands of the id, the external reality and the superego. This aspect is referred to as the synthetic or integrative function of the Ego.

The first successful mediations are achieved in play, and this at a time (childhood) when the mediator is still much weaker than the parties concerned.

a. *Winnicott on play*

We attempt below to select a number of central points from the wealth of Winnicott's thought.

1. Of prime importance is that Winnicott gives play a place in the sequence of developing relation patterns between mother and child. Play originates in the trustful relation with the mother. It arises when, in the to and fro between the mother and the child, the baby begins to observe the mother and the mother is prepared to participate: she is ready to be that which the baby wants to find, alternating with her expectation that she will be found. (May I draw attention in this context to Picasso's inspired words: "I don't search, I find"?) The baby experiences separation in an atmosphere in which the reachable mother absorbs the separation shock. A transition area is thus created between omnipotent magical control (of the purely symbiotic) on the one hand and actual control (of the incipient objectively separated mother and reality) on the other. "I call this a playground because play starts here. A potential space between mother and baby or joining mother and baby" (Winnicott, 1971, p. 47). This playground is thus already part of the ego organization, because it is born out of the incipient discrimination between baby and mother on the part of the baby.

The child's ability to be alone in the presence of the mother grows out of this trustful relation. Because the other is reliable and available and reflects, in the experience of the child, what happens in its play. In a subsequent stage the child is ready for the interlocking of two play areas: it can stand the other's introducing play material without being put out to any extreme extent.

What one has, then, is a direct developmental line from transitional phenomena to play, from play to shared play and from here to cultural experience. "At the point in time and space of the initiation of their state of separateness" (Winnicott, 1971, p. 97), the separateness of mother and child, we are witness to the first play experience of the child in which it makes its first not-me possession (the transitional object) into a symbol of the union between mother and baby.

Thanks to the "healing" presence of the mother (buffer protection) the baby can allow and profit from the separation: it triumphs over it in a playful, creative act.

2. Clinically, and from the point of view of the child psychiatrist, we should like to underline that:

- in play the child bundles aggression and hate instead of discharging them directly at people: this makes play a social contribution of the first order;
- play is an excellent organizational form for the child through which it enters into emotional relations with other children: in its play rôle it begins to see its playmates as independent others;
- play has a binding and unifying effect on the personality: it couples the individual's relation to his inner world with his relation to the shared actual outer world. The child that is too shut up in itself cannot play.

b. Erikson on play

This play theorist too underlines the great importance of play, which, paraphrasing Freud, he calls the royal road to understanding the infantile Ego in its striving towards synthesis. "Play, then, is a function of the ego, an attempt to synchronize the bodily and the social pressures with the self" (Erikson, 1950, p. 211).

Erikson - naturally - places the play of the child in the life cycle. For him, the play of the child is the childish version of the general human ability to cope with experience through the creation of a model situation and to attain mastery over reality by experimenting and planning.

What a child does in play is nothing less than to project a relevant personal theme on the microcosmos of a play space. By means of a follow-up of adults he ascertained that what they had played out in their childhood (a description of this childhood play had been recorded in writing) was nothing less than a condensed statement of what would also later prove to be a dominant theme in their personality.

In view of their operational clarity, we should like to enumerate the aspects which Erikson identifies in his theory of play. The fragments played by children obey the repetition-compulsion principle, i.e. they serve to work out a 1) traumatic experience, but at the same time they are the expression of a 2) playful renewal.

They are inspired by the need to 3) communicate, even to confess, but they also unquestionably give utterance to the joy of 4) self-expression. They are designed for the 5) practising of growing skills, but they also serve to attain mastery of a 6) complex life situation (Erikson, 1972, p. 130-131).

c. Bruner on play

Bruner (1974, p. 11-48) situates the importance of play within the framework of evolution, supporting his argument with a review of data from ethological literature on behavioural observations of the higher apes (hominids).

An important evolutionary hypothesis is that a distinct pattern of immaturity was selected which permitted greater flexibility in adapting to a territory or a habitat, characterized in the case of man by his technical-social mode of existence involving the use of instrument and symbol.

Between the different species of apes (orangutan and chimpanzee) great differences exist as regards the rigidity of the patterns that regulate admission (induction) into the group. As flexibility increases (chimpanzees) the system of reciprocal exchange also increases. And this is accompanied by quantitative and qualitative changes in the regulation of the immaturity of the young which greatly interest us: maternal buffering and protection increase in duration; the situation changes quantitatively (according to the famous field survey carried out by Van Lawick-Goodall, among chimpanzees the mother-child bond can persist for as much as 5 years!) but also qualitatively. There is a much longer period in which *play* occupies first place, and there is much more participation in this play by adults, especially, but not exclusively, by the mother. There is an enormous increase in the period of "observation learning" of adult behaviour by the young, that which is observed being incorporated via play. In his famous standard work published in 1926 ("The mentality of the apes") Köhler applies to this the term *serious play*.

Important for us is what this learning-in-play behaviour assumes according to Bruner:

- this "matching to model" points to incipient differentiation: namely, between yourself and your performance on the one hand, and the model on the other. This phenomenon is referred to by linguists as deixis - the awareness that if I say "I" it is not the same as if you say "I"; similarly, "in front of me" is not the same as "in front of you" and "in front of the car".

(Unfortunately we must leave this topic, but before doing so we should like to recall Erikson's words at the First World Congress of Infant Psychiatry, 1980: "The I-consciousness and what *that is: that is what we must concern ourselves with*").

- Observation learning also assumes: bringing subroutines into

sequence to form a larger action pattern in order to respond to the model. It is in play that, free from external pressure, from the pressure of survival as the biologists say (the mother takes care of that), free from what the philosophers so beautifully term extrinsic finality, all of these subroutines are practised and modularized (= moulded into a smooth automatism); in play, new combinations are tested and new variations tried. It is this play that becomes *mastery play* and leads to tool use. It is this play that leads to "dissociation" in the use of instruments: i.e. the capacity to recognize the potential sub-aspect in the whole (apes learn in playing that they can break a large stick and so obtain a smaller one which fits the hole which contains the coveted banana).

Thus, from playing man (*homo ludens*) evolves *homo faber*, who (via power and precision grip) gets a grasp on an instrumental world, in which process the complexity of the guiding cerebrum of *homo sapiens* constantly increases.

But the human child goes further: from *mastery play* to *symbolic play*: the instrument is no longer an utilandum but the point of departure for an imaginary situation. Placed between the legs, the stick becomes a horse; planted in the sandpit it becomes a giant. If the child can make this great step it can be initiated in the signal system, in the conventions and rules of the community: because just as the stick stands for a horse, the green of traffic lights stands for yes, all right, you're allowed to drive on and the red stands for not safe, stop, traffic offence.

And, playfully, in his action mastery the child has learnt to code the different aspects of the action: the agent (author) - the action - the object - the place - the possessor - the direction. These are also the basic ingredients of syntax. In the early stages of speech, language can be regarded as an outgrowth of the proficiency in action and the perceptual discrimination which the child has acquired in play.

d. Piaget on play

According to Piaget (1972) play is that activity in which assimilation to one's own self is predominant and accommodation (to external laws and the viewpoint of others) is very subordinate to absent.

- In *exercise play* an activity is carried out for the activity itself, without an external or internal aim, and for the *Funktionslust* attached to it. Playfully carrying out a sensorimotor scheme or intellectual function gives the child a feeling of dominance, power and virtuosity: "le plaisir d'être cause."

- In *symbolic play* a symbolic transposition occurs whereby the child subjects things to its own activity without rules or limitations.

According to Piaget, the explanation of the play of the child lies in the thought of the child itself. The child plays because it is still a child, i.e. its thought is still predominantly egocentric. This term is to be defined as follows: the child's concern is with its own activity and its own viewpoint; a solid accommodation to the standpoint of others and to the physical laws is achieved by the child only with difficulty and gradually in the operational phase. The child's imbalance, this dissociation between assimilation and accommodation - or, in other words, between ego-centricity and ex-centricity - makes the assimilation of reality to the child's own self with accommodation subordinated - and this is the definition of play - a vital condition for the child's growth and development. Symbolic play is egocentrism in its purest form ("à l'état pure"). It fits the description of egocentrism as regards both "signifiant" (the signifier) and "signifié" (the signified). As regards significance, play is concerned with the reliving and working out of the child's experiences in the service and for the satisfaction of the I. In this, the play symbols are the lively and dynamic elements which - without limits: anything can represent anything - serve the child's individual subjectivity. And as a real substitute the play symbol (the stick between the legs which stands for a horse) also makes the subjective much more actual and present than verbal symbols alone could do. The more the child grows mentally, the more room it makes for accommodation, the more his play activities will be marked by a growing adaptation to reality. Playing will evolve towards playing according to rules, i.e. based on agreements with the other and therefore fair play. This naturally implies that offences against the rules of the game will be penalized. As far as Piaget's *classification of play* is concerned: if overlapping and ambiguities in the categories are to be avoided only the formal structure of play - the mental complexity and organization that give play shape - can serve as a basis for classification.

Three structural criteria can be applied: l' exercice (exercise), le symbole (symbol) and la règle (rule).

These give rise to the following classification:

- le jeu d' exercice: exercise play (beginning in the first year of life);
- le jeu symbolique: symbolic play (fiction play, as-if-play, beginning at the end of the second year of life);
- le jeu de règles: play according to rules (begins at the end of the

kindergarten period. Typical of the school child proper and adult play).

What is more, this classification on the basis of mental complexity agrees diachronically with the classification of stages of intelligence:

- the sensorimotor, practical intelligence (intelligence sensori-motrice et pratique);
- the (pre-logical) representative, intuitive intelligence (intelligence représentative et intuitive);
- the (concrete-logical) operative, deliberative intelligence (l' intelligence opératoire et réfléchie).

In view of the internal consistency of this classification, entirely answering our interest in the intellectual and affective development of children, we have adopted it. As the children examined are only three years of age, obviously we are concerned in our study only with exercise play and symbolic play.

More specifically, as far as play structure is concerned we are interested in whether a child has taken the great step in its play towards symbolic representation and evocation (of the absent). The distinction between the symbol and the absent thing symbolized is essential to symbolic play; this is possible only if the child has reached the second - representative - intelligence stage: the internal image represents, makes present again, that which is not there.

CHAPTER IV

METHOD

Introduction: The aim is to investigate, by means of a test group of low-birth-weight children and a reference group of full-term children, how far the low-birth-weight child has progressed in his ego development at three years of age and to what extent he differs in this respect from the three-year-old, full-term child with a birth weight within the norm. A systematic exposition of such differences as are found in the ego sphere will provide a clearer answer to the general clinical question: are low-birth-weight children high-risk children as regards their psychological development?

In this chapter it will be explained:

- a. How the test group and the reference group were recruited and the bases on which their comparability rests.
- b. Which specific procedure was used in the child-psychiatric examination.
- c. On which "operationalized" list of ego items and play items the children were evaluated and how the reliability of the evaluation was increased by having each child-psychiatric report judged by three evaluators.
- d. How the data thus obtained were systematized with the help of Guttman scales on which the children studied receive a score. Once such a scale has been constructed, testable predictions can be made (Chapter VI).

1. Study design: test group/reference group

- The *test group* is composed of the children who were born in 1972 with a birth weight of 2000 g or less and admitted in that year to the neonatal intensive care unit of Sophia Children's Hospital in Rotterdam because of their perinatal condition.

The cut-off point for birth weight was proposed by the Paediatric Department

A short elucidation from the paediatric viewpoint is called for here, the data for which have been taken from Mettau's dissertation (1978, p. 148-149). The term low birth weight is more or less arbitrarily applied to a birth weight of 2500 g. or less.

Children with a low birth weight, the special concern of this study, can be divided into two groups:

- Children born prematurely, defined as children born after a pregnancy of 28-36 weeks;
- Small-for-dates (S.F.D.): children, whose body weight at birth is at or under the 2.3 percentile line of the intra-uterine growth curve for weight (Kloosterman, 1969).

The reason for adopting a 2000 g. cut-off point for this study was to ensure that the low birth weight of the child would be beyond question and to eliminate borderline cases at the top end.

If developmental effects connected with low birth weight exist, there is more chance of finding them in a group selected in this manner.

Of the 48 children who met these selection criteria (27 girls + 21 boys), at three years of age 40 were available and reachable for the study.

The eight children who did not take part in the study were made up of:

- 5 boys, with a birth-weight range of 1670-1840 g;
- 3 girls, with a birth-weight range of 1520-1970 g.

The reasons for non-participation were as follows:

2 children out of the eight were in an infant home;

2 children came from a foreign family which did not respond to the invitation and four other families either did not wish to take part or did not appear for the examination.

The final result was a *test group* with the following composition:

- number of children: N = 40, of which 24 girls, 16 boys;
- age at testing (post-natal): 3 years;
- birth weight: 2000 g. or less (range 1080-2000 g.);
- all of the children were admitted post-natally to the neonatal department of Sophia Children's Hospital in Rotterdam.

Graphs 1 and 2 present the distribution of birth weights for the boys and the girls separately.

In graphs 3 and 4 there is also a separate presentation for boys and girls of the distribution of admission duration.

The average duration of admission for the girls was 56 days (range 36-94 days).

The average duration of admission for the boys was 64 days (range 37-98 days).

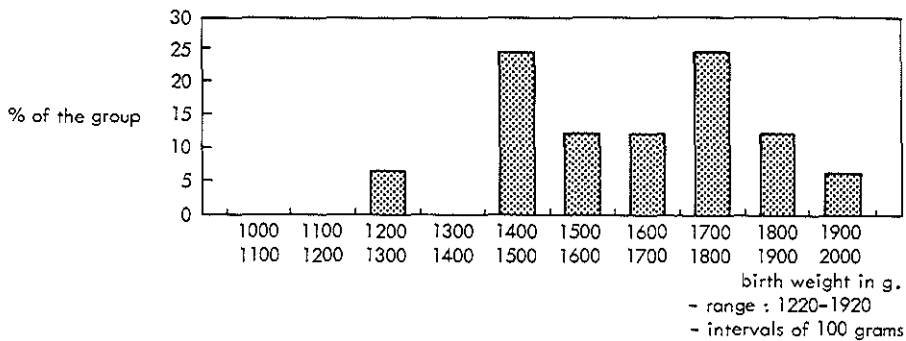
- The *reference group* consists of three-year-old full-term children with a birth-weight range of 2650-5015 g. ($\bar{X} = 3455$ g.). They were recruited via the infant consultation bureaus in the same regions from which the children in the test group come.

The children in the *reference group* were matched in pairs with the *test group* on the basis of the following criteria:

- child's sex
- child's age
- mother's age
- father's age
- number of children in family
- number of siblings and the child's position in the family by age
- socio-economic class based on occupation of parents.

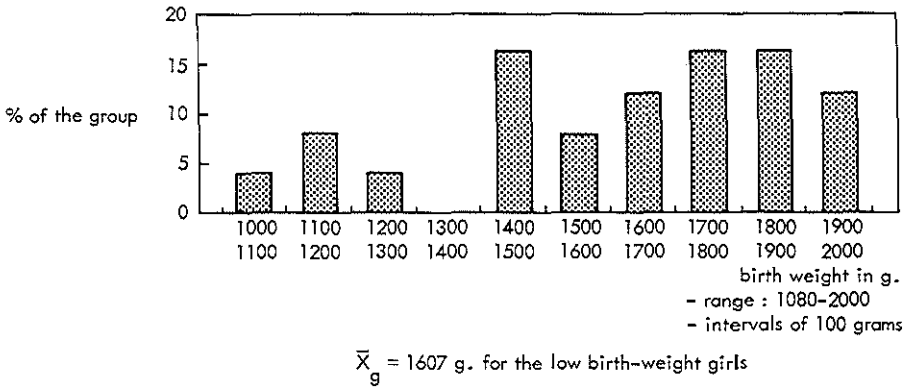
The procedure used in actually constituting the test group and the reference group was as follows:

The parents of the LBW children who met the study criteria (see p. 37) were written to and, if they agreed to co-operate, visited at home. On the basis of the information obtained about the low-birth-weight child and the family, the welfare centre for the area in which the LBW child lived was asked to look in their files for a full-term child with a birth weight over 2500 g. who was comparable to the LBW child on the above-mentioned matching criteria. For the entire procedure the approval was also obtained of the district doctor responsible for the welfare centre in question.

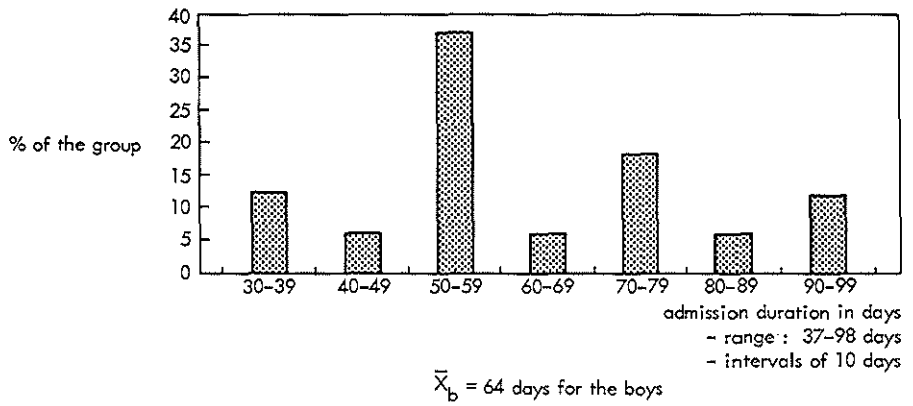


$$\bar{X}_b = 1624 \text{ g. for the low birth-weight boys}$$

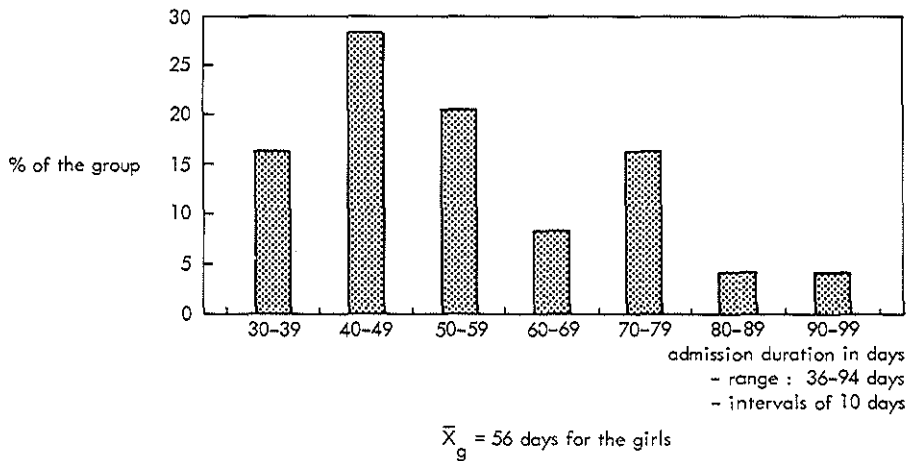
Graph 1: Birth weight distribution of the low-birth-weight boys (N = 16).



Graph 2: Birth weight distribution of the low-birth-weight girls (N = 24)



Graph 3: Distribution of admission duration for the low-birth-weight boys (N = 16).



Graph 4: Distribution of admission duration for the low-birth-weight girls (N = 24).

Graph 5 plots the birth weight (y axis) of the LBW girls against their gestational age (x axis).

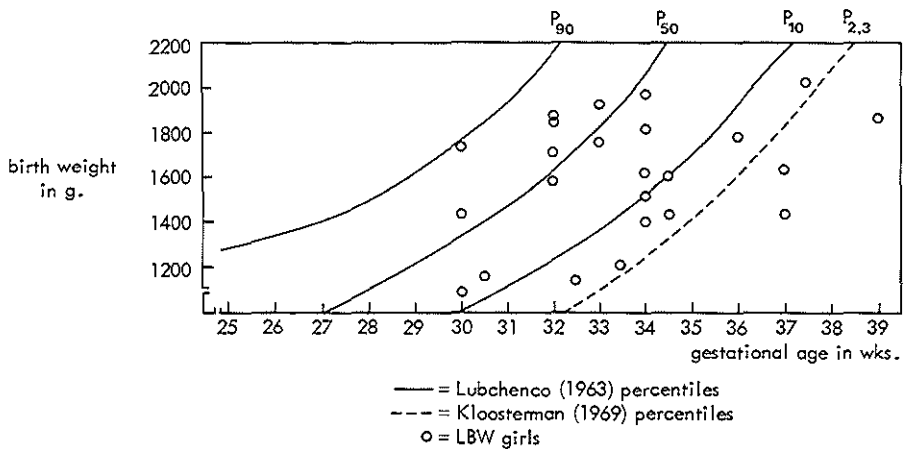
If the birth weight of a child is below a given minimum norm for the gestational age, the child is described as "small for date" (SFD) or "small for gestational age" (SGA). If the child's birth weight is at or above this norm the term "appropriate for gestational age (AGA) is used. In the Netherlands this minimum norm is taken as being:

below the 2.3 percentile of Kloosterman.

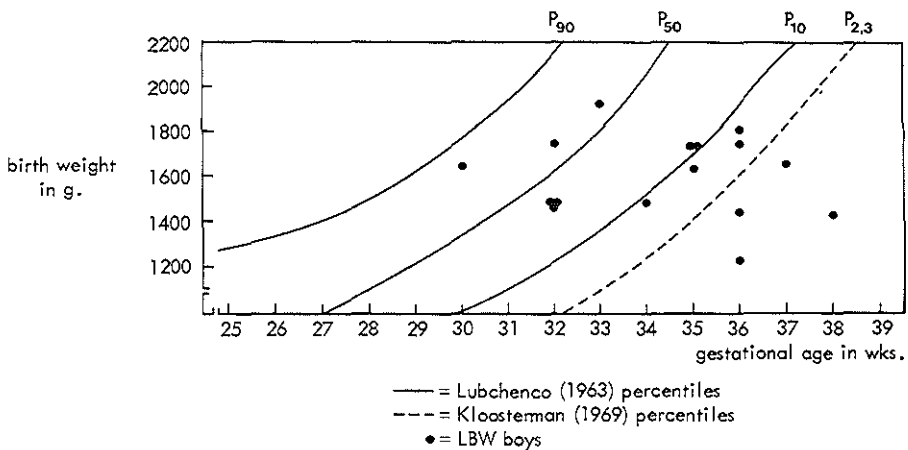
In the Anglo-Saxon countries the norm is commonly taken as being:

on or below the 10 percentile of Lubchenco.

Both norms are shown on the graph.



Graph 5: Birth weight (in grams) plotted against gestational age (in weeks).
Low-birth-weight girls (N = 24)



Graph 6: Birth weight (in grams) plotted against gestational age (in weeks).
Low-birth-weight boys (N = 16)

A child whose weight is above Lubchenco's 90% line is described as "large for gestational age".

A similar graph for the LBW boys is to be found on page 41.

*Socio-economic classification of the test group**

The occupation of the father was chosen as the criterion. The occupation of the mother was taken as the criterion in the occasional instances where it was "higher" than that of the father.

Occupations are grouped according to the "code list of occupations" in "Beroepsmobiliteit in Nederland, een sociaal-statistische studie" ("Occupational mobility in The Netherlands, a social-statistical study) (van Tulder, 1962).

This "code list of occupations" is not scientifically validated. The classification was adopted for practical reasons (clarity of arrangement).

Table 1: Socio-economic classes of the test group*

Occupational classification		test group: %
Social stratum I	Liberal and academic professions, directors, higher education teachers, senior civil servants ...	2.5
Social stratum II	High-level employees, senior officials, intermediate-level technicians ...	5.0
Social stratum III	Tradespeople, intermediate-level civil servants ...	10.0
Social stratum IV	Small shopkeepers, skilled workers, junior employees ...	65.0
Social stratum V	Trained workers	17.5
Social stratum VI	Untrained workers	0

Table 2: Age of mothers at birth of test children*

Age at birth of the test child	≤17	18-20	21-25	26-30	31-35	36-40	≥41
Mothers (%)	0	5	25	47.5	10	12.5	0

* Footnote: As stated on page 39 the reference group was matched in pairs with the test group on this factor.

Table 3: Position of the test children in relation to other children in the family. N=40

1. Only child	27.5%
2. Elder of two	20.0%
3. Younger of two	20.0%
4. Second of four	2.5%
5. Youngest of 3-8 children	30.0%

Footnote: As stated on page 39 the reference group was matched in pairs with the test group on this factor.

2. Child-psychiatric testing procedure

In a preliminary talk the child's parents are told what the examination will involve and who will carry it out: first an intelligence test by a psychologist (Drs. Skoda), after that a child-psychiatric test carried out by the author. The parents know that after the examination they will have the opportunity to discuss the findings and put any questions they may have. Naturally, after the examination, the clinicians who have performed it will offer any *lege artis* assistance that may prove necessary.

- On the day he carries out the child-psychiatric examination, the child psychiatrist does not know whether the child he is examining belongs to the test group or to the reference group. He has not yet met the family. Naturally, it is not strictly speaking a double-blind test: often a great deal is revealed by the appearance and presentation of the child when the family is received.
- An environment is created in which the child can make itself and its capabilities known. (If necessary and/or if requested by the parents, in their presence). After the examination a child-psychiatric report is made on the child.
- The aim is to get a picture of the child's present status, as far as possible solely from its presentation during the examination.
- The concern in the examination is with the way in which and the degree to which the child copes with its "developmental task", rather than with diagnoses such as "hyperkinetic syndrome with behavioural problems" or "moderate or serious affective and cognitive retardation".

Such statements may be pertinent but they give only broad, unspecified characteristics and are ill-suited to making comparisons between the children. They throw light only on partial aspects, and because of the limited amount of information they provide, offer an inadequate factual basis for the later discussion with the parents and for appropriate treatment (Cohen et al. 1975)

Some examples of child psychiatric reports are given in the appendix (pp. 159-164).

3. Operationalization of child-psychiatric theory

- The concepts discussed in ~~chapter two~~, on which our investigation is founded, were operationalized by drawing up two lists of items to be used in evaluating each of the child-psychiatric reports: a list of *ego items* and a list of *play items*.

- The list of ego items is divided into a series of "strong" ego aspects (items 1 to 15) and a series of "weak" ego aspects (1 to 11). Each item contains a brief clinical formulation of a theoretically important aspect of ego development. The items are so chosen that they are sufficiently clear clinically and at the same time permit scoring. Where necessary the item was placed in its theoretical context by means of a short footnote.

The items cover a fairly broad range of developmental aspects of theoretical and clinical importance for a three-year-old, but can not be exhaustive. A list of *play items* was drawn up in the same way. For the sake of clinical clarity they were arranged under the headings: affective style of playing (item 1 and 2), manner of playing (item 3), play in an interpersonal relation (items 4 and 5), structural level of play (item 6) and theme of play (item 7).

- The lists of ego items and play items are given below.

EGO ITEMS

"Strong" ego items

1. The use of a sentence with "I" as subject. Use of my, mine, you, your, etc.¹
2. The child uses I-sentences in alternation with speaking about oneself in the third person. His sense of I-you, mine-your, seems to be smaller.
3. Presence of self-awareness and verbalization² e.g.: "I am tired", announcement of action³: "I am going to...", "I will take..."

Footnote:

1. - On the other hand, the distinction between "me" and "not me" is enormously strengthened when the child understands and uses concepts such as "mine" and "I". (De Hirsch, 1975, p. 110)
 - The infant comes to differentiate between self and non-self in a gradual way. With the acquisition of language this distinction becomes far more clear-cut (Peller, 1966, p. 462).
2. Waelder felt that a prerequisite of superego formation is the capacity for introspection and the ability to stand back and regard the self from an imaginary vantage point. (De Hirsch, 1975, p. 113).
3. Planning speech (Luria and Ludovitch, 1977, p. 61)

7. Capacity to verbally situate^{1, 2}.
 - at home...
 - in my room...
 - in our school...
 - at that lady's (psychologist)...
8. Enough concentration to finish a task (with my help), such as an age-appropriate puzzle.
9. Recognition and naming of sexes³ (whether or not with emotional apraxia such as naming one and not the other, etc.): girl, boy, sir, mrs, man, woman.
10. Naming of puppets⁴.
11. Naming of animals⁴.
12. Naming of jigsaw pieces⁴.
13. Naming of inanimate objects such as furniture⁴.
14. Skilful manipulation of scissors, colouring pencil, hammer-play.
15. Playing at puzzles:
 - a). surveyable, with direction
 - b). changing of level, one moment trial and error, another moment with direction, and again another moment wrong.

"Weak" ego items

1. No use of I-sentences (or other proper use of pronouns).
2. tactile searching for boundaries: of the face of the examiner, of the wall, etc.
3. Little sense of space: only trial and error; attempt to put a big object into a small one.
4. More or less chaotic behaviour:
 - a). catastrophic reactions⁵: spasmodic, helplessly persisting and aggressive behaviour.
 - b). Making a mess in such a way that the floor is covered with toys. Walking over the toy, etc.
 - c). refusing tasks.
 - d). Lack of concentration (sequence of activities is difficult to follow).
 - e). Releasing of unhibited aggression on cars, blocks, puppets, piano-keys.

Footnote:

1. Number, space and time markers... are the framework for the organization of experience (De Hirsch, 1975, p. 99)
2. Narrative speech (Luria and Yudovitch, 1977, p. 61).
3. Identity ("aims of integration") (Frankl, 1961, p. 149-150).
4. The world we live in (the world of immediate experience). ("Aims of integration").
5. Form of "narcissistic rage" as described by Kohut (1972, p. 383).

5. Unarticulated speech.
6. Speaking in:
 - one - word
 - two - word sentences
 - three - word
7. Language of varying level: from syntactically correct up to less clear, but understandable in context¹.
8. Accompanies only actions and perceptions with speech; no self-awareness².
9. Does not answer questions: I won't .../ can't listen³.
10. Scrawling with unskilful pencil-grip.
11. Walking on tiptoe, unsymmetrical eye-position, primitive affecto-motor patterns.

PLAY ITEMS

Affective style of play

1. a). Playing is spontaneous and animated and gives the child enjoyment, as befits its age⁴.
 - b). Play gets going after an initial emotional blockage.
 - c). There is play, but with numerous disruptions⁵.
 - d). There is play, but with much agitation and drivenness⁶.
2. There is little or no spontaneous play. The examiner introduces the play elements and the child takes them up at a primitive level/takes them up scarcely or not at all⁷.

Manner of playing

3. a). Even with help from the examiner the child can muster only a little/scarcely any concentration⁸.

Footnote:

1. "In other words, as the child slips back and forth between the different levels of organization, the formal features of language reflect these changes" (De Hirsch, 1975, p. 111).
2. Synpraxic speech (Luria and Yudovitch, 1977, p. 61)
3. "The child who is unable to deduce from the incoming message the phonemic and syntactic rules underlying the surface structure of language tends to tune out. He has learned not to listen" (De Hirsch, 1975, p. 99)
4. - "Children play because they like doing so". (Winnicott 1964, p. 143)
 - "Play fits the dynamics of the child" (Buytendijk 1932, p. 25)
 - The Ego's Mobility in Play (Hartmann, 1939, p. 78)
5. "Play disruption" (Winnicott 1971, p. 52; Erikson, 1940)
6. "The instincts are the main threat to the play as to the ego". (Winnicott 1971, p. 52)
7. "When an organizer must be involved in a managerial position, then the implication is that the child is unable to play in the creative sense" (Winnicott 1971, p. 50).
8. "Preoccupation... akin to the concentration of older children and adults... characterizes the playing of a young child" (Winnicott 1971, p. 51)

- b). The child displays dexterity in manipulation: always/sometimes/seldom.
- c). The child shows knowledge of the toy either through verbalization or through the recognizability of its play¹: yes/sometimes/seldom.
- d). The child indulges its impulses in regard to the toy: the affective element is powerful and compelling².
- e). The child displays delay and inhibition in play².
- f). Play is accompanied by affects which point to primitive anti-thesis (for example pride and joy if the toy works verses a catastrophic reaction if it does not work or does not work quickly enough)³.
- g). The child is exaggeratedly compulsive and repetitive in its play⁴.
- h). The child takes hold of a lot of toys and: plays with them/ scarcely plays with them.

Play in interpersonal relation

- 4. a). The child can admit the examiner into his play and:
 - does not find it disturbing
 - does find it disturbing to a varying extent⁵.
- b). The child draws the examiner into his play⁶.
- c). The examiner and/or the mother is in the service of the child's play⁸.
- d). The child does not allow itself to be approached much or at all by the examiner in its play⁷.
- e). There is pleasure in being with and playing along with the mother and/or examiner⁶.

Footnote:

- 1. "Mastery Play" (Bruner 1974, p. 32).
- 2. "Children play to master anxiety or to master ideas and impulses that lead to anxiety if they are not in control" (Winnicott 1964, p. 144)
- 3. "Play tends towards a unification and general integration of the personality" (Winnicott 1964, p. 145).
- 4. "Threat of excess of anxiety leads to compulsive play or repetitive play" (Winnicott 1964, p. 144).
- 5. "The child is ready for the next stage, which is to allow and to enjoy an overlap of two play areas" (Winnicott 1971, p. 48).
- 6. "The way is paved for a playing together in a relationship" (Winnicott 1971, p. 48)
- 7. "The playing child inhabits an area... that can not easily admit intrusions" (Winnicott 1971, p. 51)
- 8. Play like that of a very young child, in which "the mother figure's adaptive function (is) taken for granted" (Winnicott 1971, p. 52)

5. Play allows the child some affective distance vis-à-vis the mother/examiner. Some "capacity to be alone" in the presence of someone¹: yes/growing/little.

*Structural level of play*²

6. a). Play is at the exercise level³.
- b). There are - at first sight - some symbolic elements in the child's play, but the play as a whole indicates that the child has not yet or not yet sufficiently achieved the distinction between the "symbol" and the "symbolized".
- c). The symbolic representation⁴ level has been sufficiently attained, because the child's play displays one or more of the following aspects:
1. The play appears to be aimed above all at structuring and ordering the material, or the inner world-outer world.
 2. There are brief episodes of symbolic play / the play is inventive and leads to extended symbolic material.
 3. The child's play bears the stamp of uniqueness and identity; there are tendencies towards increasingly adapted representation⁵, there is a feeling for rôles.
- 6-extra: the evocation of absent persons during play⁶.

Footnote:

1. "The next stage is being alone in the presence of someone. The child is now playing on the basis of the assumption that the person who loves and who therefore is reliable is available and continues to be available when remembered after being forgotten" (Winnicott 1971, p. 47-48).
2. Piaget: Play should be categorized according to the mental complexity it displays (1972, p. 115)
3. "Exercise play": see definition on page 34
4. The symbolism of the child's play, in other words its "comme si", "let's pretend", "as if" character, is clear
5. An evolved form of symbolic play which bears witness to the child's growing adaptive capability
6. This was added as a separate item in view of its clinical importance in relation to affective bonds and growing object constancy (Objectconstancy: "The ability to maintain a lasting relationship with a specific, single object" (Rycroft, 1968, p. 100).)

Theme of play

7. The content of the child's play reveals a life experience which runs - verbalized or dramatized form - as follows:

I

+ are good enough, my basic needs are fulfilled^{1, 2}.

the world

1. Yes;

2. yes, but: though there are elements - e.g. oral aggression of puppets - which require some reservations, the overall climate of the child's play is satisfactory;

3. predominantly yes;

4. many reservations: there is a great deal of insecurity in the play picture;

5. not sufficiently, because....

We based the gradations of reservations of play themes* on the presence of the following aspects in the child's play:

- my body is sick / sickness threatens

- faces / mouths are dangerous

- care needs are played out with urgency

- I am full of aggression towards persons

- "I can't do it, I don't dare" (low self-esteem)

- I tend towards trial and error, stopping and getting angry when I fail instead of showing pride and perseverance

- elements / events in the child's play call forth anxiety / panic / play disruption.

* Although there is a lot of subjectivity in the registration and the evaluation of those themes in the child's play, we did not want to do without them for clinical reasons. Moreover, the subjectivity of interpretation is corrected to some extent by the fact that the scoring is done by three evaluators.

4. Protocol for the data

• Three evaluators (two child psychiatrists and one psychologist) each received a copy of all the child-psychiatric reports to evaluate and score on the basis of presence or absence of the *ego items* and *play items* described above.

After each evaluator had scored a report on his own, the child finally received a score for an item if at least two of the three evaluators had reached the same verdict for that item.

Footnote:

1. "The initiation of playing is associated with the life experience of the baby who has come to trust the mother figure" (Winnicott 1964, p. 146).

2. "One child after another will use a few toys and ten to twenty minutes time to let some disturbing fact of his life, or some life task, become the basis for a performance characterized by a unique style of representation" (Erikson 1972, p. 130-131).

- As each individual child-psychiatric report is limited in its information and based on a limited examination of roughly one hour, by no means all items are present in each individual report.
- After each child had been given scores in the above manner, the items were analysed for their frequency of occurrence in the four groups: for example item 1 of the "strong" ego items was scored by
 - 2 of the 16 LBW boyws
 - 10 of the 24 LBW girls
 - 11 of the 16 control boys
 - 22 of the 24 control girls.

In the same manner a frequency distribution per item was drawn up for the 40 pairs of children (each pair consisting of 1 test child and 1 matched reference child), for example for item 1 of the "strong" ego items:

- in 23 of the 40 pairs only the reference child scored
- in 10 pairs both the LBW child and the reference child scored
- in 2 pairs only the LBW child scored
- in 5 pairs neither child scored.
- This procedure gave rise to a clinical guideline, in that certain items stood out because of the marked difference in their frequency of occurrence in the different groups.
- An ordering principle was then sought which would allow the difference between the LBW group and the reference (full-term) group to be structured as clearly as possible in terms of unity of items.

5. Scale analysis: "Guttman"

A method of scale analysis was applied to the ego items and the play items, namely the Guttman analysis. This method was used because of the clinical suspicion that the items have a hierarchical character (Edwards, 1957, p. 172-199).

Choice of items for Guttman analysis

The 12 items (6 ego items and 6 play items) given below qualified for the Guttman analysis. The choice of items was restricted for the following reasons:

1. the "SPSS" computer package (Statistical Package for the Social Sciences) can handle only 12 items at a time in 1 analysis. (Nie et al., 1970).
2. All of the children must have scored on the items chosen; the technique of scale construction requires responses from all the individuals of the group on the selected items.

For this study, therefore, 6 ego items and 6 play items were chosen which are clinically relevant - based on the concepts of developmental psychology given in chapter 2 - to the matter of gaining an insight into the degree to which the three-year-olds examined fulfil their "developmental task"; further, all of the child-psychiatric reports had been scored on these 12 items in the manner described in "protocol for the data".

Selected items: (This list of 12 selected items refers to the original list of ego items and play items on p. 44-50.)

EGO ITEMS

- I. Use of an I-sentence or use of another correct possessive or personal pronoun (item 1 of the "strong" ego items).
- II. Making remarks about, speaking about, key figures (in the broad sense of the term). (Item 4/e/ of the "strong" ego items).
- III. Spoken language of sufficient level, i.e. child does not score on items 5, 6 or 7 of the "weak" ego items*.
- IV. Sufficient concentration for a task appropriate to the age group, e.g. a simple puzzle (item 8 of the "strong" ego items).
- V. Organization in thought, expressing itself in thinking in space-time-age categories (the child scores on item 5, 6 or 7 of the "strong" ego items or a combination of them)*.
- VI. Dexterity in the manipulation of material (item 14 of the "strong" ego items).

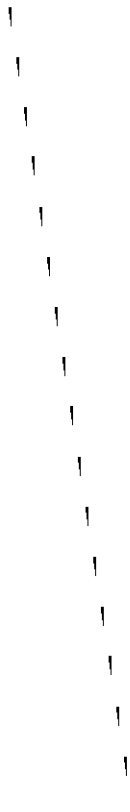
PLAY ITEMS

- VII. Spontaneous and animated play such as befits the age (item 1/a/ of the play items).
- VIII. The child shows knowledge of the toy, either through verbalization or through recognizability and sequence of its play (item 3/c/yes/ of the play items)**.
- IX. Child has some "capacity to be alone" in play (through organization and object constancy). (Item 5 / yes + growing/ of the play items).

* In this case items 5 + 6 + 7 of the "weak" ego items (see page 47) are brought together to form a larger entity, resulting in: "spoken language of sufficient level" provided the child has not scored "yes" on the original "negatively" formulated items. The same applies, mutatis mutandis, to item V.

** Where items were involved which did not have a dichotomous score (e.g. page 48, item 3c / yes - sometimes - no) the scoring was altered to become dichotomous for the Guttman analysis. In this case, those with "yes" scored positively and those with "sometimes" or "no" negatively.

- X. The structure of the child's play has one of the aspects which point to symbolic play (distinction symbol / symbolized made). (Item 6/ c/category 1, 2 or 3 or combination).
- XI. There is evocation of absent persons in play ("significant others"). (Item 6 - extra).
- XII. The play theme shows sufficient basic trust: play as a dramatized declaration of the history of the psychological bond with the mother (item 7/yes/yes, but.../predominantly yes/).



CHAPTER V
CONSTRUCTION OF GUTTMAN SCALES

A. Ego scale

The 6 selected ego items listed on page 52 were subjected to a Guttman scale analysis. This involves placing the items in order in a row in such a way that, ideally speaking, the series of ranked items forms a scale which is:

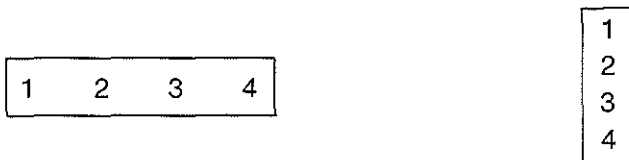
- *cumulative* and thus gives a measure from more to less ego skill (ego competence);
- *unidimensional*: the scale is so constructed that all of the items it contains have to do with the dimension (i.e. psychological category) "ego skill". If one of the items does not fit sufficiently in the ranked row the scale technique will "eliminate" this item.

Once a scale has been constructed which has ordered a set of items so that they form a "linear" measure for the desired psychological category - in the case of the present study, "ego skill" - the scores for the separate items may be added up.

This gives a figure for "ego skill" which makes it possible to compare the test group (LBW children) and the reference group (full-term-children) with the help of their score on the scale that has been constructed.

Example:

Given an ego-competence scale which meets the technical criteria and is composed of 4 items ordered as follows:



according to the Guttman scale technique this means ideally that:

- all 4 items represent a measure of ego competence and together in the order given can be used as a measure rod for ego competence. (The scale is unidimensional).

- Item 1 requires more ego competence than item 2; item 2 in turn requires more ego competence than item 3 and, finally, item 3 requires more ego competence than item 4. (In other words, the scale is "cumulative").
- Ideally, scoring positively on an item means that the individual also scores positively on all items to the right of it or under it in the row (depending on whether the "measuring rod" is held horizontally or vertically), the reason being that the scale has been arranged cumulatively.
- Given that the score which can be obtained for each separate item is known - let us take as an example 0 or 1 point - then it is possible to predict from an individual's total score what his scores were on the different items. Example: all individuals with a total score of 2 will - ideally speaking - have scored positively on the simpler items 3 and 4, obtaining 1 point for each, and will have received 0 points for the more difficult items 1 and 2. Similarly, all individuals with a total score of 1 will score positively (= 1 point) on item 4 and negatively (= 0 points) on items 1, 2 and 3.

The ego scale found by Guttman scale analysis is shown below:

1. Organisation in thought, expressing itself in space-time-age categories (the child scores on 1 or more of the items 5, 6 and 7 of the "strong" ego items)
2. Use of an I-sentence or use of other correct pronouns (item 1 of the "strong" ego items)
3. Spoken language of sufficient level, i.e. child does not score on item 5, 6 or 7 of the "weak" ego items.
4. Making remarks about, speaking about, affectively important key figures (item 4/e/ of the "strong" ego items).

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The *ego scale*, then, consists of 4 items* so arranged that item 1 requires more "ego skill" than item 2, item 2 more than item 3 and item 3 more than item 4. (The scale is unidimensional and cumulative).

* 1. Two of the 6 items have therefore been eliminated in the scalogram analysis.
 2. In the appendix the computer output of the scale is presented. A brief explanation is also given of how this output should be read and which internal validity criteria such a Guttman scale should meet.

Application of the scale as a measuring instrument in the present study.

On item 1 (3 parts) a child can obtain from 0 to a maximum of 3 points (1 point for each part).

On item 2 a child can obtain 0 or 1 point.

On item 3 it can obtain from 0 to 3 points (1 point for each part).

On item 4 it can obtain 0 or 1 point.

In total, then, a child can obtain from 0 to 8 points.

In view of the nature of the Guttman scale, if the reader is presented with a child's total score he can (ideally speaking) predict the child's scores on the separate items*.

Examples:

- a child with a total score of 2 will (very) probably have scored on item 4 and any one of the parts of item 3;
- a child with a total score of 3 will (very) probably have scored on item 4 and two of the parts of item 3;
- a child with a total score of 7 will have scored on item 4, all three parts of item 3, item 2 and two of the parts of item 1;
- stated in general terms: the children with the lowest scores score on the items with the lowest rankings, and the higher a child's total score the more of the higher-ranked items it will have scored on, moving progressively up the scale.

B. Play scale**

The 6 selected items listed on page 52 were subjected to a scale analysis. This resulted in a play scale of ranked items which, as explained above with reference to the ego scale, will be used to compare the "play skill" of the test group (LBW children) and the reference group (full-term children) by means of the scores obtained on the scale. The characteristics of this play scale are the same as those of the ego scale.

* This ego scale has a coefficient of reproducibility of .90 (see appendix), which means that predictability is only 90% This, however, is more than enough.

**The computer output of this play scale can be found in the appendix, as can the internal validity criteria.

1. Evocation of absent persons in play (item 6/extra/ of the play items).
2. The structure of the child's play points to true symbolic play (the child distinguishes between symbol and symbolized: the "comme si", "let's pretend" nature of its play is clear). (Item 6/c/1, 2 or 3/).
3. Play is spontaneous and animated as befits the age (item 1/a of the play items).
4. The child has some capacity to be alone in playing (through organisation and incipient object constancy). (Item 5/yes + growing/ of the play items).
5. The child displays knowledge of the toy, either through verbalization or through the recognizability of and sequence in its play (item 3/c/yes/ of the play items).
6. The play theme bears witness to sufficient basic trust (item 7 / yes/yes, but... / predominantly yes).

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C. Ego-play scale*

1. Organization in thought, expressing itself in space-time-age categories (the child scores on 1 or more of items 5, 6 and 7 of the "strong" ego items).
2. Evocation of absent persons in play (item 6/extra/ of the play items).
3. Use of I-sentences or use of other correct pronouns (item 1 of the "strong" ego items).
4. The structure of the child's play points to true symbolic play (the child distinguishes between symbol and symbolized: the "comme si", "let's pretend" nature of its play is clear). (Item 6/c/1, 2 or 3).
5. Spoken language of sufficient level, i.e. child does not score on items 5, 6 or 7 of the "weak" ego items.
6. Play is spontaneous and animated as befits the age (item 1/a of the play items).
7. The child has some capacity to be alone in playing (through organisation and incipient object constancy). (Item 5/yes/ growing/ of the play items).

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* The Guttman method was used to construct an ego-play scale which is analogous in every way to the *ego scale* and the *play scale* presented earlier. The scale is made up of the 4 items of the ego scale and the 6 items of the play scale and enabled a "total score" to be obtained for comparing the test group and the reference group. For computer output see appendix.

8. The child displays knowledge of the toy, either through verbalization or through the recognizability of and sequence in its play (item 3/c/yes/ of the play items).
9. Making remarks about, speaking about, affectively important key figures (item 4/e/ of the "strong" ego items).
10. The play theme bears witness to sufficient basic trust (item 7 / yes/ yes, but... / predominantly yes).

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CHAPTER VI

HYPOTHESES AND PREDICTIONS

A. Recapitulation

It might be helpful here to briefly review the line of thought pursued thus far.

1. In chapter 3 ("The Ego under observation") clinical and theoretical arguments were put forward to justify taking the development of the ego as the point of departure in seeking to determine whether and to what extent low-birth-weight children are high-risk children, the comparison being with developmental psychology's norm and with matched full-term reference children.
2. In chapter 4 ("Method") this point of departure, ego development, was operationalized in the form of "ego items" and "play items".
3. The Guttman method of scale analysis was then applied in order to obtain a unidimensional and cumulative scale on which the test group and the reference group could be placed and compared.
4. Now that 3 cumulative scales have been constructed (the ego scale, the play scale and the ego-play scale) specific hypotheses and predictions can be formulated.

B. Clinical points of departure - Hypotheses - Predictions

1. Clinical points of departure

1. Low-birth-weight children enter the world with a frail, premature and/or dysmature body which is not yet fully equipped to adapt to extra-uterine life. In consequence, they have to be admitted to a neonatal high care department; this means being separated from the mother in a sensitive period as far as the development of attachment is concerned.
2. The general developmental sequence from non-differentiation, globality and instability to increasing differentiation, hierarchical organization, precision, accuracy and skill will be negatively influenced by the low-birth-weight child's immaturity: its psycho-

physiological unripeness can make it extra difficult to acquire basic routines of mental and sensorimotor competence.

Examples are: the development and maintenance as a baby of a sufficient degree of alertness, the active visual screening and following of the world (including, first and foremost, the mother), the acquisition of secure head and trunk control, the acquisition of control of the hand in the form of power and precision grip visually guided by the eye and co-ordinated by the C.N.S.

The sensorimotor development which culminates in "the successful action" (Piaget) and provides practical intelligence will encounter difficulties. Inadequate mastery of these stages will in turn interfere with the transition from action toddler to language toddler.

All of this may, to varying degrees, have repercussions for the affective aspects of the mother-child dyad: Funktionslust, bodily well-being and autonomy through skill and organization will establish themselves only with difficulty; at very least, the mother's confidence in her child's development and in her own maternal abilities in this respect will be put to the test.

II. Hypotheses

1. Low-birth-weight children will differ in a negative sense from full-term reference children of the same post-natal age as regards differentiation and competence expressed in ego organization.
2. In play the low-birth-weight child will display less mastery and structure than the full-term child. His style of play will reveal less Funktionslust.
3. In the low-birth-weight group, the lower the birth weight was, the weaker will be the ego organization.
4. In the low-birth-weight group, the longer the duration of admission - perinatal for prematurity - was, the weaker will be the ego organization.

III. Predictions

On the basis of these hypotheses, the following predictions were formulated:

Prediction I:

At 3 years of age the low-birth-weight children will as a group have lower scores on the ego scale, the play scale and the ego-play scale than the group of full-term, full-birth-weight children of comparable age.

Prediction II:

At three years of age the low-birth-weight children will as a group have a lower IQ - which measures academic skill - than the group of full-term, full-birth-weight children of comparable age.

Prediction III:

There will be a strong relation in the test group between, on the one hand, ego, play and ego-play scores and IQ and, on the other, birth weight: this correlation will be positive and substantial.

Prediction IV:

There will be a strong relation in the test group between, on the one hand, ego, play and ego-play scores and IQ and, on the other, duration of admission: this correlation will be negative and substantial.

Note:

A correlation will also be sought between a list (see p. 93) of possible perinatal risk factors (such as, for example Respiratory Distress Syndrome) and the scores at three years of age on the ego-play scale and for IQ. As very small numbers are involved for the different risk factors (only a fraction of the 40 test children) no predictions are made for this.

CHAPTER VII

RESULTS

The results are presented below in the following order:

- Part I contains the child psychiatric results which compare the children in the test group (3-year-old LBW children) and those in the reference group (3-year-old full-term and full-birth-weight children) in terms of their *ego competence* and their *play competence* (p. 65-84);
- Part II gives the IQ values found through psychological testing of the test group and the reference group (pp. 84-88);
- Part III gives the correlations found between "perinatal risk factors" and results at three years of age for the test group of LBW children (these perinatal risk factors do not apply to the reference group) (p. 88-96).

Part I: Child psychiatric results

In summary, the procedure used to arrive at these results was as follows:

- each child underwent a child psychiatric examination, of which a written report was made;
- this report was read by 3 evaluators, who assigned scores on a list of *ego variables* (p. 44) and a list of *play variables* (p. 47), the lists having been drawn up for the present study on the basis of clinical and theoretical data;
- the Guttman scale analysis method (see p. 55) was used to construct an *ego scale* from the ego variables and a *play scale* from the play variables. A combined *ego-play scale* was also constructed;
- applying this scale technique gives each child a "mark" on the ego scale and on the play scale, the mark constituting a measure of the *ego skill* and *play skill* which the child demonstrated during the examination as regards the items contained in the scale;
- the marks obtained on the ego scale and on the play scale enable the two groups (test group and reference group) to be compared with one another. They also allow the predictions (p. 62) to be tested.

To clarify the method employed, we shall begin by giving table 4 which shows the 10 variables (scale items) on which the children examined were finally scored.

4 of these variables form the ego scale, the remaining 6 the play scale. The 10 variables together form the ego-play scale.

The purpose of this introduction is merely to elucidate procedure; thereafter the *ego scale*, *play scale* and *ego-play scale* results will be given separately.

A general comparison between the two groups can be obtained by giving the percentage of the children in the test group and in the reference group that scored on each of the variables.

Table 4: Relative frequency distribution of the scoring on the 10 Guttman scale items.

	Short description of item	Percentage of test-group and reference-group children that scored on the item	
		test group (N=40)	reference group (N=40)
I	Organization in thought: space-time	20.0	60.0
II	Evocation of absent persons in play	25.0	70.0
III	Use of correct pronouns	27.5	80.0
IV	Play structure: symbolic level	37.5	77.5
V	Sufficient language level	45.0	77.5
VI	Spontaneous and animated play	52.5	82.5
VII	Capacity to be alone in playing	55.0	82.5
VIII	Recognizability of play (mastery play)	52.5	90.0
IX	Key figures spoken about	52.5	90.0
X	Play theme reveals sufficient basic trust	72.5	87.5

Note:

For a more detailed statement of the item, see presentation of the ego-play scale (page 58).

It can be seen from the above that a higher percentage of reference children than of test children scored on each individual scale item. The same relative frequency distribution is given in table 5, but this time the test group is split up into test boys and test girls and, correspondingly, the reference group into reference boys and reference girls. This gives a global picture of the differences found, broken down according to the child's sex.

Table 5: Relative frequency distribution of the scoring on the 10 scale items.

Items	Percentage of the sub-groups that scored on the item			
	test boys (N=16)	reference boys (N=16)	test girls (N=24)	reference girls (N=24)
I	6.0	56.0	29.0	62.5
II	0	56.0	41.0	79.0
III	12.5	69.0	37.5	87.5
IV	0	62.5	62.5	87.5
V	25.0	69.0	58.0	83.0
VI	37.5	81.0	62.5	83.0
VII	31.0	75.0	70.0	87.5
VIII	12.5	81.0	79.0	96.0
IX	31.0	100	67.0	87.5
X	62.5	81.0	79.0	92.0

Note:

For a more detailed statement of the item, see presentation of the ego-play scale (page 58).

The table shows that the relative differences between the test boys and the reference boys are greater than those between the test girls and the reference girls.

The differences between the test group and the reference group and between the sub-groups as determined by the sex of the child will now be dealt with more systematically on the basis of the results obtained on each of the scales separately.

A. Ego-score on the ego scale

The ego scale is composed of the following 4 scale items:

1. Organization in thought, expressing itself in space-time-age categories (the child scores on 1 or more of the items 5, 6 and 7 of the "strong" ego items).
2. Use of an I-sentence or use of other correct pronouns (item 1 of the "strong" ego items).
3. Spoken language of sufficient level, i.e. child does not score on item 5, 6 or 7 of the "weak" ego items.
4. Making remarks about, speaking about, affectively important key figures (item 4/e/ of the "strong" ego items).

EGO SCALE

In total there are 8 points to be earned, namely:

on item 1 of the scale: 3 points

on item 2 of the scale: 1 point

on item 3 of the scale: 3 points

on item 4 of the scale: 1 point

Averages:

The average scores obtained by the groups and the subgroups on this ego scale provide a global view of the differences between them as regards ego skill.

Table 6: Average score on the ego scale:

		\bar{X}_{ego}	S.D.
1 for the total group	(N=80)	4.50	1.80
2 for the test group	(N=40)	3.52	1.52
3 for the reference group	(N=40)	5.47	1.53
4 for the boys	(N=32)	3.90	1.74
5 for the girls	(N=48)	4.89	1.75
6 for the sub-groups:			
a) test boys	(N=16)	2.75	1.06
b) reference boys	(N=16)	5.06	1.52
c) test girls	(N=24)	4.04	1.57
d) reference girls	(N=24)	5.75	1.51

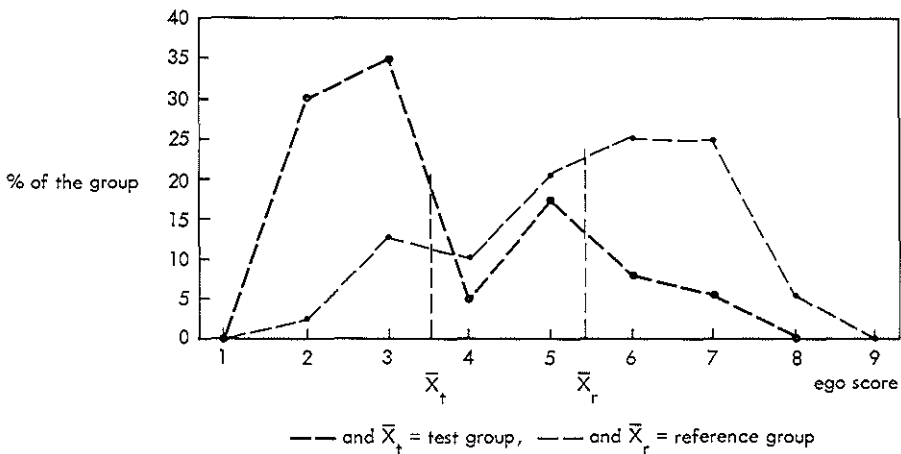
The standard deviation given in table 6 indicates the degree of variability about the average. In all of the groups this is small and more or less equal and it can therefore be ignored in interpreting the results. On average, then, the test group of LBW children scored almost 2 points lower on the ego scale than the reference group of full-term children. It will also be noticed that the difference in score between the LBW boys and the LBW girls is greater than that between the reference boys and the reference girls.

Frequency distribution of the ego scores: A better picture of the distribution of the ego scores within a group is obtained by means of a graph (e.g. graph 7) in which the ego scores occurring are shown in ascending order along the x-axis, the percentage of the children in the group in question that obtained a given score being shown on the y-axis. In this way it becomes clear that a group is not composed of "homogeneous average individuals."

It can also be seen from the graph whether the distribution within the group is uniform over the entire range of scores or there is a concentration in the low or in the high scores. Graphs of ego-score frequency distributions, highlighting the differences between the groups, are presented below.

In order, the graphs show the difference in ego-score frequency distribution between:

- the test group and the reference group (graph 7)
- the total boys' group and the total girls' group (graph 8)
- the test boys and the reference boys (graph 9)
- the test girls and the reference girls (graph 10).



Graph 7: Frequency distribution of ego scores of the test group (N = 40) and the reference group (N = 40).

The bold-face line representing the test group shows that 30% of the test group obtained an ego score of 2; 35% an ego score of 3; 5% an ego score of 4 etc. In the same way, the thin like representing the reference group shows the percentage of the reference group that obtained each of the scores marked on the x-axis.

The test group (LWB children) has a markedly lower score on the ego scale than the reference group (full-term children). The difference is significant using Wilcoxon's test for two independent samples: $P < .001$ (2-tailed). Prediction 1 is therefore not disproved.

Graph 7 also clearly shows that the test children have predominantly low scores: 65% (35% with a score of 2 + 35% with a score of 3) obtained a score of ≤ 3 . The reference group, on the other hand, have predominantly high scores: 55% obtained a score of ≥ 6 .

This difference between the two groups can also be shown by placing a cutting point, i.e. choosing a score which distinguishes optimally between the two groups because the majority of one group fall below that score, while the majority of the other group will fall above it. The patterns of the frequency distribution lines are obviously of help in choosing such a cutting point. If an ego score of 4 (half of the maximum score) is taken as the cutting point, it can be seen from the graph precisely what percentage of the test children obtained a score of ≤ 4 and what percentage a score of > 4 . The same procedure is used for the reference children. The values found are shown in the following table:

Table 7: Cutting point

Ego score	test group %	reference group %
≤ 4	70	25
> 4	30	75

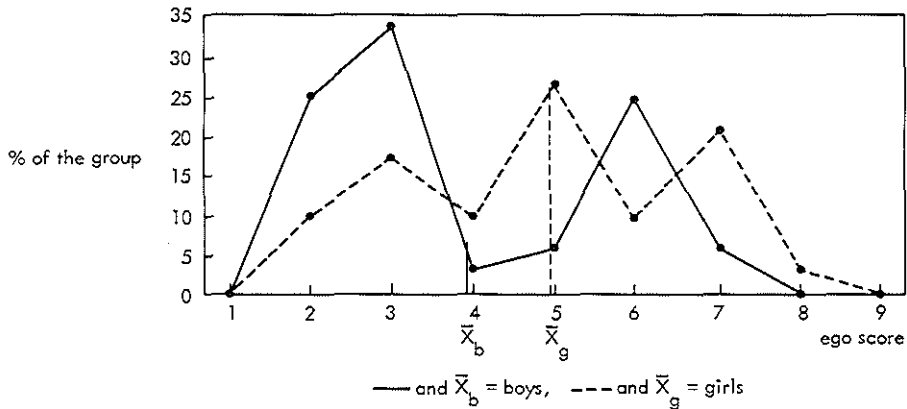
In other words, of the test children 70% obtained a score of ≤ 4 and 30% a score of > 4 , while of the reference children 25% obtained a score of ≤ 4 and 75% a score of > 4 .

This can be expressed in probabilities: the odds that a child with a score of ≤ 4 is a test child is 2.8 times ($70/25$) as high as the odds that it will be a reference child; a child with a score of > 4 has 2.5 times ($30/75$) less chance of being a test child than of being a reference child.

The odds ratio for this cutting point is

$$\frac{70 \times 75}{30 \times 25} = 7 \text{ (derived from the two probabilities)}$$

Expressed in words: the chance that a child with a score of ≤ 4 belongs to the test group is 7 times as great as the chance that a child with a score of > 4 belongs to the test group. (The higher the odds ratio is, the better the selected cutting point separates the two groups).



Graph 8: Frequency distribution of ego scores of the total boys' group (N = 32) and the total girls' group (N = 48).

- It is striking that the boys' group scores lower than the girls' group. The difference is significant: the Wilcoxon test gives a value of: $.01 < P < .02$
- Cutting point placing again illustrates how many more boys than girls have low scores:

Table 8: cutting point

Cutting point ≤ 4		
Ego score	boys %	girls %
≤ 4	62	37
> 4	38	63

Odds-ratio: 2.8

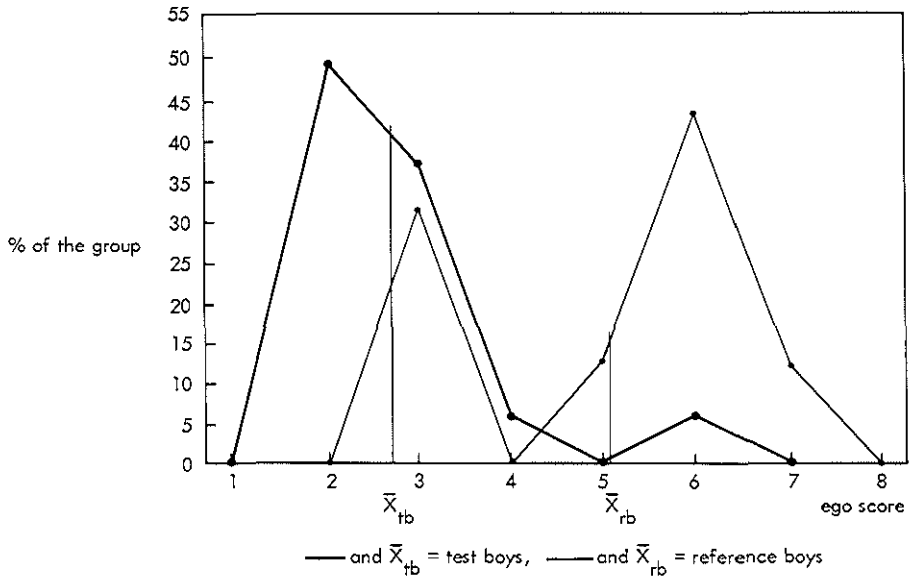
Table 9: Cutting point

Cutting point ≤ 6		
Ego score	boys %	girls %
≤ 6	94	75
> 6	6	25

Odds-ratio: 5.2

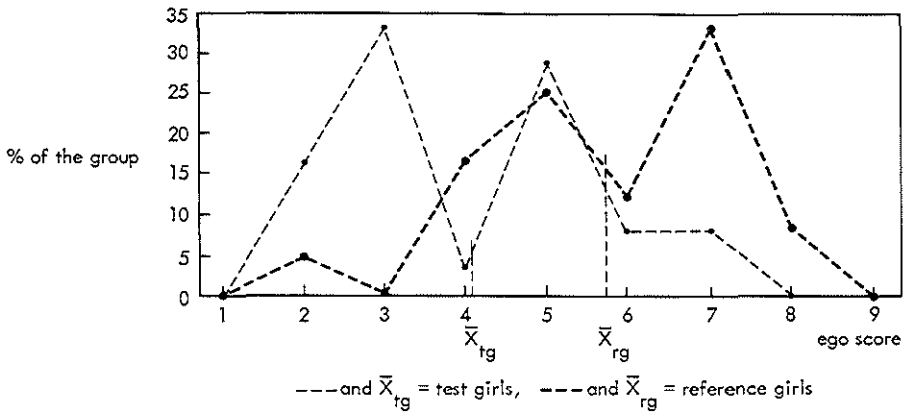
On the basis of the double criterion (test child versus reference child; boy versus girl) the total group of children examined (N = 80) can be divided into 4 sub-groups. The frequency distribution of the ego scores of these 4 sub-groups is presented as follows:

- test boys versus reference boys (graph 9)
- test girls versus reference girls (graph 10).



Graph 9: Frequency distribution of ego scores for the test boys (N = 16) and the reference boys (N = 16)

Wilcoxon test: significance testing (2-tailed): $P < .001$. The difference in scoring on the ego scale between test boys and reference boys is striking.



Graph 10: Frequency distribution of ego scores for the test girls (N = 24) and the reference girls (N = 24)

Wilcoxon test: significance testing (2-tailed): $P < .001$. The difference between test girls and reference girls on the ego scale is clearly in favour of the full-term reference group, but is much smaller than the difference in ego score between test boys and reference boys.

- The use of cutting points once again illustrates the difference

between the 4 sub-groups. In the table below it can be seen that a cutting point of ≤ 4 on the ego scale splits off over 90% of the test boys, while a cutting point of ≤ 5 splits off over 80% of the test girls. A cutting point of ≤ 6 shows the difference between reference boys and reference girls in the latter's favour.

Table 10: Cutting points

Ego score	Boys %		Girls %	
	test	reference	test	reference
≤ 4	94 ^I	31 ^I	54	21
> 4	6 ^I	69 ^I	46	89
≤ 5	94	44	83 ^{II}	46 ^{II}
> 5	6	56	17 ^{II}	54 ^{II}
≤ 6	100	87.5	92 ^{III}	59 ^{III}
> 6	0	12.5	8 ^{III}	41 ^{III}

Odds-ratio I: 34.9 Odds-ratio II: 5.7 Odds-ratio III: 8.0

Summary of the results obtained:

- On average the test group of low-birth-weight children scores lower on the ego scale than the reference group of full-term children. The difference amounts to almost 2 points. The ego competence of the test group at 3 years of age is therefore smaller than that of the reference group at the same age.
- The difference between the ego-scale scores of the test boys and the reference boys is greater than the difference between the scores of the test girls and the reference girls. The gap between the ego competence of the LBW boys at three years of age and that of the full-term boys at the same age is therefore greater than the gap between the ego competence of the LBW girls and that of the reference girls of the same age.

B. Play score on the play scale

The play scale is composed of the following 6 scale items:

1. Evocation of absent persons in play (item 6-extra of the play items). (p. 49).
2. The structure of the child's play points to true symbolic play (the child distinguishes between symbol and symbolized: the "commesi", "let's pretend" nature of its play is clear). (item 6/c/1, 2 or 3/). (p. 49).

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3. Play is spontaneous and animated as befits the age (item 1/a/ of the play items). (p. 47).
4. The child has some capacity to be alone in playing (through organization and incipient object constancy). (item 5/yes + growing/ of the play items). (p. 49).
5. The child displays knowledge of the toy, either through verbalization or through the recognizability of and sequence in its play (item 3/c/yes/ of the play items) (p. 48).
6. The play theme bears witness to sufficient basic trust (item 7/ yes + yes, but .. + predominantly yes/) (p. 50).

In total there are 8 points to be earned, namely:

- on item 1: 1 point
- on item 2: 3 points
- on item 3: 1 point
- on item 4: 1 point
- on item 5: 1 point
- on item 6: 1 point

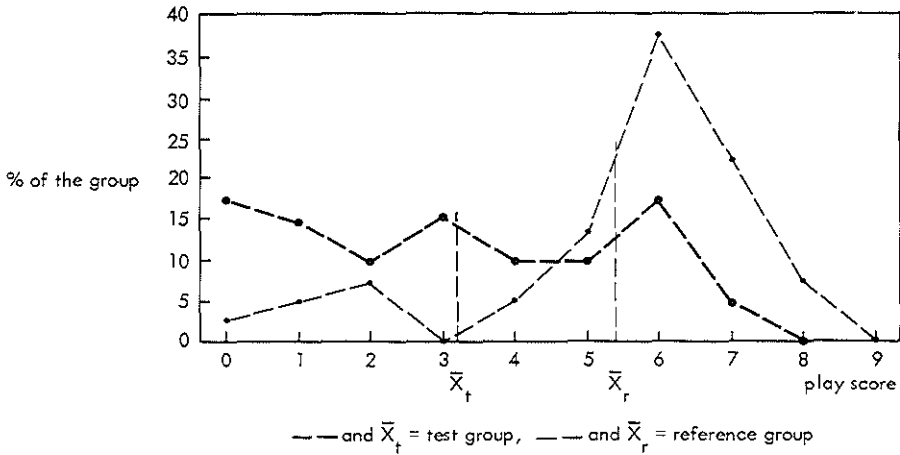
The presentation of the results on this play scale follows the sequence used for the ego-scale results.

The *average values* obtained on the play scale by the various groups give a global view of the differences between these groups in terms of their play skill as expressed in a play score.

The *frequency distribution* of the play scores in the various groups focuses attention on the differences in spread between the groups. The frequency distributions enable us to select a good *cutting point* in order to further accentuate the differences between two sub-groups.

Table 11: Average score on the play scale:

		\bar{X}_{play}	S.D.
1 for the total group (test group + reference group)	(N=80)	4.25	2.45
2 for the test group	(N=40)	3.10	2.29
3 for the reference group	(N=40)	5.40	2.06
4 for the boys	(N=32)	3.09	2.55
5 for the girls	(N=48)	5.02	2.07
6 for the sub-groups:			
a) test boys	(N=16)	1.43	1.20
b) reference boys	(N=16)	4.75	2.49
c) test girls	(N=24)	4.20	2.18
d) reference girls	(N=24)	5.83	1.63



Graph 11: Frequency distribution of play scores for the test group (N = 40) and the reference group (N = 40)

The test group's play score is clearly lower than that of the reference group, and the difference is significant using the Wilcoxon test: $P < .001$ (2-tailed). Prediction 1 is not refuted.

The placing of cutting points again clearly illustrates that the test group obtains predominantly low scores, while over 2/3rds of the reference group obtain high scores:

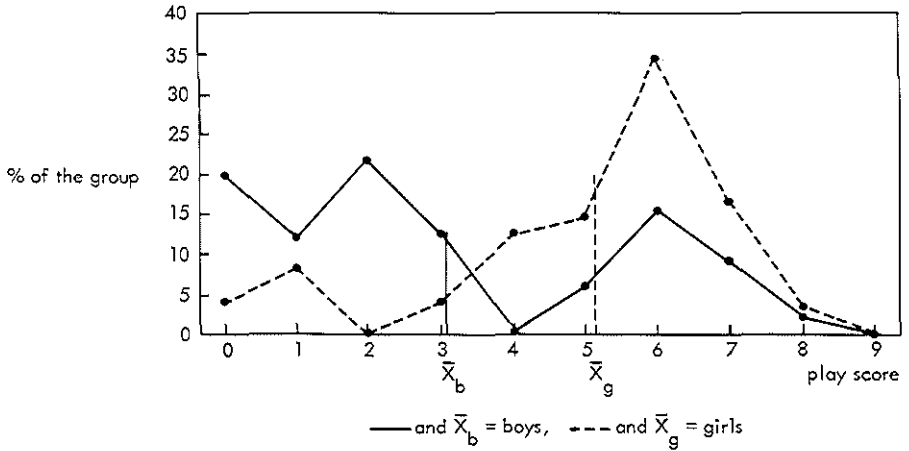
Table 12: Cutting points

Play score	test group %	reference group %
≤ 4	67.5	20
> 4	32.5	80

Odds-ratio: 8.3

Play score	test group %	reference group %
≤ 6	77.5	32.5
> 6	22.5	67.5

Odds-ratio: 7.2

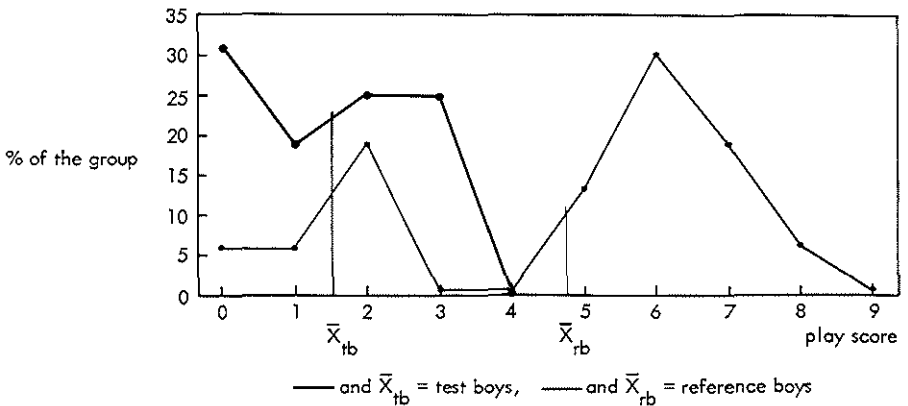


Graph 12: Frequency distribution of the play scores of the total boys' group (N = 32) and the total girls' group (N = 48)

The girls score substantially higher on the play scale than the boys. This can be seen by using cutting points:

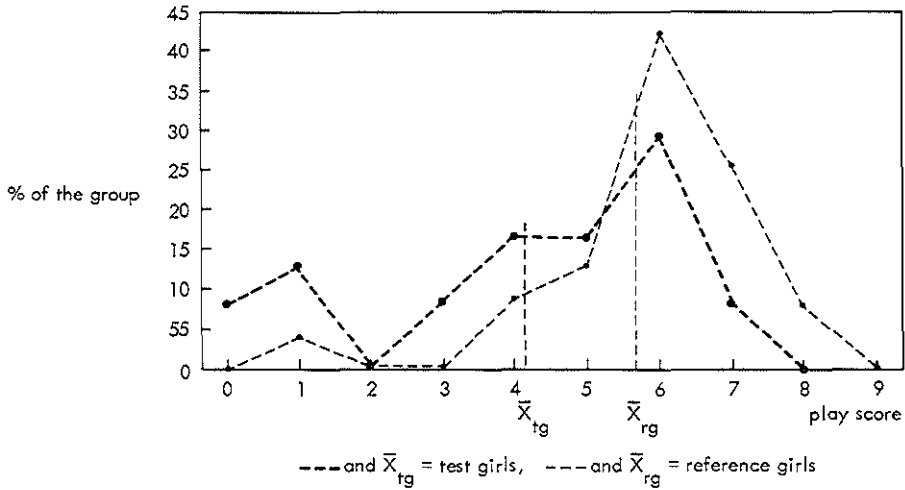
Table 13: Cutting points

Play score	boys %	girls %
≤ 3	66	16
> 3	34	84
Odds-ratio: 10.2		
Play score	boys %	girls %
≤ 6	72	44
> 6	28	56
Odds-ratio: 3.3		



Graph 13: Frequency distribution of the play scores of the test boys (N = 16) and the reference boys (N = 16)

Wilcoxon test: Significance testing (2-tailed): $P < .001$. The difference between the low-scoring test boys and the reference boys, with an average score over 3 points higher, is striking.



Graph 14: Frequency distribution of the play scores for test girls (N = 24) and reference girls (n = 24)

Wilcoxon test: Significance testing (2-tailed): $.001 < P < .01$.

- The test girls obtain a lower score than the reference girls, but a comparison of graph 14 with graph 13 for the two boys' groups shows that the difference is not nearly as great.
- The differences between the groups as regards play scores can, again, be expressed by using cutting points:

Table 14: Cutting points

Play score	test boys %	reference boys %	test girls %	reference girls %
≤ 3	100	31	29	4
> 3	0	69	71	96
		Odds-ratio: 69.0		Odds-ratio: 9.7
Play score	test boys %	reference boys %	test girls %	reference girls %
≤ 6	100	44	62.5	25
> 6	0	56	37.5	75
		Odds-ratio: 41.8		Odds-ratio: 5.0

Summary

The test group has a substantially lower play score (= measure of play skill) at three years of age than the reference group at the same age. The relative difference between LBW boys and reference boys (the LBW boys score over 3 points lower on average) is much larger than the relative difference between LBW girls and reference girls (the LBW girls score 1.60 points lower on average).

The relative difference between the sub-groups (based on the criteria birth weight and sex) is much larger in the case of play scores than in that of ego scores.

C. Ego-play score on the Ego-play scale

The ego-play scale is composed of the following 10 scale items (4 ego-scale items and 6 play-scale items):

1. Organization in thought, expressing itself in space-time-age categories (the child scores on 1 or more of items 5, 6 and 7 of the "strong" ego items).
2. Evocation of absent persons in play (item 6-extra of the play items).
3. Use of I-sentences or use of other correct pronouns (item 1 of the "strong" ego items).
4. The structure of the child's play points to true symbolic play (the child distinguishes between symbol and symbolized: the "comme si", "let's pretend" nature of its play is clear). (Item 6/c/1, 2 or 3/).
5. Spoken language of sufficient level, i.e. child does not score on items 5, 6 or 7 of the "weak" ego items.
6. Play is spontaneous and animated as befits the age (item 1/a of the play items).
7. The child has some capacity to be alone in playing (through organization and incipient object constancy). (Item 5: yes + growing/of the play items).
8. The child displays knowledge of the toy, either through verbalization or through the recognizability of and sequence in its play (item 3/c/yes/ of the play items).
9. Making remarks about, speaking about, affectively important key figures (item 4/e/ of the "strong" ego items).
10. The play theme bears witness to sufficient basic trust (item 7/ yes+ yes, but... + predominantly yes).

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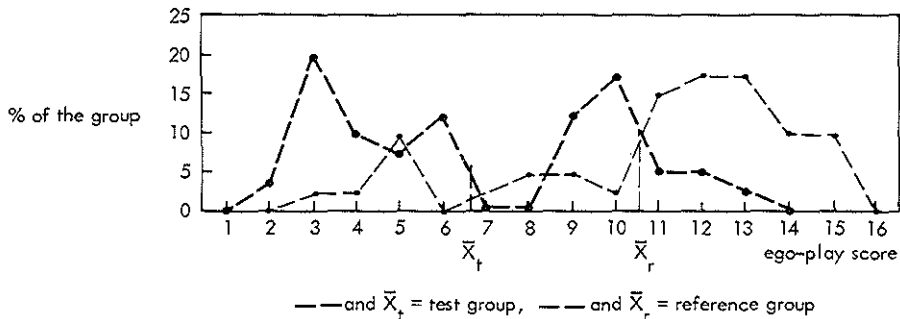
The allocation of points is precisely the same as that indicated for the ego scale (see p. 68) and the play scale (see p. 74), which means that a maximum of 16 points are obtainable.

Here too the results will be presented as follows:

- the *average values* obtained on the ego-play scale by the various groups, which indicate the global differences between the groups;
- the *frequency distribution of the ego-play scores* in the various groups, which indicates the spread of ego-play scores within each group;
- selection of *cutting points*, which further emphasize the difference in ego-play competence between the subgroups.

Table 15: Average score on the ego-play scale

		\bar{X} ego-play	S.D.
1 for the total group	(N=80)	8.75	3.97
2 for the test group	(N=40)	6.62	3.40
3 for the reference group	(N=40)	10.87	3.33
4 for the boys	(N=32)	7.00	4.13
5 for the girls	(N=48)	9.91	3.43
6 for the sub-groups:			
a) test boys	(N=16)	4.18	1.79
b) reference boys	(N=16)	9.81	3.90
c) test girls	(N=24)	8.25	3.26
d) reference girls	(N=24)	11.58	2.76



Graph 15: Frequency distribution of the ego-play scores of the test group (N = 40) and the reference group (N = 40)

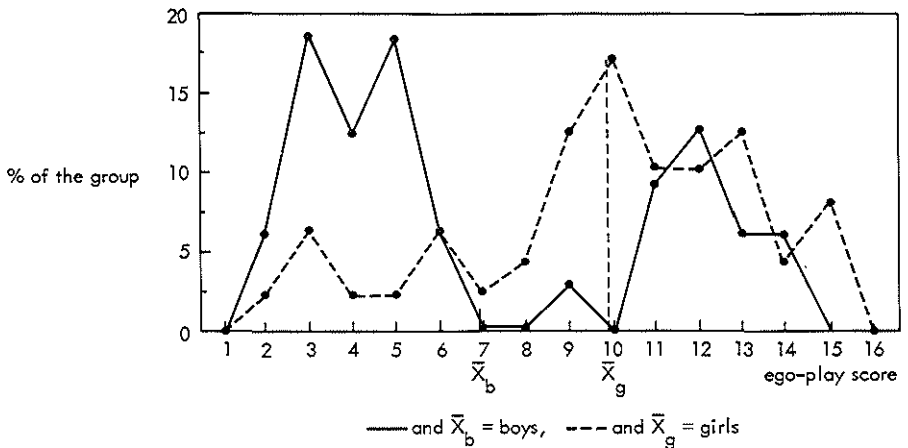
The difference in ego-play scores is great and unfavourable to the test group. Significance testing (Wilcoxon) gives $P < .001$ (2-tailed).

With a cutting point of < 8 (half of the maximum number of points) the two groups are split as follows:

Table 16: Cutting point

Ego-play score	test group %	reference group %
≤ 8	57.5	17.5
> 8	42.5	82.5

Odds-ratio: 6.4



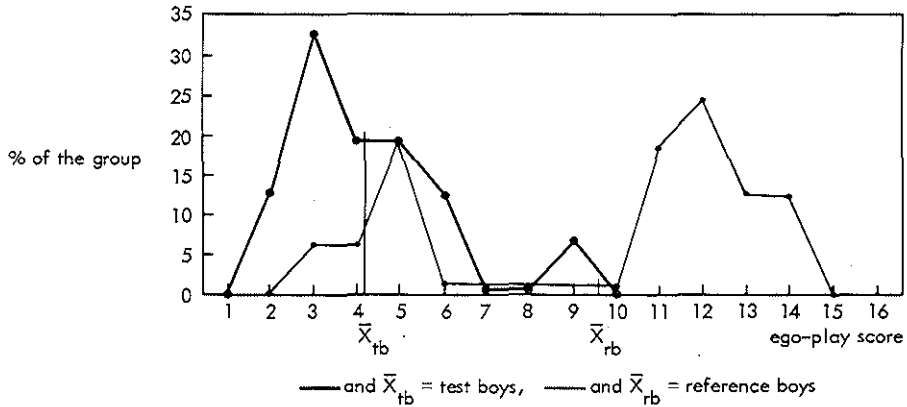
Graph 16: Frequency distribution of the ego-play scores of the total boys' group (N = 32) and the total girls' group (N = 48)

Wilcoxon test: Significance testing (2-tailed): $.001 < P < .01$. The girls obtain a much higher score on the ego-play scale than the boys. With a cutting point of < 8 , the two groups are split as follows:

Table 17: Cutting point

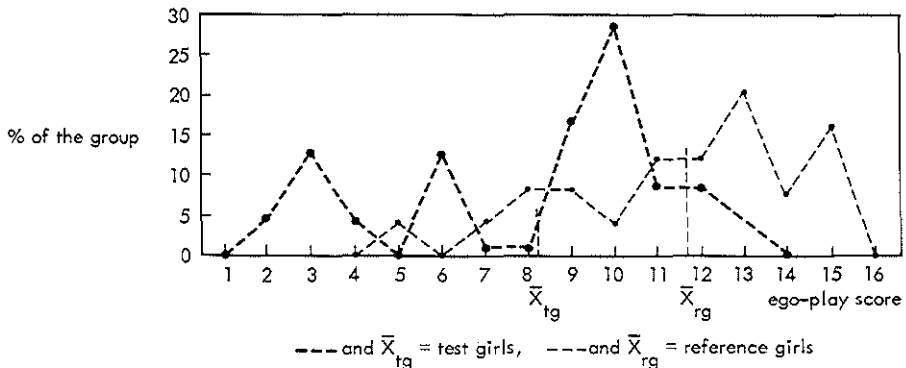
Ego-play score	boys %	girls %
≤ 8	62.5	25
> 8	37.5	75

Odds-ratio: 5.0



Graph 17: Frequency distribution of the ego-play scores of the test boys (N = 16) and the reference boys (N = 16)

Wilcoxon test: Significance testing (2-tailed): $P < .001$. The difference between the ego-play scores of test boys and reference boys is very large; however, a fraction of the reference boys ($\pm 1/3$ rd) also have low scores.



Graph 18: Frequency distribution of the ego-play scores of the test girls (N = 24) and the reference girls (N = 24)

Wilcoxon test: Significance testing (2-tailed): $P < .001$. Though the test girls also clearly score lower, the gap between them and the reference girls is smaller than that between the test boys and the reference boys.

The differences between the groups can be shown by using various cutting points:

Table 18: Cutting points

Ego-play score	test boys %	reference boys %	test girls %	reference girls %
≤8	94	31	33	17
>8	6	69	67	83
		Odds-ratio: 34.3		Odds-ratio: 2.4

Ego-play score	test boys %	reference boys %	test girls %	reference girls %
≤10	100	31	79	29
>10	0	69	21	71
		Odds-ratio: 69.0		Odds-ratio: 9.0

Ego-play score	test boys %	reference boys %	test girls %	reference girls %
≤12	100	75	96	64
>12	0	25	4	46
		Odds-ratio: 11.8		Odds-ratio: 17.3

The lowest cutting point, 8, already throws into relief the relative difference between the globally low-scoring test boys and the test girls, who do not show up badly until the cutting point is placed 2 points higher.

Summary

The test group also scores lower than the reference group on the combined ego-play scale. The low birth-weight group scores on average slightly over 4 points lower than the full-term reference group of the same age.

The differences between the sub-groups, and especially the relative difference between LBW boys and LBW girls, are additionally emphasized on this combined scale:

The LBW boys score an average of 4.18 points, compared with an average of 8.25 points for the LBW girls; consequently, the "gap" between LBW boys and reference boys (who score an average of 9.81 points) is much larger than that between the LBW girls and the reference girls (who score an average of 11.58 points). One can ask: what does the *ego-play scale* add to the information provided by the ego scale + the play scale?

The fact that the (4) items of the ego scale and the (6) items of the play scale "fitted together" and could be combined to form a new, ego-play scale of 10 items (in accordance with the Guttman technique) already

pointed to the existence of a relationship between these ego and play items (bearing in mind that the Guttman scale is a *uni-dimensional* and cumulative scale).

The combined scale provides a broader measure of the child's (structurizing) organizational ability: we thus come closer to our clinical judgement, which also (implicitly) encompasses as many items as possible.

The low-birth-weight children, therefore, are globally weaker than the reference children as regards the organized development of their personality. (We return to this in the section entitled. "The results evaluated in the light of the problem definition". See p. 98).

D. Comparison of the "matched pairs"

In the results which have thus far been presented by groups, in all cases the results of the reference group were better than those of the test group. To this method of presentation - the customary one - there are also certain objections, in that the picture obtained is not always valid for the separate individuals that make up the group. For this reason, we should like to give here the results for the matched pairs on the ego scale, the play scale and the ego-play scale.

1. Boys' pairs (N = 16)

On the ego scale:

- 1) 14 times the test boy scores lower than the reference boy (87.5%)
- 2) 1 time the test boy scores as high as the reference boy (6.25%)
- 3) 1 time the test boy scores higher than the reference boy (6.25%)

On the play scale:

- 1) 14 times the test boy scores lower than the reference boy (87.5%)
- 2) 1 time the test boy scores as high as the reference boy (6.25%)
- 3) 1 time the test boy scores higher than the reference boy (6.25%)

On the ego-play scale:

- 1) 15 times the test boy scores lower than the reference boy (93.75%)
- 2) 1 time the test boy scores higher than the reference boy (6.25%)

2. Girls' pairs (N = 24)

On the ego scale:

- 1) 17 times the test girl scores lower than the reference girl (70.9%)
- 2) 5 times the test girl scores higher than the reference girl (20.8%)
- 3) 2 times the test girl scores as high as the reference girl (8.3%)

On the play scale:

- 1) 17 times the test girl scores lower than the reference girl (70.9%)
- 2) 4 times the test girl scores as high as the reference girl (16.66%)
- 3) 3 times the test girl scores higher than the reference girl (12.5%)

On the ego-play scale:

- 1) 19 times the test girl scores lower than the reference girl (79.25%)
- 2) 4 times the test girl scores higher than the reference girl (16.6%)
- 3) 1 time the test girl scores as high as the reference girl (4.15%)

Conclusions to be drawn from the comparison of the matched pairs

- In over 85% of the pairs the LBW boy scores lower on the three scales than the reference boy of the same age. It can therefore be concluded that as a group the LBW boys display a weaker organization than the matched reference boys of the same age.
- It has already been seen that, in terms of points on the separate scales, the gap between the LBW girls' group and the reference girls' group is smaller than that between the LBW boys' group and reference boys' group. Similarly, the comparison of matched pairs shows that more LBW girls score as high as or higher than their reference girl of the same age, namely between 20% and 30%.

Thus, at 3 years of age the low-birth-weight problem manifests itself in a more pronounced form in the LBW boys than in the LBW girls. Statements about the group as a whole apply, therefore, more strongly and more generally to the LBW boys' group than to the LBW girls' group.

Part II: Intelligence test

IQ was determined using the Stutsman intelligence test.

This test has been transposed into Dutch but not standardized. This is not an objection as regards the present study, because what is involved is the comparison of two groups.

We present first the average IQ values for the various groups; these show the global differences between the groups (p. 85).

Next comes the spread of IQs within the groups, in the form of distribution graphs (pp. 86-87).

The differences between the groups are additionally emphasized by the use of cutting points.

The IQ differences in the matched pairs are then dealt with.

Table 19: 1Q averages

Averages		\bar{X}_{IQ}	S.D.
1 for the entire group	(N=80)	114.41	23.49
2 for the test group	(N=40)	104.65	27.22
3 for the reference group	(N=40)	124.17	20.71
4 for the boys	(N=32)	103.96	21.98
5 for the girls	(N=48)	121.37	22.09
6 for the sub-groups:			
a) test boys	(N=16)	91.75	19.48
b) reference boys	(N=16)	116.19	17.33
c) test girls	(N=24)	113.25	19.92
d) reference girls	(N=24)	129.50	21.39

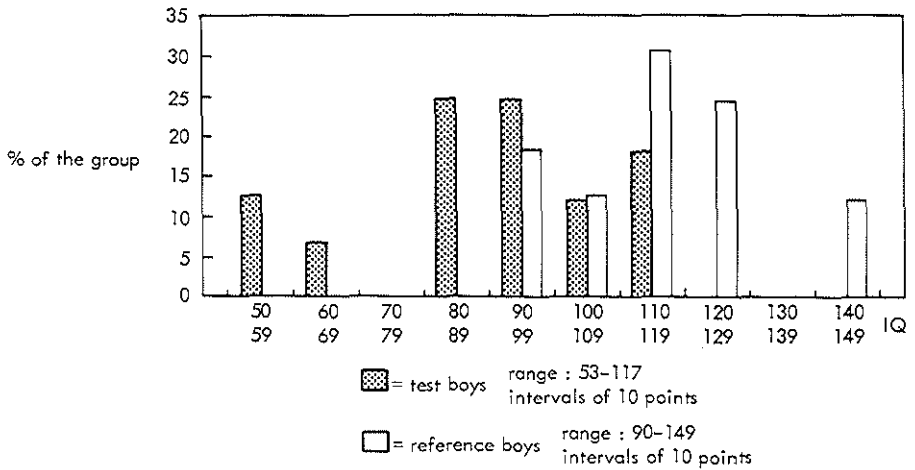
– The relative difference in IQ of approximately 20 points between the test group and the reference group is large and significant using the variance analysis method: $F = 16.52$; $P < .001$. Prediction II, therefore, is not refuted.

- The relative difference between boys and girls is also large (approximately 18 points in favour of the girls) and variance analysis shows this difference to be significant: $F = 12.00$; $P < .001$.

– The difference between the four sub-groups is large and significant. Variance analysis gives: with 3 degrees of freedom, $F = 11.67$ and $P \ll .001$.

- A very large difference in IQ exists between the test boys and the test girls, on average almost 22 points. This difference is significant using the Wilcoxon test: $.001 < P < .01$ (2-tailed).

- The difference in IQ between reference boys and reference girls (approx. 13 points) just fails to be significant: the Wilcoxon test gives a value of $.05 < P < .10$ (2-tailed).



Graph 19: Distribution of IQ for the test boys (N = 16) and the reference boys (N = 16)

Distribution of IQ

Of the test boys, 18.75% clearly score too low and retardation is pronounced. The remainder display a smooth distribution ranging from moderate retardation to low average and high average IQ scores. The biggest difference between the test boys and the reference boys is that no reference boy scores lower than 90, whereas 44% of the test boys do so. The overall picture is of a clear shift to the right along the IQ axis in comparison to the test boys.

The difference is again apparent when a cutting point* is applied:

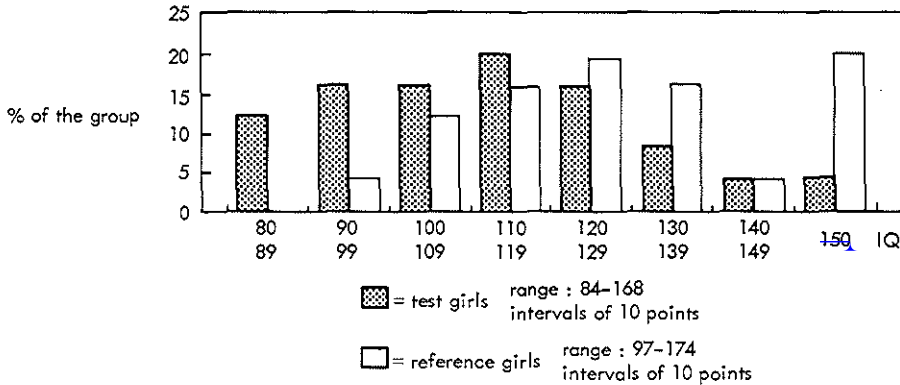
Table 20: Cutting point

IQ	test boys %	reference boys %
≤99	69	19
>99	31	81

Odds-ratio: 9.0

* Note:

The cutting point selected was what for the reader is the "practical" norm, 100. As distribution graph 19 works with intervals of 10 points the cutting point was set at 99; table 20 and graph 19 are therefore comparable.



Graph 20: Distribution of IQ for the test girls (N = 24) and the reference girls (N = 24)

A fairly smooth distribution is found for the test girls and none of them score lower than 80.

As with the reference boys, no reference girl scores lower than 90. There is a shift to the right along the IQ axis in comparison to the test girls.

The difference is again apparent when a cutting point* is applied:

Table 21: Cutting point

IQ	test girls %	reference girls %
≤99	28	4
>99	72	96

Odds-ratio: 9.0

Comparison of the matched pairs on IQ scores

1. Boys' pairs (N = 16)

- In 12 pairs the test boy scores lower than the reference boy (75%)
- In 4 pairs the test boy scores higher than the reference boy (25%).

2. Girls' pairs (N = 24)

- In 19 pairs the test girl scores lower than the reference girl (79%)
- In 1 pair the test girl scores as high as the reference girl (4%)
- In 4 pairs the test girl scores higher than the reference girl (17%)

* Note:

The cutting point selected was what for the reader is the "practical" norm, 100. As distribution graph 20 works with intervals of 10 points the cutting point was set at 99; table 21 and graph 20 are therefore comparable.

Conclusions in respect of the IQ results

The academic skill of the test group at 3 years of age is lower than that of the reference group at the same age. The relative differences between the LBW boys and the reference boys are greater than those between the LBW girls and the reference girls.

The IQ differences between the test group and the reference group and between the sub-groups as determined by birth weight and sex accord (as far as global differences are concerned and the direction of those differences) with the results obtained for the ego scale, the play scale and the ego-play scale.

Part III: Degree of correlation between "perinatal risk factors" and results at three years of age.

This third part concerns only the test group (N = 40), composed of L(ow) B(irth) W(eight) children.

The reference children were selected in such a way that they did not have these risk factors.

The following is a brief recapitulation of a number of data concerning the test group:

- | | |
|--|-------------------------------|
| 1. Birth weight range of the test group | 1080-2000 g. |
| 2. Birth weight range of the LBW boys | 1220-1920 g.
(see graph 1) |
| 3. Birth weight range of the LBW girls | 1080-2000 g.
(see graph 2) |
| 4. Average duration of admission for the LBW boys | 64 days
(see graph 3) |
| 5. Average duration of admission for the LBW girls | 56 days
(see graph 4) |
| 6. Number of "small for dates" among the LBW boys | (see graph 6) |
| 7. Number of "small for dates" among the LBW girls | (see graph 5) |

The results in this third part are grouped as follows:

1. Correlation found between, on the one hand, child psychiatric results and IQ at three years of age and, on the other, the birth weight for the test group as a whole (table 22).
2. Correlation found between, on the one hand, results at three years

of age and, on the other, duration of perinatal admission for "praematuritas" for the test group as a whole (table 23).

3. Correlations between, on the one hand, results at three years of age and, on the other, birth weight and duration of admission respectively, for LBW boys and LBW girls separately (table 27 and 28).

N.B. To permit a proper appraisal of the differences found between LBW boys and LBW girls a number of correlations are presented between perinatal factors; these too show differences between LBW boys and LBW girls (table 24-26).

4. Finally, a presentation is made of the correlations found between 15 perinatal risk factors selected by the paediatrics department and results at three years of age, for the test group as a whole and for the LBW boys and the LBW girls separately (table 31).

1. Correlation between:

- ego-score
 - play-score
 - ego-play score
 - IQ
- and birth weight

Table 22: Correlation between the scores at three years of age and birth weight for the total testgroup

	r	Significance testing (one-tailed)
1 Ego score and birth weight	.13	n.s.
2 Play score and birth weight	.26	n.s.
3 Ego-play score and birth weight	.24	n.s.
4 IQ and birth weight	.11	n.s.

(Method: Pearson Product Moment)

For the total test group of low-birth weight children there is only, a weak correlation between *birth weight* and *competence* at three years of age expressed in terms of ego score and IQ score. For play score and ego.play score the correlation is somewhat higher and on the border of .05 significance.

As far as prediction III is concerned, therefore, the results show no more than a tendency in the direction of that prediction.

2. Correlation between:

- ego-score
- play-score
- ego-play score
- IQ

and duration of admission

Table 23: Correlation between the scores at three years of age and duration of admission for the total test group.

For the total test group	r	Significance testing (one-tailed)
1 Ego and duration of admission	-.01	n.s.
2 Play and duration of admission	-.19	n.s.
3 Ego-play and duration of admission	-.13	n.s.
4 IQ and duration of admission	-.24	n.s.

(Method: Pearson Product Moment)

The negative correlation between *competence* at three years of age and *duration of admission* is also weak.

The correlation between IQ and duration of admission approaches .05 significance.

As far as prediction IV is concerned, therefore, the results show no more than a tendency in the direction of that prediction.

Before going on to the correlation between birth weight and duration of admission on the one hand and results at 3 years of age on the other for the LBW boys and the LBW girls separately, the following correlations should first be presented because of their relevance in judging the figures:

Table 24: Correlation between duration of admission (days) and birth weight (grams).

		r	Significance testing (one-tailed)
1 for the total group	(N=40)	-.60	P < .001
2 for the LBW boys	(N=16)	-.52	.01 < P < .02
3 for the LBW girls	(N=24)	-.70	P < .001

(Method: Pearson Product Moment)

Table 25: Correlation between birth weight (grams) and duration of pregnancy* (days).

		r	Significance testing (one-tailed)
1 for the total group	(N=40)	.19	n.s.
2 for the LBW boys	(N=16)	-.24	n.s.
3 for the LBW girls	(N=24)	.36	.02 < P < .05

(Method: Pearson Product Moment)

* Note: duration of gravidity is based on the anamnesis of the mother. Replies often took the form of "half months" or "half weeks" and were therefore converted into days.

Table 26: Correlation between duration of admission and duration of pregnancy.

		r	Significance testing (one-tailed)
1 for the total group	(N=40)	-.14	n.s.
2 for the LBW boys	(N=16)	-.25	n.s.
3 for the LBW girls	(N=24)	-.14	n.s.

(Method: Pearson Product Moment)

The correlation between duration of admission and birth weight is as could be expected, but the relation is much higher for the girls than for the boys, at $r = -.70$ versus $r = -.52$. (table 24).

Further, the relation between birth weight and duration of pregnancy for the LBW boys is negative ($r = -.24$), whereas for the girls it is positive ($r = .36$) and just significant. (table 25).

(There are more small for dates among the LBW boys than among the LBW girls. See graphs 5 and 6).

On the other hand, for both the boys and the girls the correlation between duration of admission and duration of pregnancy is weak ($r = -.25$ for the boys; $r = -.14$ for the girls). (table 26).

- For the boys there is a positive correlation between IQ and birth weight and it is significant; for child-psychiatric scores and birth weight the correlation is from weak to none (table 27).

- _ For the LBW girls, on the other hand, there is almost no correlation between IQ and birth weight, whereas there is a significant correlation between play score and birth weight and between ego-play score and birth weight (table 27).

Table 27: Correlation between the scores at three years of age and birth weight.

a) For the LBW boys (N=16)	r	Significance testing (one-tailed)
1 Ego score and birth weight	.19	n.s.
2 Play score and birth weight	-.02	n.s.
3 Ego-play score and birth weight	.10	n.s.
4 IQ and birth weight	.43	.02 < P < .05
<u>b) For the LBW girls (N=24)</u>		
1 Ego score and birth weight	.15	n.s.
2 Play score and birth weight	.45	.01 < P < .02
3 Ego-play score and birth weight	.38	.02 < P < .05
4 IQ and birth weight	.02	n.s.

(Method: Pearson Product Moment)

Table 28: Correlation between the scores at three years of age and duration of admission.

a) For the LBW boys (N=16)	r	Significance testing (one-tailed)
1 Ego score and duration of admission	-.14	n.s.
2 Play score and duration of admission	.02	n.s.
3 Ego-play score and duration of admission	-.06	n.s.
4 IQ and duration of admission	-.57	.001 < P < .01
<u>b) For the LBW girls (N=24)</u>		
1 Ego score and duration of admission	.22	n.s.
2 Play score and duration of admission	-.10	n.s.
3 Ego-play score and duration of admission	.03	n.s.
4 IQ and duration of admission	.14	n.s.

(Method: Pearson Product Moment)

- For the boys there is a negative correlation between IQ and duration of admission and it is significant. This outcome does not refute prediction IV. However, there is scarcely any correlation between scores on the child-psychiatric scales and duration of admission.
- For the girls there is a very weak correlation between all the scores and duration of admission.

Important "Perinatal Risk Factors"

- The following 15 "perinatal risk factors" were chosen by the paediatrics department for the purpose of determining whether a correlation exists between risk factors and results at 3 years of age.
 - They were selected from a multiplicity of factors which a neonatologist considers important on the basis of consensus between the neonatologists: for practical reasons (work investment) and considerations relating to group sizes (the total group consist, after all, of only 40 LBW children), those clinical factors were selected to which neonatologists attach the most weight.
- The "perinatal risk factors" selected are shown below, together with the percentage of the test group in which they occur. The clinical or biochemical criteria for the factor in question are given in a very concise form.

Table 29: Frequency of occurrence of perinatal risk factors in the testgroup.

Perinatal Risk Factor	test group % (N=40)	boys % (N=16)	girls % (N=24)
1 Duration of pregnancy: ≤ 37 weeks	85	87	83
2 Birth weight: < 2.3 percentile (Kloosterman)	17	25	12
3 Asphyxia post partum: APGAR < 5	5*	-	8
4 Hypothermia: $\leq 36^{\circ}\text{C}$	65	56	70
5 Congenital defects + operation (e.g. partial intestinal resection)	-	-	-
6 Hypoglycemia: < 20 mmol/l	17	19	17
7 Hyperbilirubinemia: ≥ 250 $\mu\text{mol/l}$ (≤ 37 weeks)	17	19	17
8 Acidemia: $\text{pH} \leq 7.20$	20	19	21
9 Hypoxemia: O_2 saturation $\leq 70\%$	5**	6	4
10 Respiratory Distress Syndrome	40	56	29
11 Convulsions: irrespective of etiology	-	-	-
12 Acidemia after day 10: $\text{pH} \leq 7.20$	7***	6	8
13 Hypoxemia after day 10: O_2 saturation $\leq 70\%$	10****	12	8
14 Convulsions after day 10: irrespective of etiology	2	-	4
15 Artificial respiration after day 10: irrespective of duration	17	19	17

* : in 62.5% not known or excluded

** : in 47.5% not known or excluded

*** : in 27.5% not known or excluded

****: in 72.5% not known or excluded

- The most striking difference between boys and girls is the R.D.S., which is almost twice as common in boys as in girls (56% and 29% respectively).

If a "degree" is assigned based on the duration of the syndrome, set arbitrarily as follows:

degree 1: duration of syndrome < 24 hours

degree 2: duration of syndrome 1-4 days

degree 3: duration of syndrome > 4 days

The 9 boys with R.D.S. score as follows:

3 boys - degree 3

3 boys - degree 2

3 boys - degree 1

Of the 7 girls with R.D.S. 6 girls score degree 1 and 1 girl scores degree 3.

Average number of risk factors

LBW boys (N = 16): 3.37

LBW girls (N = 24): 2.87

Table 30: Frequency distribution of the number of risk factors occurring simultaneously per child.

Number of factors per child	1	2	3	4	5	6	7	8	9
LBW boys % (N=16)	6.25	19	44	12.5	12.5	-	6.25	-	-
LBW girls % (N=24)	25	25	20	12.5	12.5	-	-	-	4.25

(The number of factors occurring simultaneously per child was found to range from 1 to 9)

Correlation between:

- ego score
 - play score
 - ego-play score
 - IQ
- and the 15 perinatal risks factors

The correlation was determined between the results at 3 years of age and the 15 selected risk factors with the help of the computer for the entire test group of LBW children and for the boys and the girls separately.

In the results shown in table 31 the correlation coefficient often indicates not more than a tendency. Conventionally the result is taken as being significant where the P value is <.05.

Table 31: Correlation between the scores at three years of age and the perinatal risk factors.

	Kendall corr. coefficient	Significance testing (one-tailed)
For the total group of LBW children (N = 40)		
Ego score and birth weight (<2.3 percentile)	-.16	n.s.
Ego score and R.D.S.	-.11	n.s.
Ego score and artificial respiration after day 10	-.11	n.s.
Play score and birth weight (<2.3 percentile)	-.21	n.s.
Play score and Acidemia up to day 10	-.23	n.s.
Play score and R.D.S.	-.27	.02 < P < .05
Play score and artificial respiration after day 10	-.25	.02 < P < .05
Ego-play score and birth weight (<2.3 percentile)	-.19	n.s.
Ego-play score and acidemia up to day 10	-.18	n.s.
Ego-play score and R.D.S.	-.23	.02 < P < .05
Ego-play score and artificial respiration after day 10	-.23	.02 < P < .05
IQ and birth weight (<2.3 percentile)	-.20	n.s.
IQ and R.D.S.	-.20	n.s.
For the LBW boys (N=16)		
Play score and R.D.S.	-.43	.02 < P < .05
Ego-play score and R.D.S.	-.51	.01 < P < .02
For the LBW girls (N=24)		
Ego score and birth weight (< 2.3 percentile)	-.23	n.s.
Ego score and artificial respiration after day 10	-.20	n.s.
Ego-play score and birth weight (<2.3 percentile)	-.22	n.s.
Ego-play score and acidemia up to day 10	-.21	n.s.
Ego-play score and artificial respiration after day 10	-.41	.01 < P < .02

- For the group as a whole there is a significant correlation between play score and R.D.S. (.02 > P < .05) and play score and artificial respiration after the tenth day (.02 < P < .05). There is also a significant correlation between ego-play score and R.D.S. (.02 < P < .05).
- For the boys' group there is a significant correlation between play score and R.D.S. (.02 < P < .05) and ego-play core and R.D.S. (.01 < P < .02).
- For the girls' group there is a significant correlation between ego-play score and artificial respiration after the tenth day (.01 < P < .02).

Conclusions regarding part III of the results

The correlation between a number of selected perinatal risk factors in the test group of LBW children and the competence found at 3 years of age as expressed either by ego and play skill or by IQ is not very pronounced.

Now and then a higher correlation factor occurs, but the correlation is never "uniformly" and "strikingly" high between a given factor and the scores on the ego scale, play scale and ego-play scale and on the intelligence test for the entire group of test children or for the sub-groups, LBW boys or LBW girls. (The question of risk factor and weight is dealt with again in the comparison between the results and the data in the literature: see pp. 115-122).

CHAPTER VIII
DISCUSSION OF THE RESULTS

I. Summary of the results

A. Difference between test group (= LBW children) and reference group (full-term children)

1. The ego competence of the test group is at three years of age substantially lower than that of the reference group, the average scores of the two groups on the ego scale being respectively 3.52 *points* and 5.47 *points*. This difference is significant using the Wilcoxon test (2-tailed): $P < .001$.
2. The test group has a lower capacity of organized play than the reference group: the LBW children obtained an average of 3.10 *points* on the play scale, whereas the reference children obtained an average of 5.40 *points* (Wilcoxon: $P < .001$).
3. On the combined ego-play scale the test children obtained an average of 6.62 *points*, while the reference children obtained the substantially higher average of 10.87 *points* (Wilcoxon: $P < .001$; 2-tailed).
4. Using the Stutsman intelligence test, an average IQ of 104.65 was obtained for the test group, compared with 124.17 for the reference group (variance analysis: $F = 16.52$; $P < .001$).
5. The percentage of children who scored positively on the *individual items* of the ego scale and of the play scale was markedly lower in the case of the test children than of the reference children for all items.

B. Sex differences between LBW boys and LBW girls

1. On the ego scale, the LBW boys obtained an average of 2.75 *points*, while the LBW girls scored an average of 4.04 *points*.
2. The difference in *playing skill* is even greater, the low-birth-weight boys scoring an average of 1.43 *points* on the play scale, compared with a much higher average of 4.20 *points* for the low-birth-weight girls.

3. On the combined ego-play scale the test boys scored an average of *4.18 points*, while the average scored by the test girls is almost twice as high, at *8.25 points*.
4. There is also a large difference between the LBW boys and the LBW girls in *academic skill* as measured by IQ. A relative difference was found of almost 22 points: IQ for the LBW boys: 91.75; IQ for the LBW girls: 113.25. The difference is significant using the Wilcoxon test: $.001 < P < .01$ (2-tailed).

C. *Differences within the matched pairs:* (each pair is composed of 1 LBW child and 1 full-term child, matched according to the criteria given on page 39).

In 87.5% of the pairs the low-birth-weight boy scored lower than the full-term boy on the ego scale.

In 87.5% of the pairs the low-birth-weight boy scored lower than the full-term boy on the play scale.

In 93.75% of the pairs the low-birth-weight boy scored lower than the full-term boy on the ego-play scale. In 75% of the pairs the LBW boy had the lower IQ.

In 70.9% of the pairs, the LBW girl had the lower score on the ego scale. The LBW girl had the lower score on the play scale in 70.9% of the pairs, and on the ego-play scale in 79.25% of the pairs. In 79% of the pairs the LBW girl had the lower IQ.

II. Evaluation of the results in the light of the questions: Are LBW children high risk children? How far have they got with their developmental task at three years of age?

At three years of age the low-birth-weight child has not got as far with *ego organization* as its full-term contemporary: it still displays many immature (unripe) aspects.

First and foremost, the LBW child does not have sufficient *selfconsciousness*, which should find expression in I-sentences and the use of pronouns which distinguish between itself and the other.

The LBW child *still does not announce its actions sufficiently*: it is not often that it says "I'm going to play with the doll... with the police car now". Rather, it either goes to the toy or, much more frequently stands there somewhat confused and shy. It is not inclined to say "I don't want to any more" if it is tired of a puzzle, but either stops and goes on to something else or carries like a good child but not with

much directedness. It tugs at its mother's skirt or stays close to her instead of saying "Mum, you're coming to" or "No, I don't want to go". When it has to go to the toilet it shows this rather by its posture than by saying so.

The LBW child still often has an *insufficient array of ready sentences* (communicative skill) to indicate that it wants or does not want something, or that the other must or must not do something. The signals it sends out are still more those of an action toddler; they are still not very articulate and pregnant, still diffuse and global. This contributed to an impression of *frailty*, of the *absence as yet of firm directedness* and self-assurance.

It still has little *consciousness of space and time*: it verbalized few similarities or differences between here (the examination room) and there (home, nursery school playroom...). It still does not think much in terms of: I've been here or there, I got this or that. Its *language* is often still at a lower syntactic level than fits its age and, above all, displays large fluctuations in level.

Moreover, in the spontaneous utterances of the LBW child there is insufficient reference to *key figures*: persons from the LBW child's family or in close proximity to it who are of great affective value. In the group examined by us it was not so much a question of a deficiency in "attachment" (Bowlby, 1969) or "bonding" (Jeffcoate et al., 1979, p. 346): on the contrary, the unripe aspects of attachment or bonding are clinically sufficiently present (in the form of attention-demanding and proximity-seeking behaviour). However, the affective bond with the key-figures - as a process through time - is still *insufficiently incorporated in the organization of the personality*: they are not yet sufficiently active as internalized ideal figures modifying the child's ego. The LBW child's relationship is still very variable in level and still displays aspects of very early dependency.

In addition to a deficiency in ego skill in the form of selfconsciousness, firm directedness and language skill, in addition to a deficiency as regards internalization of orientational key figures, the LBW child stands out because of his as yet limited *playing skill*. His capacity for organizing play is even more limited: very often there is still insufficient familiarity with and mastery of the toy; play is still predominantly at the exercise level, a function being pleasurably carried out, rather than the child's having reached a stage where it can give shape to its inner world in a symbolic manner. The creative impulse - as Winnicott (1965, p. 12) calls it - and the phantasy function, which is the imaginative extension of the physical function (Winnicott,

1965, p. 7), are not yet ready, are still in the germinative stage, just as the firm control over the body is not yet ready. There is still too much direct dependency on the adult figure, which means that there is as yet insufficient capacity to be alone, insufficient self, to carry play further. Again, there is as yet no evocation of the still insufficiently internalized other.

There is not yet sufficient "organized experience" to be dramatized in play, to be practised and overcome in the fiction of play. All of this, however, gives rise to the danger that a vicious circle will develop: insufficient mastery of the body inhibits spontaneous and animated play; insufficient play leads to insufficient playing skill and tool use; this in turn can lead to the inhibition of the creative and therapeutic element in play which in the beginning Funktionslust derives from the feeling of dominance, virtuosity and power that play gives (as Piaget, 1972, says in "la naissance du jeu", p. 95) and later anticipates this bodily competence in a symbolic manner (see the verses of Heinrich Heine cited by Freud given in the introduction).

This as yet insufficient enlargement of the personality in the sense of ego skill, internalization of orientational key figures and playing skill should be viewed in the light of developmental prospects: it is with this equipment that the LBW child will soon be going to kindergarten, to be appraised by the teacher and by the woman next door but also by its competent contemporaries. It is with this equipment, as yet too weak, that it stands on the threshold of the phallic-oedipal phase, which is of farreaching importance for its image of itself and future orientation.

III. Relevance of observations of a three-year-old: theoretical and clinical

A critical reader may ask himself: can so much be expected of a three-year-old? In answering this objection, we shall turn to some authorities again.

- Kagan (1971, p. 3): "... Most psychologists are awed by the amount and rate of change in physical and psychological growth that occur during the first 30 months of life, and wish to understand this drama. The newborn is transformed from a crying, squirming, reflexive creature to a coherent, symbolic, coordinated and planful child in less than 30 months. And a set of convenient milestones mark the journey..."
- If the psycho-analyst is not convinced by the opinion of the cognitive psychologist, the words of Hart de Ruyter may be of help

(1972, p. 36): "... Around the same time (roughly the second half of the third year of life), however, the ripening of the child's personality is so far advanced that it is not only able to step out of its egocentric world but can also display initiative and thus become an active member of the small community known as the family. The child has become an "I-ness": it says "I" and no longer speaks about itself in the third person, it knows that it is a boy or a girl, that it has a father and mother, brothers and sisters. It has become a toddler - in analytical terminology: it has entered the oedipal phase ..."

- This may be true of the healthy, full-term child, but can standards already be applied at this age to the LBW child? What do findings at this age mean?

Here too, we shall let experts answer.

- Saint-Anne Dargassies (1979, p. 229): "We considered the following ages to be of particular developmental significance: 1. the age of 3 years. We found this to be the extreme lower limit for follow-up as the age when the development of motor functions is complete, cerebellar dysfunction becomes detectable and speech is established; the child is also broadening his social contacts and his capacity for observation and experience, which favour enrichment by experience, can now be tested..."

- And Drillien (1972, p. 564): "...Three years, which is the minimum age for making a reasonably confident assessment about handicaps other than severe physical, mental and neurological defects..."

IV. Comparison of the results with data from the literature

A. General comments

It is common knowledge in paediatric and child-psychiatric circles that follow-up research into the development of low-birth-weight children is very abundant and that a great many studies have been undertaken in Europe, Australia and the United States. The opening sentence of an article of the American Journal of Diseases of Children supports this: "Numerous studies of the intellectual and physical outcome of low birthweight infants have been made over the past 25 years..." (Gross et al., 1978, p. 753).

Nonetheless, it is difficult to find adequate comparative material, chiefly because this is a subject in which there are so many variables. The following are a number of factors which can affect the nature of a study:

1. the children's birth-weight group (less than 1000 grams, less than 1500 grams, less than 200 grams, etc.);
2. the period in which the children were born, in view of the rapid evolution in high care for these children, at least in the specialized centres;
3. the number of "small for dates" among the children - incidence in per cent, the criterion adopted in the sense of "on or below the 2.3, the 5 or the 10 percentile" of different "gestation period/weight diagrams";
4. the drawing of a distinction between boys and girls or not; the presentation together of groups of children of widely differing ages on the basis of, for example, their "developmental quotient" or their "IQ" or the presentation of a single age group;
6. the regional function of the centre presenting its results and the wide differences in the socio-economic class of the families served by such centres;
7. the recording of "perinatal data" on these children and the criteria applied in doing so (the researcher who has worked in the field for years can not always rid himself here of the impression he gets in reading such articles: there are "realists", there are also, however, "triumphers" who do not see what is so clearly present in the others);
8. the use of a control group or not;
9. the content of the articles and their authors' main orientation - ranging from "paediatric" through "developmental neurologic" and "neonatologic" to "developmental psychologic and child-psychiatric."

It is hardly surprising, therefore, that the results presented differ greatly.

Gross et al. (1978, p. 753) state that: "...considerable variability in results has stemmed from unclear identification of patient population, discrepancies in direction of follow-up, differing testing methods, and over time, levels of perinatal care..."

To give an idea of some research results, bearing in mind this "considerable variability", we have drawn up a review of a number of important centres and authors of various sorts and orientations...

Naturally, the intention is merely to present a sample. In this review some of the main elements and data from the study in question are presented: needless to say, the responsibility for any inaccuracies in citing these studies lies wholly with the present author. (See folding sheet at the back of this book.) Finally, in making comparisons with

other research data it is necessary to lay particular emphasis on the fact that most follow-up studies are of paediatric origin and directed at clinical-paediatric aspects and at IQ. As far as the global development of the child's personality is concerned, a distinction is made between "major handicaps" and "minor handicaps".

Major handicap is usually defined as either:

1. a severe motor handicap (usually cerebral palsy),
2. a severe sensory handicap (impairment of the visual or auditory function to a degree serious enough to severely handicap the individual in his general adaptation),
3. mental retardation, the criteria used being an IQ or Developmental Quotient of < 70 with an upper limit of $< 80-85$,
4. a combination of these.

Minor handicaps are handicaps "other than severe physical, mental or neurological defects" (Drillien, 1972, p. 564). Usually they are indicated in a few short sentences formulated in general terms borrowed from the general jargon of psychology. Frequently used descriptions are: "school problems related to hearing disabilities and delayed speech." (Fitzhardinge, and Commey, 1979, p. 779); "...a rather great frequency of visual, speech and behavioural problems even in prematures who become strictly normal" (Saint-Anne Dargissies, 1979, p. 243); "deficits in language development, perceptual and fine motor skills, behaviour problems and learning difficulties." (Drillien, 1972, p. 582). It will be clear that the present study, which is child-psychiatric, is aimed more specifically at those aspects in low-birth-weight children which underlie possible minor handicaps. Child-psychiatric research was chosen as the method precisely because these global categories - if found - demanded further specification.

B. Specific comparisons

Part. 1. Comparison with the research data in the literature with regard to the child-psychiatric aspects and those of developmental psychology.

§1. *Ego functions and competence*

- De Hirsch et alii (1966) report on a comparative study of an equal number of premature and full-term, mature children, examined at three ages: kindergarten age, at the end of the first class and at the end

of the second class. The study involved 53 premature children born in 1955-1956, all of whom had been admitted to the premature nursery of Babies Hospital, Columbia-Presbyterian Medical Center, New York, N.Y. The birth weights of the premature group ranged from 980 to 2239 g. In all except 6 cases the duration of pregnancy was less than 37 weeks. Applying to both groups are: 1. that all the children come from English-speaking families; 2. that they display no severe sensory defects, and 3. that the children with an IQ which deviates from the norm in either direction by more than 1 S.D. are excluded.

The full-term control group differed from the premature group in the following respects:

1. the premature group contained more girls (53%), "who are thought to be more mature than boys of the same age", than the control group (41%);
2. the premature group contained more white children (68%) than the control group (60%);
3. more notably, the number of mothers with post-high-school training or college is significantly higher in the premature group than in the control group (30 of the 53 mothers of the premature children versus 8 of the 53 mothers of the control children).
4. the two groups were in accordance as regards the number of mothers with jobs outside the home (24 in each group), the number of times that the children were read to each week and the frequency of kindergarten attendance.

We have given the above in detail because of the comparability criteria discussed earlier and to show that in our view what is involved is a study in which "major handicaps" and "socio-economic class differences" have been eliminated beforehand for the premature group, or which would even favour this group.

Nonetheless, the authors found that: at kindergarten age the premature group scored lower than the control group on 36 of the 37 tests used.

The differences were significant in 15 cases, 11 of them relating to *oral language and reading readiness tasks* (tasks which, as the authors point out, require a relatively high degree of *integrative competence*). The other 4 tests in which the premature group had a significantly lower score were: *motility patterning* (excess of concomitant movements), *fine motor patterning* (prolonged speed index), *Bender Visuo-Motor gestalt Test* and *auditory-perceptual patterning* (tapped patterns).

In their general discussion the authors point to the following:

1. There are subtle dysfunctions in the premature group in tasks which demand a high degree of *differentiation* and *integration*.
2. The authors are struck by
 - a. "the *diffuse-ness* of these children"
 - b. "their difficulty in mobilizing energy *in the service of a goal*."
3. Premature children display psycho-physiological homeostatic problems. They are therefore more dependent on their mothers' support. As a result, it is probably that children born prematurely "*pass through the normal stages of infantile dependency at a considerably later age than children born at term.*"

In short: these authors point to differences in integrative *competence* which cause premature children to be distinguished by: insufficient "differentiation", language weakness, insufficient mastery of body motion, insufficient firm directedness and greater infantile dependency. They too stress that - even without prior knowledge of the child's history - the practised observer can easily "recognize" the premature child (see our comment on the procedure on page 43: in our view this does not admit of a true double-blind test).

• The same author, Katrina de Hirsch *), deals again in detail with the personality organization of the premature child in 1975 in her article in *The Psycho-Analytic Study of the Child*. This article is purely theoretical and refers back to the study cited above. The following are some of the principal points made in it:

1. The author recognizes the "premature child" because it presents itself as "unfinished" and "immersed".
2. "Their maturational status resembled that of younger children."
3. "certain features were common to virtually all the prematurely born children:
 - clinically, they struck us as disoriented in time and space and as if they did not know how they fitted into the schemes of things,
 - the prematures' approach to the examiner and the testing situation differed from that of the children born at term. "Infantile was the most frequently mentioned term in their protocols. They needed massive support and demonstrated little autonomy,
 - the premature children's ego organisation **) appeared to be loose and fragmented:

* The author refers to herself as a "remedial therapist working with children who present difficulties with spoken, printed and written language". She is a Consultant in Language Disorders, NY State Psychiatric Institute.

** It is only in this psycho-analytically oriented article that the author speaks about "ego strength", in which she found significant differences between the premature children and the control children in the 1966 study.

"we were impressed with the ebb and flow of their attention",
"more than full-term children, they moved in and out of focus.
The level of their performance fluctuated",
"their anxiety appeared to be diffuse and amorphous",

- many of the prematures impressed one as dependent, passive and shadowy,
- they were still wedded to the pleasure principle and unable to mobilize their plentiful energy in the service of tasks that were unrelated to their drives". (N.B.: the brief summary given under points 2 and 3 consists of a list of quotations from the article).

Finally: the author deals at length with the hypothesis that the weak ego organization and the difficulties with patterning perceptuo-motor and linguistic stimuli are not two different phenomena but the manifestation of "pervasive organismic immaturity."

- It is interesting that Caplan et alii (1963) reach similar conclusions in their investigation of 27 premature children at the age of 7 to 12 years. (Control group: 23 children) They speak of "definite differences in regard to certain ego functions", by which they mean, more specifically, the "organization" of perception, motor activity and thinking in time, space and number categories. In addition to the significantly lower scores of the premature group in the Bender Visuo-Motor Gestalt Test, there is also a difference in the "verticality perception test": here too the authors conclude that, at school age as well, the premature children examined still observe at a more immature level and that their perception attests to insufficient "differentiation" compared with the control group.
- Bethenod et alii (1979) report from the French language area. Involved here are 139 children of very low birth weight (< 1000 g) born between 1967 and 1976 and admitted to the "Service pour Pathologie Néonatale" of Hôpital Debrousse in Lyon. Of the 139 children 40 survived, and of these 26 were seen by a "psychiatrist or psychologist" at ages ranging from 1 to 11 years. Of these 26, 21 were seen by the authors at an age of 4 years or older, and on these children they report that:
 - "l'immaturation affective est un trait de caractère pratiquement constant." Here too it is stressed that the children do form bonds but remain fixated in earlier stages, "à leurs images parentales sécurisantes" (fixated to their security-giving parental images);
 - psychomotor instability, anxiety and inhibition occur frequently. These authors too underline the passive, submissive ("soumission") and low-on-initiative behaviour of these children.

- In her theoretical articles of 1941 and 1945 Phyllis Greenacre deals with perinatal problems and later psychological development. Though the articles are of a general psychiatric/psycho-analytic nature, detailed reference is made, among other things, to Shirley's comparative study (1939) of premature and full-term young children. The author also draws on her own extensive experience with such patients as a psychiatrist but also as an analyst. She treats at length the "clinical hypothesis" that difficult births and "poor antenatal and perinatal conditions" cause (or are accompanied by) a psycho-physiological state characterized by "excessive chronic tension" and "susceptibility to excitation". The more disturbed the "sensori-motor balance", i.e. the relation between sensory stimulation and the capacity to effect some sort of motor discharge", the greater the tension is. If this continues to exist over a prolonged period it can become incorporated in the individual's working balance and becomes characteristic for his "make-up". (Note the great similarity with modern views, such as expressed in, for example, articles by the paediatrician Brazelton on the very great difficulties which LBW infants have in regulating their "behavioural states".) (Brazelton, 1979, p. 61-72).

On the basis of psycho-analytic concepts about anxiety and narcissism the author states that it is her "theory" - supported by experience - that this has (can have) the following effects on the growth of the personality:

- To compensate for this fragile feeling of the organism, which easily gets into a "state of tension and anxiety", the feeling of narcissistic omnipotence increases. This causes, among other things, an increase in primitive "mirroring" of the environment. But the sense of reality too soon loses its balance: the ego remains weak and confusion easily arises. It is difficult for the ego to find satisfying, firm goals. The patient's libidinous bonds are compelling but also superficial. The patient seems poorly individualized, he is in too great a state of "flux" (large fluctuations in directedness at objects and at people, large fluctuations in the organization of the personality).

To give credit where it is due: more than 35 years later we find that, already at that time, Phyllis Greenacre expressed with great accuracy the psycho-physiological fragility and its consequences for the organization of the personality so often found - naturally, to varying degrees - in the low-birth-weight child.

§2. *Play results in the literature*

Very little is found in the literature about research into the play function. Our view, as we have explained earlier, is that play is a fundamental barometer of a child's development.

- As long ago as 1939 the celebrated American psychologist Shirley made a comparative study of 30 premature and 30 control children with ages varying from 2½ to 5 years and records the following characteristics of a play period she observed.

Table 32: Prematurity Syndrome Manifested during Play Period.

Items (Shirley)	Prematures % (N = 30)	Controls % (N = 30)
Remarks about unusual sounds	67	37
Speech difficulties	60	23
Cry in the playroom	80	57
Cry at examinations	60	77
Attention to crying of other children	37	20
Rapid change from toy to toy	43	23
Scattering toys	23	17
Seeking help	43	17
Giving up, discouraged	27	10
Jittery, nervous	83	27
Bowel movements at Center	40	30
Five or more urinations	27	12

(Shirley, 1939, p. 120, table 3)

It can be seen that - if I may be allowed to translate the above characteristics into our items - what is chiefly involved are observations concerning the "affective style of play" and the degree to which "play disruption" occurs in the form of somatic tension, distractibility by external stimuli or by internal drivenness. One does not, however, have a systematic study of play embracing its "organizational" "and egosynthetic" aspects. On the basis of the above characteristics, from a psycho-analytic standpoint it can be said, as Greenacre does in her commentary, that "the picture gives the impression of markedly increased infantile anxiety" (1941, p. 42), which already says a great deal about the "anxiety-bundling" dimension of the ego.

- Shirley too observes that premature children have (great) difficulty with the enlargement of the creative act because of their lack of mastery over motor functions: "Aesthetically the premature children seem to have an appreciation of the beautiful and a desire to create artistically. Many of them demand to paint, but their motor coordinations are so poor that these paintings are mere meaningless blobs ..." (p. 119).

- Fitzhardinge et alii (1977) report on a study of the developmental problems indicated by parents in a survey interview. The study encompassed 75 families with a child of very low birth weight (<1,500 g.) born in 1970 or 1971, the ages of the children at the time of the interview with the parents being 3-5 years.

That what was involved was not a selected, weak social class is apparent from the following statement by the authors: "The families in the study group came from average socio-economic backgrounds, mostly intact and self-sufficient: they bear little resemblance to the populations of parents with prematures where high incidences of child abuse have been noted. In addition, medical staff from the Neonatal Follow-Up Clinic have provided advice and encouragement to parents during yearly assessments of the VLBW child ..."

This was a comparative study, with 75 control families with a child weighing over 2500 g. at birth and born in the same period as the VLBW child. The study reveals that the parents themselves give a "less favourable evaluation of their child" in 2 areas, namely *development and play*. (The former, development, chiefly involves "speech and motor defects") No significant differences exist between the study group and the control group in 5 other areas: feeding, sleeping, toilet training, discipline and health. In the last of these there is one exception: a much higher frequency of upper respiratory infections is found in VLBW children.

- Finally, a study in which the play aspect is touched on indirectly. Scarr-Scalapatek and Williams (1973) report on a stimulation programme for an experimental group of 15 LBW infants of very disadvantaged mothers and a control group of 15 LBW infants from the same social class.

At the end of the first year or life (with weekly home-tutoring) the experimental group had an average Bayley score which was 10 points higher than that of the control group ($\bar{X}_e = 95$; $\bar{X}_c = 85$). Much more important from our point of view, however, is that "better developmental status within the E group was shown to be related to more maternal play stimulation."

§3. Differences between LBW boys and LBW girls in research data in the literature

We know of no study in the literature whose data contradict our findings: namely, that as a group the LBW girls score (function) substantially better than the LBW boys.

Similar results are to be found; in general, however, it can be asserted that relatively few researchers distinguish in their results between the sexes.

Given below are a number of studies, with various orientations, in which the distinction is made. Where possible some important aspects of the populations studied have been selected from the paper in question.

- Fitzhardinge and Commey (1979), in their follow-up study of 71 pre-term S.G.A. children (all the surviving children from a population born in 1974 and 1975; with a gestational age of < 37 weeks and a birth weight more than 2 S.D. below the average for gestational age), found that "the whole population, *especially the boys*, continued to show growth failure" based on growth curves to 2 years. The proportion of handicaps (defined as major neurological handicap or Bayley < 80 or both) was 49%. As far as handicaps were concerned, no difference was found between the sexes.
- Cohen and Beckwith (1979) report on a developmental psychological follow-up of 50 pre-term children (28 boys and 22 girls; average birth weight 1825 g., range 920-2 495 g.; average duration of pregnancy 33 weeks, range 26-37 weeks). They find "sex differences in competence" at 2 years of age. The LBW girls score better than the LBW boys on all 4 tests used: Gesell Developmental Schedule, Casati-Lezine Sensori-Motor Scale, Bayley Mental Scale and Receptive Language Test. On the *sensorimotor scale* the girls score significantly higher than the boys, with an average of 105,4 compared to 87.1.
- Gross et alii (1978), in a follow-up study of 118 LBW children (born 1971; birth-weight range 750-2000 g.) at five years of age, find a significant correlation between *neurological defect and male sex*. (11 cases in 57 boys, against 2 cases in 61 girls). They mention no other sex differences.
- Rubin et alii (1973) concentrate in their study particularly on IQ and school problems. They examined 78 LBW children (born between 1960 and 1964; birth weight: for 80% of the group between 2001 and 2500 g.). At 8 months (Bayley), at 4 years (Stanford-Binet) and at 7

years (WISC) the LBW-children score lower than the controls and the difference is statistically significant. As far as *school problems* are concerned: among the boys, both the *true prematures* and the *dysmatures* have more school problems while, among the girls, *only the SGA girls* are found to be high risk children.

- In 1973 Fitzhardinge and Ramsey report on a follow-up study of 32 children. (20 boys and 12 girls, born 1960-1966, birth weight < 1250 g). Examining them at 4-8 years of age they find that *65% of the boys have a form of speech defect* compared to *33% of the girls*. The average IQ of the boys is 88, of the girls 92. School progress is satisfactory in the case of 47% of the boys compared to 66% of the girls.

- Drillien (1972) points in her article to the syndrome of "transient dystonia" in LBW children (born 1966-1971; weight < 2000 g.). Among children with a birth weight *lower than 1500 grams* she finds *more abnormal neurological signs in boys* (56% of the cases) than in girls (43% of the cases). The study took place during the children's first year of life and encompassed 41 boys and 46 girls.

- De Hirsch et alii (1966) also find a difference between the sexes in favour of the girls, but this time in a different field. The study encompassed 53 premature children (born 1955-1956; birth weight 980-2239 g.) and an equal number of full-term control children. They were examined at three ages: kindergarten and 1st and 2nd class of primary school. It was found that the premature girls scored higher than the premature boys in reading, writing and spelling at the end of the first and second classes. *The difference is significant for writing and spelling* at the end of the second class. They refer to other researchers (Wortis and Freedman, 1965) who find that "males are particularly susceptible to the effects of prematurity."

- Freedman and Wortis (1965) concentrated on the lowest social classes in their study. It encompassed 215 black children (born 1956-1959; birth weight < 2100 g.). In an examination at 2.5 years of age they find more deviations (more neurological problems, lower IQ's) in the boys than in the girls. For the boys they even find - in the very low social class they are dealing with - a significant correlation between IQ, motor test and neurological diagnosis and the mother's level of education. Their hypothesis is that *vulnerability to negative external influence is greater among boys* (as regards both prematurity and environmental influence).

- And finally, Solnit and Green (1964): in their excellent clinical-theoretical article on the vulnerable child syndrome, prematurity is

explicitly named as one of the potentially predisposing syndromes. They illustrate their article with a case list of 25 children of various ages. Of these, 18 are boys and 7 girls. Again, the numerical relationship between boys and girls (which is not, however, the subject of this article) appears to us significant.

- As early as 1939, Shirley distinguished between boys and girls in her paper "A syndrome characterizing prematurely born children". She asserts that the items constituting the syndrome form a more consistent pattern in boys than in girls and adds:

"This fact is consistent with the general findings of other investigators who have observed that boys suffer more than girls from prematurity, whether the measure is in terms of mortality of or cerebral injury or of congenital defects" (1939, p. 21).

Part 2. IQ results in the research literature on LBW children

a). General comments

We shall confine ourselves here to a few general points. A number of differences in the IQ sphere have already been mentioned in the foregoing paragraphs. Moreover, it is precisely in this more standardized area of IQ that the presentations in the literature display wide differences: in the population studied by period of birth and birth weight; in the IQ test used; and in the norm used for comparison. To the best of our knowledge, only a relatively small number of studies make use of a control group. In many cases the so-called normal distribution is employed as the standard of comparison. Again, authors frequently eliminate the so-called "untestable children", whereas these naturally help to determine average and distribution. And finally, many authors present groups made up of children of widely differing ages. It is well-known, however, from longitudinal studies that IQ is not a constant datum if the same cohort is measured at different ages (see Kagan et alii, 1974, p. 339-343). The results obtained in the present study, using the Stutsman test, were:

average IQ of the LBW children = 104.65;

average IQ of the full-term children = 124.17.

(As stated earlier, this difference is statistically significant using the χ^2 test).

One might ask: why that average of 124.17 for the reference group? Is this not far above the well-known average of 100? Is this a valid group for comparative purposes?

The reference group is composed of only 40 children. Such a small group can obviously not be an exact copy of the normal distribution. No attempt was made to ensure that the lowest intelligence categories according to the normal distribution were represented in the reference group.

We have, however, endeavoured to obtain a comparable group on the basis of matching criteria such as age, sex, socio-economic class of the parents and position of the child in relation to other children in the family (see p. 39).

Part of the explanation lies in the sort of test: the Stutsman test is a "fairly easy" one. From a psycho-hygienic standpoint, however, this is important, because the task in this study was to test small children who are still very frail, still very sensitive to situation, in the presence of their mother (and/or father). In doing this it is important to get to know the child's abilities and weaknesses and - as far as professionally possible - not to create a situation which is one long frustration for the child and one long painful experience for the watching parent or parents. A scientific study too must obey psychological laws. Any differences between test children and control children would be clearly revealed, and that was the objective. Again, many other investigators also report averages far above the "100". For example, in "Human Development" Moore (1967) reports on a longitudinal study of children (note: not LBW children) in their first 8 years of life. At three years of age he finds an average IQ (Stanford-Binet) of 110.15 for the boys (N = 41) and 113.65 for the girls (N = 35). In the same cohort these figures rise at 8 years of age to 123.61 for the boys and 117.91 for the girls. In his commentary the author refers to other investigators: "others have found representative urban samples to have mean Stanford-Binet IQs considerably above 100", and cites names and publications.

An important aspect is the IQ distribution within the group studied (see results on pages 86 and 87).

If we take as the criterion for serious mental deficit - as many authors do - an IQ of < 70, in our study 7.5% of the children qualify (all of them boys). On that point our population conforms with the figures in recent literature on the high care period after 1966, which give \pm < 10% as the figure for "major handicap" (including "mental deficit"). (See the review article by Pamela A. Davies, 1976, pp. 817-819).

b. Some studies for comparison

- Stewart et alii reported at a CIBA symposium in 1978 on a follow-up

study of children with a birth weight of < 1500 g. born after 1966. A first group of children (born between 1966 and 1971) had 109 subjects. The variation in age at the time of testing fluctuated between ± 3 years and $\pm 4\frac{1}{2}$ years. Of the 109 children, however, only 82 "completed" the test. The average Stanford-Binet IQ of these 82 children was 103. The authors comment: "Because of their young age, children functioning at levels more than two standard deviations below the mean could not be tested on this scale and were therefore among those excluded from this distribution."

The authors then divide up the 82 children according to period of birth: N = 18 (born 1966-1967); N = 32 (born 1968-1969); N = 32 (born 1970-1971). The three groups obtained an IQ of 95.7, 98.3 and 112.4 respectively. (The group as a whole, remember, had an IQ of 103). In our opinion this example well illustrates what was said in the general comments on pages 112 and 113.

- Hohlweg-Majert et alii (1978) report on a comparative study of 147 prematures and 214 children from a comparative group. The article gives no information about the weights of the prematures. A follow-up examination is made of the children at ages ranging from 3 to 8 years. The average IQ of the prematures is 99, that of the fullterm children 101. On the distribution of IQ within the groups the authors give, among other things, the following table:

Table 33

IQ	Prematures	%	Comparative group	%
>115	16	10.88	30	14.02
85-115	103	70.07	166	77.57
< 85	28	19.05	18	8.41

(Hohlweg-Majert et al., 1978)

A statistically significant difference ($P < .05$), unfavourable to the prematures, is given for this table.

- Finally, from Australia Black et alii (1977) report on a study of 58 "pre-school children" with a birth weight of <1500 g. (born 1971-1973). The children were examined at an age ranging from 3 to 6 years, with an average of 4.6 years. No mention is made of differences between boys and girls, the only information on this point being that the group consisted of 32 girls and 26 boys.

A "verbal IQ" is given for 43 of the 58 children and a "performance IQ" for 55. Of 3 children it is said that they were not testable. The authors

assert that the children function as a group "within the normal range"; they find no difference between SGA children and AGA children. The distribution of IQ in the group is presented in the following table:

Table 34

IQ range		Non-verbal IQ % LBW sample	N	Verbal IQ % LBW sample	N	Norms %
69	retarded	5.8	3	4.6	2	2
70- 79	borderline	1.8	1	4.6	2	7
80- 89	low average	18.0	10	14.0	6	16
90-109	average	40.0	22	41.8	18	50
110-119	high average	18.0	10	21.0	9	16
120-129	superior	13.0	7	9.3	4	7
130+	very superior	3.6	2	4.6	2	2
Total			55			43

(Black et al., 1977)

It will be clear that these are authors who use the "normal distribution" as a norm, whereby 25% of the "normal population" (2 + 7 + 16) have an IQ of < 90.

We hope that we have given a sufficient idea of the many aspects involved in comparison from the literature.

Part 3. Comparisons with the research data in the literature as regards "perinatal risk factors" and their impact on development

It seemed to us useful to indicate a number of trends and currents in the literature concerning perinatal factors and their impact. Naturally, all earlier comments about the many variables inherent in the subject "prematurity" (see pages 101-103) apply equally here.

a). *General points*

- In the literature there is an opinion - or, if one wishes, insight - which has been gaining more and more ground after several decades of follow-up research into populations with risk factors. This tendency is strongly in evidence in the much-cited review article written by Sameroff and Chandler (1976) under the auspices of the Society for Research in Child Development and published as volume no. 4 under the title "Reproductive Risk and the Continuum of Caretaking Casualty".

What these authors conclude in this review of a large number of studies is that the further removed the follow-up study is from the data of birth, the smaller is the relative weight of perinatal risk factors such as "anoxia, prematurity and delivery complications", which pale beside the much greater influence of socio-economic class and the parents' level of education. To quote them: "... An inescapable conclusion that will emerge from this review is that, even if one continues to believe that "a continuum of reproductive casualty" exists, its importance pales in comparison to the massive influences of socioeconomic factors on both prenatal and postnatal development" (Sameroff and Chandler, 1976, p. 192). Closely related to this is the clinical-scientific caution about attributing too great a predictive power to risk factors, which in prospective studies they prove not to have.

"Studies that have followed the developmental course of supposedly vulnerable infants have typically found that the initial difficulties were attenuated with the passage of time and that the earlier expectations of negative outcome were not realized. Instead, many of the children studied appear to overcome their initial handicaps and liabilities and to adapt successfully to their environment" (Sameroff & Chandler, opus citatum, p. 189).

- Internationally, therefore, investigators are searching more and more for a "cumulative risk score": for this, a multi-causal approach is advocated, with risk evaluation based on numerous factors from different domains.

These would include, among others,

1. the perinatal risk factors as such,
2. the psycho-physiological status of the small child with which it interacts with its surroundings,
3. the influence of the environment and, more specifically, the caregiver,
4. later interferences (such as intercurrent diseases, admissions, etc.)

Examples can be found in the recent collective research work "Infants born at risk" (1979) published by T.M. Field et alii. In her foreword, Lubchenko says: "... this volume is a treasury of information for all who are involved in caring for or following up infants born at risk. Reported in this book is a study by Parmelee and Sigman entitled "Longitudinal Evaluation of the Pre-Term Infant" (pp. 193-217) in which the authors arrive at a cumulative risk score composed of 16 (!) diagnostic measures. These include obstetric-paediatric risk lists such as "The Obstetrical Complications Scale", "The Postnatal

Complications Scale" (up to 1 month after birth), "The Parmelee Newborn Neurological Examination Scale" and the "Pediatric Complications Scale" (scored at 4 and 9 months after birth). In addition, there are a "Sleep Polygraph", an imposing series of sensorimotor scores at 4 and 9 months, and even a "Caregiver-Infant Interaction Scale". All of these scales together form the cumulative risk factor. When, however, 126 pre-term children are tested at 2 years of age with Gesell, Bayley and Casati-Lezine sensorimotor scale it is found that these 16 measures of cumulative risk together explain only 1/3rd of the variance found for these premature children at 2 years of age! (A cumulative adjusted R^2 of 0.28, to put it technically. We shall not discuss here the multivariate stepwise regression analysis on which this study was based).

If these children are divided into a high risk group ($n = 61$) and a low risk group ($N = 65$) on the basis of the "cumulative risk factor" they obtained, it is found that at two years of age there are no statistically significant differences between the low risk and the high risk group in the tests, unless on the Bayley Motor Scale. The performance of the low risk group, however, was consistently better at 2 years on all the tests, i.e. Gesell, Receptive Language, Casati-Lezine, Bayley Mental and Bayley Motor. But the differences were not significant.

Here too, the sex difference between boys and girls is interesting: "strong evidence of a sex difference in the relationship between early measurements and outcome variables was described" (p. 213). The cumulative adjusted R^2 was indeed much higher - 0.62 - for the 50 girls in the group of 126 pre-term children. This lends further support to the view that the development of (small) girls is accompanied by greater stability and consistency.

- Finally, these authors also indicate the weight which should be given to the different risk measures. This can be done in relation to "later performance". However, this is a post hoc method which prevents the information obtained from being applicable to other samples.

We trust that the above will be sufficient to position our study in the framework of present-day risk research.

b). Specific comparisons

As can be seen on page 95 of the results, for a number of the 15 perinatal factors chosen a correlation tendency exists between these factors and results at 3 years of age.

They are:

- *Birth weight below the 2.3 percentile line* of Kloosterman
- *Respiratory Distress Syndrome*
- *Acidemia*
- *Artificial respiration after day 10.*

In addition, correlations were sought between results at 3 years of age and *birth weight* and *duration of admission* (see p.92).

Below we give some results from the literature which can be compared with these findings.

1. The significance of birth weight in relation to gestational age.

Drillien (1972), Brazelton (1976), Sweet (1979) and Fitzhardinge (1979) are among the authors who attach great importance to a weight which is too low in relation to gestational age. Drillien points to the form which arises in the first trimester of the pregnancy and has the tendency to be irreversible. Sweet states that the small-for-gestational-age child has more chance of congenital defects and later mental deficiency than the appropriate-for-gestational-age child of the same birth weight. Small-for-date babies display more frequent and more pronounced neonatal asphyxia, have more hypoglycemia and have poorer temperature regulation. Brazelton points to regulation difficulties in healthy "fullterm but underweight" newborns; Fitzhardinge too refers to the greater vulnerability of SGA children and particularly to their postnatal growth problems and their higher percentage of handicaps.

On the other hand, one has authors who find no differences between SGA and AGA children.

- Stewart et alii (1978), in a follow-up study of 259 children born after 1966 with a birth weight of < 1500 g., found no differences between AGA and SGA children as regards major handicaps. The age of the children at the time of examination ranged from 18 months to 8 years.
- Black et alii (1977) also find no difference between SGA and AGA children as regards IQ: they examined 58 children born between 1971 and 1973 with a birth weight of < 1500 g. The age of the children at the time of examination ranged from 3 to 6 years.

2. Respiratory Distress Syndrome

This syndrome is one of the chief concomitant problems which can arise postnatally in premature children.

Needless to say, there is a close link here with the progress being

made in paediatric care. We should like, therefore, to refer to the literature which has appeared since the introduction of the most modern techniques. In their study "Developmental Assessments of Infants Surviving the Respiratory Distress Syndrome" (1979), Field et alii refer to studies of populations born before the introduction of the most modern high care techniques (internationally \pm 1966 is taken, as mentioned earlier).

The tendency revealed by these studies is that during the earliest periods RDS survivors have more developmental problems than control children (matched for duration of pregnancy, birth weight and socio-economic class) but that, if one takes IQ as the measure, the differences have disappeared at toddler age. The modern literature reports a somewhat higher incidence of developmental deficits (again, compared with LBW children without the Respiratory Distress Syndrome).

Of great importance, in our opinion, from the point of view of developmental psychology is the discrepancy found by Field et alii in their studies of RDS survivors between mental and motor performance as expressed in Bayley test scores.

These authors find a markedly lower Bayley motor performance. In their discussion they state that "the strikingly low motor performance of the RDS infant is not unique to the sample of this study" (p. 277) and cite other studies. It is difficult to determine whether these motor problems are secondary to prematurity or the RDS syndrome. The authors advise that: "Whatever the etiology of the motor deficit, its pervasiveness for the RDS survivor during the sensorimotor period of development and its persistence across the first two years warrants the focus of intervention efforts" (p. 278).

3. Artificial respiration

In the study, cited earlier, of Stewart et alii (1978) for the CIBA Foundation Symposium the authors also deal with artificial respiration in perinatal complications. The study encompassed 259 children born between 1966 and 1976 with a birth weight of < 1500 grams. All these children were seen at an age ranging from 18 months to 8 years in order to determine DQ or IQ.

The authors indicate that the percentage of major handicaps was higher in the 60 children in the group who had received mechanical ventilation (22%) than in the 129 children born in the same period (1970-1975) who had not needed artificial respiration (3%).

Among the children who had undergone artificial respiration there were no differences in the incidence of major handicaps between the group with a birth weight lower than 1000 g. and the group with a birth weight between 1001 g. and 1500 g.

There were, however, striking differences when account was taken of the indication for ventilation. The children with complicating factors such as "respiratory failure associated with abnormal CNS-signs", "respiratory failure due to perinatal asphyxia" and ventilation for "apnoeic spells" (pp. 155-156) displayed a much higher frequency of major handicaps: 100%, 47% and 25% respectively. By contrast, the children for whom the indication for ventilation was uncomplicated hyaline membrane disease displayed no major handicaps (pp. 155 and 156).

4. Acidemia

Using multiple regression analysis of the correlation between perinatal factors and later data, Stewart et alii (1978) find in the same study that of the individual perinatal factors, acidemia (arterial pH measured 2 hours after birth) contributed most strongly to the variance found in DQ, namely 2.4%. Only the factor "perinatal convulsions" made a greater contribution to the variance found in DQ, with 5.6%.

5. Duration of admission

Most authors make no mention of the duration of perinatal admission of the children studied.

Among the exceptions to the rule are Douglas and Gear (1976), who report on a follow-up study of the LBW children belonging to the national (British) cohort of children born in the first week of March 1946.

Of 12,368 single legitimate births, in 163 cases the children had a birth weight lower than 2000 g.; of these, 80 lived to 18 years of age, and of the 80, 69 were available for follow-up. The follow-up group included both children who had been nursed at home postnatally and children who had been admitted to a paediatric department.

In adolescence even the children with the longest perinatal duration of admission (more than 3 weeks) scored as high as or higher than the children with a short duration of admission (less than 3 weeks) and than the children who had not been admitted. The authors refer to another study of theirs which shows that later admissions of small

children (at an age between 6 months and 4 years) have much more pronounced effects on behaviour and intellectual functioning. The hypothesis they put forward is that the children who were kept in hospital longest were the heaviest when discharged and that a long separation is perhaps less serious than the feelings of anxiety and incompetence of a mother who has to take care of a very small baby on her own. "Even long periods of separation may be less likely to generate long-term disturbance than the feelings of incompetence and anxiety aroused in a mother who has a very small baby entirely in her care. This may explain why the most favourably assessed LBW children were those kept longest in hospital, who were also the heaviest when they returned home" (p. 826).

Our experience supports this view*. This is not an argument against the theories on the importance of "early attachment and bonding" (to which Bowlby, Robertson, Klaus and Kennel rightly attach so much weight): rather, it illustrates the complexity of "prematurity", a phenomenon in which *many factors of great weight* must be weighed against one another. It is also a good illustration of the difficulties attaching to the tracking down and evaluation of "risk factors".

The development of a child in the "lap of a large family" (this includes its mother and father, but also the neonatal high care department) is not a laboratory situation in which all conditions can be kept constant in order to measure the influence of a particular variable.

6. Birth weight

As birth weight and duration of pregnancy are the chief criteria characterizing the LBW child, data on the birth weights of the populations studied are seldom lacking in the literature. As regards the impact of birth weight, in recent decades a rapid evolution has been taking place, paralleling the progress in high care treatment of the low-birth-weight baby.

A clear account of this is given in the brief review entitled "Outlook for the low birthweight baby - then and now" by Pamela Davies (1976) of Hammersmith Hospital in London (one of "the big 3" in Great Britain, together with Drillien in Edinburgh and Rawlings, Stewart et alii of University College Hospital in London).

Up to the second half of the 1960s the general rule was a very high

* Footnote:

This is also supported by the score on item X (see tables 4 and 5). Item X measured the "basic trust" achieved in the mother-child relationship as reflected by the form of play: the relative difference between the test group and the reference group is smallest for this item.

incidence of major handicaps (35% and more) in the groups with a very low birth weight (< 1500 g.) and an even higher incidence for a birth weight of < 1000 g.. In recent years these incidences for survivors have been rapidly declining.

In 1972, for example, Drillien studied a group of 283 children born between 1966 and 1971 with a birth weight of < 2000 g. and found major handicaps in 9.6% of the cases; for the group with a birth weight of < 1500 g. the figure was 13.7% and for the group with a birth weight between 1501 g. and 2000 g 7.7%.

Studying 165 children born between 1961 and 1970 with a birth weight of < 1500 g., Davies finds a figure of 18.5% for major handicaps and no statistically significant difference between the group with a birth weight of < 1000 g. and that with a birth weight between 1001 g. and 1500 g..

In a group of 259 children born between 1966 and 1976 with a birth weight of < 1500 g., Stewart et alii (1978) find a figure of 8.5% for major handicaps. Here again there is no statistically significant difference between the group with a birth weight of < 1000 g. (13% major handicaps) and the group with a birth weight between 1001 g. and 1500 g. (8% major handicaps).

Though paediatrics can be justly proud of these improved results, it may be as well to repeat that major handicaps are defined in this literature as very severe sensory or neurological handicaps, or a DQ or IQ of < 70, or a combination of these. In other words, the definition excludes the low-birth-weight child with no severe somatic sequelae.

Table 35: Outlook for the Low birth weight baby - then and now (Davies, 1976).

Author	Birth Weight (g.)	Incidence of Major Handicaps %
<u>Up to + 1965:</u>		
Lubchenco, 1963	<1500	≥35.0
<u>Recent years:</u>		
Drillien, 1972	<2000	9.6
	<1500	13.7
	1501-2000	7.7
Reynolds & Stewart, 1974	<1500	9.5
Davies, 1976	<1500	18.5

V. Explanatory model of the findings from a developmental standpoint

1° EXPLANATION OF THE DIFFERENCES BETWEEN LBW CHILDREN AND REFERENCE CHILDREN.

In explaining the differences in developmental level between the LBW children and the full-term reference children at 3 years of age found in this study, we should like to make use of the knowledge we acquired from a prospective study of 48 LBW children matched with 48 full-term children, whom we examined at the ages of 6, 12, 18 and 24 months. (The results of this study were presented before the First World Congress of Infant Psychiatry, 1980. The congress book is in print).

A. A general developmental sequence as an explanatory model

In its earliest period of development, during its first years of life, a child passes through a developmental sequence whose direction is increasing differentiation. This can be represented schematically as follows:

Developmental sequence in gradual steps	
FROM	TO
Globality	Hierarchic Organization
Non-differentiation	Patterns, schemes, structures, configurations
Instability	Smoothly organized skills
This end of the developmental sequence is characterized by a young child that can be described as:	At this end of the developmental sequence the following descriptive terms can be applied to the young child:
(still) Vague, diffuse	(increasingly) Circumscribed, directed, specific
(still) Global	(increasingly) Detailed, accurate
(still) Unfinished	(increasingly) Precise, firm
(still) Fluid	(increasingly) Stable
(still) Fragmented	(increasingly) Connected in sequences
(still) Loose connections	(increasingly) Organized to "Gestalt"

It is our clinical experience with LBW children that, as a group, they experience great difficulty with the course of development from left to right as presented in this schema.

What is meant by this developmental sequence: how should one picture a small baby developing step by step from a state of globality and non-differentiation towards and increasing organization of his personality, with patterns, schemes and skills?

By way of illustration we shall describe a number of specific functions which are of great importance in the development of the personality and with which LBW children have difficulty.

B. Development of visual attention and visually guided reaching

During the first year of life, according to many authors one has a developmental phase in which vision is the predominant modality through which small children investigate the world (Connolly, 1970, p. 42/ Erikson, 1977, p. 47, also quoting Spitz and Bruner). "Thus vision becomes the leading perceptual as well as emotional modality for the organization of a sensory and sensual space as marked by the infant's interplay with the primal person" (Erikson, p. 47).

According to Kagan (1970, 1971), visual attention is primarily a function of an object's contours and motions; in a later phase it will be a function of optimal discrepancy as compared to schemes already known. This visual exploration of the world naturally demands a sufficient level of alertness, as Bruner says: "The characteristic initial accompaniment of aroused intention in the infant is prolonged orienting..." (1974a, p. 55).

This visual alertness will combine with reaching and grasping behaviour into what is known as "visually guided reaching". We are now able to draw a more specific developmental line of the skills which create problems for low-birth-weight children in comparison with their controls.

C. A more specific developmental sequence as an explanatory model

FROM	Developmental sequence in gradual steps →	TO
The small, fragile, still uncoordinated baby, alternately eating and sleeping, with few fixed patterns in his actions.		Incipiently organized baby
a) Fine Manual Motor Function		
Clumsy manipulations		Dexterous prehension
Primitive grasp reflex		Voluntary type of manipulation
Clawing type of hand closure		Precise index-finger-thumb grasp
+		
b) Level of Consciousness		
Vague directedness		Sufficient alertness ("Orienting")
+		
c) Visual Directedness		
Unfixed vision This pole corresponds more to what Erikson (1950,p.75) calls:		Visual exploration Here the baby is in the stage that Erikson calls:
Incorporative Mode I "Accepting impressions as they come along" (Erikson, 1950, p.77)		Incorporative Mode II "To focus, to isolate, to grasp objects from the vaguer background and to follow them" (Erikson, 1950, p.77)
+		
d) Global Body Control		
Body instability		Postural tonus; Capito-caudal command.

* The + sign signifies that the development of the functions a, b, c and d goes hand in hand; the functions run more or less synchronously in time, need one another.

Footnote:
Though the schemas on pages 123 and 125 were constructed by ourselves they were inspired by authors such as De Groot (1949, pp. 177-188), Erikson (1950, p. 77 and 1977, p. 47), Connolly (1970, pp. 3-17), Hart de Ruyter (1972, pp. 13-15), Bruner (1974a, p.55) and Saint-Anne Dargassies (1977).

By the progressive hierarchic organization set out in the schema is meant that a "whole" emerges in which the different "components" (level of consciousness, manual motor functions, visual directedness, body control) slowly but surely become integrated.

This entire theory is "embodied" in the appealing, natural totality of the baby looking alertly about him from his mother's comfortable lap who - at, say, 8 or 9 months - picks up a block, looks at it, passes it from one hand to the other, becomes quiet or vocalizes, and at a given moment turns to look at his mother's face and laughs.

The developmental work that the baby has to perform to do all this (together with the mother we have just assumed to be present, because it does not happen of its own accord) is presented approximately in the above schema, without the poetry and without the time, the effort, the trial and error, the progressions and the relapses.

It is our experience that as a group, though with variations from individual to individual, low-birth-weight children remain much longer in the incomplete developmental stages on the lefthand side of the schema and that combinations often occur with the more differentiated aspects on the righthand side of the diagram.

Once the full-term child has taken a step towards the righthand side of the schema it is - relatively speaking - much firmer and much more fixed. On the subject of the difficulties experienced by low-birth-weight children in effecting these gradual changes in organization, Katrina de Hirsch (1975, p. 101) states: "As a group, the prematurely born brought to mind Bender's observations on "Primitive plasticity" ...meaning "as yet unformed but capable of being formed". We quote this sentence because it illustrates how this author too was struck by the "as yet plastic and unformed" aspect in LBW children - terms which fit readily in the lefthand part of the schema we have presented.

D. Differences in behavioural states in neonates: LBW babies versus full-term, full-birth-weight babies

The difficulties mentioned as regards the step-by-step achievement of organization by the LBW child also display much similarity to the findings in the most recent literature, in which close attention has been paid to how the small neonate "behaves".

Explicitly involved here is "organizational bundling", with authors using terms such as: "Stages of Behavioral Organization in the High Risk Neonate: Theoretical and Clinical Considerations" (Brazelton et

alii, 1979); "Behavioural State Cycles in Abnormal Infants" (Prechtl et alii, 1973); "Neurophysiological and Behavioral Organization of Premature Infants in the First Months of Life" (Parmelee, 1975). More and more comparative studies are being made of a group of full-term babies and a group of premature babies with the same "conceptual age" (age calculated from conception, i.e. the time which has elapsed since the last menstrual cycle).

"Several studies have compared the performance of preterm infants at 40 week conceptual age with full term infants at birth" (Brazelton, 1979, p. 61).

Such things are studied as the baby's sleeping-waking rhythm, tonus status and changes therein, capacity to regulate, or allow to be regulated, itself and its reactions.

Brazelton (1979, p. 61) summarizes a number of findings from these studies:

- the *electro-encephalogram* of a preterm infant at 40 week conceptual age includes *more immature patterns* than that of the newborn;
- components of the *sleep cycle are less well organized* in the preterm infant;
- preterm infants have *less visual attentiveness* at 40 week conceptual age than full-term infants at birth;
- Visually Evoked Response *has a longer latency* in preterm infants at 40 week conceptual age than in full-term neonates.

Brazelton's own "Neonatal Behavioral Assessment Scale" was drawn up in order to be able to observe these integrative processes better. He assumes in this that a full-term, healthy baby has a range of complex behaviours at his disposal which enable him to elicit from the environment the feed-back he needs for his cognitive and affective development.

These behavioural capacities are:

1. The capacity *to respond reliably and selectively* in a social interaction with a nurturing adult or with attractive visual or auditory stimuli.
2. The capacity *to regulate his state of consciousness* in order to be available for positive stimulation and to defend himself from negative stimulation.
3. The capacity *to maintain adequate tone*, to control motor behavior, and to perform integrated motor activities such as hand-to-mouth-manoeuvres.
4. The capacity *to maintain physiologic homeostasis*.

In the study Brazelton registers not only the quality of the baby's response but also the

1. duration of the response
2. difficulty with which it is obtained
3. difficulty with which a state of responsiveness is maintained.

The responses of the low-birth-weight baby prove to be less organized: there is much more flux in his reactions, the autonomous functions (heart-breathing-skin colour) are more easily disturbed, there is much more fluctuation in tonus regulation, the baby's responses are much less vigorous. There is a large measure of "unevenness" in the picture.

In 1939, in her article "A behavioral syndrome characterizing prematurely born children", which has been cited earlier, Shirley too reports: "It may be mentioned in passing that all members of the staff have commented on the greater volatility and instability of the prematures in their emotional responses to examinations, and "premature day" is dreaded by those who are not actually engaged in the record taking" (p. 117).

E. Consequences for the LBW child and for the Mother-Child-relationship

What - in the first years of life - are the potential consequences of this psycho-physiological immaturity with which it is born for the psychological make-up of the LBW child? In what ways can it influence the mother-child relationship?

We have been able to follow the thread of this psycho-physiological lability in the development of a group of LBW children during their first 24 months of life, together with its consequences for the mother ("The caregiver"). "A newborn infant greatly influences the care he receives from those around him by the way he behaves" (Brazelton, 1976, p. 590).

A number of important aspects of this development are summarized point by point in the following review. The step-by-step arrangement is intended to make it clear that the various aspects influence one another through the course of development.

CHILD

1. Insufficiently smooth postural

MOTHER-CHILD

1. The tonic dialogue (Ajuria-

tonus: low-birth-weight children demonstrate in their lap behaviour a body rapidly changing in tonus: flaccid and then rigid; tense and active, then quiet, passive, vague and unifying with the mother's body. Opisthotonus gives way to plastic flaccidity.

2. Low-birth-weight children are in a state of excessive flux: they tend to change from redness to pallor, pant during exercise, give up easily and sigh. Their distal fine motor functions are easily distressed. They have insufficient of what Winnicott calls: Personalisation = Integration of psyche and soma (Winnicott, 1965, p. 6).

3. On account of the insufficient development of the sensorimotor competences the child remains too dependent on the mother. This is in contrast to what should happen according to Winnicott: "By the age of one year... the (baby's) mind is allied to the mother and takes over part of her function" (Winnicott, 1965, p. 7).

guearra's "Le dialogue tonique"; 1974, p. 240) is in danger. The changes and non-specificity evoke feelings of perplexity in the mother. This is in contrast to what should happen according to Winnicott: "satisfactory holding facilitates the formation of a psychosomatic partnership in the infant. This contributes to the sense of "real"."

(Winnicott, 1965, p. 19).

2. This evokes extreme fears in the mother, or to quote Winnicott: "At this stage, the mother can think that her baby is dying" (Winnicott, 1965, p. 6). Mothers are too often brought into a state of alarm.

3. The mother should evolve from "Primary Maternal Preoccupation" to "Gradually re-acquiring a life of her own" (Winnicott, 1965, p. 7). "The mother recovers her self-interest and does so at the rate at which her baby can allow her to do so" (Winnicott, 1965, p. 15). "The mother is dependent on the infant's intellectual processes" (Winnicott, 1965, p. 15). The danger here is that the mother's

child-attentiveness will be exhausted and will change into ambivalence and irritation.

4. Lack of feeling of pleasure in body functioning and increasing proficiency may very well give way to feelings of incompetence in the low-birth - weight child.
 5. The highly important phantasy function, defined by Winnicott as "the imaginative elaboration of physical function" (Winnicott, 1965, p. 7), is threatened. Realization of the "Creative Impulse", which according to Winnicott "as nothing else proves to the child that he or she is alive" (1965, p. 12) remains embryonic and unfinished.
 6. Moreover, extremely important from the developmental point of view: because of the inadequate development of good sensorimotor schemes, the evolution from action to language is interfered with in the low-birth-weight child. According to linguists, this requires cognitive comparisons between already known structures on the basis of codable discrepancies. Bruner (1980) states that after 1.5
4. The mother - consciously or unconsciously - "recognizes" in the protracted unfinished state of her child her own painful insufficiency as a mother who gave birth to an undersized, premature baby. This is an extra difficulty for her in overcoming her perinatal traumas.
 5. The "capacity to contribute" to the mother-child dyad is very small in the child. The mother waits for the ego functions to develop, according to Freud "the precipitate of abandoned objects" (Freud, 1923, p. 29). In other words: the precipitate of herself in her child. Parenthood as a gratifying developmental state is in danger.
 6. In the mother-child relationship it is necessary to differentiate the play of request/question and answer in order to achieve "conversational chains" between the mother and child.

years the child's knowledge of the world is so organized that he is at the semantic level, he is able to codify the arguments of action: an actor/ the objects/the instruments/ the locus/the possessor. The problem in LBW children, however, is the globality and the lack of detail.

In summary: The whole developmental process of the LBW child is extra vulnerable and the mother-child pair is faced with a difficult task: this is recognizable in the successive early developmental stages. It is in this light that the results found at three years of age should be viewed.

2° EXPLANATION OF THE DIFFERENCES FOUND BETWEEN BOYS AND GIRLS IN FAVOUR OF THE GIRLS.

A number of factors can be considered in seeking to explain these differences:

1. *Somatic factors*

As regards a number of perinatal factors, it is clear that the LBW boys in the population we examined had more organic problems than the LBW girls:

- a). The respiratory distress syndrome occurred in 56% of the LBW boys and 29% of the LBW girls. It was also clinically more serious in the boys.
- b). In the population we studied there are more small for dates among the LBW boys than among the LBW girls: 25% of the boys had a birth weight under Kloosterman's 2.3 percentile (for duration of pregnancy) and 12.5% of the girls.
Moreover, for the boys' group as a whole there is a negative correlation between birth weight and duration of pregnancy (the sign is thus the opposite of what one would expect).
- c). The boys were admitted to the neonatal high care department for an average of 64 days, the girls for an average of 56 days.

2. *Postnatal somatic interferences (other than admission for "Prematuritas")*

The criterion we chose here was readmission in the hospital, based on anamnestic data from the mother (or parents).

The proportions readmitted before the age of 3 were:

56.25% of the LBW boys (9 out of 16)

16.66% of the LBW girls (4 out of 24).

3. *General differences between the development of boys and girls.*

a. In the *somatic sphere*, girls develop in a more stable and constant manner than boys and boys are more vulnerable. We should like to extract a number of possible arguments in this direction from Kagan's work "Change and Continuity in Infancy" (1971), in which reference is made to other authors.

- The female is more resistant to mortality following serious disease and more males than females die during each decade of life (Kagan, 1971, p. 26).

- Matching for birth weight, more male premature infants die in the first weeks of postnatal life than females (Kagan, 1971, p. 26).

- The magnitude of predictive validity for many anthropometric dimensions is markedly better for girls, and Acheson states: "In almost every respect the physical development of the female is more stable than that of the male".

For example, the use of onset of ossification in any single bone to predict when ossification will begin in another centre is more reliable in the female than in the male (Kagan, 1971, p. 84).

- The greater stability in growth processes in the female is also reflected in the fact that debilitating environmental influence (disease, radiation, nutrition) are more likely to retard maturational milestones in boys than in girls. An improvement in environmental circumstances also has a greater effect on the male than on the female (Kagan, 1971, p. 84).

- Also interesting to note is that modern electro-neurological research reveals that the latency of the V.E.P. (Visually Evoked Potential) is "generally longer in male infants than in female infants" (Maurer, 1975, p. 31). Latency times decline during the first two years of life to reach the adult level at 18-24 months (Maurer, 1975, p. 31). This V.E.P. interests us because "correlations with conceptual age and with body weight indicate that the latency of the V.E.P. is related to maturity" (Maurer, 1975, p. 33).

Another psychological reason that the V.E.P. interests us is that it also depends on the state of the child examined, namely on its "state of arousal" (Maurer, 1975, p. 29). "In premature infants... the latencies of all components were shorter when the infants were awake" (Maurer, 1975, p. 29).

- b. In the *sphere of developmental psychology*, language development takes place earlier in girls than in boys. "We only have information on children's language in a very limited number of societies but in every one that I know, the girls are more precocious than boys in linguistic behaviors to an extent which is measurable" (Margaret Mead, 1958, p. 48). Interesting in this context are data we take from Kagan (1971, op.cit.).

There are speculations (on the basis of very limited research) that left hemisphere dominance occurs earlier in small girls. This would result in girls passing on more quickly to vocalisations (Kagan, 1971, p. 182).

Possibly fitting in with this is the tendency on the part of the mother cited in some research and particularly by the much-quoted Moss, namely that "middle class mothers of daughters were more likely to imitate the vocalisations of their infants than mothers of sons" (Kagan, 1971, p. 107-108).

4. *Results determined by the examiner's prejudices???*

J & S. Condry (1977, p. 289-301) warn against this in their article "Sex differences: a study of the eye of the beholder." They find that "males with high experience with infants see more of a difference due to the sex label than males with little experience with infants" (p. 295). As university students were used as test observers, and as the criterion for "high experience" was that the student must at some time or other have had a job in a setting with children, the present writer must also be considered as belonging to this category of the potentially prejudiced. However, his possible bias was not in the direction indicated by the article.

5. *Additional explanations in the spheres of development psychology and psychoanalysis.*

5.1 As a result of the greater difficulties that low-birth-weight children have with their psycho-physiological homeostasis, they display what Greenacre (1941) calls "a predisposition to anxiety", i.e. they get more quickly into a state of disequilibrium in which somatic

tension manifests itself for which they have insufficient directed motor discharge possibilities. To compensate and regulate this "predisposition to anxiety" an increase in narcissistic tendencies can occur. This can have a different effect on the two sexes, as will be explained below.

What is involved here is a very early stage in the child's development, in which anxiety in the sense of psychological content (experience) probably does not yet exist. At least, not according to those authors, among them Greenacre, for whom the ego development of the small baby (= seat of psychological experience) is still too limited for this to be assumed.

In that case, one might ask, what phenomena are involved? Let us take as an example: "... many clinical observations of prematurely born infants indicate that they are almost uniformly hypersensitive to sound" (Greenacre, 1941, p. 31) and examine the statement in more detail. The small, premature baby is hypersensitive to sound*. It does not yet have the skill to arm itself in a directed way against sound by shielding itself motorically, e.g. by putting its fingers in its ears or walking away from the source of the noise. Nor can it shield itself psychically by, for example, looking at a nice toy, because as yet it can fixate only poorly. It can not, either, seek regulation by sucking its fingers, because it finds the way to its mouth only with difficulty or becomes motorically disrupted if it makes attempts in that direction. It finds itself, therefore, in a state of tension because of the sensory stimulus and hypersensitivity and because of its inadequate motor-response capability. Indeed, reactions can occur which are diffuse (general and unspecific) and thus increase the tension still further. For example, a startle reaction can take place, or respiration, muscle tonus or skin colour can change.

The same applies to the full-term baby, but the tendency to unorganized reaction is greater in the LBW baby and its problems in this respect continue for much longer.

Greenacre's hypothesis - and we believe that we have observed this clinically - is that this can grow into a pattern in the developing baby. The sensorimotor disequilibrium can come to form part of the working balance (for example as a result of the inevitable admission, which gives rise to extra problems).

Greenacre then asks herself: "What might be the effect of such

* Footnote:

Many LBW babies remain for a long time in incubators, which constantly make a zooming sound.

early increase in the anxiety potential, provided this does occur, on infantile narcissism?" After noting that narcissism is a difficult concept, she goes on to use Freud's statement on narcissism as: "the libidinal complement to the egoism of the instinct of self-preservation, a measure of which may justifiably be attributed to every living creature". She postulates that the predisposition to anxiety will strengthen infantile narcissism. One of the very early manifestations of this she calls: "The mirroring tendency, derived partly from primary narcissism and partly from an imperfectly developing sense of reality, the two in fact being hardly distinguishable" (1941, p. 45)

In the small baby this mirroring tendency manifests itself among other things via "a kind of visual and kinaesthetic introjection of those around the infant." Greenacre gives as an example of this: a baby can see or feel tension or discomfort on the face or in the arms of a person, and takes it over by introjection. And, unfortunately, Greenacre says: "I believe that babies vary greatly in this obligatory capacity to reflect those around them, and that *it is the tense*, potentially anxious infant that is the most sensitive reflector" (1941, p. 46). The same "predisposition to anxiety" gives rise to a fragile sense of reality which manifests itself in "the too easy identification of such patients with those around them. They are hunting eternally for satisfactory and secure models through which they may save themselves by a narcissistic identification" (1941, p. 47). On the basis of our own study (see also the comparative literature study, pp. 110-112) we have asserted that boys suffer more from prematurity. Or, in other words, the reactions described above are in our view stronger in boys.

In this situation a complex interaction process can develop between the child and the mother which is difficult to put into words. The more the baby has this mirroring tendency, the more it presents to the caregiver what she is "wrestling with" in herself (if what is involved is tenseness in the form of, for example, restlessness, turning away, mimic tenseness, etc.). Additionally difficult is in our view the fact that these mirroring reactions are so partial, and the more so the more labile the child is: eye movements, gestures, postures, voice intonations are repeated - out of Gestalt context.

The mother can, for example, nod her head to her baby - "yessing" it - as she is caring for it and, via kinaesthetic introjection, the baby makes head-nodding motions. The mother can laughingly shake

her head and ask "Don't you like it?", which the baby will imitate without knowing the meaning.

A difficult circular process can then develop: because in a boy a process should also arise whereby he "differentiates" himself from the mother. The more the child employs such primitive mechanisms, the less a "boy-like organization" develops.*

As Margaret Mead says (1958, p. 68): "I should say that in our society a baby boy is discouraged from behaving like and female from the moment he is born. The first time his mother picks him up in her hands *her hands are saying to him* "you are a little male." A great proportion of his learning is communicated kinaesthetically (!) very, very young...". Conversely, it becomes difficult for the mother, for, what she will assent to as a matter of course and with pleasure in a girl, will evoke hesitation in her if the child is a boy. It can perplex the mother and undermine her rôle as a guide.

As Margaret Mead says (1958, pp. 54-55): "A girl is identifying with someone who smells like herself, moves like herself, feels like herself, and treats her as if she were like herself. On the other hand, the boy is continually given the task of differentiating himself away from the mother and stressing his behaviour as different from what he sees her as being, a reproductive creature." In our view all of these aspects, which will gradually come to form part of the make-up of the personality, greatly hinder the development of an "autonomous organization" especially in boys.

5.2 Aside from the later phallic significance of the body there is a more general significance which has to do with the body as instrument: Margaret Mead (1958, p. 59) says: "The male explores and works with the external world, and imposes form and structure on it, whereas the female tends to confine her activity to her own boy. This could be regarded as the basis of differences in creativity". We can not rid ourselves of the clinical impression that the fragility of the body and the difficulty of achieving supple functioning, which are so characteristic of the LBW child, interfere in a special way with a boyish, autonomous organization. We see in the boys - inherent in their prematurity - an organization which is fragile, vague, not very firm and of widely changing level and which (sometimes) is far removed from a self-conscious, phallic-locomotor, dynamically exploratory personality. We also have the

* Footnote:

What is involved here are precursors of "body Gestalt" in posture and locomotion. Not gender identity in the narrower sense: this belongs to a much higher form of organization, at the end of the separation-individuation phase (3rd year of life).

impression that in the case of the boys this can have extra repercussions on the mother, in that the discrepancy between the "idealized child" and the "real child" is further increased.

Coming to terms with this is one of several very difficult intrapsychic tasks which the motor of the LBW child faces (Solnit and Stark, 1961).

The fact that the boys are also "sicker" and less stable in their development makes everything extra difficult.

5.3 A final point of great importance, closely related to bodily autonomy and motor functions, is the integration of aggression and, especially, the neutralization of aggression in order that it can be used in the service of the ego functions. In LBW boys the difficulty of achieving motor competence leads to far-reaching blockages, shyness and an attitude (pattern) of "don't investigate and grasp" or to spasmodic attempts charged with narcissistic rage which can sometimes lead to exhaustion. Shirley expressed this strikingly as long ago as 1932: "The premature... is less capable than the term child of making an adequate motor adjustment to the stimulus. He is, in the words of Browning, a person "whose 'reach exceeds his grasp'." (Shirley, 1932, p. 125)

In our view this regulation of motor aggression is a *conditio sine qua non* of growth in organization in boys, and from clinical observation it would seem that the possible derailments are also greater in them.

Lampl-de Groot (1975, p. 281) attaches great weight to the regulation of aggression in child development: "... among the many ego capacities there is one of the utmost, perhaps decisive, importance. It is the ego's capacity to deal with the child's aggressive drives... it is precisely aggression that is least tolerated in free discharge, that is most dangerous for the developing ego organisation when turned inside, and that in many cases is more unsuitable for neutralization than is libido."

*Lorsque l'enfant paraît, le cercle de famille
Applaudit à grands cris; son doux regard qui brille
Fait briller tous les yeux,
Et les plus tristes fronts, les plus souillés peut-être.
Se dérident soudain à voir l'enfant paraître,
Innocent et joyeux.*

*Soit que juin ait verdi mon seuil, ou que novembre
Fasse autour d'un grand feu vacillant dans la chambre
Les chaises se toucher,
Quand l'enfant vient, la joie arrive et nous éclaire.
On rit, on se récrie, on l'appelle, et sa mère
Tremble à le voir marcher.*

*"Als 't kindje binnenkomt, juicht heel het huisgezin;
Men haalt het met een lachje en zoete woordjes in;
Het schittren van zijn oog deelt aan elks oog zich mede;
En 't rimpligst voorhoofd (ook 't bezoedelste wellicht!)
Klaart voor de aanblik op van 't vrolijk aangezicht,
Met iedereen in vrede.*

*'t Zij we onder 't lindeloof des zomers zijn vereend,
't Zij 't snerpen van de koude ons stiller vreugd verleent
En als we om een knappend vuur de stoelen samenschikken;
Als 't kind verschijnt, ziedaar een waarborg voor de vreugd;
Men lacht, men troetelt, kust en tergt zijn dartle jeugd;
En moeders harte smaakt zijn zaligste ogenblikken."*

"Ik vind altijd," zei mejuffrouw Naslaan, "dat men moeder zijn moet om van zulke dingen het rechte te hebben"...
"Van wie is het gedicht?" vroeg de heer van Naslaan.
"Van Victor Hugo, mijnheer".

*Hildebrand: Verhalen uit de Camera Obscura.
De familie Stastok.*

CHAPTER IX

APPLICATIONS: THE LIFE CYCLE OF THE LOW-BIRTH-WEIGHT CHILD

We should like here to touch upon the main aspects which can be of importance to doctors and paediatricians in their work with low-birth-weight children, taking the principal phases of a child's early development. In doing so, we shall avoid psychological terminology of an excessively technical nature.

Naturally, in this discussion we shall draw both on data in the literature and on our own experience. One of the most important insights which we should like to stress is that in a great many cases what is involved are problems of a continuing nature (identifiable in the developmental steps) rather than simply problems confined to the perinatal phase.

1. Antenatal:

To go through a pregnancy whose course is not biologically optimal and experience the anxiety and concern aroused by the prospect of giving birth to a baby that is not mature places a heavy burden on the mother. We should like to illustrate this with a few figures from our own study.

a). Admission of the mother during pregnancy:

The frequency with which this occurs in the low-birth-weight group shows that in many cases an endangered biological event is in progress, with its repercussions on the family. The admission frequencies for the low-birth-weight group and for the (full-term) reference group were as follows.

1. Mothers of LBW children (N = 40):

The number of mothers admitted during pregnancy was 17, or 42.5%. Broken down by the child's sex, the figures were:

- mothers of LBW boys (N = 16): 9 out of 16 mothers were admitted (56.25%)
- mothers of LBW girls (N = 24): 8 out of 24 mothers were admitted (33.33%)

The admission frequency among mothers of the reference children was much lower:

2. Mothers of (full-term) reference children (N = 40):

In this group the number of mothers admitted was 6, or 15%. Broken down by sex of the child, the figures were:

- mothers of reference boys (N = 16): 3 out of 16 mothers were admitted (18.75%)
- mothers of reference girls (N = 24): 3 out of 24 mothers were admitted (12.50%)

b. Mother's evaluation of her condition and well-being during the pregnancy.

To discover how the mother experienced her pregnancy, she was asked the question: How did you feel during the pregnancy? In answering it the mother could choose between three possibilities, against one of which she placed a cross:

- as usual
- better than usual
- sick

The following table gives the frequency distribution of the mothers' answers, with the LBW group and the reference group again broken down according to the sex of the child.

Table 36: Subjective well-being of the mother during pregnancy

Mothers of:	N	as usual	better than usual	sick
LBW children	40	18	3	19
LBW girls	24	11	3	10
LBW boys	16	7	0	9
Reference children	40	25	7	8
Reference girls	24	12	5	7
Reference boys	16	13	2	1

It will be noted that 3 years later (the age of the child at the time of the study and the time at which the question was put to the mother) 19 of the 40 mothers of LBW children (47.5%) still have a recollection of a pregnancy in which they felt sick.

This is also true, however, of 8 of the 40 mothers of reference children (20%). It might indicate a threatened emotional climate in which a child is expected and starts out in life.

Of importance here is the extent to which the person is able to recover, or, conversely, the extent to which unresolved remnants continue to have effect. The more problems accumulate, or the more quickly they succeed one another in time, the more difficult is this recovery.

2. *Perinatal:*

In the period following delivery the mother of the LBW child experiences a crisis situation:

- she must part with her child and leave the care of it to others (the N.I.C.U.). For many mothers this means: place it in better hands than hers; and, as long as she can do little more than look on, she is reminded of this every time she visits the child.
- she must come to terms with the fact that the LBW child is too small and must be kept in an incubator; in other words, that it is very different from the idealized baby she had wanted, even though the course of the pregnancy had taught her not to expect it.
- certainly for the first 10 days, and in some cases much longer, she must live from day to day, on the one hand keeping alive her directness and expectations regarding the child and, on the other, taking account of the possibility of its being lost and preparing herself for that eventuality.
- if everything goes satisfactorily - i.e. the child is in good condition and is discharged and taken home - the mother must care for a child that, in terms of psycho-physiological regulation capabilities, is not at all the same as a healthy, full-term baby with a birth weight within the norm: not even if one takes conceptual age (the theoretical age calculated from the mother's last menstrual cycle).

Presented schematically:

I	\neq	II
Healthy, premature baby (AGA) Conceptual age: 44 weeks (36 weeks gravidity + 8 weeks postnatal)		Healthy, full-term, full-birth-weight baby Conceptual age: 44 weeks (40 weeks gravidity + 4 weeks postnatal)

In other words: a fictitious, healthy baby born at 36 weeks with a birth weight within the norm for the pregnancy and having a theoretical age of 44 weeks after 8 weeks of life does not have the same regulatory

capabilities as a fictitious, healthy baby born at term with a birth weight within the norm and having a theoretical age of 44 weeks after 4 weeks of life. Leaving aside the different psychological climates in which they are born and admission in the case of the premature child, the following are a number of differences in performance revealed by studying:

Pre-term Infants at 40 weeks conceptual age Full-term Infants at Birth and

1. The EEG of a pre-term infant at 40 weeks conceptual age includes more immature patterns than that of the term newborn.
2. Components of the sleep cycle are less well organized in the pre-term infant.
3. Pre-term infants have less visual attentiveness at 40 week conceptual age than full-term infants at birth.
4. Visually Evoked Response has a longer latency in pre-term infants at 40 week conceptual age than in full-term neonates (Brazelton, 1979, p. 61).

In general the regulatory and integrative capacities of the low-birth-weight child are characterized by weakness and unevenness, as regards:

- their capacity to react reliably and selectively: for example, instead of specifically withdrawing an arm or leg when touched the child reacts in a general and variable way (startle reaction);
- their capacity to be calm and wide-awake;
- their capacity to keep their body tonus at an adequate level, to bring together non-directed motor functions and to achieve directed motor reactions;
- their capacity to preserve physiological homeostasis.

As far as the regulation of its physical status is concerned, as Brazelton says, the low-birth-weight baby is faced with *an extra developmental task*, which causes the mother great difficulty because she can see in daily life precisely those reactions that an expert records systematically in his observations (Brazelton et alii, 1979a, p. 177).

The following table presents a number of actions which a mother daily performs, or can perform, with her baby. Vertical column I shows the reactions to which these actions can give rise in a healthy, full-term baby. Column II shows the reactions that a mother can observe in her LBW child in addition to, allied to or alternating with those in column I,

to varying degrees. In the last column we give the responses which these reactions on the part of the LBW child provoke, or can provoke, in its mother.

Action at home with baby	I Reactions of healthy fullterm baby	II Possible reactions of LBW baby (in addition to, allied to or alternating with reactions under I)	Possible reactions of mother of LBW baby
Being put down in crib	Crawling	Delayed reactions	Is that all right? He reacts so little!
Being tucked in	Defensive reaction	Overreacting with exhaustion, change in skin colour; less firm respiration	Can I cope with all that? He 'll soon become exhausted! He 's so frail!
Being spun around in play	Tonic deviation	Tonic changes hypo- or hyper-	He soon goes limp or stiff, I 'd better be careful. What is that?
Being dressed	Pull-to-sit Passive movements	Does not pull back	Has so little strength still.
Feeding	Sucking	Does not suck, sucks weakly, sucks quickly and becomes exhausted	Soon he won't be gaining enough!
	Orienting looking	Scarcely opens his eyes still asleep	He doesn't look at me.
	Listening	Startle reaction when someone speaks	He takes fright so easily.

Table 37: Mother and baby at home

3. *Postnatal:*

In the first weeks and months after discharge the mother experiences a new crisis situation in which she must gradually adapt herself to her vulnerable baby, who still has such difficulty with primary physical reactions.

In this period many mothers need help and guidance, because basic patterns now begin to develop in the child and in the mother-child interaction which are of great importance but can easily go wrong. We refer in particular to:

1. the development of a good sleeping-waking cycle;
2. the development of motor control over head, trunk, limbs and hands;
3. the development of auditory and visual directedness in the child;
4. the development of physiological firmness: as regards respiratory homeostasis and the capacity to keep the air passages unobstructed by means of powerful crying, hiccuping, belching, coughing and sneezing and by motor control over the trunk (and the external respiratory muscles); as regards temperature regulation and resistance to infections, and as regards body colour and muscle tonus;
5. the development of a good food input to enable the child to thrive;
6. the gradual development of functional confidence in the mother-child relationship, that the child is progressing, that the precursors of functions make their appearance and slowly but surely develop and become firmer (i.e. recognizable, more and more specific and reliable). Also functional confidence that the developmental thread can be picked up again after a setback (through sickness of the child - domestic circumstances).

All of these factors play an important part in ensuring that the child thrives somatically, cognitively and affectively. The risks involved are neither illusory nor - in terms of frequency of occurrence - exceptional, even in babies who are discharged in good condition. This applies a fortiori to LBW children, who still clearly bear the marks of the perinatal problems that have occurred.

We should like to deal with a number of these risks in more detail: specifically with those pictures which are of frequent occurrence clinically. The division into syndromes has been made for clarity's sake; in practice the pictures often overlap in several aspects (with the exception of the extremely serious problem of battering in the list given below).

1. "A Syndrome of Transient Dystonia" (Drillien, 1972)
2. "A Vulnerable Child Syndrome" (Green and Solnit, 1964)
3. "Failure to Thrive"
4. ~~"The Battered Chrome"~~

. Transient Dystonia associated with low birth weight (Drillien, 1972, p. 576)

In 1972 Drillien noted that in many LBW children "abnormal neurologic signs" manifested themselves in the first year of life. They take the form of "subtle" symptoms, not strong enough to qualify as cerebral palsy and often of a *temporary* nature. Our interest in this phenomenon lies in its importance for the child's sensori-motor development and its repercussions on the mother's daily intercourse with her child. Moreover, the symptoms are also recognizable for the child psychiatrist who is familiar with the LBW problem if he directs his investigations at attainment of motor milestones.

Again, as Drillien says, the anamnesis of the mother is usually characteristic and suggestive of the diagnosis even before the examination commences.

The principal aspects of the syndrome are presented below in tabular form, divided into: start, course and frequency of occurrence of the syndrome (vertical column I); the aspects of the syndrome which the mother observes in daily caring for the child (column II), and examination findings (column III). As regards the last of these, for very specialistic facets we refer the reader to the article in question.

We should like, as a child psychiatrist, to place special emphasis on the significance of *stato-motor* development, where an extra risk is present in the case of "boys", "SFD children" and "RSD children" (see p. 110-111, 117-118 of the discussion).

To prevent this from becoming a matter that drags on and adversely affects the child's entire sensori-motor development - which according to Piaget is the basis for the later operational, schoolchild intelligence - ideally speaking, expert follow-up should be available for mother (parents) and child in this phase.

As Brazelton says, in this developmental guidance of child and parent "acknowledging the extra-ordinary task at hand" is of prime importance. Those who have not had enough practical experience of them are not always sufficiently familiar with the developmental problems of LBW children. The result can be that the doctor tends to regard the LBW child as an ordinary child who had a difficult start, at

Table 38: Transient Dystonia associated with LBW (Drillien, 1972).

<p style="text-align: center;">I</p> <p><i>Course and incidence of the syndrome</i></p> <p>1. Start: "Typically, abnormal neurologic signs were first detected between six and twelve weeks after the expected date of delivery". (Drillien, 1972, p. 576). This is around the time that the child is discharged and goes home, or is already at home!</p> <p>2. <i>Subsequent progress:</i> In 60% of the children with the syndrome it disappears gradually between 8 and 12 months. In 20% of the children with the syndrome it disappears (sometimes followed by hypertonia) and reappears after the children have learned to walk. These children often learn to walk without support only with great difficulty. Some of them, even when they can walk, experience difficulty in rolling over, sitting up or standing.</p>	<p style="text-align: center;">II</p> <p><i>History given by the mother</i></p> <p>Questioned, the mother reports the following symptoms in her child:</p> <p>1. "Instability, constant crying and feeding disabilities".</p> <p>2. The child is "very jittery" or "jumpy". Drillien notes that his symptom was not taken by her to be part of the syndrome if such behaviour only occurred with feeding, because this is very frequent in LBW children and more particularly in SFD children. Note the risks to which this can give rise within the mother-child relationship.</p> <p>3. The child is "easily startled" by noises or changes of postures. Many mothers express this by saying: He (or she) is so nervous! This is a concrete example of nonspecific, non-differentiated behaviour: the baby responds with a general motor startle response.</p>
	<p style="text-align: center;">III</p> <p><i>Findings on examination</i></p> <p>1. Abnormalities in movement and posture.</p> <p><i>Supine:</i> the dystonic tended to lie with extended legs and showed poverty of movement.</p> <p><i>Pull up:</i> poor head control for age in contrast to apparent maturity of head control when prone.</p> <p><i>Vertical suspension:</i> all infants extended and abducted the legs; arms were held rigidly; hands tightly fistled.</p> <p>2. Abnormality in reflexes: See Drillien, p. 577</p> <p>3. Retardation in development: especially in postural development.</p>

turning up from a supine position.

In 20% of the children with the syndrome the symptoms persist (i.e. during the first years of life).

3. *Incidence of the syndrome:*

The figures below are valid for the population presented by Drillien in her article.

Incidence is dependent on:

a). *birth weight*

< 1250 g.: 52% of the children display the syndrome. Incidence declines as birth weight increases, and in the group 1751-2000 g. is 18%.

b). *sex of the child*

- there are no sex differences in children with a birth weight of > 1500 g.
- more boys (56%) than girls (43%) display the syndrome in the category < 1500 g..

c). *intra-uterine growth retardation*

In all weight groups, SFD children display more symptoms than the corresponding AGA children.

tion.

4. The child is "rather stiff to handle":

- when being dressed: getting arms into sleeves;
- nappy changing: difficulty in abducting the groins for cleaning;
- washing and drying hands: hands kept tightly fistled;
- bathing: the baby displays "dislike of the bath, arching his back as soon as his feet touched the ground".

5. The baby is "very good at standing up", contrasting with the difficulty of getting it to sit. The mother often says: "Stood on his toes like a ballet dancer". This is an example of unevenness: the child wants to be straight (with hyperextension) and can not yet sit well.

some more or less distant point in the past. This can mean that the expert - the remark may apply even more to the child psychiatrist or psychologist - does not "follow" the child sufficiently, i.e. does not base his judgement and advice sufficiently on specific behaviours of the child, on changes over time and on well-defined developmental steps, but bases them instead on "empathy" or on "psycho-analytic concepts" which Freud did not formulate for this purpose.

There is a danger that the reactions of the mother - who becomes uncertain or even perplexed because of her child - will be interpreted as the cause. Some mothers tend towards (excessive) cautiousness, circumspection and inhibition when confronted with their LBW child and this is then taken as a sign of "indifference", "poor contact" and "under-stimulation", whereas their concern and anxiety and their many questions also point to something else.

This brings us to a second syndrome which deserves the attention of anyone who has to do with the development of the young low-birth-weight child in his work.

2. A Vulnerable Child Syndrome

In 1964 Green and Solnit described a number of problems which can frequently occur in a family in which a climate of anxiety persists around the child that the parents think/thought might die. In the case of the most critical of the low-birth-weight children such a climate certainly exists in the first postnatal days. Over the years the author has become deeply impressed by the silent fears experienced by parents until long after birth if their child has a tendency towards recurrent apnoeic spells.

Given below are the main symptoms which can be of help in detecting this syndrome, which can assume a latent and silent form but can also be very pronounced, with parents at their wits' end.

2.1. Major separation problems:

Fear of leaving their child "unguarded" or entrusting it even for a short time to the care of others (e.g. members of the family). The parents are constantly on the look-out, never relax even for a moment, forever feel compelled to go and look whether the child is asleep and often unconsciously try to wake it in order to see that it reacts. In many cases this gives rise to sleep problems.

2.2. *Infantilization:*

The parents find it exceptionally *difficult to be firm in helping the child to progress step by step*: they often react indulgently, the result of which is a troublesome, whining child, for which the parents blame themselves. Anxiety and over-protection frequently act as a hindrance to motor development: the children lie much too long as babies and are much too late in acquiring skill in sitting, crawling, grasping and standing.

The child's "action radius" also remains small in later phases.

2.3. *Bodily overconcerns:*

The parents continue to be greatly concerned about their child's alimentation and growth. Colds, rapid tiring and pale appearance are ever-recurrent themes.

2.4. *School problems:*

A great deal of anxious concern has usually already accompanied the first step, to nursery-school playroom and kindergarten. Now that the child has reached school age it is really too passive and small still, not self-reliant enough and insufficiently oriented to the conquest of the external world.

There are two main aspects in dealing with this syndrome. In the first place, the parents are often not aware that their old anxiety and mourning have not been resolved. The paediatrician discovers this only through direct questions during the anamnesis: "Were you very worried (at the time of admission)?" "Was it very serious?" "What conclusions did you draw from what the doctor said?" To put the emotions that were gone through into words, even long after the event, can have a liberating effect.

In addition, the parents need an adequate explanation of and reassurance about the present state of their child. They also need encouragement to be firm and disciplined, so that the child will not be so small and dependent and will grow in skill, frustration-tolerance and self-reliance. Finally, in our experience it is often more productive to continue to follow the child in its development, even at wide intervals of time, than to confine oneself to a short period of intense work. What is involved is following a developmental sequence over time until new and more reliable developmental patterns make their appearance.

3. *"Failure to thrive"*

By this is meant a syndrome in which the child grows insufficiently in

weight and/or height without this being traceable to any clear cause, other than the child's case history of prematurity. In many cases there are continuing alimentary disorders, and there is a susceptibility to intercurrent infections. In our experience, the not too pronounced forme fruste of this syndrome occurs with very great frequency in low-birth-weight children. Very many children remain around the "P₃" and "P₁₀" of the growth curves in their first years of life. This is particularly true of dysmature (small-for-date) children.

Though it is translated directly in the child's "physical manifestation" and the mother is daily confronted with it de visu (leaving aside the numerous comments she has to deal with from those around her, of the type: "Is he already 8 months? I didn't realize. You wouldn't think so", "He's still a little one, isn't he? How nice!", etc.) in our view this picture is underestimated. Mother and child take months putting on a couple of kilos. An intercurrent infection (these children often have colds) takes away all the ground they have gained. Despite all the effort expended, on her next visit to the health centre the mother will win little praise when it is found that her child again falls just under the P₃.

These children also often display (mild) forms of retardation as regards stato-motor development and incipient language. There is a great danger that at examinations (paediatrics or developmental psychology) the mother's attention will constantly be drawn to what the child still can not do, to the backwardness it displays in relation to the norm. As the great majority of these children are not mentally handicapped and as the perinatal problems now lie many months in the past, a climate can sometimes arise in which the mother is made much more aware of failures than of successes. Those who measure the child's somatic or psycho-motor growth should be aware of this picture in order to help the mother to retain her confidence in her child and not to lose heart in all the efforts she makes - for which, unlike the mother of the full-term child, at first sight her only reward is "relative backwardness".

Precursors and intermediate forms of functions should be known in order to avoid making the incorrect statement that in 3 months the child "has not progressed on the Denver" when for the more practised observer the child looks in a more directed way, can sit still longer on its mother's lap, is much sturdier and firmer when it sits by itself, etc. The difficulty in these children is that they take much longer to acquire a function and much longer to master it. This last is none the less progress, and the result of "hard work" on the part of mother and child.

Only when a child has mastered a function can it serve as the basis for a new and more difficult function.

It is this "following of the development of their child" that the parents of LBW children stand in so much need of.

4. *"A Battered Child Syndrome"*

We shall make some comments on this for the sake of completeness. According to the data in the literature, child abuse occurs with relatively greater frequency in the case of LBW children. In the Birmingham Child Abuse Study 15% of the 134 children were of low birth weight, whereas the incidence of low birth weight is around 7% (Smith, 1976, p. 236). Klaus and Kennel (1979, p. 147) give figures from 4 publications in which the proportion of LBW children in the battered-child population studied ranged from 13% to 30%. It is, we believe, important to point out that battering is a form of extreme parental dysfunction which occurs at most in 1% of all families. In other words, a population of battered children is a highly exceptional group. In our view great caution is needed if the parents of LBW children are not to be too readily identified with battering parents. In the population examined by ourselves, not a single case of battering was encountered. This is related, in our opinion, to the fact that the parents took part in the study voluntarily (and often with great willingness).

Most of the parents also have a positive relation with the hospital and conscientiously participate in paediatric follow-up. It is our opinion that this follow-up work has a protective effect, by preventing the occurrence of a situation in which the parents are at their wits' end with their child over a long period. Everyone who is at all familiar with the battered-child problem knows that in most cases the children belong to very alienated families who make little if any use of the supportive facilities in the social system.

5. *Two extra-vulnerable psychological functions*

There are two areas in the development of low-birth-weight children which demand special attention:

1. *Auditory directedness - "Early Childhood Language Delay"*

Rather than present data from the field of developmental psychology (which were treated in the child psychiatric section) we shall quote from the excellent article in "The Laryngoscope" (1979, p. 1898-1912)

entitled "Early Childhood Language Delay: the otolaryngologist's perspective" by Brookhouser et alii. The authors are attached to the Boys Town Institute for Communication Disorders in Children (Omaha, Nebraska) and find, on the basis of a large number of children referred to them, that developmental language disorders also occur frequently in children without SHL (sensorineural hearing loss). For anyone with experience of the precursors and initial stages of language development, these children are identifiable at an early point. As a memory aid the authors present potential high risk factors (several of which apply to LBW children) in the form of the acronym HEARING's RISKS.

In view of its clinical clarity and the great importance of hearing for the development of the child - including, later, its adaptation to school - we give the acronym below:

- H *History* in family of communication disorders

- E *Ear, Nose or Throat* deformities

- A *Anoxia* at birth or low apgar score (*)

- R *Rx-Ototoxic* or teratogenic drugs during pregnancy

- I *Maternal Illness* during pregnancy including infections or pre-eclampsia
- N *Neonatal* intensive care or prolonged hospital stay for infant (*)

- G *Growth* retardation - prematurity or full-term low birth weight (*)

- S *Stress* factors in delivery (*)

- R *Recurrent* otitis media beginning before 2 years of age with surgical intervention and/or hearing loss (*)
- I *Serious childhood Illness* with a fever of 104° F for a period greater than 24 hours (**?)
- S *Seizures*, diminished sucking reflex, or other signs of CNS dysfunction
- K *"Knocked out"*-head trauma with loss of consciousness or bloody otorrhea
- S *Subjectively* difficult to test audiologically.

We have marked with an asterisk those risk factors which in our

experience are either obligate or of (very) frequent occurrence in low-birth-weight children.

Problems with auditory orientation - with the development of a listening attitude and auditory discrimination - between baby and mother: all these language ingredients give rise so frequently in varying degrees to early language disorders in low-birth-weight children (in the boys particularly) that for this if for no other reason *developmental follow-up should form part of the postnatal care of these children.*

II. Visual orientation - "Visual Disorders"

Aside from the general importance of "fresh, clear and alert looking" as the baby's predominant mode of exploring the world and directing itself at the mother (a function which develops with difficulty in the LBW baby and is less stable), we should like to draw attention once more to the frequency of eye problems in LBW children - and we are not referring primarily here to the fortunately bygone days of retrolental fibroplasia.

In our study of a population of 40 three-year-old LBW children we found severe strabismus in 3 of the 16 boys and, among the 24 girls, one case of severe strabismus, one of moderately severe strabismus and one of bilateral ptosis of the eyelids with eccentric position of the eyes: i.e. eye problems immediately visible to the layman in 15% of the cases.

To underline that this has also frequently been reported in the paediatric literature, in the following table we present some data from the literature on specific visual (ophthalmologic) problems in LBW populations from the 1970s and previous decades (see table 39).

In reading the literature we were struck by the number of mild and moderate forms of retrolental fibroplasia (e.g. tortuosity of the blood vessels of the fundus) noted by some authors.

All of this should be viewed in the context of the child's development, in which he must learn step by step to form a clear and comprehensible picture of the world around him, and later of what is in his school book or on the blackboard. This must be integrated as a supple pattern into the whole bodily schema until it becomes a "working attitude". This is also - in simple terms - what is meant by non-optimal "visuo-motor patterns" which can form the basis of learning problems.

The problem of binocular vision and strabismus is also of great importance in that it often manifests itself at a very early stage and

Table 39: Visual Disorders in LBW populations.

Author(s), Centre	Number of children	Period of birth	Population studied Birth weight or other group norm	Age at examination	Visual Disorders
Fitzhardinge et alii Montreal, 1973	32	1960-1966	<1250 g. all AGA children	4 - 8 years	Data from the papers Visual problems in 8 out of 32 children (25%) - retrolental fibroplasia: 4 children (2 mild, 2 severe) - myopia: 2 children - strabismus: 2 children
Varloreaux et alii Grenoble, 1976	128	1958-1959	<2500 g.	13 - 14 years	Children <1500 g.: 68% display visual disorders. Children 1501-2500 g.: 48% display visual disorders Ranging from very mild to very severe The ophthalmologic list is too long for this survey
Black et alii Sydney, 1977	58	1971-1973	<1500 g.	3 - 6 years	"Most obvious feature of the group": incidence of strabismus: 20%
Saint-Anne Dargossies Paris, 1979	226	before 1962	Premature infants with no serious sequelae at age 3 years or later	3 - 23 years	This population of children with no serious sequelae is divided by the author into two sub-groups: 1. Normals (N=161): Visual disorders: 11% (myopia - strabismus - hypermetropia) 2. Subnormals (N=65): Visual disorders: 14%
Fitzhardinge et alii Toronto, 1979	71	1974-1975	SGA:birth weight 2 s.d. below the average	2 years	- Blind: 2 children out of 71 - Refractive defects: 12 children out of 71 - Strabismus: 6 children out of 71

requires the mother to apply measures (covering the eye) at an age at which the baby or toddler does not yet co-operate. This again can be source of problems in the mother-child relationship.

Ideally speaking, for such (in some cases, impressive and very chronic) problems ophthalmologic services should have at their disposal social workers and "eye kinesitherapists" to support and advise the parents.

Conclusion: The low-birth-weight child receives very specialized perinatal care of such increasing competence that both mortality and the incidence of major handicaps are declining.

During the crucial years of the child's development so many mild, moderate and, in some cases, serious problems can occur - their occurrence being closely related to prematurity - that follow-up of the developmental process is indicated as, in our view, a necessary extension of perinatal care.

This concern with growth - expressed in "growth curves" and "developmental lines" - is what links the paediatrician and the child psychiatrist, as Winnicott says.

Certainly in the first years of life a follow-up service should exist which evaluates the child's development at regular intervals: in our view this has a therapeutic effect. The service could be flexible, with intensity and frequency of follow-up geared to the individual child and its parents. To express further wishes would, we feel, be unrealistic in view of the practical problems of economy and manpower: in the 1978 Ciba symposium - on the costs and benefits of high care prevention, etc. - Reynolds says about England, a country with a high reputation in the field of paediatrics: "but there are only 9 full-time or nearly full-time neonatal paediatricians in this country" (Reynolds, p. 218).

There is an awareness of the problem, and of the fact that it is being worked on here as well as elsewhere the present study is a modest testimony.

APPENDIX

Table 40: Computer output of the Guttman scalogram analysis of the ego items.

Item	1		2		3		4		Total
Response	0	1	0	1	0	1	0	1	
<u>Ego</u>									
4	0	25	0	25	0	25	0	25	25
	error								
3	11	6	4	13	2	15	0	17	17
			error						
2	6	0	1	5	1	5	4	2	6
					error				
1	18	1	19	0	15	4	5	14	19
							error		
0	13	0	13	0	13	0	13	0	13
<hr/>									
Sums	48	32	37	43	31	49	22	58	80
Percents	60	40	46	54	39	61	28	73	
<hr/>									
Errors	0	7	4	5	3	4	9	0	32

Division point: Item 1 = 1, Item 2 = 1, Item 3 = 3, Item 4 = 1 Response = 1 for values \geq D.P.

Note:

The "errors" are displayed against a grid to improve legibility.

Interpretation:

That the scale of ego items thus drawn up constitutes a Guttman scale implies the following: given the scale and the ranking of the items in the scale, on the basis of a test person's score on the scale it is possible to discover his answers to the separate items: they are reproducible. If a set of items has a perfect reproducibility (= 1.00), the answers of the test persons above the cutting point are of the same order (= the same); the answers of the persons below the cutting point are also of the same order, but different from those above the cutting point. In determining the cutting point it is important that no answer category has more errors than non-errors; moreover, the errors should be minimalized.

If we look at the test persons with an ego score of 4, there is no deviation: all 25 score 1 on the 4 items. If we look at the test persons with a score of 3, an error is found as regards "perfect reproducibility", because 6 of them score on item 1, which is not what is to be expected. What is to be expected is that all 17 will score positively on item 2, item

3 and item 4 and that all 17 will score 0 on item 1. Every deviation is an error. A seventh person (with an ego score of 1) scores positively on item 1. Which means another error. And so on.

- *The coefficient of reproducibility:* (minimum = 0.00/maximum = 1.00) gives the measure of accuracy (in relation to a perfect reproducibility of 1.00) with which the answers of the testees can be reproduced from their total scores. In other words, a coefficient of 0.90 indicates that the proportion of errors is 0.10. In the ego-scale example: there are 80 testees and 4 items, thus $80 \times 4 = 320$ answers. Scale analysis revealed 32 errors. The proportion of errors is $32/320 = 10.0\%$.

The coefficient of reproducibility = 1 - proportion of errors

or
$$1 - \frac{\sum \text{errors}}{\sum \text{responses}}$$

The coefficient of reproducibility for this ego scale is therefore: 0.90

In general: a reproducibility coefficient of > 0.85 is evidence of the unidimensional scalability of a set of items or statements. However, this is not a *sufficient condition*: the reproducibility of a single statement can never be smaller than the mode.

The higher the modal response in relation to the total responses for a given item, the higher the natural reproducibility. Edwards therefore asserts (1957, p. 192): "In the case of statements with only two categories of response (0/1), statements for which the response frequencies divide 0.5 and 0.5 are valuable in keeping the coefficient of reproducibility from being spuriously high... The more evenly distributed the frequencies are in the various categories, the less the possibility of obtaining a spuriously high coefficient of reproducibility."

- *The minimum coefficient of reproducibility:* this factor is therefore necessary in order to know the reproducibility on the basis of the modal response-frequencies of the items. This minimum coefficient of reproducibility is easily determined. Simply find the proportion of responses in the modal category for each statement. These values are summed and divided by the number of statements. The resulting value indicates the *minimal marginal reproducibility*.

The difference between the coefficient of reproducibility and the minimal marginal reproducibility indicates the *percentage of improvement* in predictability that the scale has given.

For the ego scale (see example of computer output: p. 156).

Minimal marginal reproducibility =

$$\frac{\text{Sum of proportions of modal categories for each item}}{\text{Number of items}} = \frac{0.6 + 0.54 + 0.61 + 0.73}{4} = 0.62$$

Percentage of improvement = $0.90 - 0.62 = 0.28$

General: a percentage of improvement of ≥ 0.20 is good measure for a Guttman scale.

The relation between the percentage of improvement and the difference between 1 - coefficient of minimal marginal reproducibility gives the *coefficient of scalability* (minimum 0.00/maximum 1.00).

A rule of thumb here is that, to be able to speak of a unidimensional and cumulative scale, the coefficient of scalability should be 0.60.

$$\text{For this ego scale: } \frac{0.28}{1-0.62} = \frac{0.28}{0.38} = 0.74$$

Synopsis: internal validity of this ego scale:

- | | | | |
|--------------------------------------|------|--------------------------------|------|
| 1. Coefficient of reproducibility: | 0.90 | 3. Percent improvement: | 0.28 |
| 2. Minimal marginal reproducibility: | 0.62 | 4. Coefficient of scalability: | 0.74 |

Table 41: Computer output of the Guttman scalogram analysis of the play items

Item Response	1		2		3		4		5		6		Total
	0	1	0	1	0	1	0	1	0	1	0	1	
Play													
6	0	29	0	29	0	29	0	29	0	29	0	29	29
	error												
5	8	7	1	14	6	9	0	15	0	15	0	15	15
			error										
4	5	2	3	4	3	4	3	4	0	7	0	7	7
					error								
3	6	0	6	0	1	5	2	4	2	4	1	5	6
							error						
2	7	0	7	0	2	5	4	3	5	2	3	4	7
									error				
1	8	0	8	0	6	2	8	0	7	1	3	5	8
											error		
0	8	0	8	0	8	0	8	0	8	0	8	0	8
Sums	42	38	33	47	26	54	25	55	22	58	15	65	80
Percents	53	48	41	59	33	68	31	69	28	73	19	81	
Errors	0	9	1	4	9	12	5	3	7	1	7	0	58

Internal validity of this play scale:

- | | | | |
|--------------------------------------|--------|-------------------------------|--------|
| 1. Coefficient of reproducibility | : 0.88 | 3. Percent improvement | : 0.21 |
| 2. Minimal marginal reproducibility: | 0.67 | 4. Coefficient of scalability | : 0.64 |

Table 42: Computer output of the Guttman scalogram analysis of the ego-play items.

Item	1	2	3	4	5	6	7	8	9	10	Total
Response	<u>0 1</u>	<u>0 1</u>	<u>0 1</u>	<u>0 1</u>	<u>0 1</u>	<u>0 1</u>	<u>0 1</u>	<u>0 1</u>	<u>0 1</u>	<u>0 1</u>	
<u>Egoplay</u>											
10	0 21 <u>error</u>	0 21	0 21	0 21	0 21	0 21	0 21	0 21	0 21	0 21	21
9	4 4 <u>error</u>	1 7 <u>error</u>	0 8	1 7	2 6	0 8	0 8	0 8	0 8	0 8	8
8	6 4	4 6	3 7 <u>error</u>	1 9	0 10	5 5	0 10	0 10	1 9	0 10	10
7	3 2	4 1	2 3 <u>error</u>	2 3	1 4	1 4	0 5	1 4	1 4	0 5	5
6	4 1	3 2	3 2	1 4 <u>error</u>	3 2	2 3	1 4	0 5	3 2	0 5	5
5	1 0	1 0	1 0	0 1	1 0 <u>error</u>	0 1	0 1	0 1	1 0	0 1	1
4	6 0	5 1	5 1	5 1	4 2	2 4 <u>error</u>	4 2	1 5	2 4	2 4	6
3	7 0	7 0	7 0	7 0	6 1	2 5	4 3 <u>error</u>	4 3	1 6	4 3	7
2	5 0	5 0	4 1	5 0	4 1	4 1	4 1	5 0 <u>error</u>	3 2	1 4	5
1	9 0	9 0	9 0	9 0	7 2	7 2	9 0	9 0	7 2 <u>error</u>	6 3	9
0	3 0	3 0	3 0	3 0	3 0	3 0	3 0	3 0	3 0	3 0 <u>error</u>	3
Sums	48 32	42 38	37 43	34 46	31 49	26 54	25 55	23 57	22 58	16 64	80
Percents	60 40	53 48	46 54	43 58	39 61	33 68	31 69	29 71	28 73	20 80	
Errors	0 11	1 10	3 7	4 6	6 6	8 12	5 4	6 0	12 2	13 0	116

Internal validity of this ego-play scale:

Coefficient of reproducibility : 0.86

Minimum marginal reproducibility : 0.65

Percent improvement : 0.21

Coefficient of scalability : 0.59

Examples of child psychiatric reports

1. "Charles"
2. "Doris"
3. "Helen"
4. "Humphrey"

"Charles"

3-Year-old boy who just comes along on his own, apparently without hesitation. He has a brief look around, says yes in a friendly way when I introduce myself, picks up the ball and throws it (not hard), looks at me and says that he wants to go to his mummy. He can't be stopped. Together with his mother, we come back to my room.

Activities

He picks up the ball again. "Football", he says. Throwing the ball to each other makes him laugh loudly with pleasure: it's visibly exciting for him. It makes him stand on his toes and he frequently grasps at his genitals. Constantly (something like every half minute) he goes to his mummy for his nose. Often he doesn't really blow it. Then he just throws the handkerchief away.

In the beginning, in the first few minutes, he placed 4 cars (after first having ridden with two of them) in a row against the puppet theatre.

Thereafter he didn't find it easy to retrieve this capacity for structuring. He is very interested in cranes, a fact which is related to his father's occupation. His mother tells that.

He talks a lot, his vocabulary is fairly good. Names all the pieces of a puzzle, takes the pieces out and lets them lie where they are. For a long time refuses to put them in. He is very busy. Takes hold of many things. Can name a great many animals, calls the lion a camel (there is also a camel) but I attribute this to stubbornness or, rather, pleasure at being contrary. He is occupied for a long time with the pistol, keeps on holding the barrel against his forehead, sometimes almost in his eye. Even when I say "It'd be better to shoot at the wall" he keeps on doing this. The anxiety of this boy is apparently very great, with primitive directing of aggression against himself. Not surprising: visibly, he is a bit "the small man".

His mother has no verbal grip on him either. When he and I play at farm with the animals he becomes calmer: his very low frustration-tolerance is notable; he is very sensitive about things he doesn't succeed in or something that doesn't work, e.g. putting a tree back in a full box. Words don't help, direct help does. The same thing with the pistol: he begins to cry when the caps are finished; explaining doesn't help.

Angrily throws the pistol away. A bit later he notices that the pistol's hammer still makes a clicking sound and then he laughs again.

Though he has the puzzle at home he does it by trial and error. Finishes it (I'd promised that we would play with the ball again after the puzzle).

His observations are influenced by the masculine: on a block there is a child with a skirt, standing with her legs apart; he calls it a boy. He also calls a farmer's wife with visible breasts a boy.

In playing at farm he wants to make an enclosure with a fence. Again he shows his anxiety: there has to be an opening in the enclosure. Only after a long time does he dare to let a sheep walk inside; his fantasy world is directly charged with anxiety (to be closed up - separation?).

He also plays briefly with the doll, repeatedly telling it that it must be still. Again later: sit still while you're eating! When I say "I think you find it very hard to sit still when you're eating" his mother laughs: the boy looks at me in some surprise. In the beginning too I verbalized his anxiety a couple of times and he was able to say yes; the anxiety is therefore very close to the surface ("you were afraid, you thought what's going to happen here with this strange man").

He is very quickly; when we go out (first to the WC, later to the psychologist) he immediately runs out into the corridor.

In conclusion

Very busy, active boy; displays great separation anxiety both by impulsively running back to mother and in the game with the sheep and enclosure. Seeks defence in busy motor behaviour (with the ball): both sexual excitement (being a little boy in his mother's eyes) and anxiety defence (my genitals are still there, I feel them) are visibly present.

Vocabulary and radius of interest fairly extensive. Speech: half sentences, always readily intelligible. Never massively regressive. Probably great anxiety about being naughty. Of the shepherd he remarks: "he's got a rod". Intense to and fro between him and his mummy via a cold in the nose.

Denial of the woman in his observations. Later, this gets better: he calls the female doll a girl. The relation with adults (mummy and me) is sufficiently intensive; but he is out for pleasure and as yet has little respect for what we say.

"Doris"

Little girl, black hair, tartan pinafore dress. Sits playing in the waiting room. Mother says: "Go and play with that gentleman, I'll go with you as far as there". The girl is talkative in the corridor,

tells something about daddy, whereupon mother says: "Daddy has gone to the office, yes." Girl comes into my room, mother goes away. The girl: "a kiss", which is given. Remains alone with me the whole time. She's got a big rag doll with her; a vague transitional-object doll. Certainly colourful.

Activities

Begins with the doll's house, once in a while says clear sentences such as "I've got one at home too", regular use of I alternating with "Doris" sentences and very regressive associations; poorly articulated and vague, about Tiny, Anny, etc. About someone who fell down some stairs on his forehead (points to her forehead). I later hear from the psychologist that a member of the family had fallen that morning. While drawing, also suddenly tells, for example: "I was sick yesterday". It is all still a bit fragile and uncertain, she still has difficulty in situating clearly. She does her best to be brave; I see that she sometimes looks at me with a bit of a frown (anxiously reserved but not excessively). She then hides it with a broad smile. She also says regularly "Pretty, isn't it" or "Nice, isn't it".

About a little cupboard, etc. Takes green cupboard, and says: "There's nothing in it". Takes a couple more, says "Steps", walks away, says "Just having a look". Looks in a cardboard box. Walks back to the doll's house; takes hold of the bath, WC (finds it fun), chair, table. Briefly takes hold of the cupboard with drawers, manipulates it briefly, puts it down again. (Doesn't ask, nor does she insist if it doesn't work). Still wants to do a lot at once. Holds two pans at the same time to put them away in the refrigerator, drops one, looks at the ground and says "Where's it gone?"; the pan is lying in a box right in front of her. Stands on her toes in front of the puppet theatre once in a while, does this when she is reaching for something but it still seems somewhat unripe to me. I give her the puzzle; she takes the blocks out, puts one in (the clock); then the girl, then a shoe (she seems to be giving up already), vaguely searching now, I say "Under the girl", she puts it there. Seems to be familiar with prepositions when she hears them.

Goes on a while, sometimes puts blocks in holes where they don't belong, but goes on searching. Walks away to the cupboard with toys, comes back. With a little further encouragement she completes it. Looks at the picture on the lid of the puzzle box (in silence). I give her a quartet box with fairy-tale pictures; now she says "Mustn't look". I say "You're allowed to look", she says "No, not yet". It's not clear to me who or what she means; is this warding off an impulse or does she mean you're not allowed to crib? Lays out cards again. Counts: 1, 2, 4, 8, 9, 10, 11; 1, 2, 3, 4, 5, 6, 8, 9, 11; but not simultaneously with the cards she takes. Wants to open the water-paint box, doesn't succeed, gives it to me and says something about opening it after she has given it; calls them stones (which they resemble). I give her some coloured fibre-tipped pens. She draws a closed green shape with a sort of appendage, circles running into one another (becoming bigger). When I ask what it is she says "Circle" (or something resembling it). When I show her how to do a circle she draws roughly a closed letter C. I ask her whether she has any brothers and sisters, she says "yes, 2", says their names, X₁, X₂. It is not very clear; I understand them to be brothers. From mother I later hear: sister X. Knows her age, says 3, shows 2 fingers.

When I write her name and say "X what?" she answers...

Plays the xylophone with 4 sticks simultaneously; has fun. Makes an association with Santa Claus (for honesty's sake I must add that when she says to me "You do" I play a Santa Claus song, to which she doesn't react).

Names cow and horse. No other animals; of tortoise she says nothing. Yawns a couple of times while drawing. Says "I'm tired" (laughingly), also says "Another yawn" (Ego and body awareness). Walks back to the doll's house again. I say: there are dolls too (a couple of times). Does not affect her. Then I say: you've got a doll too; whereupon she pulls the doll in a friendly way under her arm (she was lying on the floor, from the beginning). Has repeatedly referred to Mummy; "Mummy's waiting" or "I'm playing here and Mummy's waiting" (said regressively) or "We're going home soon" (they've come in a car, I gather from her), etc. But she sticks it out. Lets an apron be tied on her when she's rather free with the colour pens; beams then; "Pretty, isn't it?"; says a couple of times "Dirty, aren't they?" (about her hands); doesn't become afraid, says "I'm going to wash them... at home". Walks with me along the corridor to mother with a phobic curve around the "funny" vacuum cleaner. I ask: what is that? No answer. "Do you find it scary?" "Yes". I explain. Says "Hello", to mother. Mother is friendly and begins to question.

In conclusion

On the whole certainly makes a very reasonable impression. Still a bit fragile; associative and unclear language level fluctuating from very correct and lucid to regressive; contact from somewhat reserved to courageously friendly, with the help of a kiss, praise and references to

mother, she sees it through. Tends to cheerfulness (chattering, humming, talking about Santa Claus, pleasure with xylophone). Same with puzzles. Needs encouragement, walks away on occasion; works sometimes with a clear view of what she's doing, sometimes superficially and inaccurately, but finishes it. Very attentive to noises (e.g. in nearby room) but asks: who is that? If I say a child with another doctor and she's enjoying herself she says: why? Also a bit phobic about the vacuum cleaner. Dares to admit her fear, listens to my explanation. (I say: I imagine your mummy has a vacuum cleaner too. Says: Yes, at home). Nevertheless, she's very happy to be able to go away again with mother, I think. A girl that can already do enough but is still labile. Fluctuating, but quantitatively and clinically not worrying. She'll learn is how I feel about it. (However, still just a bit too explorative and too little structured to attain symbolic play; leaves dolls untouched).

Key figures: Mummy, sandwich/... Daddy, car, office/... sister/... school/... sometimes unclear, it is true, but at any rate present in her world. Beginnings of sense of time: "was sick yesterday"; to judge by the way she looks now it will have been longer ago, unless it was a subjective feeling of sickness. Asks too: where's the clock here?; looks at the walls.

Incipient reaction formations: e.g. dirty... wash; rummage, act carelessly... finish the puzzle anyway.

"Helen"

Little girl, blond hair, black sweater with green turtle-neck, red corduroy trousers. Necklace with little bells, etc. Courteous little thing. Says her name when I greet her, takes Irena's puzzle with her at my suggestion. And that "hug" too, she says (the word stands for a piece of white cloth). Mother speaks in a friendly way to her. Comes along alone.

Activities

Somewhat reserved as she accompanies me. Walks a bit behind, some hesitation as she goes into my room. Puts things on table, looks somewhat shyly around, says: "Oh, I've got a doll's house like that at home". Beams as she speaks.

I notice that her eyelids are a bit red, blepharitis-like (later, when we have gone back to mother she gives her eyes a thorough rub, sitting on mother's lap). The ice is broken now and she makes comments, especially about all the things she's got at home too. Clear musical speech, once in a while unintelligible. Good syntactical level: "That's me, isn't it" when she looks in the mirror. Friendly, dares to come close, looks me in the face, lets herself be helped, for example if a cupboard with draws won't open. Of some things she says: my mother has that too (sink, for example). She takes up only the very smallest of the dolls, says that he's got shoes and socks on, puts him in the bath. "A toilet to wee-wee", etc.

Goes to the doll's pram. Puts 2 dolls on the floor. Says laughingly, amused: "they have to sit down", then looks at me. Looks at what's on top of the cupboard. Looks at me questioningly before she takes anything, whether it's allowed (incipient super-ego). Does the duck-boat-chair puzzle without any difficulty. Clear view of the situation; pieces straight to their places. Short sentences such as "Where does the man go?" and "That doesn't fit". Tries to rope me in, but when I don't fall for it carries on independently. Also does Irena's puzzle, with my help. She finds it difficult. I believe, fitting this one together, I think it's too emotionally charged: a girl walking behind a boy with a big flute at his mouth. I ask her to do it again, again she needs help.

Able to answer my question who else there is at home aside from herself and mummy and daddy. When I ask her where daddy is she says "inside", after a silence. Walks away from me to go to the pram. To brother or sister question says no. Defensive and not convincing. Draws with "magic markers" (names them herself). Skilful in handling the tops. Laughs over her drawing. What is it? "A tower!" Says something regressive once in a while about children sleeping/wanting to sleep. From questioning it seems she means dolls. Gives no answer when I relate it directly to her. Occasionally while she is drawing, suddenly looks outside a bit dreamily. Takes riding bear and gets enormous pleasure from its drumming. Her laughter is vital and merry but it also stands for something, it seems to me. Rides around with it. Later she plays the xylophone. Begins to strike harder, then says laughingly to me: loud, isn't it.

Whether she is ever afraid. Yes. Of what? No answer. I start to talk about sleeping, she doesn't answer. When I ask "Don't you want to talk about that?" she answers with conviction "No". She helps to tidy up, takes the pieces with her. Also her white cloth "hug". I ask her about it but learn nothing. When I go on to ask "Do you take it to bed with you?" she says yes. What do you do with it? Play. What? At which she says (we're already standing by the door): I want to go to mummy. Which we do.

While she was playing with the doll's pram she suddenly showed me her hands and said "dirty" (they weren't). I said: how did that happen? She looked at her hands, then at me and says: no, they're not dirty; and carried on (I don't know whether it had anything to do with the fact that just at that moment she was taking two dolls with genitals out of the pram). Plays with animals. Good naming level, though once in a while she names wrongly (clearly emotional). Can count. Knows colours (such as blue, red).

To be on the safe side I ask mother whether she sleeps well. Mother says yes. Whereupon the girl says: "I don't want to sleep with you". Shakes hands firmly with me. Carries a small basket with her things in it, just like mummy.

In conclusion

Sweet, friendly girl who goes along alone. Good speech level, once in a while regressive. The total picture is courteous, charming and good. Good relation forming. Ego-consciousness. Defensive towards her inner world. Emotional themata involved that I can not evaluate in a single session. The overall impression makes me suspect that she is about to begin on the oedipal phase.

"Humphrey"

Fresh, blond boy. Sitting on a chair next to his mother at the psychologist's. I ask whether he wants to come along. He thinks for a moment, takes a drink of his lemonade and then says yes. When he's told that he can take the beaker with him he says: "As long as it doesn't get cold".

Activities

Comes in, looks round, says oh! Immediately gets hold of the police car. Examines it, makes the wheels turn and the engine roar. Of the lights on the roof, asks: what are those? When I say "lights" he looks at the front and says: "there are lights here too". A little later asks about the central light on the roof: "Why doesn't it go on?" Easy proximity contact, directed and fresh eye contact. He also takes up the lorry, that's for me to play with.

He says: "You've got a nice playroom here". He really begins to fantasize now and uses the past tense, for example: "you were driving and I was driving and we crashed into one another". Which happens. A cardboard box serves as an object to bump into. When it falls over he uses it as a "garage". Then he sees darts. Gets them and gives some of them to me. "In turns" he says. Throws and says "missed". Follows my instructions and does better. When he feels strong emotions he develops panting and stammering speech (for example, when the cars crash). There are also periods of calm speech. Plays puppet show. A great many figures appear. First the hunter, the witch, a lady, the devil ("Who's that?"). A rabbit: "Oh, this is a nice, friendly one". Come here a moment! He's shaking hands with me... The figures appear, parade, greet and disappear again, full of life. When I remark of the witch that she looks wicked he says: "doesn't matter". He plays with the cash register, finds that special. Gives me cents. Manipulates the keys. Very calmly. I give him fibre-tipped pens and, at his request, buy them from him: price 87 cents. He holds the pen high in his hand, finds it difficult to do as I do. Draws "a long line". Draws a circle after I've drawn one. And another one. What he draws is a more or less round, closed structure. Does the duck-boat-etc. puzzle. Not with a great deal of enthusiasm. Calm, quick, accurate. He puts some blocks straight into their place, calmly searches with others.

On being asked, tells that his daddy is at work. Has two brothers, tells their names; they're "at school". He answers, but he experiences these bigger men only ambivalently, that can be seen from his face.

After heated play with the car, has to go to the W.C. First has another brief play with the cash register, then we go. When he's finished he says: I can't pull the chain. Looks questioningly at me: I lift him up and let him pull it. Plays again with the cash register. Orderly, grey coins by grey coins, brown by brown. Knows his age: I'm three now. When asked, holds up three fingers. Counts fluently to 7-8. When I tell him time's up he says: no (I'd already announced it). Wants to take the police car and then the cash register. Says: no, we're staying. When I say it really is time he says: have a look at your clock then. Then: it's not time for me! Comes along, says: Rotter! Goes out angrily into the corridor. Says: "I'll tell my mummy. Tells her. I explain to her that I'd said time was up. He says to me: "Sir, you shouldn't nag". "Hop, get along with you". He shakes hands with me as he's leaving.

In conclusion

Good appearance. Excellent verbalization: enormous temperament and suppressed aggression

which, for example, causes him to stutter during aggressive car game. Tendency to actively do things himself is strong: protests very violently that he wants to close the puppet show himself (wants to flush the toilet himself). Going along with me was his own, considered decision. Going away at my command he experiences as terror: this boy is already fighting against "the reign of terror of hour and fact"

Probably enormous insufficiency feelings vis-à-vis other brothers at home (he is the youngest). Otherwise a good picture in totality: good relation forming, excellent ego development. (Blackward in fine motor control in drawing: result of insufficiency feelings which he experiences physically?).

SUMMARY

This thesis on the low-birth-weight child owes its existence to the co-operation in Sophia Children's Hospital, Rotterdam, between paediatrics, which is concerned first and foremost with the somatic care of the child, and child psychiatry, whose main concern is the child's mental and affective development.

The constant increase in paediatric "competence" has led since the second half of the 1960s to a very marked improvement in chances of survival and in the incidence of "major handicaps" - i.e. neurological defects and/or serious sensory defects and/or an intelligence quotient of 70-85 or lower - in children with a birth weight below 2500 grams (see, for example: Rawlings et al., 1971; Fitzhardinge and Ramsay, 1973; Davies, 1976; Stewart et al., 1981).

"Competence" is a capacity which, in the possible vulnerable low-birth-weight child as in other children, should begin to develop in the first years of life with competence over the child's own body as the seat and instrument of the person. Despite the drastic reduction in major handicaps, the question remained whether the low-birth-weight child experiences problems of a less serious nature which could explain the troubles brought by parents to the paediatric consulting hours and the greater frequency with which learning problems are noted in this possible risk group in the primary school period (De Hirsch et al., 1966; Bergès et al., 1969). These less serious problems are often referred to in the literature using the term "minor handicaps" (Drillien, 1972), but they are still much less well documented.

In *chapter 1* it is explained that the present thesis is concerned with a systematic comparison of 40 low-birth-weight children and 40 full-term children who do not have this risk factor, at the age of 3.

In this clinical child-psychiatric study the psycho-analytic developmental model serves as a frame of reference. The concepts of the child's "ego" and "developmental task" are thereby introduced.

Each child also undergoes an intelligence test.

The age of 3 years was chosen because paediatric experts too

(Drillien, 1972; Saint-Anne Dargassies, 1979) consider it a good age for differentiating between major and minor handicaps. The extent to which developmental vulnerabilities exist in the low-birth-weight child at 3 years of age compared with his full-term contemporary appears in a more concrete form in answering the question: how fare has the child got with his developmental task? Which attainments and skills has his ego already mastered?

Chapter II describes how a prior "exploratory study" helped to orient the main study. The exploratory study showed that a more focused comparison was necessary with children of the same age, directed at the growth and differentiation of the personality of the three-year-old, with his "strong" and "weak" ego aspects. The difference between low-birth-weight boys and low-birth-weight girls came into sharper relief, with the result that more attention was paid to it in the main study. As it was found that children gave a demonstration of their ego functions in their play, a prominent place was given to the child's play. *Chapter III* gives the theoretical foundations required for the study. Particular attention is paid to the question which more specific ego functions can be expected in a three-year-old and what their importance is as regards development. As we are concerned in this study chiefly with the executive ego functions the ideas of non-psychoanalytic authors who have written about the development of the child can also be taken into account. Play theorists are also dealt with, and particularly those authors who link the child's ego and its play and authors who, taking a non-psychoanalytic approach, regard play as an expression of the mastery and structure that the child has attained.

Chapter IV describes the method underlying this thesis.

Notably:

- The selection of the 40 low-birth-weight children and the 40 reference children and their comparability.
- The procedure used in each individual child-psychiatric examination, resulting in an individual child-psychiatric report.
- The drawing up of a list of "ego items" and a list of "play items" based on the theoretical matter treated in chapter III.
- The allocation of scores to each report on the basis of these lists of operationalized "ego items" and "play items". To increase the reliability of the marking, 2 other judges were used in addition to the author.

Chapter V describes how the Guttman scale analysis was used as an ordering principle to indicate the differences between the test

children and the reference children. As there proved to be a certain hierarchy in the items it was possible to place a number of items in such an order that they formed a cumulative and unidimensional scale. An *ego scale*, a *play scale* and a *ego-play scale* were constructed in this way. Using the scores on the childpsychiatric reports, each child can then be given a mark on these scales indicating its ego skill and its play skill.

Chapter VI contains the specific hypotheses and the predictions based on them. If, on the basis of clinical facts, for example immaturity at birth, necessary separation from the mother and the resultant perinatal stress, the development of the low-birth-weight child is accompanied by greater difficulties, this will be reflected, according to the hypothesis, in a difference in ego organization, play skill and IQ between the test group and the reference group.

Similarly, in the test group of low-birth-weight children ego organization at 3 years of age will be weaker the lower the birth weight was and the longer perinatal admission lasted. On the basis of these hypotheses, predictions are made about the results that will be obtained.

It is also explained that, in the case of the test group of low-birth-weight children, a list of "perinatal risk factors" will be used to investigate whether and to what extent a correlation exists between these factors and the results found at 3 years of age. As the low-birth-weight group consists of only 40 children and each specific risk factor usually occurs in only a fraction, sometimes a small fraction, of the group, no explicit predictions are made about these possible correlations.

Chapter VII presents the results and consists of three parts.

The first part gives the child-psychiatric differences between the test group and the reference group on the ego scale, the play scale and the ego-play scale. The test group of low-birth-weight children scores significantly lower on all 3 scales. When the groups are split up according to sex, it is found that the gap between the low-birth-weight boys and the reference boys is greater on all 3 scales than the gap between the low-birth-weight girls and the reference girls. A comparison of the scores in each of the matched pairs of children reveals that the low-birth-weight child scores lower than the reference child more frequently in the boys' pairs than in the girls' pairs.

Part two gives the results of the intelligence test.

Here too the test group scores significantly lower than the reference group.

Part three concerns only the test group of low-birth-weight children. It gives the correlations found between, on the one hand, the results at three years of age in the form of an ego score, a play score, an ego-play score and IQ and, on the other hand, a number of "perinatal risk factors".

As the correlations are low, what one has here are at most tendencies. Relatively speaking, the most notable tendencies concern the following "perinatal risk factors":

- the birth weight in relation to the duration of pregnancy,
- the "Respiratory Distress Syndrome",
- acidemia,
- artificial respiration after day 10,
- the birth weight as such,
- the duration of admission.

These risk factors are discussed separately and the tendencies found are compared with the literature in which separate perinatal data are given.

Chapter VIII discusses in more detail the significance of these results and relates them to the questions posed at the start: are low-birth-weight children risk children and, if so, to what extent? What are the developmental problems which are often referred to in the literature using the global term "minor handicaps"?

The results which were condensed into "scores on a scale" in chapter VII are translated again into clinical descriptive terms to produce a total picture of the low-birth-weight child at 3 years of age.

The differences found between the test group and the reference group and between low-birth-weight boys and low-birth-weight girls are then compared in detail with research results described in the literature. Attention is drawn here to the importance which is also attached in the literature to a good definition of the test group in order that the results of different centres can be compared.

The complex problem of the "perinatal risk factors" and their "weight" or "impact" is considered.

The discussion ends with a tentative explanation of the results obtained from a developmental point of view, taking account, among other things, of recent literature on differences in "behaviour state" (Brazelton et al., 1979, Dreyfus-Brisac, 1975) between premature and full-term neonates.

Explanations are also put forward for the differences between the low-birth-weight boys and the low-birth-weight girls favourable to the latter.

In *chapter IX* ("Applications") what we have learnt from years of reading on and research into the development of the low-birth-weight child is summed up once more by situating it in the life cycle.

The sometimes mild, sometimes serious problems facing the low-birth-weight child and its mother in the crucial first years of life are presented in their clinical context. We hope that this presentation will also be of use to the paediatrician, the general practitioner and the health centre doctor.

The low-birth-weight child takes home with it the frailty, the fragility of its equipment, which modern research can measure, even if all has gone well during the period of perinatal admission.

At home the low-birth-weight child can display symptoms of a syndrome of "transient dystonia" which are not even necessarily present at the moment when the child is discharged but which the mother notices when, during feeding, playing or bathing, she works on the sensorimotor development of her child.

Despite the best of care, for a long time the child can grow in weight and height following percentiles which the neonatologist finds sufficient in themselves, but the psychological appraisal can be different and such as - understandably enough - to perpetuate a climate of concern. This is known in the literature as "failure to thrive".



SAMENVATTING

Uit de samenwerking in het Sophia Kinderziekenhuis te Rotterdam tussen de kindergeneeskunde, die zich eerst en vooral richt op de somatische zorg voor het kind, en de kinderpsychiatrie, die zich vooral richt op de mentale en affectieve ontplooiing van het kind, is dit proefschrift dat handelt over het laag geboortegewicht kind geboren. De steeds groeiende pediatrie "competentie" heeft sinds de tweede helft van de zestiger jaren tot een sterke verbetering geleid wat betreft de overlevingskansen en incidentie van zogenaamde "major handicaps" - zijnde neurologische afwijkingen en/of ernstige sensorische afwijkingen en/of een intelligentiequotient kleiner of gelijk aan 70-85 - bij de kinderen geboren met een geboortegewicht beneden de 2500 gram (zie bijvoorbeeld: Rawlings et al., 1971; Fitzhardinge en Ramsay, 1973; Davies, 1976; Stewart et al., 1981.) Competentie is een vermogen dat in de eerste jaren van het leven dient te beginnen met competentie over het eigen lichaam als zetel en instrument van de persoon, ook bij het mogelijk kwetsbare laag geboortegewicht kind. Ondanks die drastische vermindering van "major handicaps", bleef de vraag wel of er "geringere" problemen bestaan bij het laag geboortegewicht kind, die aan de basis kunnen liggen van de zorgen waarmee ouders zich aandienen op het pediatrie spreekuur, en die eventueel kunnen leiden tot leerproblemen in de lagere schooltijd die bij deze mogelijke risicogroep vaker gesignaleerd worden (De Hirsch et al., 1966; Bergès et al., 1969). Naar deze problemen wordt in de literatuur vaak verwezen met de term "minor handicaps" (Drillien, 1972), maar zij zijn nog veel minder goed gedocumenteerd.

In *hoofdstuk I* wordt uiteengezet hoe dit proefschrift zich richt op een systematisch vergelijken van een groep van 40 laag geboortegewicht kinderen en 40 à terme geboren kinderen, zonder die risicofactor, op de leeftijd van 3 jaar. Bij dit klinische kinderpsychiatrie onderzoek zal het psycho-analytische ontwikkelingsmodel als referentiekader fungeren. De concepten van het "ego" en de "ontwikkelingstaak" van het kind worden daarbij geïntroduceerd.

Bij ieder kind zal tevens een intelligentieonderzoek gebeuren. Voor de leeftijd van 3 jaar werd gekozen omdat ook pediatrieche experts (Drillien, 1972; Saint-Anne Dargassies, 1979) dit een goede leeftijd vinden om tussen "major" en "minor handicaps" te differentiëren. In hoeverre er kwetsbaarheden in de ontwikkeling bestaan bij het laag geboortegewicht kind op 3-jarige leeftijd in vergelijking tot zijn à terme geboren leeftijdsgenoot zal concreter blijken uit de beantwoording van de vraag: hoe ver staat het kind al met zijn ontwikkelingstaak? Welke verworvenheden en vaardigheden heeft zijn ego zich al eigen gemaakt?

In *hoofdstuk II* wordt uiteengezet hoe een voorafgaand "verkennend onderzoek" oriënterend inwerkte op dit hoofdonderzoek. Het bleek dat een meer gerichte vergelijking nodig was met kinderen van dezelfde leeftijd, toegespitst op de uitbouw en de differentiatie van de persoon van de driejarige, met zijn "sterke" en "zwakke" ego-aspekten. Het verschil tussen laag geboortegewicht meisjes en laag geboortegewicht jongens kreeg meer reliëf, zodat we daar in het hoofdonderzoek nauwgezet op wilden letten. In de uitbouw van zijn spel bleek het kind ook een demonstratie te geven van zijn ego-functies, zodat we aan het spel van het kind een ruime plaats wilden geven.

Hoofdstuk III geeft dan de noodzakelijke theoretische onderbouw van dit onderzoek. Met name wordt ingegaan op de vraag welke meer specifieke ego-functies men bij een driejarige mag verwachten en wat hun belang is voor de ontwikkeling. Aangezien we ons in dit onderzoek vooral richten op de executieve ego-functies kunnen ook de inzichten van niet-psychoanalytische auteurs die over de ontwikkeling van het kind geschreven hebben, hierbij verwerkt worden. Ook spel-theoretici worden behandeld en met name die auteurs die een koppeling leggen tussen het ego en het spel van het kind en auteurs die vanuit een niet-psychoanalytisch denkmodel het spel beschouwen als een uiting van het meesterschap en van de structuur die het kind al verworven heeft.

Hoofdstuk IV beschrijft de methode die het proefschrift schraagt. Met name:

- De selectie van de 40 laaggeboortegewicht kinderen en van de 40 referentiekinderen en hun vergelijkbaarheid.
- De gang van zaken bij ieder individueel kinderpsychiatrisch onderzoek, uitmondend in een individueel kinderpsychiatrisch rapport.
- Het opstellen van een lijst van "ego-items" en een lijst van "spel-

items" die de neerslag vormen van wat in het theoretisch hoofdstuk III werd uiteengezet.

- Aan de hand van deze lijsten van geoperationaliseerde "ego-items" en "spel-items" wordt dan ieder rapport "gescoord". Ter verhoging van de betrouwbaarheid werden hiervoor 2 andere beoordelaars ingeschakeld, naast de schrijver dezes.

Hoofdstuk V beschrijft hoe van de Guttman-Schaalanalyse gebruik gemaakt werd als ordeningsprincipe om de verschillen tussen onderzoeksgroep en referentiekinderen te kunnen aangeven. Aangezien er een zekere hiërarchie in de items bleek te zitten, was het mogelijk een aantal items zó te schikken in rangorde dat ze een cumulatieve en uni-dimensionele schaal vormen. Zo werd een *ego-schaal*, een *spel-schaal* en een *ego-spel-schaal* geconstrueerd. Op elk van deze schalen kan een kind, aan de hand van het gescoorde kinderpsychiatrische rapport, dan een maatgetal krijgen voor zijn ego-vaardigheid en zijn spel-vaardigheid.

Hoofdstuk VI bevat de specifieke hypothesen en de daarop gebaseerde predikties.

Als op basis van klinische feiten, bijvoorbeeld immaturiteit bij de geboorte, noodzakelijke scheiding van de moeder en de daaruit resulterende perinatale stress, de ontwikkeling van het laag geboortegewicht kind met grotere moeilijkheden gepaard gaat, dan zal dat zich uiten, aldus de hypothese, in een verschil in ego-organisatie, in spelbekwaamheid en in IQ tussen de onderzoeksgroep en de referentiegroep. Dan zal ook, zo is de hypothese, binnen de onderzoeksgroep van laaggeboortegewicht kinderen de ego-uitbouw op 3-jarige leeftijd des te zwakker zijn naarmate het geboortegewicht lager was en naarmate de opname perinataal langer duurde. Op basis van de hypothesen worden predikties gedaan over te vinden resultaten. Tevens wordt aangekondigd dat voor de onderzoeksgroep van laag geboortegewicht kinderen een lijst van "perinatale risikofactoren" zal gebruikt worden met de bedoeling om uit te zoeken of en in welke mate er een correlatie bestaat tussen de gevonden uitslagen op driejarige leeftijd en deze factoren. Aangezien de laag geboortegewicht groep op zichzelf al beperkt is en uit 40 kinderen bestaat, en iedere specifieke risikofactor meestal slechts voorkomt bij een (soms kleine) fractie van deze 40 kinderen, werden over deze mogelijke correlaties geen expliciete predikties gedaan.

Hoofdstuk VII, dat de resultaten geeft, bestaat uit drie delen.

Het eerste deel geeft de kinderpsychiatrische verschillen tussen de

onderzoeksgroep en de referentiegroep op de ego-schaal, de spel-schaal en de ego-spel-schaal.

Op alle drie schalen scoort de onderzoeksgroep van laag geboortegewicht kinderen significant lager. Bij opsplitsen van de groepen naar geslacht blijkt dat de kloof tussen laag geboortegewicht jongens en referentiejongens op alle drie de schalen groter is dan die tussen laag geboortegewicht meisjes en referentiemeisjes.

Bij de vergelijking van de scores binnen ieder afzonderlijk "gematcht" paar van kinderen, blijkt dat in meer jongensparen het laag geboortegewicht kind het laagst scoort dan in de meisjesparen.

Deel 2 geeft de resultaten van het intelligentie-onderzoek en ook hier blijkt dat de onderzoeksgroep significant lager scoort dan de referentiegroep.

Deel 3 betreft alleen de onderzoeksgroep van de laag geboortegewicht kinderen. Het geeft de gevonden correlaties aan tussen enerzijds de uitslagen op drie-jarige leeftijd, uitgedrukt in de ego-score, de spel-score, de ego-spel-score en het IQ, en anderzijds een aantal "perinatale risikofactoren". Hierbij is hooguit van tendenzen sprake, aangezien de correlaties zwak zijn.

De (relatief) meest in 't oog springende tendenzen zijn die voor de volgende "perinatale risikofactoren":

- het (te lage) geboortegewicht in zijn relatie tot de gegeven zwangerschapsduur,
- het "Respiratory Distress Syndrome",
- Acidaemie,
- beademing na dag 10,
- het (te lage) geboortegewicht als dusdanig,
- de opnameduur.

Deze risikofactoren worden apart belicht en de gevonden tendenzen worden vergeleken met die literatuur die aan afzonderlijke perinatale gegevens aandacht besteedt.

Hoofdstuk VIII gaat nader in op de betekenis van deze resultaten en situeert ze in het licht van de probleemstelling: zijn laag geboortegewicht kinderen risico-kinderen en in hoeverre? Wat zijn de ontwikkelingsproblemen dan wel waarnaar in de literatuur vaak verwezen wordt met de globale term "minor handicaps"?

Daarom wordt datgene, wat in het hoofdstuk Resultaten gecondenseerd was tot "scores op een schaal", weer vertaald in klinisch-descriptieve termen zodat een totaal-beeld ontstaat van hoe een laag geboortegewicht kind zich presenteert op 3-jarige leeftijd.

De gevonden verschillen tussen onderzoeksgroep en referentiegroep en tussen laag geboortegewicht-jongens en laag geboortegewicht-meisjes worden dan uitvoerig vergeleken met onderzoeksresultaten, beschreven in de literatuur. Daarbij wordt gewezen op het belang dat ook in de literatuur gehecht wordt aan het goed definiëren van de onderzoeksgroep om de vergelijking tussen resultaten van verschillende centra mogelijk te maken.

Ook aan het complexe probleem van de "perinatale risikofactoren" en hun "gewicht", hun "impact", wordt aandacht besteed.

De discussie wordt afgesloten met een tentatieve verklaring van de gevonden resultaten vanuit het ontwikkelings-perspektief. Ook recente inzichten in de literatuur over verschillen in "behavior state" (Dreyfus-Brisac, 1975, Brazelton et al., 1979) tussen te vroeg en à terme geboren neonati worden hierbij betrokken.

Verklaringen worden ook aangedragen voor de verschillen tussen de laag geboortegewicht jongens en de laag geboortegewicht-meisjes, in het voordeel van de laatsten.

In hoofdstuk IX ("Applications") wordt, wat we geleerd hebben in jarenlange lektuur over en research naar de ontwikkeling van het laag geboortegewicht kind nog eens samengevat, door het te situeren in de levens-cyclus. De soms milde, maar ook soms ernstige problemen waar het laag geboortegewicht kind en zijn moeder voor staan in de cruciale eerste kinderjaren worden gepresenteerd in hun klinische kontekst. Op zo'n manier, hopen we, dat het ook voor pediaters, huisartsen of consultatiebureau-artsen van nut kan zijn. Het broze en fragiele van zijn uitrusting, die de moderne research kan meten, neemt het laag geboortegewicht kind mee naar huis, ook als tijdens de opname perinataal alles naar wens verlopen is. Het laag geboortegewicht kind kan thuis verschijnselen vertonen van een syndroom van "voorbijgaande dystonie" ("transient dystonia") die niet eens aanwezig hoeven te zijn op het moment van ontslag maar die de moeder wel merkt als ze, bij het voeden, het spelen of het baden aan de sensori-motorische ontplooiing van haar kindje werkt. Ondanks alle goede zorgen kan het kind zich lange tijd ontwikkelen naar gewicht en lengte volgens percentielen die de neonatoloog op zichzelf voldoende vindt, maar psychologisch kan dit anders getaxeerd worden en zo kan een zorgelijk klimaat blijven bestaan, begrijpelijk genoeg. "Failure to thrive" heet dat in de vakliteratuur.

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POSTSCRIPTUM

Met genoegen schrijf ik dit laatste kapittel: het biedt mij de gelegenheid mijn erkentelijkheid te uiten tegenover al diegenen die bijgedragen hebben aan mijn - wat René Spitz zo mooi noemt - "fundamental education."

Mijn ouders kan ik, geloof ik, niet passender bedanken dan door te stellen dat ik van hen geleerd heb wat René Spitz bedoelt, omdat hun opvoeding die fundamentele ingrediënten ook bevatte.

Alle leraren die mij ooit onderwijs gegeven hebben in de geest van Hadewijch en het Vade-mecum "Vaart wel ende levet scone!" breng ik hier graag nog eens een saluut.

Zij, die, in de geest van Freud mij geleerd hebben dat er ook nog "een andere schouwplaats" is, mogen met dank voor de genoten vorming deze *Ergänzungsreihe* sluiten.

Bij Prof. W.K. van Dijk mocht ik, gelukkig voor mij, mijn opleiding in de psychiatrie starten: aan het humanistisch-analytisch klimaat in Uw kliniek bewaar ik de beste herinneringen. Van Prof. Dr. Th. Hart de Ruyter leerde ik zorg voor en solidariteit met die kinderen die om vele redenen het leven met onvoldoende "basisvertrouwen" tegemoet zien; het doet me goed te kunnen schrijven dat ik onlangs nog met ontroering een "klinische les" van U las die U besloot met een opdracht aan degenen die betaald worden om de ontwikkeling van kinderen te volgen: "Der Arzt als Erzieher des Kindes".

Prof. Dr. J.A.R. Sanders-Woudstra, mijn promotor, inspireerde met haar dynamisme dit proefschrift. Met genoegen denk ik terug - om er een element uit te pikken - aan de vele uren die we besteed hebben aan de lijst van ego- en spel- items voor dit proefschrift. Hieraan vooraf ging een zeer veelzijdige opleiding: van jou leerde ik de persoon van kinderen in kaart te brengen in de vorm van een meta-psychologisch profiel; onder jouw supervisie deed ik mijn eerste kinderpsychotherapie en ontdekte ik het grote belang van de moeder-kindrelatie. Prof. Dr. F. Verhage, mijn co-promotor heeft steeds vriendelijk-kritisch bijgedragen, zowel bij de opzet als bij het op schrift stellen van dit onderzoek, tot een werkwijze die naar overzichtelijkheid en

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Prof. A.J. Solnit from Yale University New Haven: I want to address you in english to thank you for your support and your expert advise during your annual visits to Rotterdam, not withstanding the jet-lag and in between your many other commitments.

Prof. Dr. J.W. Mettau, vanuit de afdeling neonatologie zorgde je steeds voor een goede samenwerking met de afdeling kinderpsychiatrie, mede in het belang van dit onderzoek.

Hugo Duivenvoorden was de praktische methodoloog die van grote hulp geweest is bij de systematische verwerking van het materiaal. De humor en de intelligentie waarmee je dat deed heb ik geapprecieerd; de uren bij de computer doorgebracht ontlocken mij nog steeds een "horresco referens", maar jij speelde het even gemakkelijk als een partijtje poker.

Irena Skoda heeft jaren lang als psychologe meegewerkt aan "ons onderzoek". Je zorgvuldigheid bij de hele voortgang heeft steeds bijgedragen tot een sfeer van goede samenwerking.

Hedy Westerborg-van Loon heeft ettelijke uren besteed aan het geduldig en zorgvuldig typen, aan het mee vormgeven aan tabellen en grafieken. De audio-visuele dienst heeft zijn bekwame krachten besteed - in de persoon van Loek Baars en Hillie Versprille - aan de uiteindelijke tabellen en grafieken. Ook Carla Bandel-Schweinsberg heeft hier een kunstig geslepen steentje toe bijgedragen.

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CURRICULUM VITAE

De schrijver van dit proefschrift werd geboren te Willebroek in de provincie Antwerpen in 1945.

Hij volgde de Grieks-Latijnse Humaniora te Boom aan het Onze-Lieve-Vrouwecollege van 1957-1963.

In 1963 ging hij geneeskunde studeren aan de Katholieke Universiteit te Leuven, en in 1970 behaalde hij zijn artsdiploma.

Daarbij aansluitend startte hij zijn opleiding in de psychiatrie bij Prof. Dr. W.K. van Dijk te Groningen. Vervolgens specialiseerde hij zich verder in de kinderpsychiatrie bij Prof. Th. Hart de Ruyter te Groningen en sinds 1974 bij Prof. Dr. J.A.R. Sanders-Woudstra te Rotterdam. Zijn assistentschap in de neurologie deed hij bij Prof. Dr. A. Staal in het Dijkzigtziekenhuis te Rotterdam (1977).

Hij werkt sinds 1 januari 1978 als kinderpsychiater op de afdeling kinderpsychiatrie van het Sofia Kinderziekenhuis te Rotterdam in de functie van wetenschappelijk hoofdmedewerker bij de E.U.R.

Author(s), Centre Year of Publication	Contents of paper: theoretical	Contents of paper: study of group of LBW children	Discipline of authors PAEDIATRIC	Discipline of authors PSYCHOLOGY CHILD PSYCHIA- TRY	Date of birth of population	Birth weight of population: (grams)	A.G.A. given as a variable	S.G.A. given as a variable	Number of children	Age of children years	Control group	SEX differences indicated	Some important data from the papers
Shirley, M. Harvard School of Public Health 1939	+	+	-	+	before 1939	<2500	-	-	N=30	2½-5	N=30	+	"A behavior syndrome characterizing prematurely born children"
Greenacre, Ph., N.Y., 1941	+	-	-	+	-	-	-	-	-	-	-	-	Influence of "poor antenatal and perinatal conditions" on development.
Caplan et alii Montreal, 1963	-	+	-	+	?	1500- 2250	-	-	N=27	7-11	N=27	only ♂♂	- Prematures score lower on IQ test. - Prematures have less well-developed ego functions: perceptual-motor-organization of thought.
De Hirsch et alii N.Y., 1966	-	+	-	+	1955- 1956	980- 2239	-	-	N=53	3 years; 1st class* 2nd class	N=53	+	- At 3 years the prematures score lower on 36 out of 37 kindergarten tests. - The differences are striking for fine motor tests and language tests. - At primary school age premature girls score higher than premature boys.
Wortis and Freedman, N.Y., 1965	-	+	-	+	1956- 1959	NEGRO <2100	+	+	N=215	2½	-	+	- The children are of a very low social class. - There are more sequelae in boys than in girls; boys have a lower IQ than girls.
Drillien, C.M., Dundee, 1972	-	+	+	-	1966- 1971	1) <1500 1501- 2) 2000	+	+	1) N= 53 2) N=133	1-3	-	+	- "A syndrome of transient dystonia associated with low birth weight" is described. - This occurs more in boys under 1500 grams.
De Hirsch, K., N.Y., 1975	+	-	-	+	-	-	-	-	-	-	-	+	- Detailed discussion of ego and language functions in, among others, LBW children. - The article is based on the study carried out in 1966 (see above).
Neligan et alii Newcastle, 1975	-	+	+	-	1960- 1962	X=± 2500	+	+	N=± 800	5-7	N=± 200	+	- The over-all performance of the children in the very light-for-dates group is significantly worse than the short-gestation group. - "Clearly the boys appear to be more vulnerable to the effects of abnormalities of intra-intra-uterine growth".
Mau, G., Kiel, 1977	-	+	+	-	-	<10-th percentile	+	+	>1000	follow-up to 3	>1000	-	- There is delayed development of stato-motoricity in the first years of life in the LBW children. - SGA children perform less well than AGA children.
Hohlweg-Majert et alii, Heidelberg, 1978	-	+	+	-	-	<2500	-	-	N=147	3-8	N=214	-	- No statistically significant differences between the LBW group and the control group as regards learning to walk, speech development and sphincter control. - The difference in IQ in favour of the control group is not significant.
Stewart et alii London, 1978	-	+	+	-	1966- 1976	<1500	+	+	N=83	3-5	-	-	- At ± 3 years the percentage of major handicaps is 8.5%. - There is no statistically significant difference between the SGA group and the AGA group as regards major handicaps. - Neither is there a statistically significant difference between the 500-1000 gram group and the 1001-1500 gram group.
Bethenod et alii Lyon, 1979	-	+	+	+	1967- 1976	<1000	+	+	N=139 71% have died	< 3 to ± 5	-	-	- Problems and concern in the mother-child relationship. - Psychological aspects of these children related to their immaturity.
Saint-Anne Dargassies, Paris, 1979	-	+	+	-	before 1962	mixed	+	+	N=286	3-23	-	-	Children divided in follow-up into three groups on the basis of their status: 1). normal development (56%) 2). subnormal development (23%) 3). serious sequelae (21%). The frequency of minor problems is also fairly high in group 1 and 2: 1 out of 3 children in group 1; 1 out of 2 children in group 2.

