

Some Biological, Psychological and Social Factors in Development

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Development presupposes change and continuity. In effect, however, it can also be discontinuous, as in the development of the embryo, there are certain post-natal periods when development is particularly sensitive to outside influences. The human infant undergoes a long period of gestation, but emerges vulnerable and incomplete. Thus the potential for developmental disturbance is greatest in infancy. Although adaptation implies corrective forces, recent neurological findings indicate that, ironically, some adaptations can themselves cause problems. Initially we are dominated by reflexive responses, like the innate mass-action startle reaction of the infant. These responses are gradually refined, but the earlier, primitive reflexes are unmasked if the brain is damaged, indicating that these reflexes are suppressed rather than lost. Some functions, like locomotion, seem to develop through practice, but on closer scrutiny, appear to be the result of maturation. Although the response is later lost, a pre-programmed organization is indicated by the fact that a neonate will make stepping movements if its weight is supported and will take ascending steps on stairs.

The complex biological system of human development was thought to be expressed through a hierarchically organized process in terms of different levels of function involving genes, cells, cytoplasm, organs, organ systems, behaviour and ultimately personality, and the outcome of the individual's development and adjustment was thought to depend on the interaction between biological and experiential influences.

However, two variations of the above-mentioned developmental sequence merit comment. First, the view that suggests that the structures subserving psychological development invariably show a sequential continuity (Kagan, 1980), in that changes follow directly from previous structures, is the postulated basis of the continuity of psychological development. However more modern evidence suggests that in a number of circumstances changes in development are 'characterized by replacement of an old structure . . . by a new one' (Brim and Kagan, 1980). Second, learning theory has been applied widely to explain the development of intelligence, language and other complex aspects of psychological development. But Chomsky (1959) has rejected the Skinnerian viewpoint concerning the 'sufficiency of the learning theory explanations even though it is accepted that learning in some form is important' (Berger, 1985). For instance, it

is argued that reinforcement principles are inadequate to explain the basis of psychological attachments in infancy (Sroufe, 1979).

Further, Scarr and McCartney (1983) have proposed a theory which links genetic differences between individuals and the responses elicited from care-takers. Thus it is suggested that new psychological structures are partially determined by genes. Such matters are discussed further in the next section.

Influence on Development

Genetic factors

Certain individual characteristics seem to be set very early in life, if not *in utero*, and certain behavioural dimensions measured by separate, independent raters have been shown to persist from shortly after birth to school age (Thomas *et al.*, 1977; see Chess and Thomas, 1984). There is some support for the findings in the observation that recurrent problems with feeding, bathing and dressing, together with loud crying, protest at novelty and tantrums are over-represented in those who subsequently developed conduct disorders (Rutter *et al.*, 1964), which seem to start earlier than other psychiatric conditions (Behar, 1982), and a history of childhood conduct disorder is often found to be significantly related to criminality in adulthood (Robins, 1978).

Thus it is not surprising that a variety of authorities are in broad agreement in arguing for neurobiological correlates for specific traits, such as harm avoidance, novelty seeking and reward seeking (see Rutter, 1987) and also for heritability of aggressive behaviour (Rushton *et al.*, 1986), which seems consistent over time (see Olweus, 1979). However aggression and distractibility do not show as strong a genetic loading as other behavioural characteristics (Plomin and Foch, 1980). There is an heritable component in crimes against property (see Weller, 1986) and further information on a biological substrate is accumulating—in one prospective study, Raine, Venables and Williams (1990) have shown that four independent measures of central arousal were all reduced in 101 15-year-olds who subsequently went on to receive criminal convictions in the following nine years.

Lange, and later Rosanoff and his colleagues (1941), showed that monozygotic (MZ) twins, separated early in life, generally have surprisingly similar lives with much greater concordance than dizygotic (DZ) twins. A recent, remarkable single case study is extremely compelling (see Chapter 22, this volume). Adopted children develop physical and mental diseases, including schizophrenia (see Chapter 12, this volume) and alcoholism (Goodwin, 1976; see Chapter 13, this volume), which correspond to their natural rather than their adopted parents.

Evidence for the inheritance of intelligence as well as its modification by environmental factors have been the subject of much debate. In developed countries twin and adoption studies have emphasized that polygenic factors account for up to 60% of the variance of behaviour (Anderson, 1974), but where there is serious environmental disadvantage, a more substantial proportion of the

variance is accounted for by environmental influences (Rutter, 1985). Thus both nature and nurture contribute to individual differences in intelligence. Skodak and Skeels (1949) have shown a moderate correlation ($r = 0.44$) between the intelligence measured at the age of thirteen years of children adopted before the age of six months and the intelligence of their natural mothers. Moreover, Honzik (1957) has shown that this correlation tends to increase with age (see Chapter 19, this volume). Although the correlation between monozygotic twins is somewhat reduced if they are reared apart, the correlation coefficient is still 0.74 (Rowe and Plomin, 1978).

A wide variation of individual characteristics seems to be established very early in life (Thomas *et al.*, 1963; Chess and Thomas, 1984). For instance, it has been observed that babies differ from one another in temperamental qualities—with the above-mentioned authors describing nine of these—activity, intensity, quality of mood, approach/withdrawal, adaptability, rhythmicity of biological functions, threshold of responsiveness, distractibility and persistence. Three syndromes of temperament were defined subsequently—the 'easy child', the 'difficult child' and the 'slow to warm-up child'. There are four additional important issues which merit comment. The first concerns the genetic contribution to temperament. It is undeniable that there is a genetic contribution to temperament—for instance, greater similarities have been demonstrated in monozygotic than in dizygotic twins for some of these characteristics (Scarr and Kidd, 1983). But the crucial question concerns the extent of this similarity in comparison with environmental influences (Plomin, 1982, 1983). Hence it is not surprising that some experts view temperamental characteristics as inherited personality traits, whilst others see them as potentially modifiable by environmental opportunities and expectations (Goldsmith *et al.*, 1987). Second, there is the question of the conceptual relationship between early temperamental style and later personality. Despite much theorizing and some research, the association still remains unclear (Berger, 1982; Goldsmith, 1983). Third, there is the question of stability—the evidence is that some temperamental traits appear more stable than others, at least over early and mid-childhood. Finally, there are some important cross-cultural differences—for example USA-born Chinese and white babies respond differently to minor frustrations (Kagan *et al.*, 1986).

Both twin and adoption studies support a genetic contribution to adult criminality (Mednick *et al.*, 1986), but such a contribution is of lesser magnitude in juvenile delinquency and petty criminality (Cloninger *et al.*, 1982).

Aggression in early childhood mainly affects boys and tends to persist, often being a precursor of antisocial behaviour and delinquency in later childhood. This trend towards stability over time of severe or persistent aggressive behaviour has ominous implications, and one cannot assume that such children will improve spontaneously (Robins, 1978). High serum levels of male sex hormones in aggressive adolescent boys suggest an important likely mediating mechanism (Olweus, 1986).

The evidence for a genetic basis of serious childhood psychopathology is quite strong, especially when based on twin studies—for instance 56% of MZ twins and 7% of DZ twins are concordant for anorexia nervosa (Holland *et al.*, 1984);

68% of MZ twins and 36% of DZ twins concordant for enuresis (Baldwin, 1971); and 36% of MZ and 0% of DZ concordant for autism (Folstein and Rutter, 1977).

Perinatal insults

Impulses in nerve pathways exert an organizing influence on the extent of synaptic connections. Certain environmental events must occur at circumscribed times for normal development. In the same manner neural connections must be intact for these experiences to be effective. If the normal connections are disturbed inappropriate connections are formed, while others fail to degenerate (e.g. Movshon and Van Sluyters, 1981; Archer *et al.*, 1982; Perry and Cowey, 1982). Since deliberate lesions at an early age produce persisting anomalies in neural organization in mammalian brains, perinatal damage and damage *in utero* may have the same effect and may be further compounded by disconnection syndromes. Just such damage seems to occur in schizophrenia, which would be consistent with neuropsychological and neurophysiological findings.

The long-term effects of early developmental hazards depend on the quality of the care-giving environment. A paradigm for this is the subject of 'premature children', who are technically of two kinds—those who are premature by virtue of being born too soon, and those who are too small for their gestational age (Neligan *et al.*, 1976). Any findings may be difficult to explain because often there are close links between such perinatal experiences and relatively poor social environments. Thus once an abnormality in a baby is excluded the premature children appeared to 'catch up' spontaneously, but the small-for-dates babies subsequently showed poorer intellectual and behavioural development. Even so, any poor performance is mainly determined by social rather than biological factors (Neligan *et al.*, 1976); furthermore, recent work clearly demonstrates that now, with modern neonatal paediatric care, even very low birth weight children, if free of serious defect at birth, mostly show an unremarkable outcome (Hawdon *et al.*, 1990).

A high incidence of infant deaths and congenital malformations was reported in the offspring of schizophrenic mothers (Sobel, 1961) and has been confirmed in a controlled prospective study (Reider *et al.*, 1975). There are more birth complications in children born in a group at high risk for schizophrenia (e.g. Mednick and Schulsinger, 1968; McNeil and Kaij, 1973—certain aspects of the work were retracted later (Mednick *et al.*, 1973), but this point remains unaffected).

A larger proportion of schizophrenic patients was small for gestational age at birth (McNeil and Kaij, 1973; Mednick *et al.*, 1973; McNeil and Person Blennar, 1975) and significantly lower in birth weight than their siblings (Lane and Albee, 1966). In those schizophrenic patients with little genetic loading the evidence of birth injury was greater than with those who had a strong family history of schizophrenia (Kinney and Jacobsen, 1978).

Marked anoxia at birth in one of two twins is often associated with schizophrenia in that twin (Pollin and Stabenau, 1968). In monozygotic twins discordant for schizophrenia the affected twin is likely to be left-handed (Boklage, 1977),

suggesting specific left-hemisphere damage. More left-handed schizophrenic patients have enlarged cerebral ventricles than right-handed schizophrenic patients (Andreasen *et al.*, 1982), suggesting cerebral damage in this group. This finding is in accord with a number of neurological, psychological and physiological findings (see Cruzeller, 1979, for review).

The normal, regular, cellular architecture of the hippocampus is disrupted in the post-mortem brain specimens of some schizophrenic sufferers. This may provide an underlying neurobiological substrate for the disorder. The orderly array is dependent on glial tissue and it is believed by some that the glial-dependent guidelines may be disorganized by intrauterine and perinatal damage, as might occur through viral infections and anoxic damage (Falkai *et al.*, 1988; see Roberts, 1991).

Early developmental hazards

Humans and chimpanzees reared for a period in darkness are indistinguishable from the congenitally blind if the visual deprivation occurred early. A review of this work is given in an interesting paper on double lesions to the visual cortex (Dru and Walker, 1975). Recovery does not occur if visual experience is withheld between the two lesions. However, if visual experience is permitted, it must be accompanied by self-produced locomotion for recovery to take place. Gregory (1977) has described a case of congenital cataract removed in maturity. There had been a preservation of the retinal mechanisms, since diffused light could enter the eye. Touch was often necessary for visual perception in this patient and Gregory reports how after running his hands over a piece of equipment the patient exclaimed 'Oh, now I see it!'

At a critical age birds are peculiarly sensitive to visual stimulation. Whatever visual stimulus is presented at this circumscribed period becomes irresistibly attractive (see Chapter 25, this volume). Following exposure to strong stimuli in several modalities, labelled amino acids are incorporated into specific brain regions, demonstrating protein synthesis at this critical period. The phenomenon known as imprinting can be demonstrated only if this protein synthesis occurs (Horn, 1979). Some aspects of this phenomenon can be observed in human infants, who spend more time looking at a familiar mobile suspended over their cot than they do at a novel one (Hunt and Uzgiris, 1964) and, in earlier times, used to be more attracted to their wet nurse than to their natural mother. The concept of the critical period when applied to humans implies that children deprived of certain stimulatory experiences, including proper parenting, are at risk for deficiency of personality, language and educational achievements, which will not/cannot be compensated for by later experiences. However, this rather rigid concept has been replaced by the notion of the sensitive period during which we are more ready, eager and able to learn and acquire specific skills than before or after that period. Thus it is well known that language and musical skills are best learnt in early life—and so too bladder control (Kolvin *et al.*, 1973). The notion of the sensitive period does not imply that such deficiencies are inevitable.

This notion of even limited stability of deficit is not fully accepted by developmental theorists, some of whom claim recovery of intellectual and language skills from even the most adverse life circumstances is possible, provided there is a sufficiency of emotional and stimulatory input (Clarke and Clarke, 1976), but recovery is difficult and may be incomplete (Wolff, 1989).

The caring environment

The impact of the early environment on adult behaviour has been documented in man and animals: the detrimental effects of separation and inappropriate surrogate motherhood on monkeys (Harlow and Griffin, 1965), the taming effect of handling rodents, with an associated better stress tolerance (e.g. Weininger, 1953; Zarrow *et al.*, 1972), the noxious effects of disruptive family environments, and the early loss of a parent (Brown *et al.*, 1973, 1977) all may influence adult behaviour. However, the lack of specificity of the effects of inconsistent parenting, leading in Western man to higher incidences of all mental illnesses rather than any specific illness (Oltman and Friedman, 1967), indicates that there are often, modifying factors.

Early loss of a parent leaves an individual vulnerable to psychiatric illness (Hill and Price, 1967; Brown *et al.*, 1973, 1977). This effect is particularly strong if the loss was of a disruptive type, such as prolonged disharmony at home. The severity of subsequent psychiatric problems is also related to parental loss (Birtchnell, 1970; Brown *et al.*, 1977) with an increased rate of attempted suicide (Greer, 1966).

Attachments

Attachment behaviour can be defined as behaviour which maintains proximity of the infant to care-givers and reciprocally elicits attention and care from them. These attachments are believed to have survival value in that they maintain the proximity of the care-giver to the child and in this way reduce distress in strange situations or illness. It is not possible here to explore these notions in any depth, but this has been done elsewhere (Bretherton and Waters, 1985).

It has been argued that an attachment system is a psychological structure that is hypothesized to exist within a person (Bretherton, 1985). This system regulates infant behavioural patterns and those behaviours evoked from key care-givers (particularly the mother) which are designed to maintain the infant's proximity to and contact with this care-giver, referred to as the attachment figure (Bowlby, 1982). The implication is that the system is biologically determined, the main aim being to enhance security (Bischoff, 1975) while the baby is immature. Bretherton (1985) emphasizes the dual component of the operation—from the observer's viewpoint, the maintenance of proximity; and from the internal perspective of the infant, the achievement of security. Attachment behaviour is most evident when the infant is psychologically or physically stressed, protecting the infant from harm. Bowlby (1973) argues that an attachment system has distinctive internal motivation (Bretherton, 1985), the purpose of which is to achieve homeostasis

between a child and his environment. Thus the attachment system maintains the child in a familiar environment which balances any fear of the novel and the strange—and this allows the child to explore his/her environment under reasonably safe circumstances. The attachment system becomes operationalized in the second six months of life. Bowlby's concept of attachment was of a system that functions in relation to a small hierarchy of familiar individuals that resists re-programming (Bretherton, 1985).

When external threats are minimal, exploratory behaviour can be extensive; with greater degrees of threat the child will prudently return to the secure base. But if the safe base is less than fully responsive, the attachment behaviour will become anxious (Bretherton, 1985); and where the external threats are perceived as maximal, the child may not know how to respond—he may seek clues by checking the mother's face—a phenomenon known as social referencing (Campos and Stenberg, 1981). By continuous monitoring of the environment the child will be able to construct internal working models of the environs, and the significant people in it; over time these become increasingly complex.

The above concepts have been the subject of fruitful research, some of the most creative work being that by Ainsworth and colleagues (Ainsworth *et al.*, 1978). Infants were observed in a *strange situation*, which consisted of being with an unfamiliar adult in a naturalistic laboratory, initially with mother absent. The mother then returned. The responses of the children to their mothers' absence depended on the prior evidence of the mothers' sensitivity to their infants. Responsive mothers tended to have securely attached children who greeted their mothers positively and warmly after the brief absence. Two other reactions were notable—a group of infants who were less positive in their greeting or who actually *avoided* their mothers; and a group who showed angry resistance combined with contact-seeking behaviour. Avoidant behaviour was related to prior insensitivity of the mother to infant signals. The resistant pattern of behaviour related to inconsistency of mothers' responses in the first year of life. It is important to note that early attachment patterns are predictive of nursery behaviour, with more securely attached children subsequently showing better social functioning, including being less dependent on their teachers and more actively involved with peers (Sroufe *et al.*, 1983).

Thus the environment strongly influences attachments. Secure attachments are facilitated by stimulating interpersonal interactions and other forms of affection and attention and by consistent sensitive response to the infant's needs. In fear or illness the infant is likely to become attached to whoever brings comfort. The converse is true in that attachments appear to be impeded by a non-responsive under-stimulating or insensitive environment.

Cognitive Development

Cognitive behaviour or intelligence may be broadly defined as a process of mental functioning which includes abilities such as perception, memory, reasoning and logical thought. Cognitive development is intricately related to the

dynamic interplay between biological, maturational, environmental, experiential and motivational factors (Lerner, 1978). These interactions, as Piaget's theory of cognitive development shows (Miller, 1983; Piaget, 1977) are central to the emergence of what he regards as psychological 'structures' of thinking, the latter of which proceed through four main stages. These are as follows:

(1) The sensorimotor stage (from birth to two years of age). This is dominated by 'action-ridden' learning through the relationship between the child's use of sensori-perceptions (touching, pulling, holding, looking, tasting, etc.), bodily activity and physical objects. A particularly important achievement during this period is the development of the concept of object permanence which entails the child's ability to appreciate that objects and persons continue to exist even when these are not within immediate sight of the child (Piaget, 1954). The development of this concept which begins to establish itself from about six months of age has important implications for attachment behaviours and it also reflects the beginning process of internal representation (Dunst et al., 1982) which only becomes fully developed during the next, pre-operational stage.

(2) The pre-operational stage. During this stage (2-6 years) language assumes a central role and enables the child to deal symbolically with the environment. This is also the period during which symbolic play—e.g. pretending to drink from an imaginary cup—and imaginative play—e.g. using a toy telephone to engage in a conversation with an imaginary other person—reflect the integral relationship between cognitive, environmental and speech behaviours (Shore, 1986).

(3) The concrete operational stage (6-11 years). This sees a progressive upward shift in the capacity for reasoning in terms of abilities such as classifying, number/mathematical concepts and ordering information in a logical manner. These various conceptual abilities are still often dependent on the presence of observable referents and concrete cues, although much less so than in the previous two stages.

(4) The formal operations stage (11 years onwards). The development of truly abstract reasoning and conceptual abilities involving operations such as probability, hypothetical considerations and proportionality become established during the final stage.

The qualitative and quantitative changes in cognitive functioning which occur during these stages are, in Piaget's view, associated with the process of adaptation which is mediated by two further important processes—assimilation and accommodation. Assimilation is the taking in of sensory information into existing organized patterns of experiences and responses that have already been learned—so-called *schemata*. Accommodation is the process whereby existing response patterns (*schemata*) are modified to take account of new experiences and information. For example, in the absence of a toy car, a child may use a wooden block as a substitute play object to represent the sounds and movements of a toy car. In other words, the child's knowledge and experience of play (*schema*) with proper toy cars which he has previously gained (assimilation) enables him to use a different toy object in an appropriate manner (accommodation) to good effect. Assimilation and accommodation are reciprocal processes and the balance

between the two varies from situation to situation. The notion of schema/schemata in Piaget's theory is viewed as highly important. It represents basic actions, ideas and memories—functional elements of cognitive structure—that are built upon and expanded in the course of time and experience and are an integral part of the processes of accommodation and assimilation through which learning occurs.

Piaget's theory remains one of the most influential and productive in the field of developmental psychology (Miller, 1983) and has been applied to the area of psychopathology (e.g. Lane and Schwartz, 1987). However, it is not without criticism. For example, the rate at which different children achieve certain levels of skills and ranges of different skills at each of the stages varies to a much greater degree than Piaget led us to believe. Similarly, children often develop the rudiments of more complex thinking earlier in their development than Piaget thought. Piaget's theory also argues the view that children's thinking tends to change in structure or form when progressing from one stage to another, instead of which the evidence suggests that children's thinking achieves a new or higher level of thought which is a step-up in the sequence of attainment rather than a change (Miller, 1983).

A different theoretical viewpoint on cognitive development has emerged in more recent years, the information-processing model (Baylor and Gascon, 1974; Baylor and Lemoyne, 1975; Swanson, 1985; Borkowski, 1985) which is mentioned only briefly here. It sets out to describe the kinds of intellectual processes (e.g. memory, speed of mental response, control of attention, mental strategies) that are involved when children are receiving, attending, discriminating, storing and recalling information. The strengths of this approach are considered to lie in its ability to highlight the complexity of thought and its specificity concerning different areas of performance (e.g. rules and strategies that may be involved in memory and problem-solving) and in finding out how children arrive at solutions and how they achieve understanding in the course of learning. On the other hand, the information-processing approach derives from the computer model with the shortcomings of such a model. It also has yet to take into fuller account the effects of social environmental influences within the context of a cohesive developmental perspective (Miller, 1983).

From a more general point of view, the expansion of interest and research in children's cognitive development has become quite prolific over the past two decades and we refer to only a few of the numerous areas of study. Within the domain of social cognition, the concepts of fairness, social rules and conventions represent an important aspect of moral development which has exercised the interest of Kohlberg (1980, 1981; Kohlberg and Elfenbein, 1975), a keen follower of Piaget's work. He has identified three main levels: the pre-conventional level which is characterized by self-interest and obedience to avoid punishment or gain reward, rather than by valuing social conventions. This level of reasoning prevails among young children, especially pre-schoolers, and continues up to about 6 or 7 years of age. The second, so-called conventional level is typified by an appreciation of the importance of conforming to social rules, family obligations and considering other people's point of view. This develops over a much wider

age range, from about 6 years through into young adulthood. The third, post-conventional level is the highest and most sophisticated form of moral reasoning. It involves awareness that most values and rules are relative and an appreciation of ethical principles. A longitudinal study of 58 boys over a 20-year period (Colby et al., 1983) revealed that conventional reasoning emerges as important in adolescence and remains the most common form of moral reasoning in adulthood.

Clearly, moral development is linked to increasing age, cognitive maturity and experience, but these factors do not necessarily guarantee the expression of these values and principles. Indeed, the longitudinal study of Colby et al. (1983) found that post-conventional reasoning was not very common at any age.

With the growing concerns over the numbers of children being identified as having been abused or suspected of having been abused, memory—as a preservation of experience—among young children has come to assume an important part of the psychological assessment (Ceci et al., 1987). A review of findings on children's memory with specific reference to child sexual abuse (Fundudis, 1989) shows the following: the cognitive abilities of three-year-olds is often sufficiently well-developed for them to be able to recognize the difference between pretence and reality and this has important implications for ability to recall concrete information, such as facial recognition. Memory ability of both younger and older children is better in relation to recognition (concrete details) than to free recall. Even in older children memory is inclined to be poor in relation to specific details involving times, dates and locations (episodic memory). What children remember does not differ in essence from what adults remember. How much children remember depends on age, language and conceptual level of development and on the form in which their memory is questioned, as well as on the style and manner of the interviewer's use of his or her authority.

Cognitive aspects of depression among children have attracted considerable interest in recent years (Kazdin et al., 1986; Asarnow et al., 1987; Kazdin, 1990). Related to this is the child's concept of death. An understanding of the concept of death as final or irreversible is usually achieved some time after the seventh birthday, during the period referred to in Piagetian terms as the concrete operations stage (6–11 years) (Speece and Brent, 1984). In as much as the concept of death in terms of suicidal behaviour is concerned, it has been found that the fuller understanding of this concept develops with the acquisition of abstract thinking abilities. In Piagetian theory this coincides with the stage of formal operations (11 years onwards), which is when the emotions of self-despair, self-hate and anger are more easily recognized as motivating forces behind thoughts and acts of self-destruction (Carlson et al., 1987). This of course does not mean that younger children do not have suicidal thoughts or engage in suicidal behaviour; rather, it is that the frequency of such behaviour is much lower and the motivating factors less clear cut (Fundudis, 1990).

In summary, the increasing cognitive skills that children develop are part of an emerging process of 'multiple learning' (Maccoby, 1984) based on the interaction between biological and experiential factors. These skills imply mainly intellectual expressions of behaviour. However, in many ways they also involve

other aspects of reasoning which are part of but extend beyond mere intellectual capacity. These include, for example, moral judgement; thoughts and attitudes about suicide and death; and memory in relation to traumatic experiences. Therefore, in psychiatry and clinical psychology it is important that the assessment of the patient's mental functioning allows for the teasing out of which aspects of the individual's cognitive abilities and related thoughts and attitudes are relevant to the fuller understanding of that patient's psychological problems. Such clarification often has important implications for treatment and management of the patient's problems.

The assessment of these factors has to take account of the child's stage of development. As we have seen, this, in turn, is dependent on genetic, pre-natal and perinatal factors which interact with the family and wider social environment.

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