

A DISORDER THEORY OF MENTAL RETARDATION*

D. RUSSELL DAVIS,

Medical Psychology Laboratory, University of Cambridge.

At the end of the eighteenth century Itard was able to hold to the opinion that the mental retardation shown by his famous patient, Victor, the wild boy of Aveyron, was due to the circumstances of his life before his capture when 11 years old. The retardation would be put right, Itard argued, when Victor was brought under a favourable discipline. Although in some respects Itard achieved results hardly yet surpassed, Victor's incapacity in language functions persisted little reduced, and the experiment in treatment is deemed to have failed. Victor's incapacity, therefore, was not only that he had not learned, but also that he did not learn in favourable circumstances. The latter finding has led to the conclusion that Victor was incapable of learning by reason of his constitution. The same conclusion has been reached in numerous cases since Itard's on similar grounds.

This, which may be called the constitutional or the 'too little' theory of mental retardation gained ascendancy at the beginning of the nineteenth century and has now held the centre of the stage for a century and a half. It attributes mental retardation to an inferior constitution, or, as Doll (6) put it, "a congenitally low potential for development not obviously related to disease processes," i.e., to too little mind (as the term oligophrenia implies), or too little intelligence, too little general ability or too little vitality. The retarded are subnormal in constitution and hence in capacity, it is supposed. There are numerous versions of this type of theory. In a letter about a case a neurologist recently remarked: "One feels that his nervous system may not have been put together quite so well as it should be." We might call this the "loose-screw" theory.

There are now reasons for doubting whether the constitutional theory is as generally valid as it has been thought to be. Itard may well have been right after all in supposing that Victor did not suffer from any constitutional weakness. His efforts to teach him may have failed, not for this reason, but because there were obstacles to learning which were the products of experiences in early childhood. This theory will be called the environmental or the disorder theory of mental retardation.

For a disorder theory there are three main sources of support:

1. The evidence that genetical (inheritance) factors play a predominant part in the aetiology of the common forms of mental retardation is inconclusive.
2. Experiments on young animals have revealed mechanisms, disorders of which could be responsible for retardation in mental development in children.
3. Clinical studies of retarded children provide evidence compatible with a disorder theory.

A comprehensive survey of the evidence in each of these three fields of research would require several papers, and here only the main points can be indicated, many of which are still controversial. Genetical and environmental theories are not mutually exclusive, but complementary. The cases of mental retardation to which

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reference is made below showed no structural abnormality or metabolic dysfunction, but the disorder theory applies also to cases in which there are aetiological factors of other kinds as well.

1. THE EVIDENCE IN SUPPORT OF A GENETICAL THEORY

The support for a genetical theory has its roots in the work of Francis Galton. Whereas Itard worked in the climate of opinion of the French Revolution, Galton, who established the modern study of individual differences in man, worked in the very different climate prevailing in England in the middle of the last century. Greatly influenced by the theory of his relative, Charles Darwin, he became interested in the modes of operation of natural selection in man, and hence in the part played by genetical factors in determining individual differences. Accordingly, he showed a strong bias towards the view that individual differences reflect differences in genetical constitution, and often showed the most extreme neglect of the possible influences of the environment. Admittedly he demonstrated, in certain of his samples, that the only child, and the first and the last child in a family, is more often eminent than a child occupying another position in the sibship and attributed this greater prowess to the enjoyment of a closer relationship with the mother (7).

Nevertheless, Galton claimed that his studies of the family trees of the eminent showed eminence to follow certain lines with a frequency and a clarity belying any explanation in terms of the environment. Yet there is no evidence in pedigree studies of this kind which can decide between a constitutional and an environmental theory, and his conclusions are no more than a reiteration of the then readily acceptable view that position and power are held by virtue of birth rather than fortune. It may be comforting to us to suppose that there are genetically superior and also inferior families, but there is little justification for doing so.

The tendency for mental retardation to run in families has probably received more emphasis than it deserves. That there is a familial tendency is not to be denied (15, 17), but the better families have probably been under-represented in the samples from which conclusions have been drawn. Certainly, samples of adults drawn from mental-deficiency hospitals contain an undue proportion of poor and broken families, and the better families are not adequately represented in them, nor in samples of children ascertained as E.S.N., for these families tend to make other arrangements for their invalids. At any rate, mental retardation to the degree of educational subnormality occurs not infrequently in the children of parents of apparently good genetical constitution.

In our sample of children with intelligence quotients in the E.S.N. range, about thirty per cent of the fathers have occupations in Class I and II on the Registrar General's Classification, and only about twenty-five per cent in Class IV and V. Usually, rather over fifty per cent are found to be in Class IV and V. One reason for this bias in our sample — which is very different from that in most samples — is that it is drawn from a specialised, teaching hospital clinic to which cases are sent for diagnosis and research. Doctors, whether general practitioners or school medical officers, tend not to refer cases from poor families, for such cases appear to pose no diagnostic problems. This is only one of the several reasons why cases are not referred.

That mental retardation occurs in families of apparently good genetical constitution raises difficulties for a genetical theory, although these are not insuperable. That it occurs relatively commonly in families of apparently poor constitution is equivocal evidence. It may be inferred that the children of such parents are poorly endowed genetically. On the other hand, it can be directly observed that the care

and discipline such parents provide for their children tend to be inferior. The evidence from studies of the mental development of children fostered in homes of various qualities gives as much support to an environmental as to a constitutional theory (5).

Galton gave greater precision to the study of individual differences by showing that when measurements are made of qualities in large samples, they tend to have a characteristic inverted-wine-glass distribution. He went on to argue on statistical grounds that distributions like this are produced when the degree to which the quality is possessed is determined by multiple factors, each of which has only a small effect. Work on intelligence scales has been based on the assumption that intelligence is a quality so determined, and that the retarded are not a species to be sharply distinguished from the least intelligent of the normal, their condition being the product of unfavourable combinations of multiple factors; they lie at the inferior end of a more or less normal distribution. It does not necessarily follow, however, that, as has commonly been supposed, the factors are predominantly genetical. It could equally well be that they are all environmental, or, more likely, some genetical and some environmental.

The manner in which the genetical factors are distributed has been studied over many decades. On the other hand, very little precise knowledge has yet accumulated about the possible environmental factors, their nature and the way in which they bring about their effects. Indeed, it is still very puzzling when mental retardation occurs in a child brought up in what appears on superficial enquiry to have been favourable circumstances. It is worth remembering, however, that until the Bacillus Tuberculosis was discovered, tuberculosis was attributed to a weakness in constitution, although dampness and over-crowding were thought to have something to do with it. Multifactorial determination is likely to seem less important when those factors in mental retardation which correspond to the Bacillus have been identified. The emphasis on multifactorial determination has discouraged attempts to define the factors.

Galton suggested that further support for the theory that the multiple factors responsible for individual differences are mainly genetical would be found in the comparison of identical and fraternal twins. Evidence like this used to be regarded as crucial, and the much greater concordance of identical twins than fraternal twins in respect of intelligence used to be accepted as conclusive evidence in favour of the genetical theory. However, the assumptions underlying twin research now appear less acceptable (19). In any event, were it supposed that the results in respect of intelligence show that genetical factors play the leading part in the aetiology of mental retardation, it would also have to be supposed on similar grounds that genetical factors play the predominant part in the aetiology of tuberculosis. The most satisfactory evidence would come from comparisons of identical twins separated and brought up from birth or early childhood in different environments, but is difficult to obtain in practice for lack of case material.

The ascendancy of the genetical theory in the nature-nurture controversy has particularly influenced the significance attached to intelligence test scores. They have been assumed to reflect, not only the degree to which certain mental abilities have been developed at the time of testing, but also the degree of intelligence fixed more or less at the time of conception. This latter, now somewhat surprising assumption has been justified on various grounds, but especially by reference to the constancy of the intelligence quotient. A parody of the argument would be thus. When one measures the height of a person, one measures not only his actual height at the time, but also his potentiality for height, since the rank order he takes in the population tends to remain constant.

The parody might be carried further. Height, the product of many factors, is affected by such things as nutrition and acute and chronic infections. Improvements in nutrition, the reduction in the frequency and severity of infections and probably many other factors have led to a big reduction in the frequency with which physical growth in childhood is stunted and a steady increase during the last few decades in the average height. If a similar importance is attached to the environmental factors in intelligence, we can reject the gloomy prognostications of those who see in the greater fertility of the unskilled working class a serious danger to the quality of the stock. On the contrary, we may be optimistic that improvements in the psychological conditions in which our children are brought up will lead to improvement in mental stature as impressive as those which in recent years we have seen in physical stature. Unfortunately, we do not know in what degree improvements in mental stature are already occurring, because there are great difficulties in getting satisfactory evidence.

Those who adhere to a genetical theory of intelligence tend to argue that mental retardation begins at conception or at least at birth; they thus suppose it to be congenital. They assert, therefore, that the diagnosis can be made in the first year of life, although there may be technical difficulties in doing so. But the balance of evidence is now contrary to any such assertion. The diagnosis may perhaps be made in the first year in cases in which there are structural defects or relevant physical signs, but in cases without these signs the rate of development in the first two or three years of life correlates poorly with intelligence quotients measured subsequently. In a substantial proportion of cases retarded to the degree of educational subnormality, the history suggests that development during infancy was normal. Retardation in the first year does not preclude normal intelligence later on.

Those who attribute mental retardation to an inferior constitution tend also to argue that the retardation affects a wide range of mental functions. Yet this argument too is precarious. In most cases, mental development has been distorted as well as slow. The functions especially affected are language and educational ones, and then often far from uniformly. Psycho-motor development may be well advanced. It is often overlooked, although it is of great importance, that the mentally retarded tend to show serious disturbances in their social relationships. Disorders in certain other aspects of development are unduly common, although they occur only in the minority. In our series, for instance, as in other series, about 15 per cent are left-handed, or show a poor development of handedness; about a quarter are cross-eyed; the majority were late in achieving control over urination at night; defects in articulation are also unduly common; if all degrees are included, they occur in at least one half. These disorders are explained at least as well by an environmental as by a genetical theory. Moreover, in many cases of mental retardation, such clinical features as lack of concentration, fleeting attention and negativism suggest that the learning processes are disordered rather than sluggish.

Many types of mental defect show physical malformations, and these may be attributed to specific pathogenic genes, or, more often than used to be supposed, to environmental factors affecting pre-natal development. Metabolic disorders, like phenylketonuria to which recently a great deal of attention has been paid have been demonstrated in only a very small proportion of cases. The majority of any group of mentally retarded are of normal physique and show no defect in constitution or metabolic dysfunction. It is occasionally claimed that they look strange or stupid, but such claims do not bear examination. It is still possible to argue as Maudsley (13, p. 341-2) did, that there is "injury done to the very fine tissues of the brain and their occult molecular processes which although impenetrable by our most

subtle means of research is still so serious as to be irreparable." It seems at least as reasonable an assumption, however, although the weight of tradition is against it, that there is no significant constitutional defect, and that the retardation is the result of psychological experiences, and is moreover, potentially reparable. This assumption dismisses genetical factors as of minor importance. It does not deny that they make some contribution to aetiology.

2. SOME ANIMAL EXPERIMENTS

What then are the psychological experiences responsible for mental retardation? Some interesting suggestions arise from some recent studies of animal behaviour, of which three will be mentioned here as examples.

- (i) Hebb, amongst others, has shown that rats and dogs brought up as pets with a free run of a varied environment show greater learning and problem-solving capacity, i.e., they are more intelligent than animals reared in the restricted environment of a cage; the lower the age at which the more varied and stimulating experience is gained, the greater is the effect (e.g., 4).
- (ii) In an analysis of the reasons for failures in training as guide dogs for the blind, Pfaffenberger and Scott (16) brought to light these facts. The percentage of failures was low, about ten per cent, when the dogs were removed from kennels to foster homes before they were thirteen weeks old. It rose steeply for each week after thirteen weeks that the dogs were kept in the kennels. It was high, above seventy-five per cent, when they were kept in their kennels for eighteen weeks or longer. The failures were mainly due to inability to take responsibility and to exercise judgement in meeting unusual situations.

They explained these facts along these lines. Primary socialisation in the dog, i.e., attachment to litter mates or to a human being, begins at about three weeks old. It takes place little or not at all after thirteen weeks old. That is, as Scott has shown in other studies, the critical period for primary socialisation in the dog is from three to thirteen weeks. The regime at the school allowed some contact with humans from eight to twelve weeks old; after this a dog formed a more definite attachment to a human being in the foster home, where he stayed until he was a year old, when intensive training in the school began. If he did not get to a foster home soon enough, he formed a weak attachment only to a human being, and his capacity to be trained as a guide dog was more or less severely reduced. He did not benefit from instruction in the ordinary schools, if primary socialisation had not taken a normal course.

- (iii) From experiments on the effects of removing goat kids from their mothers for short periods immediately after birth, Liddell (11) came to the conclusion that the mother normally becomes a "conditioned security signal" and protects the young animal from the effects of stress. If a kid is removed immediately after birth, and the normal process of attachment to the mother is disturbed, he becomes especially vulnerable to stress.

Liddell's experimental subject, the kid Jill, showed some features of mental defect. Exploratory behaviour, even in the presence of the mother, was greatly reduced, and she tended to show freezing and immobility. Conditioning took place much less easily and produced more disturbance. By acting as a conditioned security signal, the mother relieves anxiety, and this is one of the ways in which she protects the young organism from excessive or noxious stimulation. Is mental defect the result of failure in this function?

These and other experiments on young animals have suggested several hypotheses which might explain mental retardation in children. Four hypotheses of topical interest will be discussed below.

The critical period hypothesis

Students of animal behaviour have drawn attention to a number of instances in which habits are acquired during a limited period only (e.g. 18). They are learned very slowly at other times if at all. Lorenz's studies of imprinting provide perhaps the most dramatic example: The young goose forms an attachment to the mother goose or a substitute within a minute of two after hatching. Similarly, as Liddell has shown, the goat kid forms an attachment to the mother within the first hour after birth; if it does not do so then, it does not do so at all. Primary socialisation in dogs takes place rather later, within a critical period lasting from about three to thirteen weeks. Territory habits are acquired by male dogs as soon as they become sexually mature. Chaffinches lose the ability to learn songs after they are thirteen months old.

A possible reason, therefore, why Victor remained deficient in language functions despite Itard's efforts to teach him is that there is a critical period for the learning of these functions, which had passed. Humphrey (8) made a similar suggestion in his preface to his translation of Itard's monograph. "Training," he wrote, "may be too early or too late."

There appears to be a critical period for the learning by children of social habits akin to primary socialisation in dogs, the rough limits of which are five to eighteen months old. The study of deaf and autistic children suggests that there is a critical period for learning to discriminate speech sounds auditorily, extending from about nine to thirty-six months old. The critical period for learning to control urination is contemporaneous; that for learning to read, from five to eight years old. On the other hand, the evidence obtained from the study of cases of congenital cataract after operation which purported to show that there is a critical period for learning to discriminate shapes visually is now regarded as worthless.

The evidence that there are critical periods in children for the learning of these and other functions is at present inconclusive and confused, but the hypothesis appears promising and has seized the interest of several psychopathologists (2). The next question is: What are the reasons for the decline in the capacity to learn? One possible answer is that learning is rapid during the critical period because needs are then strong and have not been met in any other way. For instance, in his second year, the child begins to achieve the satisfaction of several pressing needs through the establishment of social relationships and through speech. If circumstances are not then favourable, and fear reactions are repeatedly evoked, he may withdraw into autism and protectively shut himself off from social relationships. He does not then learn to speak, and soon ceases to listen to speech, although he may continue to listen to some inanimate sounds. Again, the nine-year-old non-reader develops strong avoidance of reading and seeks elsewhere for substitutes for the satisfactions which success in reading would have given him.

The mentally retarded child has not learned at the normal age, it may now be supposed, because circumstances have been unfavourable. He does not learn later in more favourable circumstances because the critical period has passed. If more were known of the reasons for the decline in capacity to learn, it might be possible to work out new, more effective methods of remedial teaching. In any project of this kind, account must be taken not only of the late development of mental functions, but also of the disorder of the functions already developed.

Primary socialisation in man

The second hypothesis to be discussed is that mental development only proceeds normally if primary socialisation has come about normally. This is similar to Bowlby's well-known thesis, although it differs in certain respects. Bowlby has stressed the necessity for a close relationship with the mother, and the origins of psychopathic traits in disturbances of this relationship. His model has been imprinting in geese and goats, and in his recent analysis of the child's tie to his mother (3) he has placed the emphasis upon the instinctive needs to cling, to follow and to suck, which are active in the first few months after birth. He has also been impressed by what he calls "monotropy": the attachment to a single person.

However, a better model would appear to be primary socialisation in dogs, which occurs at about the time of weaning. The attachment may be made to a human figure, but more naturally it is made to litter mates. The corresponding process in man probably takes place between five and eighteen months old and its failure affects all aspects of mental development. It is not necessarily the mother-figure to whom the attachment is made. The attachment is not necessarily to a single person. This is an area in which research is likely to be carried out in the next few years. It may well be that the tie to the mother or to others has several strands, some instinctive, as Bowlby has suggested, and some the product of experience.

At any rate, it appears likely that some of the causes of retardation are to be found in disturbances in socialisation. If this is so, the first step in treatment is to try and improve the relationship of the child with a parent or guardian. Primary importance should be attached to this relationship in my view and not, as may perhaps be justified in other types of case, to that of the child with the psychiatrist, which can only be temporary and extraneous. Incidentally, the recent emphasis upon the child's tie to the mother has had surprisingly little effect so far upon the methods of child psychiatrists, many of whom continue to separate the child from his mother as soon as he enters the clinic.

The influence of the discipline upon mental development

Mental development, it may be supposed, consists largely in the acquisition of functions, abilities, habits and skills through the processes of learning. Its rate and pattern would be expected to depend, therefore, upon what may be termed the discipline in the home. By discipline is meant the sum total of the conditions affecting learning.

This expectation has been borne out now in numerous investigations, in which it has been shown that the degree and pattern of mental development is correlated with the discipline in the home. Levy's studies (10) of the effects of maternal over-protection on educational attainment are well-known. In my laboratory Kent (9) has shown that the verbal and practical intelligence of eight-year-old children differs according to the character of the discipline, and Lynn (12) that it varies with motivational factors in the family. Louis (unpublished results) has demonstrated certain consistencies in the disciplines to which E.S.N. children have been subjected. Even in the first few months after birth, the rate of mental development is influenced by the discipline, as Blank (unpublished results) has recently shown.

These investigations are the counterparts of Hebb's studies of the effects of the discipline upon the learning and problem-solving capacity of rats and dogs. They help to define some of the environmental factors determining intelligence, although the methods used in the studies of children have of course short-comings, which do not affect the animal experiments.

Mental retardation, the result of stress

When the causes of mental retardation are under consideration, however, Liddell's experiments appear to provide a more valid model than do Hebb's. They suggest that impairment in learning capacity is due to stresses to which the individual is especially vulnerable because of disturbances in the attachment to the mother or other parent figure. In the absence of adequate conditioned security signals, the young child's behaviour becomes disorganised in reaction to stresses. Since these vary in severity, and may be acute or chronic, the retardation may occur as a sudden arrest in development or be insidious in its onset.

The disorganisation may be shown in many different ways. Liddell regards the effects demonstrated in kids as akin to Pavlov's experimental neurosis, but for several reasons psychosis would appear to be a better term by which to describe the effect in children, although this term has been used in more specialised senses. In the literature there are a large number of clinical papers which discuss whether mental defect may be due to psychosis (e.g., 14). The clinical features would have been found to be compatible with this view in a larger proportion of cases, had the term psychosis been given a broader meaning. Bourne (1) has coined the term "protophrenia" in order to describe cases in which mental processes have not become integrated, usually, he found, because of grossly perverted rearing. We can keep out of this controversy if we use the term disorder, which is precise enough for the present.

3. THE CLINICAL EVIDENCE

The children who become retarded do so because they have been insufficiently protected from stresses. The mother is the main shield in our culture. Is there clinical evidence in support of this theory? To pose a more specific question, do the mothers of retarded children show any distinctive features, other than a tendency to be unintelligent?

We have recently made a number of observations on this point, and can hazard some tentative conclusions. Amongst other things, we have compared the mothers in a select group of 12 retarded children, aged between two and five years, without organic signs and coming from fair or good homes with the mothers in a control group of 12 children examined in our clinic under similar conditions. These children were miscellaneous, the majority being retarded in speech but not generally retarded.

The mothers of the retarded children had as a group grown up in homes disturbed by the loss of a parent or by open conflicts between the parents. They had displayed unfavourable attitudes towards the child before its birth, as well as after it. They had not formed a good attachment to the child during the period five to eighteen months old.

These conclusions, which still require elaboration and confirmation, are hardly surprising, but their interpretation is controversial. Adherents to a constitutional theory admit the incompetence of the mothers. They attribute it to lack of intelligence. They deny that it is casual. The disorder theory does not specify the reasons for the incompetence and allows that they may be several and various. It supposes the incompetence to be casual.

There is a further difference of the utmost importance. On the constitutional theory, the incompetence, being also constitutional, is irreparable, and the retardation of the child is irreparable. The disorder theory allows that the mother can be helped to play her protective role better.

We come back, therefore, to Itard's experiment in treatment. When we repeat it, as I hope we shall all do on many occasions and in many variations, we shall be wise to do so with children much younger than Victor, and to treat not primarily the child, but the mother-child and the family.

Prevention is better than treatment. If we are to achieve any degree of success in prevention, then health visitors, psychologists, social workers, teachers and physicians must co-operate in the support of families. If families are to thrive, they need the material, social and cultural conditions to do so. We who are concerned about mental health, not only this week and this year but every week and every year, must speak out loudly and clearly, and with growing knowledge and experience, in favour of the public policies which will instruct, help and encourage mothers and fathers in the carrying out of their functions of protecting their young children during the vulnerable stages of their mental development.

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