

Childhood Autism - I: Developmental Origins .

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Childhood autism is so disabling that it is usually considered an illness or severe psychiatric reaction. I do not myself agree with this interpretation. I would like to suggest how such an array of bizarre behaviour, language defect and social impairment can be the product of distorted development. By distortion I mean not so much a disruption of the child's relationships (though this will be an inevitable consequence) but a distortion of his capacity to make sense out of his world and hence of the people around him so that for that reason he will relate abnormally to them - and indeed initially to everything else.

From the very beginning of our life, from babyhood, this capacity to make sense of our world depends on a very active process. Babies are very busy people, editing, as it were, what they see and hear into a coherent pattern which of course changes as they themselves extend and modify it. Such a process is basic to a child becoming a communicating individual because it equips him not only to recognise with whom he is communicating, but what he is communicating about. However simply we view language, from its very beginnings its fundamental use by children is to vocalise to people, about things, situations or events in their own simple way. Hence communication and social awareness in babies both have their foundation in this emerging active interest in making sense of their world and it is in this very basic process which the defects of the autistic child lie. Such defects may be of varying severity therefore autistic children lie on a spectrum of disability from totally non-verbal, non-communicating, inaccessible children, to children who chatter, making sentence though oddly in all oddly inflected and socially inappropriate manner, revealing not only in their speech but in all their behaviour their inability to recognise normal social constraints. What are these defects? The object of these two papers is to describe them and the manner in which they divert the autistic child from the normal process of language acquisition and social response; in the second paper to show how such a process produces a distinctive clinical picture which can be differentiated from other children with severe communication and behaviour problems.

The development of communication and social response in normal children presupposes an interest in and awareness of their world to an extent which we all take for granted and with which their vocal output is closely related. When babies are very young - within their first few weeks, most of their vocal repertoire is concerned with their internal state. The baby grizzles or cries when he is hungry or wet and coos when he is full and warm. Quite soon however he begins to phonate, and without yet articulating or using any sort of babble, to change the pitch of his voice in ways which convey to his parents quite an array of messages revealing his awareness of the world around him. This vocal repertoire is well established by the age of six months and can be demonstrated experimentally. Its nature is best described by outlining the experiments which are conducted.

I recorded a number, initially six, normal six-month old babies. They were all first children who had only heard the language of their parents and were recorded each week over one to two days in everyday unstructured situations at home. From listening to these recordings it became apparent that all the babies were making certain sounds in similar situations. For example, if a child wanted something he made a simple distinctive vocal signal with a brief rising inflection, which was remarkably similar for all the children. They made other signals when greeting, e.g., their parent, when wanting

something but being unable to reach it eg. when frustrated, and when faced with something unusual but pleasing. This led me to arrange a number of standard situations, common for each family in which these signals could reliably be elicited, producing a tape for each child on which was recorded the four signals for request, frustration, pleased surprise, and greeting. Equipped with these recordings I constructed a listening tape for each parent on which 4 babies were presented, each producing the 4 signals, though each in a different order. One of the babies in each tape was the baby of the parent listening to it, another was a baby brought up in a different speaking environment (I had also recorded several children of the same age who were first children of overseas colleagues), the other two were selected randomly from the original group of recorded babies. I then asked each parent three questions having given them the tape to listen to for as long as they wished. The first was to identify each of the signals (sixteen in all) produced by the 4 children; the second to identify the non-English 'speaking' baby. Findings of the results are presented elsewhere [1] but the fascinating and quite unexpected result was that the parents could identify the signals but could not identify their own baby nor the non-English speaking baby. The work was then extended and the results confirmed. It seems then a very important developmental stage in the manner in which our babies communicate with us is that as early as six months they are able to convey, with very simple vocal signals, i.e simply by voice inflection messages which we recognise more readily than the identity of the child, and further more that these signals seem to be independent of language background. From the evidence available it seems that autistic children do not produce these signals Why not?

In the context of our current discussion it is important to be clear, as far as possible, what these signals are conveying. As indicated both from the recordings and the experimental work these signals are not produced in response to the parents reaction nor indeed (except of course for the greeting signal) whether they were there or not. In short they do not seem to be audience dependent. They may not even be dependent on intact hearing since we do not know as yet whether deaf babies produce these signals at this stage. What the signals do depend on seems to be an already well established capacity to make sense of a wide variety of sensory information. This is evident because the same signal can be elicited by very diverse circumstances; for example eliciting a request noise depended on showing the baby a meal when he was hungry and it was very clear that it did not matter how it was presented, who did it or where, so that the baby was able to extract from a wide variety of experience a particular 'sense' and responded it seems almost automatically with a signal 'this is something I want'. The manner in which all the children made a particular order out of diverse situations as revealed by their vocal signals was impressive.

The same experiment cannot be conducted with autistic children that young, simply because they are not diagnosed as early as six months. However, the same experiment was conducted with autistic children aged between 2 years and 2 years 11 months. The results were very different - each autistic child had a repertoire of signals which their parents immediately recognised. However they could not recognise the signals of any other autistic child. This was for the simple reason that their own child's signals were quite idiosyncratic, i.e they were distinctive to their own child. Interestingly they could recognise the signals of a retarded non-autistic child of the same age because they sounded "normal". It does seem that autistic children eventually do make efforts at conveying the same sort of information vocally as normal children. However they do not produce the same common vocal signals as normal children - though retarded non-autistic children do. Such was the nature of these inflected idiosyncratic signals in the autistic child that they gave the impression of being "thought up" and suggesting that was necessary because at the time when they would have been naturally released the child was unable to make them. This was clearly not due to any motor inability since all the autistic children had a history of active phonation as babies, but was perhaps due to their inability to make the same sort of sense, or perhaps any sort of sense, out of their world which would have given it structure and revealed to the child those common qualities in diverse situations which elicited the signals so spontaneously in normal babies. Whereas, as young as six months the normal baby is already beginning to regularise his experience, and develop a horizon of expectations so that he knows what is pleasing, and what is familiar, this whole process may be absent or severely defective in the autistic child, a defect revealed to us in his inability to produce simple vocal inflections (of which he is quite capable) which signal to parents their normal child's growing awareness. Parents of autistic children do not recall their children making these signals, though often their absence is unnoticed except when compared with the vocal behaviour of their younger siblings.

The next stage at 10 months or so is the emergence of babbling which consists of back vowel/front consonant combinations eventually strung together and conversationally inflected. The baby at this stage, often babbling while lying by himself in his cot, will sound to his parent as if he were conversing. The autistic child does not inflect his babble this

way, but tends to utter strings of phonemes repetitively producing a much more monotonous sound. The back vowel/front consonant combinations typical of this stage are usually interpreted by parents as words, e.g. "mama", "dada". Understandably parents believe that they promote these words by providing them as models themselves encouraging thereby the child to imitate. In so doing, they feel he refines his vocal output more closely to approximate to the model they provide and in this way embarks on his first words. In fact the normal child will produce "mama" sounds quite indiscriminately. He is as likely to repeat them, certainly from a tape recording, whether his parents, another adult, he himself or another child has produced the sound. Accepting of course that the baby's vocal response depends on a great deal more than simply the sound he hears, it is quite remarkable how indiscriminating he is. In contrast the autistic 2 year old takes a great deal of notice of the acoustic qualities of the sounds he hears, so that he will imitate a phrase that is his own and ignore a similar phrase produced by his parents or by a child of the same age. The whole role of imitation seems to be quite different with autistic children; ironically they are much more sensitive to and reproduce much more accurately sound models provided. The major difficulty however is that they do this very selectively tending to imitate only themselves. In contrast the normal child is largely unconcerned about the identity of the speaker, or at least the acoustic qualities of his voice and is much more interested, even at one year old, in the nature of the spoken message however simple it is. It does seem from this evidence (and these points have been experimentally demonstrated) [2] that the autistic child is not interested in 'message', which could require him to be making sense out of what the message conveys, and so concentrates his attention on the acoustic properties of the sound. Thus equipped he will refine this capability to become the skilled mimic we know him to be. Such a skill is the basis of his echolalia and the ability of the autistic child not only to echo the content but also the accent and inflection pattern of the utterances he hears. He has ironically little inflection pattern of his own as is revealed by his monotonous repetitive babbling.

Between his first birthday and 18 months, though sometimes earlier, the normal child begins to produce words which he attaches as labels to objects of interest around him. The most significant point about this process comparing him with the autistic child is that the normal infant will label in this way a wide array of objects incorporating them by the label into one category. Parents are well aware of this behaviour. At this stage the normal child will draw attention to e.g. all animals or all vehicles and call them by one label, usually sharing this experience enthusiastically with his parents. By so doing he reveals again that he is interested in and actively abstracting categories out of his experience. The groups of objects he gathers together into one category may be initially very diverse and even idiosyncratic to him. This is further evidence of the emerging capacity of the child to regularise his experience. Later the categories that children establish and label conform with our own, e.g. a child may initially label all vehicles as 'car', but soon afterwards he will distinguish cars (which he may still call 'cars'); later still he will use more conventional labels (car and bus). At this stage, the normal child is again revealing in his language his interest in making order and communicating it. The autistic child's first words are quite different. The most important contrast is that they refer to highly specific objects, i.e. one car, probably his father's. Whatever label he attaches to that, he would not attach to any other car simply because in the detail and highly specific way he experiences his world other cars will look different (as indeed they are). This means that his early vocabulary is a series of highly specific discrete labels, usually accurately pronounced, but in no way communicating an interest in categories or sharing an experience as is the case with a normal infant.

This vital capacity to see regularities in his experience is extended in a normal child to the conversation he hears around him, so that in ways which we do not yet understand, he is able in the second half of his second year to extract rules which no-one teaches him, yet equip him to construct phrases. By this time he will have a vocabulary of labels but gradually resorts to conversing in phrases which we all understand, though we only hear them in the young child, i.e. phrases like 'Daddy push car', 'want more milk', 'go out now'. These phrases always make sense; the child somehow knows which words to put in and which to leave out, always presents them in the right order and indeed with the right emphasis - using, for example, 'daddy push car' (and not mummy) or 'daddy push car' (and not pull it) appropriately. How does he know how to construct such phrases? Nobody around him talks like that to provide him the models. Yet he has the ability to formulate an infinite array of such phrases, none of which he has necessarily heard before. In my opinion this is yet another example of the normal child's emerging capacity to establish and utilise regularities in both his visual and auditory experience. It equips him a little later to grasp without apparent effort the normal rules and constraints of grammar, using plurals, past tenses and so on in the effortless manner in which even quite retarded children embark on their mother tongue. The autistic child does not do this. Unable to recognise, formulate or put to use these regularities they build their language out of what they have heard using it with highly specific connotations so that their parents know that both their understanding and use of language depends entirely on context. Some autistic children are extremely

skilled in this way, but when tested have no real grasp of language as the toddler with his phrases is using it.

As the normal child so effortlessly develops his cognitive processes; establishing order in his world and from this his communication system, he is also fashioning another skill which is fundamental to his enjoyment and indeed to his management. This is the emergence of play. As the normal child begins to recognise similarities between the diverse items of his experience (to which he then attaches a word label) he must abstract a general, all embracing impression of these items which then becomes a symbol for him. For example, as the child recognises that the whole array of different vehicles or any other grouping he finds interesting, are basically the same he must in so doing establish for himself a model or symbol for that particular category. The results of doing this are very striking and readily seen if one offers such a symbol, i.e. a toy car to children before and after this stage of recognition has been completed. Given a toy car the 13 month old child will handle it, may rub it against his face or throw it on the floor, whereas the 2 year old given the same toy will run it along the surface of the table, make a noise of a car or drive it into an imaginary garage. In short, for him the toy is a symbol of all those items of his experience which he has put into one category and given a label 'car'. He has embarked on representational play. It is one of the most contended and time-consuming processes in the growing child's life. It is denied to the autistic child. Autistic children unable to establish categories or formulate labels are thereby unable to recognise symbols in this way. The play of an autistic child is very striking, tending to be repetitive exploring the physical qualities of the plaything whatever it is. Their vulnerability to ritualistic obsessional 'play' is well known. It is part of the price they pay for the very basic cognitive defects with which they struggle. This struggle is also seen in their preoccupation to maintain the same arrangements of furniture, their need to maintain a familiar and predictable routine and to follow the same route from one place to another. Since they have such difficulty in creating order out of their experience, it is clear that they will cling desperately to the order they know, both spatially and temporarily. For this reason they will become the rigid, anxious and obsessional children we know them to be. Even their play may well reveal this need for creating and maintaining their own artificial order. Many of them characteristically line up or stack objects meticulously as part of their play, and are upset or furious if the lines or stacks are disrupted.

As the normal baby grows into the infant and toddler he very actively engages himself in the whole process of organising his experience, seeking regularities and categories which are revealed not only in his behaviour, but in each step of his language acquisition. His early vocal signals demonstrate this process as do his first words and his remarkable ability to construct toddler phrases. These fundamental communicative stages are absent in the autistic child because the underlying cognitive process which generates them is either absent or seriously defective. This is all the more disturbing because this cognitive process, unfolding daily before us in our normal children is little understood and taken largely for granted. We have very little understanding of the neurophysiological equipment which presumably matures in a child to carry him along this cognitive pathway and equip him spontaneously and with such ease to generate normal speech. In what way is this equipment (whatever it is) distorted in autistic disability? It may be that some clue is afforded by the peculiar assets of the autistic child. These include their acoustic sensitivity, and hence their mimicry and skilled echolalia, their sense of direction and visuo-spatial skills, their ambidexterity and absence of a 'preferred' eye, and their acute awareness of locations and arrangements. All of these have been demonstrated as minor hemisphere functions. In contrast their defects including language acquisition and a grasp of symbols are functions associated with the major hemisphere. It is tempting to think of these children as not developing cerebral asymmetry, so that they emerge as children with two minor hemispheres assuming that the rest of us in the course of our early years gradually establish major hemisphere functions as we develop the asymmetrical use of our cerebrum. Certainly the very basic difficulties of recognising categories, editing experience in this way and retaining and generalising such order in our experience is a profoundly disabling defect of a developmental process which is so vital that we do not recognise its absence in these tragically affected children. In some of them this process may have been obstructed or interfered with by some cerebral insult, but clearly there are some autistic children where no such insult has occurred so that in my opinion we need to account for their tragic array of disabilities by a serious defect in development.

1. Ricks D M, Vocal communication in preverbal normal and autistic children. In: N O' Connor (Ed) *Language*

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2. Ricks D M, Making sense of experience to make sensible sounds: Experimental investigations of early vocal communication In: M Bullowa (Ed)

