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Some Contributions of Experimental Psychology to Understanding the Minds of Children

One of the questions that seems to have always interested people concerns the way in which other people experience events around them; what it's like to be someone else and see the world from their point of view. Exploration of this problem seems central to humanistic psychology, and much of the work that is done appears to be directed towards achieving a better understanding of the thoughts and feelings of other people. The reasons for doing this are headed by the belief that understanding others is an important part of developing personally, but I think must include curiosity as well.

The main difficulty in the way of understanding what it's like to be someone else is, of course, that experience is something that can't be transmitted from one person to another directly but must be communicated through other channels, so we can never be certain that we understand correctly. This problem may not be very important when we are just wanting to satisfy ourselves that we understand (as happens in groups), but if we want to convince other people (science?) it becomes pressing, and for a long time experimental psychologists have avoided tackling the question of experience and concentrated instead on what people can be seen to do. This stance now seems, however, to be less universal, possibly because many people have become convinced that certain knowledge cannot be attained in any field of inquiry, which makes the inquiry into human experience somewhat less daunting. Many experimental psychologists are now willing to use the methods of study available to them to try to understand other people's experience, and to try to build up a picture of the mental world of the child as he develops toward adulthood. The results of this enterprise may be of interest to humanistic psychologists, and I would like to outline a selection here. My aim is both to show something of what has been achieved so far and to show that it is still, as always, necessary to view these achievements with caution and scepticism. The topics selected, although to some extent arbitrary, should illustrate some of the strengths and weaknesses of the approach.

One of the most important questions that can be asked is how the very young infant views the world. If we can show that he reacts to the same features of it as an adult, the necessity for development (of a qualitative type at least) is probably ruled out. In fact it took a remarkably long time for people to ask this question, as they tended to follow a long philosophical tradition that assumed the need for learning to see the world in the adult way. It is also difficult to think of things that a very young infant can do to demonstrate the way he sees things to us. Recent studies, however, indicate that in the first month of life the infant can pick out much of the information from his environment that an adult would use, even though his ability to focus the image on his retina may be severely limited (*Haynes, White and Held, 1965*). *Bower (1974)*, for example, discusses evidence indicating that infants in the second week of life, if alert

and supported in an upright position, can show defensive behaviour of head retraction and placing their hands in front of their face when confronted with an object moving towards them. Similar reactions were elicited by an expanding optical pattern (which looks as if approaching to an adult), so the babies do not seem to be merely responding to some non-visual cue such as air displacement. Bower also maintains that at this age infants can reach toward real objects with some allowance for distance, and that they will reach for virtual 'objects' created by a stereoscopic arrangement.

Such findings show that very young infants possess a visual system of some sophistication which can utilise optical information specifying depth and movement, and bring together the separate information supplied by the retina of each eye, although it is uncertain to what extent the cerebral cortex is involved in these activities. In addition the modalities of vision and touch seem to be at least partially co-ordinated. But how much use can the infant make of such information? Is he, for example, able to store visually presented information for later use? Such an ability would be needed to recognise familiarity in even the simplest patterns, and without it it seems that what the baby sees could have little meaning for him. One well-known investigation of this problem was carried out by Fantz. He found that infants under about 2 months old did not look at one of two stimulus patterns any more than the other when the patterns were made of the same elements, varying only in arrangement (a difference in form, with such dimensions as brightness, area, amount of contour and so on held constant). Had they looked at one more than the other we could have deduced that they are able to store the information needed to distinguish the patterns from each other (in order to 'prefer' one). Unfortunately, when no differences are found using this technique we are not in a good position to conclude anything, as the baby may well be able to see the difference between the figures whilst looking equally long at each. Instead, we have to look for a more sensitive investigatory technique.

One possibility is to see whether infants look less at patterns they have seen before when they are exposed repeatedly (whether they habituate), which could indicate that they have remembered and recognised the patterns. *Friedman, Nagy and Carpenter (1970)* carried out such a study in which they repeatedly exposed chequerboard patterns to infants a few days old and obtained the habituation response. It can, however, be argued that such results are due to drowsiness or fatigue, so that *Friedman (1972)* had to repeat the experiment (with one day old infants this time) with the addition of a new pattern at the end of the series of exposures. The infants habituated to the repeated pattern, but looked longer at the new pattern, so that even these young babies seem to have some ability to store visual information. It should be pointed out that this only definitely applied to a small number of *Friedman's* subjects, as many showed what they thought of the experiment by such methods as falling asleep. It is also worth noting that this is evidence only for a relatively short-term storage of visual information, and many people feel that habituation is a rather special process. In particular we can't conclude that such young babies make much use of this capacity without more direct evidence that they do so.

In the first month of his life, then, the baby may not be able to derive much meaning

from what he sees because of his possibly limited ability to store visual information and his lack of experience of the world around him. This is consistent with the views of many people (Freud, for example) who felt that babies must have to discover the existence of the world as a separate entity from themselves, and to distinguish dreams from reality. In fact the most influential worker in this field, Piaget, believes that this is the crucial intellectual achievement of the first year of life. Piaget's primary concern has been with the philosophical problem of what knowledge is, which he felt he could approach by studying its construction during childhood. This philosophical perspective makes his views sometimes seem to psychologists to miss the point, but it gives them an enviable breadth. He believes that the baby does not move from his initial complete egocentricity all at once, but as part of a gradual process during the first year of life, until finally the world is seen as having a separate existence and as being occupied by other people and objects within a spatial and temporal framework.

This view of the baby's intellectual development is, on the face of it, in striking contrast to the development of his perception. By the age of five months he can follow moving objects with his eyes and is not surprised or in difficulty when they pass behind other objects. He seems able to recognise familiar objects and people, and can reach for and retrieve visible objects with reasonable accuracy. However, as Piaget (1954) rightly points out, if he sees an object covered by something that could easily be removed, such as a cloth, he does not search for it under the cloth (or anywhere else apparently). He acts as if it had ceased to exist. A few months later, when search is initiated by disappearance, babies who have seen objects being hidden in one place (A), and then seen them hidden in a different place (B), will often search for them at the original place (A - this is often called the AB error). They do not seem to understand the independence of the object's existence from its spatial location, and so may search in the place where the missing object was found before.

These observations have attracted a good deal of interest, and various alternative explanations have been tried. It may be, for example, that the young baby simply lacks the motor skill necessary to remove an obstacle covering the object. This view is refuted by Bower and Wishart's (1972) demonstration that 20 week old babies can lift off a transparent cup covering a desired object yet fail to remove an opaque cup. Another possibility is that the young baby does not remember the hidden object, and hence has no reason to search, but this argument turns out on careful examination to be very like Piaget's. It may be that he simply has a 'poor memory', but his abilities in other situations make this unlikely. In the case where infants who can find objects hidden at one place search in places where they had previously found things (the AB error) memory difficulties cannot be the explanation, since they can be induced to search in the wrong place even when the desired object is plainly visible, as long as it is unobtainable (*See Harris, 1975*). As Harris remarks, it seems to be not so much the case that the baby is naive because of his poor memory as that he has memory difficulties because of his intellectual naivete. What may be happening in this kind of experiment is that the infants treat the place they had previously found something at as a sort of 'toy box'. *Evans and Gratch (1972)* found that 9 month old babies make the same number of errors if the toys hidden one after the other at the two places are

different as they make when the same toy is hidden at each place, and it is even possible to observe babies who have found the toy at place B searching, toy in hand, at place A.

It seems, then, that Piaget is right to stress that it takes time for the baby to develop his understanding of the world. As for all science, though, we can never be certain that this is the case, although the theories put forward gain credibility as more and more alternative possibilities are falsified and discarded. The claim that the young baby does not understand the separate existence of objects is particularly difficult to evaluate, as there is always the possibility that he feels somewhat like a person watching a conjuring trick who sees his watch disappear, knows that it still exists, but is not quite sure where to look for it. On this view the problem is not so much one of discovering the independent existence of objects as of finding out about how they are located in space.

An interesting consequence of these researches is that the traditional boundaries between perception, memory, thinking, socialisation, language and so on are being broken down and replaced by a more rounded (humanistic?) view on the mental world of the baby. Perception, thinking and memory are clearly more active processes than was once thought, and their interdependence is now clear. Schaffer (1971) has drawn attention to many ways in which the baby's social interactions are affected by his cognitive development, and his ability to represent other people to himself in particular. The demonstration by Bower that babies younger than 5 months old are not distressed by seeing multiple images of their mothers, whereas babies over 5 months are, also demonstrates the parallel between the infant's ideas about social and physical objects. Studies of language acquisition have been integrated with the rest of children's experience by considering what children need to know before they can talk, and what they mean by what they say. Such considerations make the onset and form of early speech less surprising than when it was studied as a grammatical system in isolation.

So far we have seen that experimental psychologists are beginning to gain some idea of the mental world of the baby. When we turn to look at rather older children, the position is less clear. Again the work of Piaget has proved the most influential. One of his claims is that children below age 6 or 7 are unable to make transitive inferences, so that if they have information that Alice is older than Bob (A B) and Bob is older than Colin (B C), they are unable to combine these to infer that Alice is older than Colin (A C). This is important because if children are unable to make such inferences they will have to build up their knowledge about the world in a very piecemeal fashion. Transitive inferences provide a very powerful way of organising information.

The elegant experiments of Bryant and Trabasso (1971), and Harris and Bassett (1975), have shown that in favourable circumstances such inferences can in fact be made by 4 year old children. Their difficulty seems to be less one of logical capacity than one of memory and practice in using the ability. Although this point is crucial to an understanding of what it is that is developing in children's thinking, it might at first

sight lead to much the same conclusion as Piaget's about their mental world - they probably do not usually make such inferences in reasoning at age 4. However, Bryant (1974) goes on to show that young children do make use of such inferences by relating things they see to surrounding visual frameworks, which again brings Piaget's view into question.

In general, it is noticeable that the claims we can make about the mind of a child get less and less clear as we consider older and older children. There are a variety of possible reasons for this. It may be that as his mental world becomes more like that of an adult it is difficult to point out differences in a simple way. It may just be easier to investigate the less complex mental world of a baby - or it may be easier to oversimplify what it is like because of the lack of verbal reports (from babies) and because of its more 'alien' nature to us.

As an example of these difficulties, let us consider again the attempts that have been made to investigate Piaget's claim (see Piaget and Inhelder, 1969) that children are unable to carry out certain kinds of logical thinking until they are about 6 or 7 years old. Transitive inferences form only one facet of this general position. Although young children can represent aspects of their environment to themselves they are unable, Piaget believes, to systematically alter their mental representations in order to predict many of the consequences of their actions. The consequences of activities like messing about with quantities of liquid and pouring them from one container to another cannot be predicted, but must instead be discovered. If this is the case then the reasoning of children at this stage will be tied to the way they represent things to themselves, so that they will be unable, say, to see things from another person's point of view. This theory does not rule out the possibility that young children may have elaborate fantasies, and can even be taken to suggest that the distinction between reality and fantasy may be more difficult for them to make than it is for adults.

Many experiments have been devoted to investigating this conception of the young child's mind, but the results have been far from clear. One of the reasons contributing to this lack of clarity is now becoming increasingly obvious, namely that many investigators have not taken sufficient account of the social and interpersonal aspects of experiments. Each child is a different person with his own idea of who the experimenter is and what he wants, and his own aims, which are bound to vary from child to child. The only allowances that have traditionally been made in this direction are that most researchers have been at pains to build up a relationship with the child and to make sure that the meaning of the instructions was got across, since many words can mean different things to adults and children. Unfortunately, the effects of the way the children view the experiment itself are more problematic. I will illustrate this point initially by means of examples where the child's and the experimenter's views of the purposes of the experiments were so divergent that the experimenter's purpose clearly could not be achieved. The experiments (Young, 1974) involved asking children questions about their reasons for judgments they had made of the relative likelihood of two possible events. These reasons were to be analysed as if they illustrated how children think about what adults would call 'chance' or 'probability':

Example 1:

Experimenter: *'Why did you choose that one?'*

Child (aged 8): *'Don't know why. Why do you keep asking me why?'*

Experimenter: *'I'm interested'.*

Child: *'Well I'm not!'*

Example 2 (a different experiment, but with the same experimenter and child):

Experimenter: *'Why did you choose that one?'*

Child: *'I want to Hee Ha! He writes down everything I say!'*

Another way in which divergence between the children's and the experimenter's ideas of the experiment can lead to difficulties occurs when they are asked questions to which the experimenter already knows the answer, to see if they know. The snag is that they may not know that he knows but wants to know if they know. A nice illustration is given by Wales (1971):

'A boy of four is asked how many legs a horse has, and he refuses to answer. Margaret Donaldson, knowing that the boy knew the correct answer asked him afterwards why he had not given it - 'if that big man didn't know, then I wasn't going to tell him!'

Other difficulties can be caused by the fact that because research work is so often carried out in schools, the children tend to see the experiments as requiring school-type answers, and the researcher as a kind of privileged teacher who works only occasionally. If the materials can be counted or added or whatever they've been up to in class recently, they will often do this even when it is not appropriate (from the experimenter's point of view). Sometimes you are even told the answers before any questions have been asked.

A more insidious possibility is pointed out by Hayes (1972), which arises from the fact that in normal interaction we don't correct people every time they make a slip of the tongue. Instead the listener 'fixes up' what he assumes was meant. In Piaget's class inclusion problem, where a child might be shown six roses and four tulips and asked if there are more roses or more flowers, this could certainly happen. Piaget believes that young children say there are more roses than flowers because they cannot simultaneously conceive of a class and a subclass of that class, but it may be that they 'fix up' the experimenter's question to a more sensible one (are there more roses or more tulips), without being so rude as to tell him so. A case where a similar thing

seems to happen is given by McGarrigle and Donaldson (1975). In order to assess their understanding of the invariance of number, children are often asked to watch a row of blocks being lengthened, and then asked if there are now the same number of blocks as there were before. Usually there is a second, static, comparison row which was initially the same length as the other row but after the transformation is noticeably shorter than the lengthened row. The fact that young children typically assert that there are more blocks after the lengthening transformation has been taken to indicate lack of understanding of the invariance of numbers. However, McGarrigle and Donaldson point out that what may happen is that the experimenter's action of changing the length of the row leads children to infer that he wants to talk about what he has been doing. They may then think that the question about number actually refers to length. When the transformations were carried out by a 'naughty' teddy bear, McGarrigle and Donaldson found that children were less likely to assert that the lengthened row had increased in number.

To summarise, then, we have seen examples of the ways in which experimental psychologists are beginning to examine the problem of how children of different ages experience the world around them. I have argued that the evidence seems clearer the younger the children are. One reason for this would appear to be that there is at present no satisfactory way to make allowances for the interpersonal nature of experiments with young children, but this problem is beginning to be faced. It is also worth remembering that the conceptions of infant experience may have a spurious clarity that comes from knowing so little. All the views that have been expressed are probably wrong, but it is hoped that by putting them forward to be disproved more will come to be known. In many ways it is sad that after some hundred years of experimental psychology what we can say must be so qualified and cautious, and really so little. However, the concerns of humanistic psychology are those of experimentalists too, and it is perhaps hopeful that they are no longer afraid to face them.

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Peggy Thornborough

The Age of Aquarius - Its not all Chaos

I thought John Rowan sounded very depressed in his report ('Self and Society' March 1977) and felt sorry about this as I feel on the contrary that humanistic psychology is slowly penetrating into many traditional fields and bringing about gradual change. In fact, I feel it is the healthiest and most hopeful sign amidst the greed and violence and alienation of our world.

I was talking to a friend of mine who is a psychotherapist of Jungian training, very open to new things, and who is a member of the Joint Working Party considering the registration of psychotherapists. She told me - which is not clear in John Rowan's report - that if a register is set up it will not debar people working as therapists even if they cannot claim to be registered. This seems to me an important point to remember. She also told me that it is proposed that on the Council there should be a number of laymen which would make for a healthy balance with those of a more traditional mould.

It seems to me a pity to polarise the new and traditional forces, and this springs out of my own experience. In the growth movement there appears to be a general denigration of anything to do with the Tavistock Centre. My own 'waking up' commenced in 1955 when, as a working probation officer, I had a year off to do the Advanced Casework Course at the 'Tavy'. Looking back, I can see that it was somewhat rigidly based on Freudian and Kleinian lines, but at that time for me it burst the horizons of my mind. Through it, it became clear to me that I needed analysis, but I was much more inclined to Jung than Freud. I was helped through the Tavy to contact the Society of Analytical Psychology who enabled me to enter into a Jungian analysis as a clinic patient at reduced fees. I can never be thankful enough to my analyst for the way in which she led me through a journey into myself - a journey in which often I felt as if the self I knew was disintegrating all around me, often painful, yet discovering riches, and which enabled me to go on growing.

It was in 1969 in the United States that I first discovered the growth movement and which I got into in the following year when it started to flourish in London. I have