Learning and the Origins of Understanding

by

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Development of the Experience-gathering Equipment

'Fundamental Understanding' is, as has been suggested earlier, that capacity, learned on the basis of a complex system of inherited structures and propensities, whose function or purpose is, so far as is possible, to ensure the survival of the organism. The greater the variety of habitats and the wider the range of circumstances the individual organism might be expected to encounter the more unspecialised and pluripotential its structure and adaptive abilities must be; hence the greater and more varied the range of its necessary activities and derived experience, and the longer the duration of its period of preparation - its childhood or infancy.

The human organism occupies many years in preparation for adulthood or that phase of the life-cycle where improvements in performance are based on minimal further changes in bodily structure and must therefore normally depend almost entirely on the previously acquired quality of learning. It might be thought of as consisting in a balance between a capacity for dealing rapidly and effectively with familiar and anticipated contingencies for which it has been 'trained', so to speak, and a less clear-cut more dynamic capacity for recognising and approaching less familiar sets of conditions, and for quickly and effectively learning behaviours which are likely to prove adaptive not only in the short term but also in the long term - increasing the likelihood of even more satisfactory interactions in the future.

Becoming an adult human being of course involves the early specialised developing of some aspects of fundamental understanding which will facilitate both communication between individuals and the assimilation of certain conventional skills and information. The great differences in the manner of development of the fundamental understanding and that which embodies interpersonal and linguistic understanding are such as to make it possible to study the two as parallel and to some extent rival pathways of development; however, despite the differences, the 'social-linguistic' ('analytic') is always contingent on the 'fundamental' ('synthetic') understanding and it is the general form of the early development of the latter which is to occupy our attention for the time being.

New understanding always arises as a result of the active exercise of the older. All new understanding derives from and embodies the principles of prior understanding. If it is recognised that novel understanding must have its source in new experience which in turn must derive from the organism's *observations* (or actions on the environment), and that such observations can only be designed on the basis of extant understanding, it

follows that the new experience is the outcome of the discrepancy between the results of the observation which were predicted from the design and those recognised to actually occur in the event.

Clearly what is recognised is a matter of interpretation based on existing understanding, hence gain of experience must derive from a very narrow band of discrepancy so that rate of gain of experience at any stage of development must be governed by the 'reactive surface area' of present understanding and therefore depend upon the state of consolidation and enrichment (competence) arising from variation, as well as on the duration and vigour of observation. Just as the rate of reaction of chemical substances is directly proportional to the state of fine division or the degree of subdivision of the reactants, as well as on the temperature, pH, etc., so is the rate of experience-gain proportional to the state of refinement of the previous understanding, as well as to the circumstances and other conditions prevailing at the time.

Pursuing this a little further will be reserved for a later date since our present object is a brief revision of the early development of the organism's equipment for the sampling of environmental forces and the gathering of new experience. What I refer to as learning-how-to-learn 'tools' are only fairly well defined states of preparedness which, as we have seen, grow from even more basic operations and give rise, by refinement and/or combination, to even more advanced learning-how-to-learn systems of 'tools'. The whole is a rapidly growing explosion of understanding any level of which is responsible for designing, initiating, directing and sustaining (or maintaining) the activities of the 'hardware' (i.e., the bodily structures), which activities thus <u>always contain the essence of those activities which underlie and have led to the presently operating understanding</u>.

When considering the evolution of fundamental understanding several principles, here given under two headings, should be borne in mind:

(i) A consideration of <u>economy of structure</u> in learning (really experience-gaining) apparatus suggests that simple structures, where the form of the apparatus largely directs and defines the form of learning, are most suitable for learning simple skills. Provided it is adequate for the purpose, the simpler the apparatus the more satisfactory it is likely to be in learning.

For example, a young baby is initially a trunk from which the limbs project like paddles. The arms at this stage have a very limited

range of movements at the shoulders and elbows, the wrists move almost wholly within the pronatory range and, at first, the fingers and thumbs are tucked neatly away. Such a simple and relatively 'stiff' lever system is ideal for the business of learning the main or axial limb movements. As the limb proportions change and the constraints on movement relax (partly as a direct result of the learning process) the resulting increase of movement 'space' renders further movement variations more likely and provides a basis for expansion of experience and understanding.

It would seem that since understanding develops always by the new deriving from a sort of division of the older - primary principles so to speak giving rise to secondary, secondary to tertiary, etc. - the learning 'hardware' (bodily structures) should ideally develop and proliferate in harmony with the increasing understanding; however, the retarded child almost always possesses hardware far too sophisticated for his needs and so both lacks the clear-cut simple movement-defining constraints of the more rudimentary bodily structures (equivalent to loss or blurring of the signal known as 'equivocation' in a transmission line) and suffers the distracting and 'jamming' effects of superfluous and chaotic bodily excesses (the equivalent of masking interference or 'noise'), in addition to integrational difficulties to be discussed briefly towards the end of this essay.

ii) The use of rudimentary structures which continually change form, mechanical characteristics, etc., during the learning of skills, and which steadily increase in complexity, naturally imposes a certain minimum 'tolerance' or uncertainty on the realisation or outcome of any designed bodily action, a tolerance which, as implied earlier, is essential to the build-up of experience.

'Tolerance' in this respect refers to the range or envelope of recognisable or acceptable variants. When considering the movements of a young child tolerance might be represented by the degree of natural 'clumsiness'. The movements of a two year old child, for example, however right for him would be seen as extreme clumsiness in a three-year old. As he gets older and bigger the range and amplitude of unintended variants on a deliberate movement get steadily smaller or, as we generally put it, his movements get more precise or he becomes 'cleverer with his hands'; however, we should be aware that there is normally a nice balance between the clumsiness which frequently disturbs the definition of the basic

> movement pattern on the one hand and the over-precision which obstructs the possibilities for variation and change on the other, and any upset of this balance is likely to interfere with normal development. Any influence which trains unwarranted precision in a child's movements diminishes the range of tolerance and limits the increase of experience. Such limiting forces may be entirely spontaneous to the child, or directly or secondarily, consciously or unconsciously, the result of adult influence.

Bearing these principles in mind we may return to our study of the normal early evolution of the human organism's experience-gathering apparatus which consists at any moment in time in the steadily changing, maturing, mechanical structures coupled with the contemporary capacity for driving and directing the operations of these structures in their observations on the environment.

A newborn baby, indeed a baby during the first several months, can be seen to be a very loosely integrated creature. Unlike animals such as the horse, which are capable of highly organised bodily actions from birth, the human baby appears to be a mass of largely independently moving limbs. In fact it is a profitable exercise to view the baby as five 'limbs' connected through a central trunk; the 'limbs' may then be thought of as more-or-less complex levers for moving their main exploratory and distal parts (hands and feet for the arms and legs, visual or auditory (or olfactory) focus or mouth for the head 'limb') through space.

The organism is required to develop a stable and principally vertical, 'chassis' from which to operate and subsequently a locomotor mechanism for transporting the chassis and support parts from one place to another; however, the aspects which must most concern us at this time are those which develop at first in common with and later on the basis of the chassis structures, for these are the ones most closely associated with fundamental understanding.

The Stages of Development

Developmental 'stages' in the sense that I am using the term refers to the sequential point and developmental period during which appear the first signs of anything that might be recognised as clearly characterising the behaviour towards the point when the behaviour may be said to be described by the definition given to the stage, and on to the point when the set of behaviours, constituting the definition of the stage, may be said to be mature or in equilibrial harmony with the child's functional level. For example, up to a certain age no sign of a particular kind of expected behaviour may be discernible by the observer. Then, at first fragmentary, behaviours of this kind appear more and more frequently as if planned by the child. Eventually such behaviours may become so common as to form a characteristic part of the child's persona of behavioural traits but steadily the child's power over this particular behavioural form increases until it is wielded at last as a whole and used normally as a component of some even more complex activity. Nevertheless, however complete a stage, skill or piece of understanding may be it must continue to develop as the child develops.

Organismal integration. The first stage, which however continues to consolidate indefinitely, is bodily integration, which necessitates the baby's developing the use of his 'limbs' individually, but more and more in conjunction with one another. Each 'limb', as its stamina increases, steadily extends its range of operations and 'region of interest' both by reaching further in every direction and sense and by increasing the number of postures of the limb through which it can bring its focus of action to bear at any locus. It is important to remember however, that although the observer fixes his attention on the extremity of the child's limb, knowing the main purpose of the stem of the limb will be in due course to move and direct this extremity, the sensations from which experience will be crystallised arise from *the whole limb* (and trunk etc.,) and there is no reason to suppose that the hand, for example, has any priority for the child's attention at this time.

As the 'region of interest' of each limb increases in extent and solidarity the overlap between provinces leads to one limb's becoming the object of interest for another and, in due course, to two limbs acting on or sharing a common 'focus' of interest. Such a combination or union is really a 'co-operation' between two or more systems regulated primarily by information fed back to the controller of each participant member in the ensemble which pursues its own private ends in addition to those accruing from interplay and a liaison with the others, rather as member musicians

of a chamber group play their own individual parts whilst consciously combining and participating in the larger whole. Then, pursuing the analogy a little further, the members of the team in working more together than independently, come to play more and more co-sympathetically until finally their harmony of activity is such that they play as if one musician.

This bodily integration, which as has been suggested results from external 'loop' co-operations, may be seen as the first major stage in the development of the understanding-gaining mechanism; however, although from about nine months any movement of any part of the body is normally well integrated with all other movements, this process of integration continues to develop virtually throughout life, and in particular during the time of bodily growth.

The growing child's formation of an integrated or complete bodily control, (which implies a bodily image or understanding of the limits, limitations, scope and possibilities, etc., of his bodily parts and further means a reciprocal structuring of and familiarity with the space within and through which the bodily parts move and have their being) together with his increasing capacity for bringing together, into focus as it were, the extremities of two or more 'limbs', allows him to direct the 'spotlight' of his attention in any direction and at any distance relative to his body and to actively and co-ordinatedly move the focus through every direction and throughout every dimension of space.

Origins of choice. During the first half of the first year every action in response to 'environmental' stimulation, that is to say every activity of the child, is necessarily immediate and obligatory; as immediate and inevitable that is, as the prevailing system of forces allows. Since the child's 'focused' attending is subject to these restrictions there will be an apparent rivalry for this attention between 'competing' environmental[1] patterns so that the precise forms of the resultant behaviours must be largely a matter of chance and temporal priority. His attention will be attracted and distracted willy-nilly as an elaborate system of relative interests is built up.

1 Environmental, as a word or concept, appertains to all those forces to which the organism can respond or, putting it another way, of which the organism can be aware. Hence the states of his own body must be included, and it might be said that by far the most important environmental influences for a young child are his own postures and behaviours.

A pre-requisite for the appearance of choice in the child's developing understanding is the ability to delay physical responding to recognised potential influences, which in turn requires his increasing capacity for varying the strength of his 'interest' towards a pattern (stimulus[2]) so as to allow graded deviation in the direction of his interest.

Such an ability to vary the level of attending and to delay the previous inevitable chain response behaviours could arise from the child's smoothly but actively 'following' a focus of attention under conditions where the strength of attraction varies from moment to moment, the focus moving into or out of the child's variably structured 'regions of interest', and where the moving focus comes close to or coincides with 'stimulus' patterns of equal or greater attractiveness. A more obvious but I suspect less important factor in the development of deliberate choice is the effect of environmental distraction in which external environmental features disrupt sustained attending as for example by startling, or force the attention through the imposition of a pattern of potentially greater intrinsic attractiveness, such as a baby's 'very favourite' play object or some special 'fascination'.

However, both these mechanisms have their origins in the earlier division of attention due to the pre-focused state where something inadvertently coming into contact with the child's hand or within his visual or auditory sphere of interest forces the interest in that direction, and reciprocally suppresses interest in the other limbs and regions of space. For example, at about six months a child's grasping at an object with one hand still tends to result in his loosening his grasp on and attentional contact with an object in the other.

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2 The whole concept of 'stimulus-response' in the study of behaviour is a very unsatisfactory and often misleading one. The 'response' is generally speaking the active process, the stimulus usually an available pattern of forces selected and seized upon (or actively ignored) by the responsive organism. That is to say, the importance of the stimulus, with a few crucial exceptions, is determined by the state of preparedness of the responding, or not responding, organism.

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The child's capacity for varying the strength of his attentional response and for delaying its access is further strengthened as the child's coming to retain a brief after-image of the form and direction of his *action* lays the foundations for the maintaining and subsequent recall of an image. This early development of (inertial) 'memory' arising in company with the exercise of delay in responding and early choice between potential 'objects' competing for the child's attention, leads in due course to the probability of effective competition, as it were, between images which are actively sensuous to the child and those which are retained or recalled ('remembered'); however, before the establishment of 'continuant' behaviours, which is the natural consequence of such opportunities for choice, a further refinement in bodily organisation must arise, namely sequential complementary division of functioning between limbs.

Complementary function in the 'limbs'. This is really an extension of the 'focusing' of concentrated attention but consists in the smooth and co-ordinated exchange of relatively complex actions or activities from one part of the body to another as in the transfer of an object, not by simply passing it from one hand to the other (which of course first commonly occurs about half way through the first year) but by means of the successive involvement of the two hands in a flowing sequence of limb and trunk behaviours, seen clearly first in the moving of an object from one side of the body to the other but later being commonplace in the normal exercise of such activities as bead-threading, knot-tying, combined use of 'knife and fork', etc., and subtly less obviously in almost every subsequent two-handed activity, including 'brick building', drawing, practical 'matching' and 'sorting' etc. It is as if the action rather than the object were passed from 'limb' to 'limb' or side to side, with continual monitoring through the head-limb.

Such a capacity is intimately bound up with the power to direct attention alternately from one hand to the other, as in striking a drum or in using both hands reciprocally to pick up a lot of objects, etc.

Handedness or lateral dominance. Normally, towards the end of the first year the appearance of a slight bias or preference for one side tends to obviate indecision and lateral confusion (Buridan's Ass' dilemma), which are inherent weaknesses in the normal, integrated, co-ordinated and largely symmetric two-handed approach to tasks, without interfering with the validity of such bimanual behaviours. This tendency in favour of one side, usually the right, when initiating an asymmetric response, which is probably a very simple mechanical bias, is dignified by such terms as

'lateral dominance' and 'laterality', and has become surrounded by a mystique and a great deal of nonsensical thinking.

Children who have failed to integrate their movements adequately do not develop a true laterality based on a capacity for focusing the whole bodily attention through any part, although they commonly have a 'preferred' hand. They are 'one or other handed' rather than right-handed or left-handed.

Continuant behaviours. Towards the end of the first year, as intimated earlier the child's emerging ability to hang onto the concomitant sensations of sensory activity beyond the period that the senses are actually responding to external stimulation, combined with his increasing potential for making choice constitutes a foundation for competition for attention between the immediately sensuous and the remembered, between the palpable and the imagined. Changes of activities have previously depended on choice between potentially rival external stimuli so allowing, in the absence of adventitious disruption, only for concatenations of conjoined responses each leading onto the next, often in an oscillatory manner. For example, a held object might be put into a held vessel to which the child responds by taking it out again, bringing him again to the situation to which he had previously responded by putting-in. The child's physical structures etc., impose a sufficient 'tolerance' or impreciseness for continual variation but the behaviour continues in general to oscillate until fatigue or distraction interrupts or deflects the behaviour pattern.

From about twelve months or so circumstances occasionally promote conditions where the disposal of a picked-up object is followed by a return of the child's attention to the source of the object where another object may be picked-up and disposed of. From this time on such events become more frequent and by fifteen months the main foundation of the capacity for transferring a number of objects successively from one place to another (as in putting perhaps five cubes into a cup), a capacity necessary to almost all subsequent complex operations and which I term 'continuant', is demonstrably laid. A simple analogy for this vitally important change from oscillatory to on-going activity might be the rectification of 'alternating' electrical current to 'direct' flow.

Period of rapid experience gain. In practising continuant skills during the ensuing twelve or so developmental months the child is 'forced' not only to familiarise himself with the basic operation, through the continual transfer of objects etc., so as to relegate the basic operation to a

'subconscious' carrier phase but also to accumulate innumerable perceptual experiences relating to the appearances, properties and associations of the various objects and the materials involved, to the use and nature of the space within and through which his own body and external objects are moved (and reciprocally to the use and control of the movements of his own body), and to the behaviours of the moving and moved objects and substances within that space. This period is clearly a very rich one from the point of view of general experience gain.

The 're-direction' of actions. Behaviours during the greater part of the second year although more and more consciously planned and anticipated nevertheless tend, once initiated, to be carried through as complete actions; however, as the continuant aspect of all activities becomes more automatic the child's ability to control and change the course, even the form or definition of an action actually during its execution increases so that by the end of the second or beginning of the third year his powers of 're-directing' actions allow for choice actually during the course of an action. Hence instead of activities being broken up into a sequence of separate, inertially complete actions, their continuous control with instantaneous change of direction, etc., becomes possible on the basis of the information fed back from constant monitoring of the events.

The primary learning-how-to-learn 'tools'. Such a degree of sophistication as is normally only attained by three-and-a-half years, is necessary for even the earliest extended and active searching for similarity or difference, as in 'sorting' and 'matching' and for a deliberate striving to reproduce a one, two or three-dimensional pattern; however, by quarter way through the third year the child is usually able to behave for brief periods as if she were consciously attempting to copy a brick or drawn pattern. From this time on conditions normally become steadily more conducive to the early development of the learning-how-to-learn tools.

Within the early stages of the development of learning-how-to-learn tools the child's tool-like behaviours are clearly triggered by her recognising certain sets of circumstances but the continuation, order of component behaviours, and the definition and the direction of further action are governed almost wholly by the conditions prevailing at the time, one action leading on to another. Facility in the activities leads to each action's having a greater influence over the subsequent ones whilst increasing 're-directive' freedom allows decisions to extend from individual actions to whole sequences of activities. Gradually it thus becomes possible for the whole design of such an activity to be envisaged from the start from the materials and circumstances of which it was originally a part. Becoming

more complete it is wielded or applied by the child as a whole, at first an end in itself (for the sake of the activity) and subsequently as a means to some other end; used in fact as one tool in the child's tool-kit of experience gaining equipment.

In due course such 'tools' are assimilated into the child's personality of behaviours, indeed many aspects of her personality may be seen to consist in her manner of approach to tasks and problems which is largely determined by the quality of the learning-how-to-learn 'tools' she employs.

As has been said the earliest signs of differentiation of these 'tools' may be discerned in the behaviour of a child during the second quarter of the third year, and the fourth year sees their reaching a high level of maturity as well as signs of their effective use of means of actively carrying out novel experience. Derivative learning-how-to-learn tools have not yet been discussed but the development of the environmental-influence sampling equipment during the first three to four years may be summarised as in the accompanying diagram.

EARLY DEVELOPMENT OF EXPERIENCE-GATHERING OR LEARNING-HOW-TO-LEARN TOOLS

Age in months

0	Increasing total amount, range amplitude, density and variation in bodily movement	Increasing amount and range of 'fixation', 'following' and 'scanning'.
3	Early overlap of space domains of basic 'limbs' (including head); 'Interference' between limbs leading to external communications loops and 'co-operations' between limbs.	
6	Obvious early 'focusing' of attention; responses immediate and irresistible. (forced attending).	Rapidly increasing bodily integration in activity.
9	Early bilateral 'complementary' activity; actions passed from one part of the body to another; early delay in responding.	Increasing deliberate securing (e.g., manual picking up) followed by passive or unheeded 'losing'.
12	High level of integration; centrated 'focusing' of attention; deliberate delay in responding; early choice; actions generally alternating but occasional 'continuant' behaviours; lateral bias or dominance.	Increasing powers of deliberate disposal.
15	Early distinct stage of 'continuant' behaviours.	
24	Early 're-direction'; continuant behaviours well enough established to allow decisions modifying the behaviour during the actions.	Practising 'continuant' activities with the inevitable gain in experience of bodily awareness, space structuring, properties and behaviours of objects etc., the raw materials for.....
27	Occasional behaviours as if deliberately amassing and separating objects, or reproducing a pattern from a model.	. . . .
30	Early definition of learning-how-to learn 'tools'.	..... the development of learning-how-to-learn tools (Learning the tools).
42	Primary learning-how-to-learn 'tools' well established.	
45	Early use as tools for learning.	(Learning from the use of the tools.)

Relevance to practical teaching

An awareness of such a main-stem system of development assists the teacher in planning the form, and in ordering the priorities, of an educational programme.

For normal progressive expansion of understanding it is necessary that the production of any activity simultaneously exercises all those fundamental skills on the basis of which the activity has developed. Normally the free and freely reinforced movements of and from the early activities is at least adequately sampled so that the underlying or precursor activities are continually involved; however, the child whose anomalous development has meant that his understanding has never been in complete harmony with his physical growth (being retarded and less than normally competent for whatever reason) and who has not sufficiently learned to equate effort with pleasure, is likely to neglect the rehearsal of any underlying activities not entirely necessary to the matter at hand.

Hence in the teaching of handicapped and retarded children deliberate attention must be given to ensuring the constant recapitulation of these foundation activities in order to compensate for the neglect due to primary or secondary impediment During the exercise of a task a good 'rule of thumb' is to be willing to devote approximately 90% of our, and the child's, effort to these basic matters, leaving an entirely adequate 10% for the more sophisticated levels of the activity.

Therefore quite apart from the specific reasons for having a child pursue a particular activity it is essential that the teacher constantly asks herself a number of questions which might include the following:-

1. Is the child making maximal use of his available bodily movements and reciprocally of his available space? Are his movements brisk and vigorous? Good movements involve maximal variation within the defining envelopes of the actions but little or no superfluous, irrelevant or unnecessary movement.

2. Do all parts of the body participate in each action and activity, the less actively protagonistic occupying a supportive role, always prepared to assist, complement or take over/inherit the main part?

3. Is the whole attention constantly focused on an activity however unusual the variant employed or does it seem that it tends to be

split, divided and thereby diminished when less common postures or greater effort are required?

4. Is the child able to restrain himself from immediate physical engagement with the materials when approaching a problem or task so as to allow sufficient opportunity for assessment, interpretation and decision on a suitable plan of campaign?

5. Is the underlying 'continuant' ability sufficiently facilitated (free and automatic) to provide an unobtrusive carrier phase (freeway) for every ongoing activity?

- 6. Is the active focusing of attention utilised in constantly monitoring all activity so as not only to recognise and seize upon new experience but also to detect anomaly, eccentricity, etc., and so allow for 'redress of error' and changes of mind?

7. Are increasingly extended sequences of behaviours being carried out, towards achieving or maintaining 'tool' maturity, as if planned that way (as opposed to the child's always working in a piecemeal fashion)?

8. Are sufficient variants of techniques, materials, circumstances, etc., being used so as to perpetually strengthen the definition of the 'tool'?

9. Is there a definite goal *in the use of the tool* (as opposed to a drive to complete the 'task'), the end result being in keeping with the outcome as anticipated from the inception of the action?

'Motivation'

Mental effort drives ultimately from physical effort.

The more effort the child puts into physical activities, as his understanding expands, the more he will subsequently apply to the derived mental equivalents. It is the association between effort and pleasure (not the influence of 'success' or 'achievement') which finally determines the strength of 'motivation', and the earlier and more effectively this bond is forged the greater will be the child's implicit scope for developing understanding.

Appendix 1

Note on Learning Difficulties Arising from Inadequate Bodily Integration

Any failure of complete fusion and unification in the functioning of the several limbs results in some degree of permanent fragmentation of the child's 'region of interest', with multiple foci in his directing - or blurring of his 'focusing' of - attention.

A proper discussion of the various effects of such a developmental break down must be left until a later date but a consideration of the much simpler but roughly analogous effects of an ocular squint may be helpful in drawing attention to the very serious implications for education.

The blurring of definition or the contradictory information which results from a misalignment in the use of eyes tends to be compensated for by effectively 'closing' one eye, usually by withdrawing attention from its retinal activity in some way. There is inevitably a consequent limiting of the visual range and loss of stereoscopy, among other untoward effects.

In a similar manner children with inadequately integrated systems deliberately, but usually unconsciously, neglect some parts, or the activities of some parts, of their bodies at certain times, or alternate attention in an haphazard way. Often the region of space normally inhabited by the neglected part will also be neglected even by other active parts of the body so that, for example, an object held in one hand may be searched for unsuccessfully using the other hand. Demands on the child to use both hands co-operatively may excite confusion and anxiety. Commonly manual activities are controlled by minimal visual monitoring thus minimising experience-gaining opportunities.

Appendix 2

Note on Natural Priority

As has been suggested all basic skills develop in a natural sequence, later ones growing out of earlier ones; however, it is also true that the earlier ones generally are a functional priority over the later. For example walking is a skill virtually unrelated to mental development but at the right time and under the right conditions walking extends the child's world, allowing him to transport his previously developed skills and understanding from one place to another, as well as to extrapolate activities involving mobility of a part of the body to others involving the whole. Walking is normally practised first during the later three-fourths of the second year at a time when general understanding is expanding very rapidly. If in a slowly developing child walking is given priority over fundamental understanding it can represent a major obstacle to development where it both competes for the child's attention and restricts the opportunities for the sort of learning which requires long periods of activity in one place and close to a working surface (usually, of course, the floor).

Similarly 'talking' is normally practised long before it plays a major part in development but without interfering with this development. In due course the medium of talking is utilised as speech for the communication of information etc., and becomes a virtually essential behaviour; however, 'talking' given inappropriate or improper priority in a retarded child frequently becomes a powerful weapon of defence against what the child views as excessive demands, and a major obstruction to learning progress.

'Reading' is the third of this triad of skills which between them commonly occupy most of parents' and teachers' attention in association with the development of young children. Reading as normally taught can only extend the child's previous understanding of speech into another medium and, since linguistic understanding reflects more fundamental non-linguistic understanding, represents 'knowing' twice removed or information at second-hand. And yet children with little understanding and skill or at least limited understanding of speech are subjected to what is called 'reading'. Reading supervening at the appropriate stage in a child's development prefers great advantage but for the backward child it often represents nothing more than a party trick and not infrequently, used as a defensive manoeuvre, forms a major obstacle to advancement.

There is no need to neglect any activity or skill, certainly not walking, talking and reading, but emphasis and timing must be judged from reference to their places of functional priority within the pattern of fundamental development.