Jean Piaget (1986 – 1980) has been one of the most influential figures in psychology's history, Piaget was interested in the ways in which childrens' cognitive capacities develop. One of the most important contributions that Piaget made, was to establish the fact that the cognitive processes of young children are not simply immature versions of that of an adult, but that they have their very own rules. As will become apparent in this essay Piaget's theory and his findings have been widely challenged and as with all good theories have generated an enormous amount of research.

Based originally on observations of his own three children, Piaget contended that cognitive development is constructed into four stages, this essay will examine each stage individually and then evaluate Piaget's theories by exploring some of the major criticisms and supporting views.

These stages are held to be invariant, that is, all children pass through them in the same sequence without skipping any or, except in the case of brain damage, regressing to earlier stages. The stages are also held to be universal, that is, the same for all people irrespective of their culture. These hierarchical stages are characterised by an overall structure and a sequence of development, which occurs within this structure. According to Piagetian theory, these structures consist of *schemas*, which are essentially, a way of organising experience. *Schemas*, Piaget purports, are the primary component of intelligent behaviour. These *schemas* adapt through a continuous process of *assimilation* and accommodation in an *endeavour* to attain *equilibrium,* which is essentially balance. Assimilation is the process of adapting existing *schemas* to fit new experiences.

The first of piaget's stages of cognitive development is the *sensori* (Sensing)- *motor* (doing) stage which lasts 0-2 years and is divided into six sub-stages. It is essentially a stage of practical discovery, which occurs by physical exploration with the environment through the senses and by utilising motor skills. A baby accommodates and assimilates information which it encounters into schemas. Piaget contends that a baby has no *object permanence*, this is the understanding that objects continue to exist in their own right when moved out of sight. Piaget discovered that an infant will look where an object disappears for a few minutes but will not search for it and, if it fails to reappear will lose interest, Piaget called this *passive exploration*. By sub stage six, the infant has achieved object permanence. The other major progressions in the sensorimotor stage are *self-recognition* and *symbolic thought*, language, designating words for objects is an example of symbolic thought. And finally *deferred imitation* which is the imitation of an action which has occurred sometime in the past, this indicates an important advance in the capacity to *remember*.

The second of Piaget's stages is the *pre-operational* stage which lasts from 2-7 years but is divided into two sub-stages, the pre-conceptual sub-stage (two-four years) and the intuitive sub-stage (our to seven years). During this stage the use of internal images, symbols and language are especially important for the child's continuing development of a sense of self awareness, however, at the same time the child's world is fundamentally absolute and things are very much as they seem. The nature of the pre-conceptual child's thinking makes it difficult for it to understand relative terms such as 'bigger' or 'longer', things tend to be 'biggest' or 'longest'. The intuitive child does have this ability but remains limited in its ability to think logically and is unable to *decentre*. *Centration* is the inability to fathom more than one perceptual factor at a time. A pre-conceptual child asked to divide balls that are 'big and blue' and those that red 'small and red' will either

put all the blue (or red) balls together or all the big (or small) balls together irrespective of their respective colours or sizes. At this stage the child also lacks *seriation* and *artificialsim* and therefore has difficulty in arranging objects on the basis of, for example increasing length or when asked 'Why is the sun yellow?' might produce the answer, 'Because some-one painted it'.

Other classifications of the *pre-operational* stage are *conservation*, the understanding that things must remain constant in terms of number, quantity and volume regardless of changes in appearance and *egocentrism.* The latter, Piaget contends is the child's inability to see the world from another's perspective. They are quite literally self-centered, however, an interesting distinction is made between this concept and the word selfish, which is a different notion entirely. Piaget observed this phenomenon in his swiss-mountain experiment (1952).

The next stage is the *concrete operational* stage which lasts from seven to eleven years. In this stage the child can perform operations requiring logic such as *conservation*. This ability only holds for what Piaget terms as concrete situations. That is the child is only able to perform mental actions on actual objects and not in abstract terms. In the *concrete operational* stage, the child is no longer *egocentric* and is able to *decentre*.

Beyond eleven years the child is said to enter the final stage in cognitive development which is he formal operational stage. The formal operational thinker is able to imagine and deliberate that which has never actually been encountered using an essentially adult form of logical and symbolic thinking and scientific reasoning, e.g. test tube experiment (Inhelder and Piaget 1958).

Many modern psychologists suggest that Piaget underestimated both the innate cognitive development and the cognitive abilities of children. Meadows, for example contends that Piaget ignored individual differences in his studies, she argues that, *'Piaget's paradigm of development is an idealised description which may or may not have any tangibility' (1988)*. Horn (1976) believes that children can 'skip' stages and there is debate over the actual concept of *stage*. Even if it is valid there is the further issue of the cultural universality of the stages, he purports that basic cognitive processes are universal but how these processes are brought to bear on specific contents (at the surface) is influenced by culture and so is culturally diverse. It has also been argued that Piaget ignored both emotional and social influences upon cognitive development.

One aspect of Piaget's work, which has frequently been criticised, is his methodology, the observation of his own children it is said, falls short of the controlled methodology characteristic of experimental psychology. *Piaget's use of particular observations to demonstrate general points is unscientific, Brainerd (1978).*

Ginsberg (1981) and Dansen (1994) argued that instructions given to children during Piaget's experiments were perhaps indefinite and therefore susceptible to misinterpretation. Piaget asked the children the same question twice, this could quite possibly cause confusion as it leads to the presumption that the first answer is incorrect. Piaget's conservation experiments were recreated by Rose and Blank (1974) and Samuel and Bryant (1984), in which they asked questions only once, both experiments produced differing results from those reported by Piaget in that very few errors were made.

Piaget's claims about *object permanence* within the *sensorimotor* stage have received much criticism, Bower and Wishart (1972), for example found that the way in which an object is made to disappear influences the infant's response. Baillargeon (1987)

conducted an experiment involving four and a half-month-old babies in which he concluded *object permanence* can occur at such a young age.
Much attention has also been afforded to Piaget's theory of *centration*, Donaldson (1978), for example has asked if the difficulty the child experiences is to do with what is expected of it and how the task is presented. He re-created the 'beads' experiment with six-year-old children. Using four toy cows, three black and one white, the cows were laid on their side and the children told they were 'sleeping'. Of those asked 'Are there more black cows than cows?' 25% answered correctly, however, of those asked 'Are there more black cows than sleeping cows?' 48% answered correctly. Similarly, Gelman (1978), Berko and Brown (1960) and Bruner et al (1966) have all argued that the word 'more' has a different meaning for children and adults. Adults use to 'more' to mean 'containing a greater number', for children the meaning refers to the general concept of larger, longer and so on.
Piaget's views of *egocentrism* in children under seven have also been challenged, Donaldson (1978) argues that the 'swiss mountain' experiment confused the child as it was not clear what was being asked. He claims Hughes' experiments were far easier to understand as they were more readily related to the world of the child. Donaldson calls this '*human sense'*.
According to Piaget, it should not be possible to accelerate the cognitive development process though the various stages. Meadows (1988) argues to the contrary, suggesting that training does in fact produce performance enhancement which can be quite notable and long lasting. She claims pre-school age children can be taught to perform concrete operational tasks three to our years ahead of time at levels of competence comparable to untrained eight year olds. An experiment conducted by Price-Williams, Gordon and Ramierez (1969), however, produced more ambiguous results (Mexican village experiment).
Some psychologists e.g. White and Ferstenberg (1978) and Dasen (1994) put forward evidence to suggest that in fact only one-third of adults tested in Western samples actually reach the formal operational stage and the ability to think abstractly does not exist at all in some areas of the world.
There are many other experiments which refute or invalidate Piaget's claims but what does remain an undisputed fact is that Piaget's impact upon child psychology has been tremendous.

As Ginsberg (1981) contends, Piaget did not actually propose a '*theory of instruction*', however, it has been suggested that there are three main implications for education of Piaget's theory of cognitive development. These are; *the concept of readiness, the curriculum and teaching methods,* each are ways in which Piaget's theory has been made relevant to pre-school and primary education rather than actual requirements.
Central to Piagetian views of the educational process is the idea of *discovery learning*. Piaget discovered that children explore and so cognitive development occurs spontaneously, discovery learning provides children with objects to explore but they are self-motivated. From a Piagetian perspective, children learn from actions rather than passive observations. In adopting a more Piagetian curriculum, the role of the teacher becomes very demanding, children must be provided with learning opportunities that enable them to advance to the next developmental step. Rather than providing the

appropriate materials and allowing children to get on with it, teachers should create a proper balance between actively guiding and directing children's thinking patterns and providing opportunities for them to explore by themselves, teaching from the concrete to the abstract. This process is achieved by creating *disequilibrium*. It is, therefore, essential that teachers to assess very carefully, each individual child's current stage of cognitive development, this relates to the concept of *readiness*.

Teachers are guides in the child's process of discovery, and the curriculum should be adapted to each child's individual needs and their intellectual level. (Smith & Cowie, 1991).

In adapting to the Piagetian curriculum, teachers should also encourage children to learn from each other. Listening to other, often-conflicting views can assist in the breakdown of egocentitrism. In addition to this cognitive value, peer interaction also has social value and as a result, small group activities are as important as individual work.

Piaget's works were first published in the 1930's, however, it was not until the 50's that primary schools began adopting his theory in education. During the 1960's *open plan* primary schools were favoured to allow children to discover at their own pace and, to an extent attend lessons of personal choice.

There remains much evidence of Piagetian theory in pre-school and primary education, methods such as Highscope and Montessori display certain Piagetian features.

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