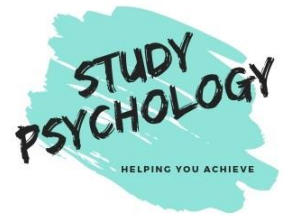


FACTBOOK

A01 and A03

COGNITION & DEVELOPMENT





Cognition and Development

Piaget's Theory of Cognitive Development

Piaget's (1936) theory of cognitive development explains how a child constructs a mental model of the world.

According to **Piaget**, schemas are the basic building blocks and enable us to form a mental representation of the world.

A schema is a mental representation of something you have seen or experienced which is stored in memory.

Jean Piaget (1952) viewed intellectual growth as a process of adaptation/ adjustment to the world.

Piaget's theory explains intellectual growth through the concept of cognitive development, which occurs through the processes of assimilation and accommodation.

As children interact with their environment, they assimilate new information into existing mental structures and accommodate their schemas to incorporate new knowledge, leading to intellectual growth.

Assimilation is using an existing schema to deal with a new object or situation.

Accommodation happens when an existing schema does not work and needs to be changed to deal with a new object or situation.

Equilibration is the force which drives the learning process, as we do not like to be frustrated and will seek to restore balance by mastering the new challenge (accommodation).

Equilibrium occurs when a child's schemas can deal with most new information through assimilation.

An unpleasant state of disequilibrium occurs when new information cannot fit into existing schemas (assimilation).

Equilibration is the force which moves development along. **Piaget** believed that cognitive development did not progress at a steady rate, but rather in leaps and bounds.

Piaget developed a theory of cognitive development which is in a series of progressive stages.

Piaget's stages of cognitive development are; sensorimotor, preoperational, concrete operational and formal operational.

The sensorimotor stage is approximately from birth to two years old.

The preoperational stage is approximately from age two until age seven.

The concrete operational stage is approximately from age seven to eleven.

The formal operational stage begins at approximately age eleven and lasts into adulthood.

In the sensorimotor stage the main achievement is object permanence; which is knowing that an object still exists, even if it is hidden. This requires the ability to form a mental representation (schema) of the object.

The sensorimotor stage in Piaget's theory is characterised by the development of object permanence, the use of sensory and motor skills to explore the world, and the absence of symbolic thought.

The characteristics of the preoperational stage in Piaget's theory are egocentrism, animism, centration, and the inability to understand conservation.

Animism is the belief that inanimate objects (such as toys and teddy bears) have human feelings and intentions.

Egocentrism is a child's tendency to only see the world from their point of view.

Egocentrism is the overwhelming focus on the self as the centre of importance. Many young children display this characteristic.

Piaget & Inhelder (1956) used the three mountains task to demonstrate egocentrism. Piaget & Inhelder used three mountains each with a different object on top. They placed a doll at the opposite side of the mountain to the child and found that most children struggled to say what the doll would see from that perspective.

In the preoperational stage young children can think about things symbolically. This is the ability to make one thing; a word or an object, stand for something other than itself. However, thinking is still egocentric, and the infant has difficulty taking the viewpoint of others.

Preoperational children found the mountain task most difficult in Piaget & Inhelder (1956).

Class inclusion refers to the ability to classify objects into two or more categories simultaneously. For example, the ability to recognise that categories such as 'cars' includes smaller sub-categories of white and black cars.

Piaget & Inhelder (1964) found that children under the age of 7, struggle with the more advanced skill of class inclusion (categories have sub-sets). When they showed children aged 7-8 years pictures of 2 cats and 5 dogs and asked them was there 'more dogs or animals', they

responded there were more dogs. **Piaget & Inhelder** suggest that younger children cannot simultaneously see a dog as a member of the dog group and the animal group.

The concrete operational stage marks the beginning of logical or operational thought. This means the child can work things out internally in their head, rather than physically try things out in the real world.

Conservation is the understanding that something stays the same in quantity even though its appearance changes.

The concrete operational stage is where children develop conservation skills. Children can conserve number (age 6), mass (age 7), and weight (age 9).

The characteristics of the concrete operational stage in **Piaget's** theory are conservation, reversibility, classification, seriation, and the ability to think logically about concrete objects and events.

The formal operational stage happens from age 11 years upwards and continues throughout adulthood, especially as we continue to learn and experience new things.

The main achievement of the formal operational stage in **Piaget's** theory is the ability to think abstractly and hypothetically.

The characteristics of the formal operational stage in **Piaget's** theory are abstract thinking, hypothetical reasoning, logical thinking, and the ability to think about multiple possibilities and outcomes.

However, **Bradmetz (1999)** followed up on the development of 62 children from age 7-15 years, regularly testing them for formal thinking skills. At age 15 only one participant could reliably carry out the tasks, contradicting the idea that formal thinking begins in early adolescence.

Piaget's theory is significant in understanding cognitive development because it emphasises the role of active exploration and interaction with the environment in shaping a child's thinking and understanding of the world.

Evaluation

Piaget studied his own children and the children of his colleagues in Geneva in order to deduce general principles about the intellectual development of all children, which is biased.

Piaget's samples were very small, mainly composed of European children from families of high socio-economic status. Researchers have therefore questioned the generalisability of the data.

As **Piaget** conducted the observations alone the data collected was based on his own subjective interpretation of events, lowering the reliability of his findings.

Behaviourism would also refute **Piaget's** schema theory because it cannot be directly observed as it is an internal process. Therefore, they would claim it cannot be objectively measured.

Hughes (1975) suggested that Piaget underestimated the abilities of children because his tests were sometimes confusing or difficult to understand.

Hughes (1975) tested the ability of children to see a situation from two different perspectives using a method similar to the mountain task but with a boy toy and two police officer dolls. The sample comprised of children aged 3.5-5 years, of whom 90% gave correct answers. Even when he devised a more complex situation, with more walls and a third police officer, 90% of four-year-olds were successful. This suggests Piaget underestimated the ability of younger children and his stages may not be accurate.

Gathering data from children can be problematic; they may not understand the questions, they have short attention spans and they cannot express themselves very well and also may be trying to please the experimenter.

McGarrigle & Donaldson (1974) set up a study for conservation of number, where the counters appeared to be moved by accident. In one condition they replicated Piaget's task asking children to say which row has more counters or if they were the same. They found similar results to Piaget in that children aged 4-6 answered incorrectly. However, in another condition a 'naughty teddy' appeared and knocked all the counters closer together, and subsequently 72% gave the correct answer.

McGarrigle & Donaldson (1974) suggest that younger children can conserve if they are not put off by the questioning.

Siegler & Svetina (2006) showed that children under 7 years old can in fact understand class inclusion, which goes against Piaget.

Siegler & Svetina (2006) gave 100 five-year-olds from Slovenia ten class inclusion tasks, getting an explanation of the task each time. If the children received feedback, they performed better on the task.

Vygotsky, a contemporary of Piaget, argued that social interaction is crucial for cognitive development. This was in contrast to Piaget.

Critics such as Vygotsky and Bruner prefer not to talk about stages at all, they see development as a continuous process.

Piaget underestimated the role that others played in the learning process. Whereas Vygotsky believed that learning from more knowledgeable others was key when consolidating new ideas.

As Piaget concentrated on the universal stages of cognitive development and biological maturation, he failed to consider the effect that the social setting and culture may have on cognitive development.

Dasen (1994) conducted research in remote parts of the central Australian desert with 8–14-year-old Aboriginal people. He gave them conservation of liquid tasks and spatial awareness

tasks. He found that the ability to conserve came later in the Aboriginal children, between aged 10 and 13. This contrasts with **Piaget** who said it happened much earlier.

Dasen (1994) states that only one-third of adults ever reach the formal operational stage.

Research has shown that the formal operational stage is not always met. **Keating (1979)** reported that 40-60% of college students fail at formal operation tasks.

Piaget's research was valid as he carried out detailed naturalistic observations of children, and from these he wrote diary descriptions charting their development. He also used clinical interviews and observations of older children who were able to understand questions and hold conversations.

There is evidence for the existence of individual formation of schemas, and **Piaget** suggests that individuals develop different schemas whilst experiencing the same thing.

Howe et al (1992) demonstrated how children pick up different facts and knowledge despite experiencing the same learning activity.

Howe et al (1992) placed children aged 9-12 into groups of four to discuss the movement of objects down a slope. All the children showed a better understanding after the task but each child picked up different facts and reached slightly different conclusions. This supports **Piaget's** ideas of how schemas are formed.

Piaget's ideas have been of practical use in understanding and communicating with children, particularly in the field of education.

Piaget's ideas changed how education was delivered in the classroom using more interactive, discovery learning, rather than the traditional teacher-led experiences.

However, **Lazonder & Harmsen (2016)** concluded that discovery learning with considerable input from teachers was the most effective way to learn.

The influence of **Piaget's** ideas in Developmental Psychology has been enormous. He changed how people viewed the child's world and their methods of studying children.

Vygotsky's Theory

Lev Vygotsky (1934) was a Russian psychologist who was influenced by **Piaget's** work.

The work of **Lev Vygotsky (1934)** has become the foundation of much research and theory in cognitive development over the past several decades, particularly of what has become known as Social Development Theory.

Vygotsky's theories stress the fundamental role of social interaction in the development of cognition.

Vygotsky saw cognitive development as a social process of learning from more experienced others (experts). He also saw language development as more important than **Piaget** did.

Like **Piaget**, **Vygotsky** claimed that infants are born with the basic materials/ abilities for intellectual development yet **Piaget** focused on motor reflexes and sensory abilities.

Unlike **Piaget's** notion that children's development must necessarily precede their learning, **Vygotsky** argued social learning tends to precede (i.e. come before) development.

Vygotsky developed a sociocultural approach to cognitive development.

Vygotsky claimed that individual development cannot be understood without reference to the social and cultural context within which it is embedded.

Vygotsky suggested higher mental processes in the individual have their origin in social processes.

Vygotsky refers to tools of intellectual adaptation; these allow children to use basic mental functions more effectively and these are culturally determined (e.g., memory mnemonics, mind maps).

Vygotsky assumes cognitive development varies across cultures, whereas **Piaget** states cognitive development is mostly universal across cultures.

Vygotsky states cognitive development stems from social interactions from guided learning within the zone of proximal development as children and their partner's co-construct knowledge.

For **Vygotsky**, the environment in which children grow up will influence how they think and what they think about.

For **Vygotsky**, thought and language are initially separate systems from the beginning of life, merging at around three years of age, producing verbal thought (inner speech).

According to **Vygotsky (1978)**, much important learning by the child occurs through social interaction with a skilful tutor.

The 'more knowledgeable other' (MKO) refers to someone who has a better understanding or a higher ability level than the learner, with respect to a particular task, process, or concept.

The 'zone of proximal development' (ZPD) is an important concept that relates to the difference between what a child can achieve independently and what a child can achieve with guidance and encouragement from a skilled partner.

Vygotsky (1978) sees the 'zone of proximal development' (ZPD) as the area where the most sensitive instruction or guidance should be given, allowing the child to develop skills they will then use on their own, developing higher mental functions.

The ZPD is the gap between a child's current level of development and what they could achieve with the help of a more knowledgeable other.

Expert assistance helps a child cross the ZPD, gaining a much more advanced understanding.

Vygotsky believed that when a student is in the ZPD for a particular task, providing the appropriate assistance will give the student enough motivation to achieve the task.

Freund (1990) conducted a study in which children had to decide which items of furniture should be placed in particular areas of a dolls house. Some children were allowed to play with their mother in a similar situation before they attempted it alone (zone of proximal development) while others were allowed to work on this by themselves (**Piaget's** discovery learning).

Freund (1990) found that children who had previously worked with their mother (ZPD) showed the greatest improvement, suggesting that guided learning within the ZPD led to greater understanding/performance than working alone (discovery learning).

Vygotsky suggested that children not only learn more facts during social interactions but they acquire more advanced reasoning abilities.

Vygotsky claimed instructional concepts such as 'scaffolding' and 'apprenticeship', in which a teacher or more advanced peer helps to structure or arrange a tasks, provide more successful outcomes, when the novice has to act alone.

The idea of scaffolding was introduced by **Wood et al (1976)**.

Wood & Middleton (1975) gave 4-year-old children a set of blocks and pegs to build a 3D model shown in a picture. Building the model was too difficult a task for a 4-year-old child to complete alone. **Wood and Middleton** observed how mothers interacted with their children to build the 3D model. The results of the study showed that no single strategy was best for helping the child to progress but offering support gave them the motivation to work it out.

Wood et al (1976) named certain processes that aid effective scaffolding; including gaining and maintaining the learner's interest in the task, making the task simple and emphasising certain aspects that will help with the solution.

Wood et al (1976) also suggest that controlling the child's level of frustration and demonstrating the task can help the child achieve.

Scaffolding (assistance) is most effective when the support is matched to the needs of the learner. This puts them in a position to achieve success in an activity that they would previously not have been able to do alone.

According to **Dixon-Krauss (1996)** the teacher's role is mediating the child's learning activity as they share knowledge through social interaction.

Copple & Bredekamp (2009) suggest that scaffolding is a key feature of effective teaching and can include modelling a skill, providing hints or cues, and adapting material or activity.

Vygotsky's theories also feed into current interest in collaborative learning, suggesting that group members should have different levels of ability so more advanced peers can help less advanced members operate within their zone of proximal development.

Evaluation

Rogoff (1990) dismisses the idea that **Vygotsky's** ideas are culturally universal and instead states the concept of scaffolding (which is heavily dependent on verbal instruction) may not be

equally useful in all cultures for all types of learning. In some instances, observation and practice may be more effective ways of learning certain skills.

Roazzi & Bryant (1998) provide support for the ZPD. They gave a similar task to children working alone and those working with the help of an older child. The older children offered prompts and suggestions which made the task more successful.

Roazzi & Bryant (1998) also provide support for scaffolding, as older children in the offered support to the younger children, which resulted in more success.

Conner & Cross (2003) used a longitudinal study to follow 45 children completing problem-solving tasks with the help of their mothers at 16, 26, 44 and 54 months old. As the children gained in experience, they used their mothers help less often. This supports the idea of scaffolding that levels of expert help decline during the process of learning.

Vygotsky's ideas have practical applications in education and show the benefits of having a more knowledgeable other or learning through scaffolding.

In education, Vygotsky's principles are fundamental, such as social interaction during learning, in the form of group work or peer tuition.

Van Keer & Verhaeghe (2005) found that 7-year-olds tutored by 10-year-olds, in addition to regular whole-class teaching, progressed further in reading than a control group with no additional support.

Alborz et al (2009) reviewed the use of teaching assistants and found they were very effective at improving the rate of learning in children.

Liu & Matthews (2005) criticise these ideas as they found in China, classes of up to 50 children can learn effectively in lecture-style classrooms with minimal interaction from others.

Howe et al (1992) suggest that what children actually learn varies considerably between individuals, even in group situations for learning.

Baillargeon's Explanation of Infant Abilities

Renee Baillargeon wanted to show how young children develop a cognitive understanding of the world around them.

The main focus of Baillargeon's research is infant cognition and early development.

Baillargeon's research on causal reasoning in infants furthered our understanding of Piaget's theory of cognitive development.

Baillargeon's explanations of early infant abilities include knowledge of the physical world and violation of expectation research.

Knowledge of the physical world refers to our understanding how the physical world works. For example, object permanence in infants.

Violation of expectation research is a method of investigation studying an infant's knowledge of the world. The idea is that if children understand how the physical world operates then they will expect certain things to happen in given situations.

Violation of expectation research is a technique based on the idea that an infant will show surprise when witnessing an impossible event.

If children show surprise in given situations it means they have an intact knowledge of the world, as the expected behaviour did not occur.

Baillargeon suggested that young babies had a better understanding of the world than **Piaget** believed.

Baillargeon used a technique that has come to be known as the violation of expectation (VOE) paradigm. It exploits the fact that infants tend to look for longer at things they have not encountered before.

In a VOE experiment, an infant is first introduced to a novel situation. They are repeatedly shown this stimulus until they indicate, by looking away, that it is no longer new to them.

Baillargeon (2004) explained VOE experiments as those that test children's abilities, which she described as more sophisticated than **Piaget** believed.

In a typical **Baillargeon** experiment babies see two test events; an expected event which is consistent with the view that something may happen, and an unexpected event, which violates this.

Baillargeon & Graber (1987) showed 24 babies, aged 5-6 months, a tall and a short rabbit passing behind a screen with a window. A baby with object permanence would understand that as the rabbits are passed behind the screen (hidden), they are still present.

In **Baillargeon & Graber (1987)** there were two test conditions, an expected condition where the short rabbit cannot be seen behind the screen but is expected to come out the other side. A second condition, unexpected where the tall rabbit could not be seen behind the screen in the window, as would be expected.

In **Baillargeon & Graber (1987)** infants looked for an average of 33.07 seconds at an unexpected condition compared to 25.11 seconds at an expected condition.

Baillargeon & Graber (1987) suggest that a baby who has object permanence would show surprise when faced with the unexpected event. For children to be surprised by the unexpected event, they must have known that the tall rabbit would appear in the window. This demonstrates a good understanding of object permanence.

Baillargeon suggested that even very young children have an awareness of the physical properties of objects.

In **Baillargeon et al (1985)** the habituation stimulus was a 'drawbridge' that moved through 180 degrees.

In the 'drawbridge' study, a coloured box was placed in the path of the drawbridge. In the possible event, the drawbridge stopped at the point where its path would be blocked by the box. In the impossible event, the drawbridge appeared to pass through the box and ended up lying flat, the box apparently having disappeared.

Baillargeon (1987) habituated 3-month-old infants to a truck rolling down a track and behind a screen. A box was introduced and placed either beside the track where the truck would roll past it or on the track where it should block the truck's path. The screen was then replaced and the truck sent down the track as before. **Baillargeon** found that the infants looked significantly longer at this impossible event and concluded that they knew that the box still existed despite being behind the screen and that it should have blocked the path of the truck.

Baillargeon's studies indicate that three-month-old infants have an understanding of objects that **Piaget** says does not appear until nine to twelve months.

Baillargeon's research clearly shows that infants appear to look for longer at scenes that break physical laws like object permanence.

Baillargeon conducted different types of VOE experiments, from occlusion (rabbit study) to containment (using containers) and support (expectation that objects fall when not supported).

Baillargeon, Needham & DeVos (1992) set out to establish what babies understand about support phenomenon; a technical term for our knowledge of how objects rest on each other.

Baillargeon, Needham & DeVos (1992) used a sample of 32 babies aged 6-7 months in their experiment. The infants were seated on their parent's knee and shown a box resting on a tabletop. During the trial, a gloved hand reached out and pushed the box along the supporting surface to different resting positions; fully resting on the surface, 70% on the surface or 15% on the surface.

Baillargeon, Needham & DeVos (1992) found significantly more time was spent looking at the impossible scenario (15% on the surface), suggesting the babies expected the box to fall onto the floor and their attention was captured when it did not do this.

Baillargeon et al (2012) proposed a theory of infant physical reasoning, suggesting we are born with a physical reasoning system (PRS), which is our basic understanding about the world around us.

Evaluation

All of **Baillargeon's** studies provide empirical support for her theory of cognitive development.

There are many studies that have used **Baillargeon's** methodology, and they consistently produce similar results.

Baillargeon's methodology has been widely used to investigate infants' knowledge of object permanence, physical causality, and other aspects of cognitive development.

Baillargeon's theories are widely accepted amongst developmental psychologists.

Baillargeon's VOE studies have high internal validity, as many of the experimental variables were controlled sufficiently to say they were causing the effect on the results.

Bower et al (1971) support Baillargeon's research by demonstrating that four-month-old infants will move their gaze towards an expected event. They showed children a moving train which became temporarily hidden behind a screen before re-emerging the other side. The children were able to understand that the train was out of sight but would be expected to reappear.

Bower (1974) argued that visual tracking studies reveal that 5-month-old infants can represent objects in space, something **Piaget** attributes to far older infants.

The VOE method challenges **Piaget's** research which claimed that when a baby loses interest in a hidden object, they no longer believe that it exists. It could be that the children were simply distracted by other visual stimuli and so stopped looking.

Schoner & Thelen (2004) point out that all the VOE studies show is that the infants notice a difference between the two events they have been shown, they claim everything else is an extrapolation from this.

Cashon & Cohen (2000) showed that infants looked longer at scenarios which were more interesting, challenging **Baillargeon's** ideas.

Bremner (2013) highlighted **Piaget's** point that recognising unexpected events does not necessarily mean that children understand them.

Hespos & Van Marle (2012) suggest that **Baillargeon's** ideas help us to explain our universal understanding of the physical world.

Hespos & Van Marle (2012) state that the universal understanding of the physical world is innate, as we all have a good basic understanding of the physical world regardless of culture or experience.

This innate basic understanding of the physical world suggests that **Baillargeon's** physical reasoning system (PRS) is correct.

Social Cognition

The development of social cognition refers to the concept of the child developing a sense of who it is and how it fits into society. As the child matures it develops an increasing idea of its self-identity.

Self-identity is influenced by various factors, including social interactions, cultural norms, and personal experiences.

Self in this context refers to a person's self-awareness. **Murphy (1947)** proposes that 'the self is the individual as known to the individual.'

Learey (2004) suggests the self is 'a cognitive structure that allows self-reflection and organises information about ourselves.'

Self-identity refers to the concept of a person's perception and understanding of themselves as a unique individual within society.

Family dynamics and relationships can have a significant impact on an individual's self-identity.

Personal values and beliefs can shape an individual's self-identity.

Personal experiences, such as achievements and failures, can impact how a person perceives themselves.

Cultural norms and values also play a role in shaping an individual's self-identity.

The development of self-identity is a complex process that occurs throughout childhood and adolescence.

The development of self-identity is a process that occurs as a child matures and gains a sense of who they are and how they fit into the world around them.

Carl Rogers' (1951) humanistic theory suggests that self-identity is shaped by the congruence between one's self-concept and their actual experiences and behaviours.

According to **William James (1890)** self-awareness involves the ability to recognise oneself as a distinct entity separate from others.

Charles Cooley's (1902) looking-glass theory suggests that our self-concept is shaped by how we believe others perceive us.

Selman's Levels of Perspective Taking

As social cognition refers to how an individual becomes aware of how they fit into a social world, **Selman (1980)** suggests that to understand another person's point of view, we must understand that not everyone thinks the same.

Selman (1980) investigated social cognition using role-taking interpersonal dilemmas. From this he established levels of interpersonal interactions, which he called perspective taking.

Interpersonal dilemmas are stories about people interacting with each other, which have different possible outcomes.

Selman (1970) looked at changes that occurred with age, in children's responses to scenarios in which they were asked to take the role of different people in a social situation.

Selman (1971) investigated perspective taking using a sample of 30 girls and 30 boys. They were split into three groups of 20 based on their age; 4, 5 or 6 years. The children were tested individually and given a task to measure perspective taking.

Selman (1971) used scenarios which required children to consider how each of the people in the situation felt. **Selman** found that the level of perspective taking correlated with age, suggesting a clear developmental sequence.

Selman's Levels of Perspective Taking provide a framework for understanding how individuals develop the ability to take the perspective of others and understand that different people may have different thoughts and beliefs.

Selman used his perspective taking research to formulate a stage theory, using a series of developmental levels.

Selman used the term 'role-taking' to explain how taking the role of another person allows a child to see behaviour from a different perspective.

Selman (1980) proposed that there are different levels of perspective taking in interpersonal interactions. He developed five levels of thinking.

Level 0 of **Selman's** Levels of Perspective Taking is the egocentric stage, where individuals can only understand their own perspective.

Level 0 is the egocentric viewpoint (3-6 years) where a child can label other people's obvious feelings but do not see the cause of those feelings.

Level 1 of **Selman's** Levels of Perspective Taking is the social-informational stage, where individuals can understand that others may have different perspectives based on different information.

Level 1 is the social informational role taking stage (6-8 years) where children know other people may have different information and may or may not agree with them.

Level 2 of **Selman's** Levels of Perspective Taking is the self-reflective stage, where individuals can understand that others may have different perspectives based on different beliefs or values.

Level 2 is the self-reflective role taking stage (8-10 years) where children can see other people's viewpoints, but not at the same time as their own.

Level 3 of **Selman's** Levels of Perspective Taking is the mutual stage, where individuals can understand that others may have different perspectives based on mutual perspectives and can engage in reciprocal role-taking.

Level 3 is the mutual role taking stage (10-12 years) where children can see the mutual and simultaneous viewpoints of others.

Level 4 of **Selman's** Levels of Perspective Taking is the societal stage, where individuals can understand that others may have different perspectives based on societal norms, values, and roles.

Level 4 is the social and conventional system role taking stage (12-15+ years) where children realise that society has a view and a set of values/ norms that should be obeyed.

Selman believed that development through these stages is based on maturity and experience.

Gurucharri & Selman (1982) tested the interpersonal dilemmas in a longitudinal study over 5 years with 41 children. They found that 40/41 children developed perspective taking as predicted by the Levels theory.

Epley et al (2004) found that egocentric errors decline with age, supporting the levels of perspective taking idea.

Evaluation

Selman's interpersonal dilemmas have become an accepted way of investigating the development of perspective taking.

There are similarities with **Selman's** levels and **Piaget's** stages, particularly with regard to egocentrism which decreases after the age of seven.

Longitudinal studies such as **Gurucharri & Selman (1982)** have high validity as they collect data over an extended period of time.

Selman failed to consider social factors, such as arguments which would promote perspective taking.

Selman's research samples were all taken from Western, middle-class society, which limits the generalisation.

Selman recognised that the levels of perspective taking do not fully explain social development.

Studying behaviour and placing it into sequential stages or levels does not account for individual differences in children.

Schultz et al (2003) suggested three aspects of social development; interpersonal understanding, interpersonal negotiation strategies and awareness of personal meanings of relationships.

Interpersonal understanding is what **Selman** measured, where if we can take different roles then we can understand social situations.

Interpersonal negotiation strategies are social skills that we develop in order to deal with social situations, such as asserting our behaviour or managing conflict in a situation.

Having an awareness of personal meanings of relationships, helps children reflect on social behaviour in the context of different relationships.

Selman was able to show significant correlations between age and the ability to take different perspectives in social situations. However, correlational research cannot infer cause and effect.

Buijzen & Valkenburg (2008) observed interactions in toy shops, with parents who refused to buy their child a new toy they wanted. They noted any coercive behaviour in the children (forceful), which is an example of unhealthy social behaviour. **Buijzen & Valkenburg** found negative correlations between age and perspective taking (which was assessed by interview).

Buijzen & Valkenburg (2008) suggest there is a relationship between perspective taking abilities and healthy social behaviour.

Gasser & Keller (2009) did not find any link between perspective taking and social development. They tested perspective taking in a group of bullies and their victims. They found that bullies had no difficulties in perspective taking.

Gasser & Keller (2009) suggest that perspective taking may not be a key element in healthy social development.

As perspective taking is a cognitive ability, it cannot be the only factor in a child's social development. This idea is too reductionist.

Individual differences, such as cognitive abilities and empathy levels, can impact the development of perspective taking skills.

Cultural factors play a role in perspective taking, as individuals from different cultures may have different norms and values that influence their understanding of others' perspectives.

Wu & Keysar (2007) provide cultural evidence for perspective taking ability.

Wu & Keysar (2007) compared American and Chinese children on perspective taking tasks. They found that Chinese children were more advanced, suggesting there are cultural differences.

Theory of Mind

Theory of Mind (ToM) was first coined by **Premack & Woodruff (1978)** as the cognitive capability of understanding another's mind.

Theory of Mind (ToM) is the ability to put yourself in someone else's shoes, understand that they may be thinking or feeling different to you. This is an essential skill for empathy and success in social interactions.

Theory of Mind refers to the ability to understand and attribute mental states to oneself and others, such as beliefs, desires, and intentions.

The development of Theory of Mind involves understanding that others have different beliefs, desires, and intentions from oneself.

Theory of Mind plays a crucial role in social cognition and is important for understanding and predicting others' behaviour.

Theory of Mind development typically occurs during early childhood and continues to develop throughout adolescence and adulthood.

The Theory of Mind (ToM) is believed to develop at around 4 years of age.

Some people believe that Theory of Mind is developed after mastering basic early skills such as attention, imitation, recognition and imaginary play.

Smith (1999) suggest children develop a Theory of Mind in the following order; understanding wanting, understanding thinking and understanding that seeing leads to knowing. **Smith** also suggest that understanding 'false beliefs' and 'hidden feelings' demonstrate the development of a theory of mind.

According to **Smith (1999)** understanding wanting is a recognition that different people want different things.

According to **Smith (1999)** understanding thinking is the recognition that different people have different beliefs about the same things. Each person's belief may be just as valid as the next person.

According to **Smith (1999)** understanding that seeing leads to knowing suggests that if you have not seen it yourself, you do not know about it, so will need more information to understand it.

According to **Smith (1999)** understanding false beliefs is an idea that sometimes people believe things that are not true, and may act according to their beliefs, not as to what is really true.

Perner et al (1987) used a deceptive box task to test false beliefs in children. They found that children exhibit an understanding of false beliefs around 4-5 years old.

The idea of false beliefs has been tested extensively in Child Psychology.

According to **Smith (1999)** understanding hidden feelings is the idea that people can display different emotions to those they are really feeling.

The Theory of Mind (ToM) is tested using the false belief method. A child is shown a scenario and asked to interpret it from the viewpoint of one of the characters. If they can do this, they have a developed ToM.

Wimmer & Perner (1983) studied ToM using a group of children aged 4, 6 and 8 years old. They watch a toy (called Maxi) place some chocolates in a blue cupboard. Maxi leaves the room during which time his mum moves the chocolates to a green cupboard. The children see Maxi return and are asked 'where will Maxi look for the chocolates?'. **Wimmer & Perner** found that most 4-year-olds incorrectly expect Maxi to look in the green cupboard whereas 6 and 8-year-olds correctly believe he will look in the blue cupboard.

Simon Baron-Cohen is by far the biggest contributor to our knowledge of ToM. However, most of the information he has collected has been from his work on children with autism.

Baron-Cohen et al (1985) asked children to watch as two dolls (Sally and Anne) act out a scenario similar to the **Wimmer & Perner** cupboard experiment. Sally places a marble in her basket and leaves the room and her basket behind. Anne removes the marble and places it in her box, then Sally returns.

Baron-Cohen et al (1985) studied the responses to the Sally Anne task by comparing autistic children with two other groups (Down's syndrome and Normal). He asked them a question to check their understanding of the dolls names before checking their memory. He measured their responses to a belief question in the scenario, which required them to see things from the dolls perspective. They found that autistic children struggled the most with the 'belief' question and could not place themselves in the scenario to see things from the dolls perspective.

In **Baron-Cohen et al (1985)** 85% of the children in the two control groups correctly identified where Sally would look for her marble, compared to only 20% of the autistic children.

Baron-Cohen et al (1985) suggested that even though the mental age of the autistic children in the experiment was higher than that of the controls, they alone failed to impute beliefs to others.

Baron-Cohen et al (1985) suggested that children with autism seem unable to appreciate that others have different thoughts or beliefs to themselves.

Autism is a developmental disorder characterised by an inability to socially interact with others. Studies have shown that children with autism lack a theory of mind, which restricts them from interacting emotionally with others.

However, not all children with autism lack a theory of mind. It is also possible to develop a child's theory of mind through play therapy and guided tuition.

Evaluation

Many of the studies testing the ToM lack validity, as often the scenarios are artificial and the procedures are carried out under controlled conditions.

Many of the supporting studies testing the ToM lack ecological validity as they are conducted in strictly controlled, artificial conditions.

In the experiments testing ToM there could be issues with understanding, as young children may not comprehend the questions, or equally so may want to please the research so show demand characteristics.

A limitation of ToM research is the reliance on false belief tasks to test the theory; however **Bloom & German (2000)** argue these may not be valid.

Bloom & German (2000) suggest that mistakes made on false belief tasks may be the result of poor visual memory rather than ToM.

Some studies suggest that the tasks used to assess ToM might actually be testing perspective taking instead.

Not all children with autism lack a theory of mind, nor are problems with theory of mind limited to autistic people (**Tager-Flusberg, 2007**).

In contrast, **Perner et al (2002)** suggest that ToM is an innate ability which develops alongside other cognitive abilities, largely as the result of maturity.

Wilde Astington (1998) argues that ToM develops as a consequence of our interactions with others and is gradually internalised.

Replications of the Sally Anne test have shown similar results to those from **Baron-Cohen (1985)** suggesting that the method is reliable.

Leslie (1987) suggested an innate theory of mind mechanism (ToMM) that matures in 'normal' children at around 2 years of age. **Leslie** proposed that autism can be understood in terms of an impairment in the growth and functioning of this mechanism.

The ToM occurs in all cultures, which supports the idea that there is some underlying biological mechanism, but our experiences can help nurture it.

Cross-cultural studies like **Liu et al (2004)** have found a similar pattern of development of ToM abilities in different cultures.

Liu et al (2004) suggested that ToM abilities did not necessarily develop at the same age in all cultures but in the same sequence.

Frith & Frith (1999) found evidence that the amygdala, temporal cortex and frontal cortex show raised levels of activity when people are asked to consider the actions or feelings of other people. This proposes that certain brain areas are involved in the development of a Theory of Mind.

The ToM coincides with **Piaget's** conservation skills and is developed around the same age, suggesting this is a valid concept.

There are real world applications from understanding how ToM is developed and can be used to help people with autism navigate the social world a little better.

The Mirror Neuron System

The mirror neuron system consists of brain cells called mirror neurons, which fire in response to personal action and in response to the action of others.

It is suggested that mirror neurons are involved in the social cognition processes of empathy, understanding intention, perspective taking and theory of mind.

According to **Ramachandran (2006)** the ability to share the emotions of those around us is due mirror neurons, and this ability has shaped how we communicate in society.

Mirror neurons fire when a person observes the same action performed by another, the neuron mirrors the behaviour of the other.

Dysfunction in the mirror neuron system has been implicated in disorders such as autism spectrum disorder.

Mirror neurons are a type of brain cell that fire both when an individual performs an action and when they observe someone else performing the same action.

Rizzolatti et al (1996) were studying electrical activity in a monkeys motor cortex, when a researcher reached to get his lunch in view of the monkey, and this action activated the monkeys cortex.

Rizzolatti et al (1996) studied macaque monkeys and noticed that when wired with electrodes, they showed the same firing patterns when they watched other monkeys pick up food, as when they did so themselves.

Rizzolatti et al (1996) coined the term 'mirror neurons'.

It is suggested that problems with the mirror neuron system could account for the inability of people with autism to empathise, which might explain their lack of ToM.

Dysfunction in the mirror neuron system has been associated with difficulties in social interaction and communication, as seen in disorders such as autism spectrum disorder.

Ramachandran & Oberman (2006) proposed the 'broken mirror' theory of autism. This suggests that neurological deficits in the mirror neuron system prevent a developing child understanding the behaviour of others.

The mirror neuron system is believed to play a role in empathy, as it allows individuals to understand and share the emotions of others.

Cheng et al (2006) used brain scans to see if gender differences played a part in the mirror neuron system.

Cheng et al (2006) found that female brains show a stronger motor resonance than male brains, which might explain why females are better at social referencing; where we look at others to read their emotions and know how to respond.

Studies suggest that people understand other people's actions and intentions through motor resonance; this is the perception of another's actions which produces brain activity very similar to what would be observed if they had performed the same actions.

Gallese & Goldman (1998) suggested that mirror neurons respond not just to observe the actions but to the intentions behind behaviour. Rather than the common-sense view that we interpret people's actions with reference to our memory, Gallese & Goldman suggested that we simulate others' actions in our motor system and experience their intentions using our mirror neurons.

Rizzolatti & Craighero (2004) looked for mirror neurons in humans, however it is not yet possible to experimentally test single neurons in humans. They used brain scans to show a network of mirror neurons in the frontal and parietal regions.

Lacoboni et al (1999) used fMRI scans to show support for the mirror neuron system in the frontal and parietal lobes, as these areas were most active when a person performs an action, and also when they see another person performing an action.

Evaluation

Jarratt (2012) says we are capable of understanding actions that we are unable to perform, without needing mirror neurons.

Hickok (2014) believes the function of mirror neurons is not about understanding the actions of others but about using others to make our own choices how to act.

Hamilton (2012) conducted a meta-analysis of 25 studies and concluded that there was little evidence for a global dysfunction of the mirror neuron system in those with autism.

Hadjikhani (2007) provide support for a link between autism and dysfunctions in the mirror neuron system. Brain scans have shown smaller areas of the brain, rich in mirror neurons in people with autism.

Nishitani et al (2004) used scanning techniques to show how brain activity was lower in people with autism compared to that of neurotypical individuals.

Heyes (2012) says that we do not know whether mirror neurons have evolved to help us understand each other's actions or whether they are the after-effect, which is the brain's response.

Most of the research into mirror neurons studied the brains of animals which cannot be generalised to humans.

The research into mirror neurons is difficult, costly and involves scientific equipment which lacks external validity.

According to **Bekkali et al (2019)** there is no direct evidence for mirror neurons in humans, as there is no 'gold standard' way of measuring them.

Hamilton (2013) concluded that evidence for mirror neurons was inconsistent and hard to interpret.

Haker et al (2012) scanned the brains of people as they watched a film of people yawning. They saw more activity in the area associated with mirror neurons, when the participants yawned in response.

Lacoboni et al (2005) showed activity in the inferior frontal gyrus (rich in mirror neurons), increased when participants tried to understand the intentions behind an action.

