| CHAPTER 4 |

Main Areas of Human Development I: Emotional, Cognitive, and Social Growth From Birth to Late Adolescence

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ABSTRACT

This chapter provides an overview of human development, specifically focusing on the characteristics of cognitive, emotional, and social development from birth to late adolescence, through an overview of major foundational psychological theories. The goal of this chapter is to offer a comprehensive understanding of the diversity and relevance of emotional, cognitive, and social processes by presenting different, complementary theoretical approaches, illustrated with practical, real-life examples.

Despite presenting aspects of emotional, cognitive, and social development separately within the chapter, numerous theories and approaches, as well as research evidence, are presented that emphasise the interconnected and reciprocal nature of these processes. Proper functioning of the cognitive system is necessary for the establishment of balanced emotional states and social relationships because, as detailed within the chapter, according to certain cognitive emotion theories, emotions arise based on the cognitive evaluation of external events and internal states. Similarly, a lot of empirical evidence demonstrates that the social environment plays a primary role in a child's appropriate emotional, cognitive, and psychosocial development.

The chapter also highlights the first two years of life as a critical period in not only cognitive and emotional but also social development. Experiences acquired during this period influence later developmental stages. Positive experiences and a supportive social environment lead to the development of adaptive cognitive schemas that contribute to later balanced social and emotional development. In contrast, negative experiences and an unsupportive social environment can result in the formation of schemas that increase the likelihood of difficulties in emotional and social development; unsuccessful resolution of age-specific crises; and likelihood of the emergence of psychopathologies such as anxiety, depression, and personality disorders.

KEYWORDS

cognitive development, emotional development, social development, sociocultural context, learning

Andrea BARTA (2025) 'Main Areas of Human Development I: Emotional, Cognitive, and Social Growth From Birth to Late Adolescence' in Bernadett RAPOSA – Balázs Péter HÁMORNIK (eds.) *Social and Personality Development in Childhood.* Miskolc–Budapest: Central European Academic Publishing. pp. 111–135. https://doi.org/10.71009/2025.brbph.sapdic_4

1. Cognitive Development

Cognition encompasses various intellectual abilities, activities, and processes. Cognitive development refers to changes in these abilities from birth to late adolescence. Cognitive processes include perception, attention, memory, categorisation, thinking, reasoning, and decision-making. These processes enable the acquisition, storage, manipulation, and utilisation of information in different contexts.[1,2]

The development of language is particularly remarkable, as significant differences in proficiency can be observed at various stages of life. Infants can only produce sounds, but by the age of around 1 year, they start using their first meaningful words. Language is the cognitive ability that allows us to express our thoughts and understand the thoughts of others using sounds, letters, and grammatical rules, a particularity of human cognition.[3] The most influential periods of language acquisition are infancy and early preschool years.[4] Language and thought develop side by side, with language helping us organise our internal thoughts and social interactions through communication.[5] Thinking involves manipulating all forms of information, playing a significant role in problem-solving. Reasoning pertains to logical thinking and making deductions based on the provided information. During the process of decision-making, individuals focus their thinking on selecting among different alternatives.[6,7,8]

According to the dual-process theory of decision-making, the decision-making process is realised through two parallel cognitive systems. The analytic or rational system provides logical, scientific thinking, which is associated with fewer cognitive biases, while the experiential or intuitive system enables quick, automatic thinking, utilising heuristics (shortcuts) that result in more cognitive biases. As age progresses, analytic and rational thinking becomes increasingly sophisticated. Research has shown that middle and late adolescents make more accurate and logical statistical inferences, displaying fewer cognitive biases than early adolescents. Developments in the rational system and decision-making can be explained by the maturation of metacognitive processes; this is because adolescents, with age, increasingly monitor, control, and correct their thinking processes and the strategies applied in various decision-making situations. However, concomitant with the development of the rational system, with advancing age, the experiential and intuitive system also becomes more prominent, and the application of heuristics

1 Galotti, 2016, pp. 18–39.
2 Groome et al., 2014, pp. 2–22.
3 Ibid., pp. 302–309.
4 Galotti, 2016, pp. 178–182.
5 Owens, 2016, pp. 17–45.
6 Evans, 2020, pp. 1–25.
7 Galotti, 2016, pp. 425–427.
8 Groome et al., 2014, pp. 240–269.

becomes more frequent, especially in decision-making situations involving social contexts. [9]

1.1. Constructivist Cognitive Development Theory

Jean Piaget's theory of cognitive development emphasises the active role of children in creating new mental structures. Children assimilate their existing mental structures with environmental stimuli, thus creating new, more advanced, and complex mental structures that contribute to appropriate adaptation.[10]

Piaget developed the stage theory of development, where qualitative changes occur in different stages, each building upon the previous one. The cognitive structures developed in one stage contribute to the creation of more complex structures in the next stage. These stages are associated with specific age periods and are not interchangeable; they follow a particular sequence. According to the theory, developmental stages are universal and appear in every individual, with the environment having a less determining role.[11]

Mental structures and cognitive activities develop through the processes of assimilation and accommodation. Assimilation involves applying an existing cognitive structure to new situations. For example, seriation, a mental structure that develops in early school age, can be used for not only physically arranging objects in order of size but also mentally ordering tasks, such as scheduling homework or activities. Accommodation, on the other hand, entails changing mental structures to adapt to new environmental influences. A child's seriation ability evolves and changes each time they apply it to different tasks. Thus, both assimilation and accommodation are present in every activity, facilitating successful adaptation and development.[12]

Piaget identified four developmental stages. The first is the sensorimotor stage, which lasts from birth to 2 years. During this stage, infants are unable to mentally represent information or form conscious memories, so their development is based on sensory and motor actions. Without the presence of a perceivable object, infants lose interest because they have not formed a mental representation of the object. For example, if a hidden object is not visible to the infants, it effectively does not exist for them, a phenomenon explained by lack of the mental structure of object permanence. Infants respond to external stimuli through automatic reflexes, such as the grasping or sucking reflex. Through assimilation and accommodation, these reflexes develop into more complex schemas. For instance, infants start controlling the grasping reflex with visual cues, bringing the perceived object closer for further exploration. By the age of 2 years, they acquire the ability to mentally represent objects, including the concept of object permanence, understanding that objects and people exist even when they are not seen.[13]

9 Albert and Steinberg, 2011, pp. 211–224.
10 Babakr, Mohamedamin and Kakamad, 2019, pp. 517–524.
11 Galotti, 2016, pp. 45–71.
12 Cohen and Waite-Stupiansky, 2013, pp. 57–72.
13 Rabindran and Madanagopal, 2020, pp. 2152–2157.

The second stage is the preoperational stage, which extends from around the age of 2 to 6. During this stage, children can use language to express their thoughts and perceive the past and future through mental representations.[14] However, reversible mental operations are lacking in this stage. Children cannot consider multiple perspectives or concentrate on multiple characteristics of an object or situation. For example, when asked to group objects of different sizes, colours, and shapes, they may shift between different criteria and fail to hold onto their initial categorisation criterion. This one-sided focus is also evident in the concept of conservation, as children in this stage cannot understand that changes in appearance do not necessarily affect quantity. In one of Piaget's conservation experiments involving plasticine, most 3- to 4-year-olds believe that a flattened piece of plasticine contains more plasticine than the original piece in ball form, simply because it appears larger. Egocentrism characterises their thinking, as they believe that others perceive the world exactly as they do. They cannot differentiate between their perspective and that of others, assuming that others know what they know, such as thinking that someone standing opposite them sees the same things they do, even when their viewpoint is different. For example, they might assume that their parents know what the toys at preschool look like or what happened at a birthday party they did not attend.

The concrete operations stage extends from around age 6 to early adolescence, up to 11–12 years old. During this period, children develop the ability to understand conservation, categorisation, and seriation. They can consider multiple perspectives, distinguish between appearance and reality, and perform mental operations with the presence of concrete objects. In the concrete operations stage, children, as opposed to those in the preoperational stage, can not only determine that two differently shaped pieces of plasticine contain the same amount but can also provide logical reasoning for it. They often use reversibility as an argument, explaining that the flattened plasticine can be reshaped into a ball. They can categorise objects based on multiple criteria and, after selecting one criterion, disregard the others. Older children can even categorise using multiple criteria simultaneously. Piaget argued that children in this stage can perform these mental operations only when concrete objects are present.[15]

The formal operations stage occurs during adolescence and is characterised by abstract and systematic theoretical thinking. Adolescents can engage in logical reasoning, conduct mental experiments to consider the consequences of their actions, and evaluate possible alternatives. Abstract thinking allows them to perform operations without the presence of concrete objects and to solve problems involving unknown variables. In the application of logical reasoning, significant differences emerge between individuals in the concrete and formal operational stages. When presented with syllogisms that contain empirically false premises, adolescents can disregard the truth value of the premises and focus solely on whether the conclusion

14 Owens, 2016, pp. 17–45.
15 Babakr, Mohamedamin and Kakamad, 2019, pp. 517–524.

follows logically. In contrast, children in the concrete operations stage cannot separate the truth of the premises from their content. Formal operational thinkers recognise the distinction between logical and empirical reasoning. Adolescents' cognitive development enables them to understand that there are different ways to interpret the world, based on various rules and expectations. They question social norms and institutional systems.[16]

1.2. Sociocultural Cognitive Development Theory

According to Lev Vygotsky's sociocultural development theory, the cultural environment determines the cognitive abilities a child develops. In contrast to Piaget's theory, where children develop the mental structures necessary for adaptation on their own, in Vygotsky's theory, these schemas are shaped through the interaction between the child and their environment.[17] Cultural tools, available within the society, aid in the development of cognitive abilities, or their absence can result in underdeveloped abilities. The child's parents, family, and school environment contribute to the formation of mental structures by assisting the child in learning through social interactions.[18] The zone of proximal development refers to the difference between a child's current level of development (what they can do and understand independently) and their potential level of development (what they can do and understand with the help of an adult or more experienced peer).[19] Therefore, with the help of members of the social environment, a child can reach their potential level of development. The level of the zone of proximal development varies depending on the child's current level of development. For instance, a parent can assist a child in learning basic mathematical operations, such as addition, by manipulating concrete objects or presenting real-life situations that require addition, such as "Sarah eats 3 slices of apple, her brother eats 5 slices of apple, how many slices of apple do the two siblings eat together?" The process through which new skills, schemas, and mental structures become integrated into the cognitive system through social interactions is called internalisation.[20]

Culture influences which skills and mental structures a child will acquire. In Western societies, alongside basic education in math, writing, and reading, there is strong emphasis on teaching digital and practical skills that students can use in the labour market after leaving school. In contrast, other cultures focus on developing different skills and mental structures, such as fishing, hunting, agricultural skills, or craftsmanship, to ensure adaptation. Speech is one of the most important cultural tools, contributing to the formation of all mental structures and the development of cognitive abilities. Communication through speech enables assistance from the social environment, which facilitates reaching the potential level of development.

16 Galotti, 2016, pp. 45–71.
17 Hughes, 2021, pp. 41–46.
18 Swain, Kinnear and Steinman, 2015, pp. 15–48.
19 Kozulin et al., 2003, pp. 15–64.
20 Vasileva and Balyasnikova, 2019, pp. 1–15.

Internal speech also helps children, adolescents, and adults perform complex tasks and guide themselves through the tasks.[21]

1.3. Information Processing Approach

According to the information processing approach, environmental stimuli go through various processes, interact with prior knowledge in long-term memory, and are organised into existing schemas or conceptual categories. When no prior knowledge exists on a topic, new schemas or conceptual categories are formed.[22]

Information from different sensory modalities is processed and interpreted through perception in the cognitive system. Perception is the cognitive process through which information from the external world gains meaning. Attention is the cognitive ability that allows us to focus our mental resources on a specific task. It directs perception and helps differentiate between task-relevant and irrelevant information or stimuli. Complex, novel tasks require more attention and greater mental concentration, while well-practiced tasks can be performed almost automatically without significant attentional effort. Multitasking, or dividing attention between multiple tasks, is possible alongside automatic task performance.[23]

Memory is the cognitive process that enables us to store relevant information selected for attention for long-term use. The active memory unit responsible for active information processing is called the working or short-term memory, which has limited capacity. Pioneering discoveries by George Miller showed that an individual with average intellectual abilities can store and manipulate around 7±2 chunks or units of information in the working memory. Chunking, which involves grouping information based on a logical rule, allows for efficient processing of larger amounts of information compared to handling individual units. For example, when memorising a series of numbers such as a phone number, chunking allows us to create groups of two or three digits, making it much easier to remember. The process of chunking is also activated during learning when we attempt to identify relationships between pieces of information by categorising and organising the material. Working memory capacity is notably lower in preschool-aged children, at around three or four chunks, and increases with age. Through active processing, information is transferred from the working memory to long-term memory.[24]

In long-term memory, we organise our knowledge using categorisation. Significant differences exist in the amount of accumulated knowledge between younger and older children. How infants, preschoolers, young school-aged children, and adolescents organise and categorise information varies. Memory is constructive, influenced by prior experiences, knowledge, and memories. People tend to fill in missing information in their recall, often unintentionally. This phenomenon is

21 Panhwar, Ansari and Ansari, 2016, pp. 183–188.
22 Groome, 2014, pp. 160–165.
23 Galotti, 2016, pp. 80–88.
24 Groome, 2014, pp. 137–142.

particularly evident in the memories of children, who can be highly susceptible to manipulation through suggestive questions. [24] A study conducted with 8-year-old children found that the occurrence of false memories is not only triggered by children's increased tendency to obey adults but is also influenced by the current memory traces. In the experiment, children who recalled false or partially false memories were more prone to agree with the misleading information provided by the experimenter in a deception task than did children who did not have false memories.[25] In a review from 2016, research results were summarised regarding how the interviewer's attitude can impact children's testimonies, accuracy of their memories, and their susceptibility to influence. Creating a secure, supportive environment leads to more accurate recall than neutral, unsupportive conditions. The interviewer's supportive attitude results in more accurate recall, less acquiescence, and greater resistance from the child regarding suggestive questions. For children who are less cooperative, anxious, insecurely attached, and cognitively deficient, a supportive environment and attitude during the interview are particularly important.[26] The context of encoding is also highly relevant for retrieval performance. Numerous studies have shown that retrieval is more effective when the learning context, environment, learner's emotional state, or mood at encoding matches the context during retrieval.[27]

2. Emotional and Social Development

2.1. Functions and Types of Emotions

Besides their evolutionary functions, emotions play a prominent role in the 21st century as they influence our emotional and physical well-being, learning, everyday activities, decision-making, problem-solving efficiency, adaptability to different life situations, personal successes, social relationships, and moral decisions.[28,29] Sroufe categorised the functions of emotions into three major categories.[30] From an evolutionary perspective, one primary function of emotions is to respond to emergencies, activating bodily physiological changes that trigger the fight or flight response.[31] The communicative and social function of emotions is particularly relevant since we communicate with others through our emotions and their expressions and share our emotional states, as well as through the events and experiences that led to these emotional states.[32] In infancy and childhood, the expression of emotions plays a

25 Otgaar et al., 2012, pp. 397–403.
26 Saywitz et al., 2016, pp. 1–18.
27 Galotti, 2016, pp. 18–39.
28 LoBue, Pérez-Edgar and Buss, 2019, pp. 7–8.
29 van Kleef and Côté, 2022, pp. 629–658.
30 Wilson and Wilson, 2015, pp. 1–7.
31 Cannon, 1927, pp. 106–124.
32 Hess and Thibault, 2009, pp. 120–128.

crucial role in communication because children depend on their social environment during this period.[33] Similarly, in childhood and adulthood, the exploratory function of emotions is essential as emotions motivate individuals to learn and discover new stimuli.[34]

Emotional reactions arise from various mental processes, activities, and physiological changes. The perception, attention, motivation, thinking, learning, memory, and combined operation of these cognitive processes trigger emotional reactions. In addition to physiological reactions and the activity of the nervous and limbic systems, which ensure survival and adaptation from an evolutionary perspective,[35] emotional reactions include an automatic, powerful subjective feeling and the expression of emotion, which can be influenced by culture, context, age, and gender.[36,37,38]

Based on the interpretation of perceived events, we can distinguish between positive and negative emotions. Subjective interpretation influences whether we perceive certain emotions as positive or negative. Fear and fright are generally interpreted as negative emotions, even though feeling fear and the subsequent behaviour can have positive consequences in a dangerous situation. Similarly, love can be considered either positive or negative.[39,40] Emotions also differ in terms of their intensity and duration. Emotions are typically short-lived, intense reactions, while moods are weaker in intensity and longer-lasting states. Emotional expression also varies and is influenced by social, cultural, and gender expectations. The intensity of emotional expression does not necessarily match the intensity of the experienced emotion since individuals regulate and control the degree of emotional expression through their cognitive systems, which is a prerequisite for functioning social relationships.[41,42,43] Additionally, primary emotions and secondary emotions can be distinguished.[44,45] Discrete emotion theories emphasise the presence of culture-independent basic emotions,[46] while structural developmental theories focus on the explanation of secondary emotions.[47]

33 Granqvist et al., 2017, pp. 534–558.
34 Sroufe, 1995, pp. 11–15.
35 Dror, 2014, pp. 13–20.
36 Poláčková Šolcová and Lačev, 2017, pp. 75–82.
37 Shuman et al., 2017, pp. 47–56.
38 Wilson and Wilson, 2015, pp. 14–21.
39 Carver and Scheier, 1990, pp. 19–35.
40 Wilson and Wilson, 2014, pp. 21–5.
41 Chaplin, 2015, pp. 14–21.
42 Hareli, Kafetsios and Hess, 2015, pp. 1–12.
43 Lim, 2016, pp. 105–109.
44 Becker-Asano and Wachsmuth, 2010, pp. 32–49.
45 Demoulin et al., 2004, pp. 71–96.
46 Hess and Thibault, 2009, pp. 120–128.
47 Sroufe, 1995, pp. 38–50.

2.2. Emotion Theories

2.2.1. Discrete Emotion Theories

Discrete emotion theories are based on Charles Darwin's evolutionary emotion theory. According to Darwin's approach, emotions served an adaptive function during evolution, ensuring survival, success, and reproduction. The correct interpretation of environmental stimuli and the behaviour and emotions of others increase the chances of the correct response. Darwin observed the emotional facial expressions of infants from different cultural backgrounds and concluded that there are universal basic emotions that are instinctive and innate.[48,49]

Similar to Darwin, Paul Ekman also examined emotional facial expressions in different cultures. He identified six basic emotions that appear in every culture: happiness, sadness, fear, anger, surprise, and disgust.[50] Carroll Ellis Izard, in addition to the six basic emotions defined by Ekman, identified four more: shame, contempt, guilt, and interest.[51] Like Izard, Silvan Tomkins suggested that emotions could originate from the interpretation of facial expressions, and that facial expressions could increase the intensity of experienced emotions, a concept known as facial feedback.[52,53]

2.2.2. Structural Developmental Theories

Emotional development is inseparable from context and environment. Emotions develop through interactions with the social environment, so emotional development is closely related to social development. Individuals with limited social networks also have basic emotions, but secondary social emotions develop during social interactions. Representatives of structural developmental theories argue that emotional development occurs through the interaction of physiological, psychological, cognitive, and social environmental systems.[54]

According to Sroufe, every secondary emotion has a preceding childhood emotion. The experience of a new emotion results from the structural transformation of a previous emotion due to the influence of the social environment. Simple early childhood emotions such as anger, joy, and fear evolve into complex emotions. Culturally and socially determined secondary social emotions include love, jealousy, anxious fear, bitterness, empathy, sympathy, and more. If early social interactions with caregivers and mothers are disrupted during infancy, the development of secondary emotions may also be negatively affected because infants learn that they cannot influence their

48 LoBue, Pérez-Edgar and Buss, 2019, pp. 8–10.
49 Wilson and Wilson, 2015, pp. 31–35.
50 Ekman, 2003, pp. 1–13.
51 Izard, 1977, pp. 67–95.
52 Coles, Larsen and Lench, 2019, pp. 610–651.
53 McIntosh, 1996, pp. 121–147.
54 Wilson and Wilson, 2015, pp. 35–36.

social environment, which can lead to social and emotional developmental problems in the future.[55]

2.2.3. Physiological Emotion Theories

Physiological emotion theories consider the physiological component of emotions as the key factor in the formation of emotions, disregarding the study of emotional expression and facial expressions. Based on the James-Lange theory, emotions arise because of physiological and bodily reactions to an event, with emotions being triggered by the subjective perception and interpretation of these bodily reactions. According to this theory, for example, when a child is frightened by a barking dog on the street, it is not the feeling of fear that triggers the associated bodily reactions. The child begins to produce bodily reactions such as trembling, rapid heart rate, and crying as a result of perceiving the barking dog, and the perception of these bodily reactions then provokes the emotion of fear.[56,57,58]

One criticism of the James-Lange theory, as noted by Walter Cannon, is that physiological changes do not always go hand in hand with the experience of emotions. For instance, physical work or sports activities can increase heart rate and sweating, but these physiological reactions often do not generate emotions such as fear.[59] Another critique of the James-Lange theory is that emotions often appear simultaneously with the presentation of environmental stimuli, even before interpreting the bodily reactions. According to Philip Bard, emotions develop when the thalamus transmits information about the perceived environmental stimulus to the brain, which simultaneously results in physiological reactions.[60] Based on these arguments, Cannon and Bard concluded that externally triggered emotions and physiological reactions occur simultaneously, and there is no causal relationship between physiological reactions and the appearance of emotions.[61]

2.2.4. Cognitive Emotion Theories

In their theory, Schachter and Singer emphasised the role of the cognitive factor, in addition to the presence of physiological reactions, in the formation of emotions. This cognitive factor involves the interpretation and labelling of bodily reactions. According to the two-factor theory, appearance of an environmental stimulus triggers a physiological response, and the emotion is then created after the response is interpreted cognitively.[62] Therefore, if a child encounters the stimulus of a barking dog and feels fear, the perception of barking triggers increased heart rate and rapid

55 LoBue, Pérez-Edgar and Buss, 2019, pp. 13–15.
56 Fehr and Stern, 1970, pp. 411–424.
57 LoBue, Pérez-Edgar and Buss, 2019, pp. 8–10.
58 Wilson and Wilson, 2015, pp. 31–32.
59 Cannon, 1927, pp. 106–124.
60 Bard, 1934, pp. 264–311.
61 Dror, 2014, pp. 13–20.
62 Schachter and Singer, 1962, pp. 379–399.

breathing, and the child identifies and explains these bodily reactions as fear. The theory also highlights that cognitive interpretation and context play a crucial role in the creation of emotions, as the same physiological reactions can elicit different emotions. For example, a child's rapid heartbeat and increased breathing, resulting from playing hare and hounds in the park, can evoke feelings of happiness, excitement, and joy, while the same physiological reactions during a test may result in feelings of fear.[63,64,65]

The cognitive appraisal theory, represented by Richard Lazarus and Susan Folkman, posits that cognitive appraisal is a crucial factor alongside physiological responses in the development of emotions. According to the theory, when children are confronted with the stimulus of a barking dog, they first evaluate the situation and identify the potential danger. This cognitive appraisal triggers physiological reactions and the feeling of fear simultaneously. During primary appraisal, the individual evaluates whether an event or environmental stimulus is positive, negative, or neutral. If the person evaluates the event as positive or neutral, there will be no heightened physiological reactions. However, if the event is perceived as negative or dangerous, a secondary appraisal occurs, during which the individuals assess their abilities and coping strategies that can help them deal with the negative event. The secondary appraisal can result in the person perceiving the event as harmful, dangerous, or challenging. The perception of harm or danger occurs when the person does not possess the necessary coping skills for dealing with the event or is unable to apply these skills in a given situation. The presence of coping skills or confidence in using them can lead to the event being interpreted as a challenge. Reappraisal involves continuously reinterpreting the event based on new information that may be relevant to coping with the event.[66,67]

2.2.5. Theory of Primary Emotional Systems and the Role of Play in Children's Development

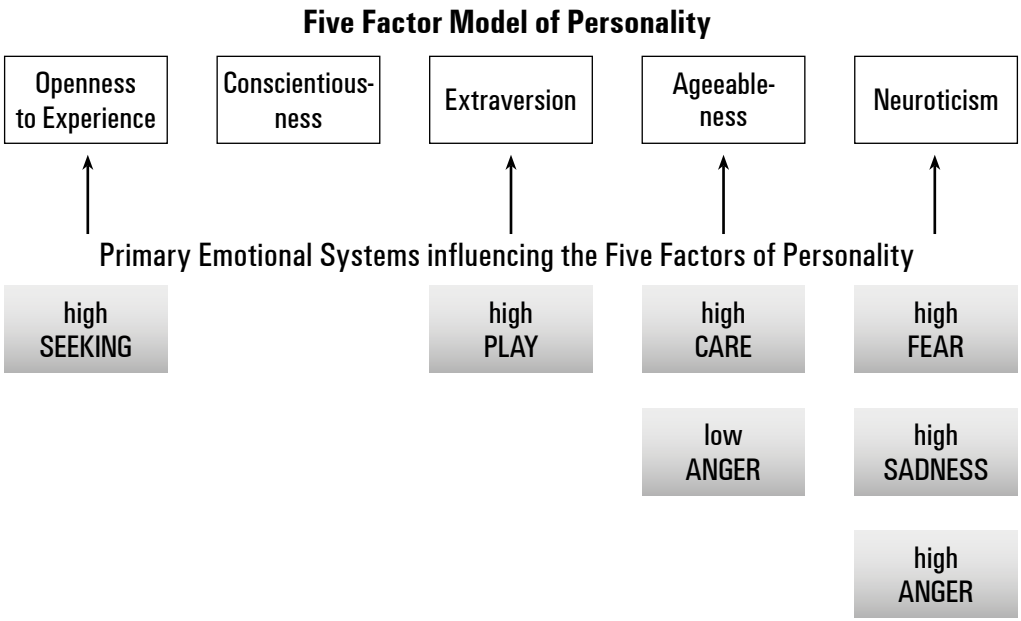
In Jaak Panksepp's evolutionary theoretical approach, he distinguished between brain systems that elicit negative and positive emotions, which also influence personality traits such as agreeableness, extraversion, openness, and neuroticism (see Figure 1). Within positive emotions, he identified the brain emotional systems of seeking, lust, care, and play, while within negative emotions, he identified the brain emotional systems of fear, rage/anger, and sadness/panic. The brain's emotional systems that elicit negative emotions have an adaptive role. The fear brain system helps recognise situations indicating a threat, allowing individuals, through learning in childhood, to avoid physically or emotionally dangerous situations. The anger system can be activated in not only situations where people are under attack and must

63 Dror, 2017, pp. 7–16.
64 Griffiths, 2017, pp. 197–203.
65 Wilson and Wilson, 2015, p. 32.
66 Folkman et al., 1986, pp. 992–1003.
67 Lazarus, 1991, pp. 819–834.

defend themselves but also situations where achieving a goal is jeopardised, leading to frustration. For example, children might get angry at a sibling if they feel they are not getting enough attention from their parents. Panic or sadness arises in situations where a person feels alone, excluded, or abandoned.

Similar to the negative emotional brain systems, positive emotional systems also play a crucial role in adaptation. The survival brain system fosters a child's curiosity and exploratory behaviour, forming the basis for survival and learning. The lust and care systems enable the satisfaction of sexual desire and offspring care needs, allowing for the experience of associated positive emotions. Despite the initiation of sexual life typically occurring in adolescence or early adulthood, activation of these emotional brain systems can be observed in children's play, such as roleplaying games where children take on roles, care for dolls, feed them, give them drinks, etc.

Figure 1: Primary emotional systems and personality[68]



Social play is the most crucial emotional brain system in childhood, with an evolutionary role in forming and maintaining social relationships. The absence of social play in childhood and increased engagement in non-social forms of play, such as phone and computer games, can lead to reduced social skills.[69]

Play involving objects emerges in infancy, leading to exploration and learning by allowing the child to discover the properties and behaviours of objects and their

68 Montag and Panksepp, 2017, p. 8.
69 Ibid., pp. 1–15.

functions. From the age of 1.5 to 2 years, children begin to organise objects, laying the foundation for later categorisation. By the age of 4, they start building and creating new objects using available materials. These early play activities enhance children's thinking, problem-solving strategies, language development, mathematical skills, and spatial abilities.

Another early play activity involves engaging in physical games, such as those related to movement (e.g. cycling, jumping, dancing, and climbing), fine motor games (e.g. manipulating toys, colouring, and cutting), and games with other children or parents (e.g. hare-and-hounds and hide-and-seek). Physical play activities positively impact spatial-visual skills, eye-hand coordination, math performance, social acceptance, and social competence.

Symbolic play develops through representational systems such as spoken language, writing, counting, and music. Language games, such as rhymes and tale reading, enhance children's phonological awareness. Involvement in musical games, such as singing and dancing, develops prosocial behaviour. Through drawing activities and drawing games, children can express their emotions and thoughts.

Roleplay, drama games, and fantasy games contribute to the development of children's reasoning and social skills. Imaginative play is a key learning form for language, communication skills, and storytelling. Fantasy-based imaginative play, in particular, has a positive impact on executive functions, with children possessing more vivid imagination exhibiting higher attention-switching, inhibitory control, and working memory capacity. Several studies have demonstrated that the depth of engagement in roleplaying games influences children's creativity.[70]

2.3. Attachment as a Process Influencing Emotional and Social Development

In an evolutionary approach, John Bowlby defined attachment as a genetically encoded process. This means that infants are born with the ability to form attachments, and these attachments serve an evolutionary purpose by promoting survival. Children can form attachments with multiple individuals, but one of these, primary attachment, is particularly significant and qualitatively different. Typically, primary attachment forms with the caregiver, usually the mother, during the sensitive period within the first two years of life. Infants and mothers instinctively seek proximity to each other, and the infant's inborn attachment behaviours, such as crying or smiling, cause the caregiver's attention and care.[71]

The disruption or failure to develop attachment between the primary caregiver and the child, or inadequate emotional care from the primary caregiver, is referred to as maternal deprivation. This can have long-term negative consequences on the child's social, emotional, and cognitive development. The cognitive schemas individuals form about themselves, the world, and social relationships are rooted in their early attachment experiences and determine their attachment style. Damage

70 Whitebread et al., 2017, pp. 7–22.
71 Granqvist et al., 2021, pp. 90–113.

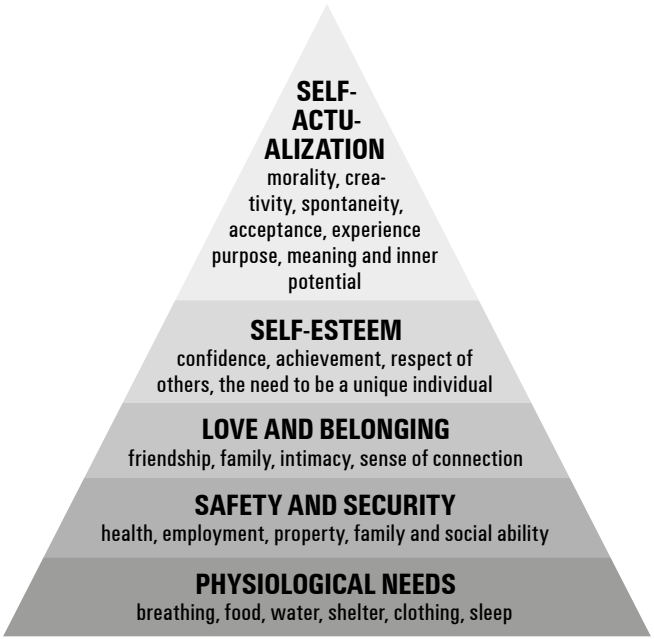
to primary attachment can negatively affect the establishment and maintenance of later social relationships. Children who experience maternal deprivation may have difficulty trusting others, perceive themselves as less lovable and valuable, and feel less capable of effectively managing social relationships. Early attachment representations can be altered by subsequent attachment experiences or by reinterpreting past events.

Individuals with a secure attachment style trust the person to whom they are emotionally attached. They believe they deserve love, react adaptively to relationship disruptions, and can act independently when necessary. In contrast, individuals with anxious-ambivalent attachment assume that others do not reciprocate their love and intimacy, and they are uncertain in their relationships. This attachment style often results from inconsistent or unreliable responses from the primary caregiver to the child's needs. Individuals with avoidant attachment style tend to avoid interaction with the primary caregiver and do not show signs of distress when the caregiver leaves. This style can develop when the caregiver rejects the child's attempts at closeness or exhibits impatience or aggression in response to the child's behaviour. These children learn to avoid interaction with their caregivers and believe they must rely on themselves for happiness and cannot effectively manage social relationships.[72]

In Abraham Maslow's theory regarding the hierarchy of needs, he enumerated the biological, social, emotional, and cognitive needs whose fulfilment is essential for mental well-being and ideal social and emotional development. As illustrated in Figure 2, after satisfying the basic biological needs, the next level includes the need for safety and security, the foundation of which is the presence of secure attachment. According to Maslow's theory, if the needs at the lower levels of the hierarchy are not met adequately, such as the child, adolescent, or adult not feeling safe or loved, fulfilment of needs in the higher levels of the hierarchy may also be damaged. Consequently, a child with insecure attachment may experience impaired cognitive and self-actualisation abilities and low self-esteem. According to the theory, neglecting the biological and emotional needs of a child and providing inadequate responses during critical periods by the parent, such as ignoring the child's cries, failing to comfort, or providing insufficient care for biological needs, may contribute to their school adjustment problems, low self-esteem, low academic performance, and difficulties in identifying and achieving individual potentials and goals later in life. In contrast, securely attached children, whose biological and emotional needs were adequately met during critical periods, are more effective in establishing and maintaining social relationships, have higher self-esteem and self-confidence, and are more motivated in learning, thus achieving higher academic results. They have higher intrinsic motivation, as their needs for security, autonomy, and competence are more fully satisfied, making them more effective in identifying and utilising their individual strengths during the pursuit of their individual goals.[73]

72 Stevenson-Hinde, 2007, pp. 337–342.
73 Kenrick et al., 2010, pp. 292–314.

Figure 2: Maslow's hierarchy of needs[74]



2.4. Psychosocial Development

According to Erik Erikson's theory, individuals go through various psychosocial developmental stages from childhood to adulthood, each characterised by a psychosocial crisis. The resolution of these crises can have positive or negative effects on an individual's personality. An individual's emotional and social psychological needs interact with their social environment, which influences the satisfaction of these needs.[75]

The first psychosocial stage is trust vs. mistrust, which lasts from birth to approximately 1.5 years old. During this stage, infants completely rely on their primary caregiver for help and care. If parents respond lovingly and appropriately to the infant's needs, such as meeting their biological needs when they cry and providing emotional care by actively engaging with them, trust develops in the child. This trust extends to the world, and the children learn to count on the people around them, which positively influences their future relationships. A successful resolution of this psychosocial crisis leads to the development of hope in the child, as they learn that they can rely on others for support and safety. Conversely, if parents neglect or inadequately respond to the children's needs, the children may develop a sense of mistrust, feeling that the world is not a safe place and that they cannot rely on others when

74 Source: www.simplypsychology.org.
75 Erikson, 1978, pp. 222–242.

needed. Mistrust leads to fear, which can have lasting effects on the child's emotional and social development.[76]

The second psychosocial stage is autonomy vs. shame and doubt, which occurs from around 1.5 to 3 years old. During this period, children begin to control basic physical actions and strive for independence from their parents. If parents encourage their children to make independent decisions (e.g. choosing their clothes or what to eat) and help them in developing new skills (e.g. dressing themselves, alimentation, learning new games, and potty training), children become more confident in their abilities and their capacity to succeed in life. The sense of autonomy contributes to self-confidence and self-control. However, if parents frequently control their children's actions, criticise their attempts at independence, or are impatient or displeased with their unsuccessful efforts, children may feel ashamed and uncertain about their abilities, leading to low self-esteem and dependence on others.[77]

The third psychosocial stage is initiative vs. guilt, which occurs when children start to control social interactions, covering the preschool period. During this time, children initiate play activities with other children, discovering their interpersonal skills. They plan and execute activities, and with supportive social environments, they can develop a sense of purpose, learn how to control their environment, and gain confidence. The initiation and execution of new activities often involves making mistakes and experiencing failures. These experiences teach children that their actions have consequences. If parents accept and are patient with their children's unsuccessful attempts to master new skills that require self-control (e.g. using cutlery and the restroom), children learn that they can control their own bodies and actions. Initiative leads to willpower and goal-oriented behaviour. However, if parents reject their children's initiatives, react impatiently to their curiosity and questions, or provide negative feedback regarding their independent actions or ideas, children may feel guilty and uncertain about pursuing their own desires and goals, inhibiting their initiative and creativity.

The fourth psychosocial stage is competence vs. inferiority, during which children begin to discover that they can accomplish tasks by developing skills. They compare themselves to their peers and draw conclusions about their abilities. This stage corresponds to the elementary school years. Support and positive feedback from parents and teachers can lead to a sense of competence and self-confidence that they possess the skills necessary to achieve their goals and perform tasks successfully (e.g. writing, reading, and performing mathematical operations). Negative feedback or the inability to develop their skills may lead to a sense of inferiority, where children may feel less capable than their peers, undervalued, and without the skills needed for self-confidence. In school, children learn to not only complete individual tasks but also work in groups, which enhances their problem-solving and time management competencies. They also learn to overcome difficulties and failure in learning through

76 Austrian, 2008, pp. 45–50.
77 Newman and Newman, 2015, pp. 61–83.

the support of adults and peers, understanding that they can achieve their goals even in the face of obstacles.[78]

The fifth psychosocial developmental stage is identity vs. role confusion, during which an individual discovers their identity through experimenting with different roles, values, and goals, typically during adolescence. With the support of parents, teachers, friends, and peers, adolescents can freely explore various roles (e.g. in relationships, future careers, occupation-related activities) representing different interests and values. Based on the experiences gained, they develop their own identity. If the social environment restricts the process of identity exploration, or if adolescents face numerous negative experiences during this period, role confusion may develop. As a result, adolescents may struggle to find their place in the world and define their values and goals. Acceptance and positive feedback from peers can contribute to higher self-esteem and a stronger sense of identity, but feelings of exclusion can lead to role confusion and low self-esteem.[79]

James Marcia extended Erikson's theory regarding identity development by proposing that adolescents not only explore but also commit to their identities.[80] If there is no commitment or if commitment occurs without prior exploration, identity can be damaged. He termed the state of having neither exploration nor commitment as a diffuse identity. This state is typically present during early adolescence, followed by a period of exploration, usually starting in mid to late adolescence, when adolescents explore various options and roles based on activities modelled by their peers. If the state of diffuse identity persists for a long time or if adolescents fail to explore different roles, it may lead to low self-esteem, high susceptibility to influence, and lack of commitment. Foreclosure is a state characterised by commitment without exploration, often triggered by anxiety, a desire to conform to social norms, or parental pressure. Adolescents might commit to their first romantic relationship, or the career chosen by their parents, without exploring alternative options or understanding their own desires, goals, and values. Foreclosure can transit into exploration as adolescents begin to try new roles when they start thinking independently. However, this state can persist into adulthood, leading to feelings of submissiveness, inferiority, dependence on external feedback, and poor adaptability to change. In the state of moratorium, adolescents actively experiment with different roles but have not yet committed. This phase is characterised by questions, anxiety, and uncertainty, preceding the achievement of identity. Those who have explored various roles and committed to the values and goals that align with their interests have achieved identity. Achieving identity is often a lengthy process, lasting into young adulthood, as exploration continues.[81,82]

The sixth psychosocial developmental stage is intimacy vs. isolation, which is typical of young adulthood, spanning from ages 18 to 40. During this stage, the

78 Erikson, 1978, pp. 222–242.
79 Newman and Newman, 2015, pp. 61–83.
80 Marcia, 1966, pp. 551–558.
81 Marcia et al., 1993, pp. 3–20.
82 Marcia, 2009, pp. 670–677.

primary goal is to establish loving and intimate relationships. In middle adulthood, from ages 40 to 65, the seventh stage, generativity vs. stagnation, is present. During this period, individuals focus on building their careers, starting families, or making other contributions to the society. The final, eighth, stage is ego integrity vs. despair, which occurs from age 65 until the end of life. During this stage, individuals reflect on their life satisfaction, evaluating the extent to which they have achieved their goals and desires and made good decisions.[83,84]

2.5. Empathy, Prosocial Behaviour, and Aggression

According to Jean Piaget's stage theory of development, egocentric thinking characterises a child's cognition until the end of preschool age. The children are unable to consider others' perspectives, and their behaviour is entirely motivated by the satisfaction of their own needs, disregarding the viewpoints of others. Egocentric thinking is also evident in interactions with parents and peers. At this age, a child may obey a parent, such as collecting toys, to gain a reward, such as receiving praise or avoiding punishment. Interactions with peers are also influenced by egocentric thinking, for instance, sharing a toy with another child to be able to play with that child's preferred toy or presenting good behaviour to gain approval from a kindergarten teacher.[85]

During the concrete operational stage, the child gradually develops the decentration ability, considering the perspectives of others. They begin to recognise others' emotions and understand viewpoints beyond their own behaviour. Through understanding others' perspectives and motives, empathy and the capacity for compassion towards others develop in the child. The progression of decentring and empathy replaces egocentric thinking, giving rise to social and cooperative thinking, and prosocial behaviour emerges. The children no longer collect the toys solely for self-interest but recognise and understand that it brings calmness to their mother if they clean up after themselves. Actions are motivated by a desire to make others feel good, as seen in sharing toys with a friend to bring them joy, assisting a classmate who struggles with the material to help them succeed, befriending a peer in the class who lacks friends to bring happiness to their life, and so on.[86]

According to the social learning theory, children acquire social behaviours and emotions through observation and imitation, a process known as observational learning. Significant individuals such as parents, family members, teachers, peers, or even fictional cartoon characters serve as models for children. Models can be individuals who hold high status, are rewarded for their actions, care for us, or share similarities with us. Observational learning is not limited to childhood, and people continue to learn from significant individuals throughout their lives. Regardless

83 Austrian, 2008, pp. 45–50.
84 Erikson, 1978, pp. 222–242.
85 Andreeva, 2018, pp. 26–37.
86 Masalova, 2019, pp. 380–385.

of age, individuals are more likely to imitate individuals of the same gender due to social norms and expectations.[87] According to the social learning theory, children can acquire empathy and social skills through observational learning. However, they can also learn negative forms of behaviour and emotions, such as aggression.

Based on his research regarding the imitation of aggression, Albert Bandura identified various factors that can increase the likelihood of observational learning. Similarity is one such factor that increases the probability of imitation. A preschool child is more likely to imitate the behaviour and aggression of a peer who is of the same age, shares similar interests, prefers similar play activities, and has similar external characteristics than the behaviour of older children, such as teenagers, because they can identify more with the former. Similarly, there is greater likelihood of imitation when behaviour is rewarded, meaning that it is associated with consequences that are favourable to the child. Conversely, if negative events follow a behaviour, the child is less likely to imitate it. If a child sees that classmates displaying aggressive behaviour are rewarded, such as enjoying popularity in the class or gaining some advantage (e.g. acquiring their classmates' toys), there is a higher likelihood of imitation of that behaviour. However, if teachers appropriately control aggressive behaviours, for example, if a child displaying aggressive behaviour is punished or excluded from certain extracurricular activities due to their behaviour (e.g. not allowed to go on a class trip), there is lesser chance of them adopting the role of the model. High-status and successful individuals are also more likely to become models than those with lower status or who have not achieved success. Expertise, having high-level knowledge in a specific area, is another factor that increases the likelihood of someone becoming a model.[88,89]

2.6. Moral Development

Lawrence Kohlberg defined moral development as a lifelong, dynamic process. The cognitive processes underlying moral decisions and conclusions show age-related differences, and moral decision-making can be divided into various developmental stages. The first level is the preconventional level, within which two stages can be distinguished: (1) obedience and punishment and (2) individualism and exchange. The first stage is mainly characteristic of preschool-aged children, where they perceive the purpose of following rules as avoiding punishment. For example, children collect their toys when asked by a parent to avoid punishment. In the second stage, individualism and exchange, children recognise that certain actions satisfy the needs of others or themselves. Therefore, the children can consider the perspectives of others alongside their own. However, individual interests still guide actions in this stage. The child will follow rules and exhibit behaviours that lead to some positive consequences. In school, they may listen to the teacher to receive praise, understanding

87 Devi, Khandelwal and Das, 2017, pp. 721–724.
88 Ahn, Hu and Vega, 2019, pp. 1–12.
89 Bandura, 1977, pp. 16–55.

that adherence to societal rules and their behaviour affects how others, particularly the teacher, perceive them.[90]

Within the second, conventional level, lie the third and fourth stages of moral development: interpersonal relationships and maintenance of social order. In the third stage, children recognise that their behaviour affects their social relationships, including what others think of them. They strive to behave as good, kind, respectful, and helpful children to fit into their peer group. In the fourth stage, individuals acknowledge the existence of a social order in the world. People follow the instructions of those with higher status, obeying them while considering the laws and authority. In this stage, they do not yet consider personal values and individual rights alongside following the law.[91]

The third level of moral development is the post-conventional level, where individuals think about morality based on their own value systems and make decisions in different situations accordingly. Within the third level, the fifth stage of moral development is the social contract and individual rights. In this stage, individuals recognise that people have varying values and opinions on certain issues. They understand the importance of adhering to laws for the proper functioning of the society but also acknowledge that some people may disagree with certain laws. The sixth and final stage is universal principles, where individuals internalise certain values and ethical principles, making decisions based on them, independent of whether they align with societal expectations.[92]

90 Gibbs, 2019, pp. 45–87.
91 Mathes, 2021, pp. 3908–3921.
92 Vozzola, 2022, pp. 27–42.

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