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Social Learning Strategies in Children and Nonhuman Primates

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Abstract: Social learning strategies are profound for the survival of individuals. At the level of social strategies, human and other primates shared many similarities but also have differences between them. This article aim to gather previous studies about children's collaborative learning approach and other primates' social learning strategies, and compare their similarities and difference and discuss the causal information of the variability between children and primates. When different social learning techniques are linked to various incentives, both children and chimps can vary their social learning strategies. However, children are more adaptable than chimpanzees when it comes to selecting or changing their social learning strategies. Furthermore, orangutans did not exhibit the majority-based transmission, unlike toddlers and chimps, who both exhibit a tendency toward social conformity, or the tendency to do what the majority of other members of their social group do. It is suggested that all of the above-mentioned differences between young humans and apes are the result of socialization and cultural transmission.

Keywords: imitation, emulation, social development, children, nonhuman primates

1. Introduction

Observational mechanism is a specific term of social learning. In the realm of social learning, observational learning involves individuals acquiring new behaviors or skills by observing and copying others. One of the examples of observational learning is the experiment of bobo doll. This experiment highlighted how individuals can learn new behaviors through observation and imitate the behavior of others, even in the absence of direct reinforcement and punishment. Emulation and imitation belong to observational learning mechanism [1]. In the context of psychology, emulation refers to an individual understanding the underlying goals or outcomes of a behavior and adapting their own actions to achieve the same results and without repeating the whole process. A previous study showed emulation behavior in young chimpanzees, the study highlights how young chimpanzees learn to use tools by observe their peers or older chimpanzees and after learning young chimpanzees can achieve the same result as they observed [2]. However, the word emulation was first mentioned by David Wood in 1988 in his book [3]. Over the years, the definition of evolution has evolved progressively. For example, there are "end state emulation", "goal emulation", "objective emulation" and "emulation via affordance learning" [4].

On the other hand, imitation refers to complete copy model's behaviors, including the entire process and result. For example, there is study showed that children can mimic adults' behavior by

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observe them, in the experiment, the children also copied the irrelevant action of the model. Moreover, in the comparison of imitation and emulation, during imitation learning, the observer replicates the model's behavior in a more comprehensive manner [5].

Imitation and emulation are the two most common social learning strategies. Social learning strategies are profound for the survival of individuals and According to the theory of social learning, people can acquire new behaviors by observing and imitating others, emphasizing the significant role of social interactions in the learning process of social behavior [6]. Moreover, not only humans can learn imitation and emulation. In recent times, studies on behavior and the brain have revealed fascinating things about how people copy each other. They've found that many different animals, like chimps and birds, can learn to imitate, suggesting that this skill exists across different types of creatures. Importantly, researchers have noticed that people with autism sometimes struggle with imitating, highlighting how important social learning strategies are for the social skills during individual development [7]. The study also evaluates many fascinating findings. These include studying how babies imitate from a very young age, which helps researchers understand how imitation develops early on. Additionally, the review focuses on how a specific part of the brain, the left inferior frontal gyrus, plays a special role in imitation, showing that there is a unique connection between this brain area and how people imitate others. These significant findings support the idea that imitation relies on connecting what people see with what they do. This insight deepens the comprehension of how imitation significantly influences people's learning and communication, impacting different facets of people's growth as time progresses [7].

Social learning and social development are intricately connected, as social learning plays a crucial role in the broader process of social development. There are various social development theories, they may appear divergent, but they share fundamental similarities that could facilitate a more complete understanding of human development. An article underscored the convergence of theories like social cognitive theory and social learning theory, despite their differing focuses. They all highlight the crucial role of social interactions and relationships in molding an individual's development. The author argued that acknowledging these commonalities to understanding social development, could let researchers and practitioners create more interventions and policies [8].

2. A Comparison between Children and Nonhuman Primates

Study showed that both human and other primates can do imitation and emulation behavior, this article aim to compare the similarities and differences of social learning strategies (especially imitation and emulation) between human and primates by integrate some of the previous studies that focus on the social learning of children and chimpanzees and discuss the impact of social and cultural elements that may influence the social learning strategies [6, 9-10]. Social influences and group dynamics are important in shaping behaviors and decision-making processes in both chimpanzees and human children. Social conformity is a critical component of social learning. There is a study that emphasized how social conformity can affect the way of learning behaviors and affect the culture norms within a social group [9]. The study aims to examine whether children and other primates display a preference for conforming to the majority opinion, as evidenced by their tendency to imitate a behavior performed by a greater number of individuals [9].

After a series of experimental tasks and observations, the researchers found that both chimpanzees and human children exhibit a preference for majority-biased transmission, indicating a propensity to imitate behaviors that are demonstrated by a larger number of individuals. This preference highlights the significance of social conformity and the influence of majority opinion in the decision-making processes of both chimpanzees and human children within a social context [9]. In contrast, the study revealed that orangutans do not display a similar inclination for majority-biased transmission, suggesting that there is a comparatively limited reliance on social conformity mechanisms in their

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learning and decision-making processes. This distinction showed that there are unique cognitive and social dynamics that distinguish orangutans from chimpanzees and human children, and the study also emphasize the role of evolutionary factors in shaping social learning mechanisms among different primate species [9].

Although both children and chimpanzees showed social conformity and could successfully recognize the models' behaviors, the imitating ability of chimpanzees are not that strong. A study aims to investigate whether chimpanzees are able to not only perceive successful actions but also replicate them, showcasing an understanding of the relationship between an action's effectiveness and its outcomes,the researchers found that while chimpanzees demonstrate the ability to recognize successful actions performed by others, they exhibit limited capacity in imitating these actions themselves. The study revealed a significant disparity between the chimpanzees' perceptual understanding of successful actions and their ability to reproduce these actions accurately, indicating a cognitive boundary in their imitative capabilities [10].

Furthermore, the study also found the distinction between the recognition of successful actions and the replication of these actions, underscoring the complex cognitive processes involved in the translation of perceived actions into imitative behaviors. The findings suggested a potential divergence in the cognitive mechanisms governing action perception and action reproduction in chimpanzees, thus need for a deeper exploration of the underlying cognitive processes involved in observational learning and imitation [10].The study revealed the intricate interplay between cognitive capacities, social learning, and imitative behavior in chimpanzees, and providing insights into the nuanced cognitive boundaries that influence their ability to replicate successful actions. These findings contribute to a better understanding of the cognitive mechanisms that underpin observational learning and imitation in non-human primates, offering valuable insights into the evolutionary roots of these cognitive processes in primate species [10].

When dealing with the task, children exhibit a stronger tendency to rely on social information compared to chimpanzees. In 2014, there was an article compared the extent to which human children and chimpanzees rely on social cues and information from others when solving tasks or making decisions. The researchers found that human children demonstrate a stronger inclination to rely on social information compared to chimpanzees. The study highlighted the prominent role of social learning and the influence of social cues in decision-making processes among human children, indicating a heightened sensitivity to and dependence on information provided by others within a social context [11]. The research underscored the importance of cultural and environmental factors in shaping the reliance on social information in human children, emphasizing the significant impact of socio-cultural influences on cognitive and behavioral development. Furthermore, the study revealed that chimpanzees exhibit a relatively lower reliance on social cues compared to human children, suggesting a more limited reliance on social learning mechanisms in their decision-making processes [11]. The findings of this study reveal the unique cognitive and social dynamics that distinguish between human children and chimpanzees, highlighting the complex interactions between the social learning, cultural influence, and cognitive strategy development of the two species. This article offers its perspective on how to regulate the varying reliance on social information and showed the critical significance of social learning in human growth and interpersonal exchange [11].

When social learning was linked with rewards, studies showed both children and chimpanzees exhibit a preference for particular social learning strategies that are influenced by the potential payoff associated with each strategy [12]. Researchers want to examine how children and chimpanzees utilize social learning strategies influenced by various payoffs, determining whether there are marked differences in their approach to decision-making based on social learning. They discovered that while both species demonstrate the ability to adapt their learning strategies based on the outcomes of their

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actions, there are nuanced differences in the utilization and flexibility of these strategies between children and chimpanzees [12].

The study showed how environmental and social influences in shaping the decision-making processes of both children and chimpanzees, highlighting the complex interplay between cognitive abilities, social learning mechanisms, and the potential rewards associated with different learning strategies. Furthermore, the researchers emphasized the importance of understanding the evolutionary and developmental factors that contribute to the varying adaptation of social learning strategies in humans and chimpanzees. The article provided valuable insights into the cognitive and behavioral dynamics that govern the decision-making processes in both species, illuminating the significance of social learning and adaptable conduct within diverse environmental and social contexts [12].

There was a study that aims to compare the ability of humans and orangutans to acquire new sequential patterns through observational learning, particularly focusing on the understanding of arbitrary sequences. The researchers found that humans exhibit a specialized capacity for vicarious learning of novel arbitrary sequences, showcasing an enhanced ability to acquire and replicate these sequences through observation. In contrast, the study revealed that orangutans do not demonstrate the same level of specialization in the acquisition of novel arbitrary sequences, indicating a relatively limited capacity for vicarious learning compared to humans [13]. The research demonstrates the cognitive and behavioral distinctions between humans and orangutans, emphasizing the specialized cognitive processes that contribute to humans' enhanced capacity for acquiring and reproducing arbitrary sequential patterns. The findings underscore the unique cognitive abilities that distinguish humans from their primate counterparts, shedding light on the evolutionary and developmental factors that contribute to the specialized nature of vicarious learning in humans. In addition, the study emphasizes the importance of understanding the underlying cognitive mechanisms that govern vicarious learning and the acquisition of novel arbitrary sequences, emphasizing the role of cognitive specialization in shaping human learning capacities. These findings aid in comprehending the cognitive foundations of observational learning and the grasping of intricate sequential patterns, evident in both humans and non-human primates, providing valuable insights into the evolutionary roots of these cognitive processes within the primate lineage [13].

The ability for human children and chimpanzees on representational drawing also have slight difference,there was study try to uncover the developmental and evolutionary aspects of representational drawing and assess the cognitive differences between these two groups. They found that while both human children and chimpanzees are capable of producing simple marks and lines, the level of representational drawing significantly differs between the two. Human children demonstrated a higher propensity for producing representational drawings, indicating a more advanced cognitive ability to depict objects and scenes compared to chimpanzees [14]. It underscored the impact of human social and cultural contexts in fostering the progression of representational abilities in children and also reflected the significance of social and cultural factors in cognitive development. Additionally, the researchers mentioned the importance of understanding the evolutionary underpinnings of cognitive differences between humans and chimpanzees, shedding light on the unique cognitive capacities in humans. The article provided valuable insights into the developmental trajectory of representational drawing and showed the intricate interplay between cognitive abilities, cultural influences, and evolutionary factors that contribute to the development of this skill in human children compared to chimpanzees [14].

Additionally, without comparing with other primates. Previous study revealed that toddlers exhibit a natural inclination to engage in rudimentary forms of non-verbal counting and showed their early n numerical awareness and cognitive receptiveness to basic numerical concepts [15]. The study aimed to investigate the developmental milestones and cognitive processes underlying the emergence of non-verbal counting abilities in young children, shedding light on the early stages of numerical

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cognition during early childhood. This phenomenon revealed their innate cognitive capacity to comprehend and engage with numerical concepts before formal instruction. Moreover, the research suggested the important role of cognitive development and environmental influences in shaping the emergence of non-verbal counting abilities in toddlers and suggested the significance of early numerical experiences and interactions within the child's environment, emphasizing the influential role of social and cultural factors in fostering the development of numerical cognition during early childhood. This study contributes to a deeper understanding of the cognitive foundations of numerical cognition and the developmental processes that govern the acquisition of basic numerical concepts during the early stages of cognitive development [15].

3. Conclusions

This article compared and contrasted the social learning strategies between human children and other primates. There are many similarities between them but also some differences. Children and chimpanzees can all switch their social learning strategies when different social learning strategies connect to different rewards, however, children are more flexible compared to chimpanzees when choosing or switching their social learning strategies. Moreover, both children and chimpanzees tend to be social conformity, that is to say, they are more likely to repeat what most of their social members do, but orangutans did not show the majority-based transmission. In addition, when doing a task or making a decision, human children are more rely on social cues. Children also performed better when doing the representation drawing tasks. Their paintings were more representative than chimpanzees did. All of the differences between human children and primates mentioned above are suggested that are due to social influence and cultural transmission.

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