Cognitive Processes in Social Learning

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Social interactions play an important role in an individual’s well-being by helping understand ourselves, others and the environment around us. At times, social interactions can be complex and may require individuals to be self-aware, interpret social cues, adapt according to situations quickly, understand community norms and take advanced perspectives from multiple points of view. It also involves a good degree of self-control and regulation of emotion. Individuals with better social skills (higher levels of social intelligence) are known to lead a purposeful, healthier and happier life. However, social skills are known to be very hard to define using words, to quantify, teach and hence may be incredibly complex for many individuals. Individuals with social-deficits may find it extremely difficult to handle social situations leading to issues in maintaining relationships, building self-efficacy and risk being bullied/manipulated by others.

Well-known psychologist Albert Bandura and many other researchers have found that social learning occurs through active observation, modeling and interaction with other individuals. In this paper, we review various theories of social learning and explore its various aspects with an objective to see the role of cognition in learning a complex social skill. We intend to specifically answer the following questions – (i) what mental processes and memory components are involved in social learning (using interaction, observation and modeling)? (ii) What role does WM, LTM and cognitive load play in social learning processes? (iii) Can social learning (e.g non-verbal, social cues, situational awareness etc) be enhanced by using various cognitive strategies and better use of cognitive resources, especially WM?
We start with a brief introduction to human-cognition and social cognition. Then, we discuss the role of imitation, observation and modeling, thereby looking at some existing social learning theories. Later, we look at cognitive processes and role of WM in social learning. Finally, we discuss some approaches that have been successful to enhance social learning.

**Cognition: WM, LTM, Cognitive Load and Social Cognition**

Cognition can be defined as a process of learning and understanding by sensing, experiencing and thinking to produce some meaningful action. Cognitive processes involve active collection of information, processing it into a form meaningful to us and retaining (storing) it for future use. Human cognitive architecture is known to have two main components: a volatile component known as Working memory (WM) and a more permanent storage component known as Long-term memory (LTM) (Baddeley, 2007). When new information enters into the system, WM assigns meaning to it. However its capacity is limited and individuals have a fixed working-memory span. (Miller, 1994). If an appropriate action is not taken within a short span, it can be lost. Information processed is also dependent how well we manage our attention resources, on learner’s prior knowledge and their emotional states (Baddeley, 2007; Bower, 1981). It is also known that by WM efficiency can be increased with use of various strategies. Active rehearsal, spaced repetition and periodic recall are some techniques for effective information retention and retrieval from long-term memory. As more meaningful information gets stored in long-term memory, newer and better schemata are created which help in building new meanings to enhance our existing knowledge.
Performance on a task is directly related to the mental effort (and hence WM resources) required to perform the task. Sweller (Sweller, 1994) defined this amount of mental-effort needed as cognitive load. In fact, he defined three types of cognitive load – intrinsic (how hard the material is), extraneous (how well the information is processed) and germane (relevant schema construction). Factors like stress, emotions, prejudice may consume WM resources and hence reduce learning efficiency by leaving fewer available resources. Cognitive load also varies according to knowledge level of the learner – experts can chunk more information and end up needing less WM resources, whereas novices may end up exhausting WM capacity even with less information.(Sweller 2010)

Social cognition is referred to the cognitive processes that underlie various social psychological phenomena. It focuses on how people process, store, and apply information about other people and various social situations.

Social Learning: Historical Perspective

Very early studies (James & Tarde (1903)) indicate that social learning was known to occur mostly through imitation. Imitation was viewed to be a natural instinct and responsible for most of human socialization (Schunk, 2012). Later, psychologists (like Humphrey, (1921)) attempted to explain imitative behavior using classical conditioning approaches. It was thought that a child is classically conditioned to produce the word on seeing the adult produce it and whenever the object or event appears in his environment (Bandura & Walters, 1963; Schunk, 2012). In 1930, Tolman and Honzik investigated a different form of learning called latent learning, which is observational learning in the absence of a goal or reinforcement (Schunk,
According to their work, certain knowledge is implicitly acquired at the time of learning and not immediately apparent, but is demonstrated later when there is a need. One might learn various routes in the town by driving to work every day and this learning may come apparent when finding other location (e.g. a shopping mall) on the way to work. Miller and Dollard (1941) proposed an instrumental view theory according to which learning through imitation includes a motivated subject who is positively reinforced for matching the models behavior using a series of trial and error responses. (Schunk, 2012; Bandura & Walters, 1963). Later, Mowrer explained imitative learning as a result of observer directly or vicariously getting rewarded due to the consequences of the model’s responses. (Bandura & Walters, 1963). However, all these models failed to adequately explain certain contexts of social learning.

During 1960’s, Bandura and Walters studied social learning processes using a set of experiments and outlined a social learning theory. According to Bandura, social learning occurs from continuous interaction among three major components, namely behavioral, cognitive and environmental influences. A change in one of the components affects the other two which causes subsequent changes in other components. These triadic reciprocal interactions over a longer term transform an individual’s behavior. Bandura called this the theory of reciprocal determinism. Learning was categorized into two types: enactive learning and vicarious learning.

Enactive learning is through actual doing or learning from consequences of one’s actions. Vicarious learning is through observing models perform. Babies as young as eight months are known to imitate simple actions and expressions of others (e.g. clapping hands). Children learn talking by imitating sounds or words by observing their parents. Through his observational
learning experiments, Bandura showed how children are more likely to display aggressive behavior by observing aggressive adult models. In (Bandura & Walters, 1963), authors provide a range of examples explaining this phenomenon in a wide variety of cultures. Most Social learning is explained as vicarious; or a combination of enactive and vicarious. The authors also provide evidence that in some cases, learning occurred even without observer performing any overt responses himself or receiving any direct reinforcement. They suggested that there are two phases of learning through imitation, acquisition and performance. Acquisition occurred majorly due to contiguity of sensory events whereas performance phase was strongly influenced by response consequences to the model or to the observer. Three effects of could occur through observation of models which affects how effectively an observer imitates the model. Firstly, an observer may acquire a new response if the model exhibits highly novel responses. Secondly, observation may strengthen or weaken inhibitory responses that already existed. Thirdly, it is possible that observation of model elicits previously learned responses through perceiving the acts using one of the four processes: attention, retention, production and motivation.

Social Cognitive Theory and Recent Work

In 1980’s, Albert Bandura revised his original theory of social learning to social cognitive Theory where he argued that three main areas (personal, behavioral and environmental influences) affected social learning and human behavior was shaped by continuous interaction between those factors. The theory emphasizes the role of modeling (learning through observation), one’s personal beliefs/attitudes (eg. self-efficacy, outcome expectancies) and the environment around us in social learning. More recently, in a set of studies conducted and survey
work done (Zimmerman, 2013). Researchers found numerous instances where learning occurred through observation and imitation. The authors also claim that cognitive modeling produced rapid learning, significant transfer to untrained tasks and even greater retention over time.

Other modern researchers (Lakin, 2006; Bargh, 1994) have used dual-process theories to explain social cognition. These theories categorize social cognitive processes into two: controlled and automatic. Controlled processes are characterized by presence of awareness, intentionality, controllability and use of cognitive effort whereas automatic processes are instantaneous, unintentional and require little or no cognitive effort. Majority of social interactions are automatic, encoding/decoding is very quick, dynamic and highly automatic. Automatic processes use very little or no working memory and are fast (Greene et al, 2008; Evans et al, 2013). Studies also indicate that the underlying processes underlying non-verbal communication including imitative behavior, emotional expression, prejudice, expectancy and building rapport all are highly automatic. People are not consciously aware that they imitate behaviors of others. Facial expressions are often instantaneous and uncontrolled. People tend to build rapport with others by mimicking them, without intention, control or conscious awareness. Automatic processes are known to have evolved through multiple generations and occur implicitly (Lakin, 2006). Their influence extends beyond perception and interpretations to actual guidance, of important goal pursuits and social interactions (Bargh & Williams, 2006). However, people can gradually develop efficient strategies for processing social information through conscious attention thereby altering the automaticity (Lakin, 2006).
More recently, Patterson has proposed a parallel process model of social cognition, where encoding and decoding of non-verbal communication is presented in a single framework and known to occur in parallel. He also states that social cognition is affected by other factors like biology, culture, personality, situational constraints, goals, affect and interpersonal expectancies (Lakin, 2006).

The dual process theory of social cognition is also supported by studies in cognitive neuroscience (Spunt & Lieberman, 2013) where researchers have worked to determine the underlying neural connections and brain systems involved in social interactions. There are specific regions in the brain dedicated for automatic processes and controlled processes. The brain is divided into two systems: mirror-neuron system and the mentalizing system. The mirror neuron system supports all automatic behaviors (where majority of social interactions lie) and is shown to be unaffected by cognitive load (Spunt & Lieberman 2013; Greene, 2008). The mentalizing system supports all controlled, conscious behavior and its performance is affected with varying amounts of cognitive load. Other recent evidence (Spunt et al 2014; Spunt R.P., 2015) suggest that social cognitive processes are multidimensional and operate in four dimensions: awareness, efficiency, intentionality and controllability. Each task can have an automaticity profile across all the four dimensions indicating a certain level of automaticity and controllability. They claim that dedicating specific regions of brain for automatic and controlled process may not be the correct way.
Implications and Known Approaches to Enhancing Social Skills

Almost all researchers have indicated the importance of imitation (or observation) and modeling in social learning. Although social learning seems highly automatic, social skills can be improved through explicit training and practice. Personal factors like self-efficacy, motivation and environmental factors including teachers, peers and parents play an important role in social learning. Several social skill development programs primarily focus on modeling, teaching interaction skills, affective skills and using cognitive strategies for changing beliefs and attitudes (Canney and Byrne, 2006). However, they are also known to suffer from lack of generalization into new situations (Maag, 2006). Further research into making implicit information explicit may be worthwhile to explore. Finally, social cognitive processes are deemed to be highly automatic and hence not affected by cognitive load and working memory. Although the role of LTM is not explicitly discussed, it is mostly believed to be not more than a storage space to store social information.

References


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