

Child's Mind Abilities and Pragmatic Competence

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Abstract

This research investigates the relationship between Theory of Mind (ToM) and Pragmatics in children within their directly connected entourage. The purpose of the study is to explore how ToM development influences pragmatic skills among young children. The problem addressed is the need to understand the relationship between cognitive and linguistic abilities in social interactions. The hypothesis posits that children with advanced ToM skills exhibit better pragmatic competence and that the environment plays an important role in developing these abilities. The paper provides the main theoretical foundation by reviewing literature on ToM, language development, and social behaviour. It also outlines the research design, including data collection tools dealing with the population of 6-8-year-old children from Bougasmia El Djilali Elementary School. The results indicate a significant correlation between ToM development and pragmatic skills in children, highlighting the importance of cognitive skills in effective communication within their social environment. It also showed how the latter plays a major role in shaping both pragmatic and theory of mind foundation.

Keywords: Theory of Mind, Social Competence, Pragmatic Language Skills, Children, Social Development, Developmental Psycholinguistics

Introduction

The ability to navigate through complex language systems in communication and develop the theory of mind (ToM) are two of the most fundamental aspects of human development in general and children specifically, and they involve the acquisition of cognitive, linguistic, and social skills. It is noteworthy to mention that both ToM abilities and language, as well as communication skills, develop relatively at the same time in the person's life between birth to the age of five with either one influencing the other or both influencing each other. The relationship between these variables has been described and perceived as either a bidirectional relationship with both triggering the development of the other or a unidirectional relationship proposed by Mally (2002) in what is referred to as a cascading development i.e. the fundamental aspect of ToM and language is built on one another until the person, the child emerges with a fully developed capacities of these variables. This study aims to uncover the age dependency on the growth of ToM abilities, and whether age is related. Moreover, this investigation examines the relationship between the success in ToM tasks which generally reflects an under-development ToM and their level of pragmatic skills. Also, another motive is to test the influence of the child's environment on the acquisition of both ToM and pragmatics and how they correlate with social behaviour (positively or negatively), which gives this study a comparative aspect in the sense of examining the pragmatic level and social behaviour skills of two distinct groups; those with an underdeveloped ToM and those with a not yet developed ToM. This level of ToM is identified by the success and failure of ToM tasks. To delve into this link between these fundamental elements of cognitive, linguistic, and behavioural aspects, this research is motivated by the following research question, which focuses on the relationship between cognition ToM and pragmatic competencies: What role does the child's environment play in their attainment of the theory of mind skills and development of pragmatic skills?

1. Defining the Theory of Mind

Theory of Mind (ToM) is a cognitive skill studied within developmental psychology research that explores how individuals attribute states to others and use these states to comprehend and predict their actions. It plays a crucial role in cognition and understanding to recognize others as individuals with unseen thoughts and feelings and to analyze, evaluate and infer their behaviours. The development of ToM has a rich historical background, with various scholars contributing to its understanding and definition.

Within this expanded framework, two contrasting definitions for 'theory of mind' emerged, emphasizing formal propositional knowledge or socio-perceptual skills. The former involves interconnected principles describing how the mental world works, while the latter provides implicit social 'know-how' for negotiating the cognitive domain. The developmental course of the 'theory of mind' varies considerably under these alternative definitions.

Goldman (1993) views ToM as the psychology of folk psychology, which involves the attribution of mental states to oneself and others. Gennaro (2005), on the other hand, defines the Theory of mind as a unifying view of the basis of social cognition. Furthermore, Wellman (2017) describes it as the understanding of people as mental beings, who have beliefs, desires, emotions, and intentions, and whose actions are influenced by these mental states. (Claire Hughes et al., 2015)

1.1. Piagetian Perspective-taking Development(1920s-1930s)

During the 1920s and 1930s, Jean Piaget conducted ground breaking research, on cognitive development that shed light on how children comprehend the thoughts and beliefs of others commonly referred to as the theory of mind (ToM). Piaget suggested that this capacity, for understanding perspectives is not innate but develops gradually through specific cognitive stages. (Flavell, 2000; Flavell & Miller, 1998; Shantz, 1983).

In the mid-20th century, Piaget proposed that children progress through concrete stages of cognitive development. A pivotal stage is the concrete operational stage, typically between ages 7 - 11, when children exhibit dramatic improvements in abstract thought and perspective-taking. According to Piaget, early in development children are egocentric - only able to perceive the world from their viewpoint. Through diverse social experiences and cognitive challenges, children gradually refine their ability to adopt others' perspectives. This shift from egocentrism to appreciating different viewpoints lays the foundation for an elementary ToM. (Diamond et al, 2004). Moreover, Piaget argued that this cognitive change does not solely result from external factors, but involves internal maturation of mental processes. The interplay between environmental input and evolving cognitive structures

contributes to the gradual emergence of perspective-taking abilities. (Carey et al, 2015). Piaget characterized perspective-taking development as a progression, where children move along a trajectory of comprehending others' mental states. His lasting contribution highlights the dynamic interaction between cognitive maturation and social experiences in shaping how children understand the complexities of the human mind. (Pakpahan and Saragih,2022:56)

1.2. Metacognitive Development

As the importance of the Theory of Mind (ToM) grew within cognitive science, researchers began to explore how it related to understanding our thoughts and feelings. This area, called metacognitive development, delves into the complexities of self-awareness and reflection, offering insights into the inner workings of our minds.

Metacognition, often described as thinking about thinking, represents a higher-order cognitive function that goes beyond mere awareness of external stimuli. It involves the capacity to introspect, analyze, and comprehend the complexities of one's thoughts, emotions, and beliefs. The intersection of metacognition and ToM reveals a compelling narrative of self-awareness and cognitive maturation. (Drigas et al, 2020)

During the 1970s and 1980s, scholars and researchers began to explore the dynamic interplay between ToM and metacognitive development. The recognition that understanding others' mental states is intricately linked to an individual's ability to reflect on their mental states marked a pivotal moment in cognitive science (Moreau et al, 2015)

At the heart of metacognitive development lies the acknowledgement that individuals are not passive recipients of sensory input but active participants in the construction of their own mental experiences (Kuhn, 2000). This shift in focus from external stimuli to internal cognitive processes represents a significant leap in the understanding of human cognition. It involves self-awareness, self-monitoring, and self-regulation, among other crucial elements. People set out on a reflective journey, progressively learning more about the nature of their objectives, feelings, and thoughts. This process is not static but rather a continuous and dynamic exploration of the self. (Bandura, 2019)

1.3. Operant Psychology

Operant psychology, rooted in the principles of behaviourism, takes a distinctive stance on ToM by conceptualizing empathy and perspective-taking as learned behaviours

dependent upon the dynamic interaction of environmental stimuli and individual responses. Unlike innate capacities, the operant perspective suggests that these social cognitive skills are shaped and refined through operant conditioning, emphasizing the importance of reinforcement and punishment in the development of complex relational abilities. (Staddon, 2001: 21) This is to say that derived relations refer to the ability to establish connections between stimuli or events that are not directly experienced together. Empathy, in the operant psychological framework, becomes a skill cultivated through reinforcement and learning from the consequences of one's actions. It involves not only recognizing the emotions of others but also responding appropriately based on the derived relational connections between emotional states, actions, and consequences. (Schunk, 2016: 88)

2. Research Methodology

This paper attempts to contribute to the existing body of research by providing insights into the relationship between ToM and pragmatics in children. Understanding this relationship can help educators and parents develop more effective strategies for supporting children's social and cognitive development.

2.1. Population

The population under investigation in this study will consist of 6-7-8-year-old pupils at Bougasmia El Djilali Elementary School of Sidi-Bel-Abbes, with a total sample size of thirty participants (n=30). This age range is strategically chosen as it represents a crucial developmental stage where children are refining their linguistic and social skills, and Theory of Mind (ToM) is under development. The data was collected after the approval of the director of the school as well as the approval of the directorate of education of Sidi-Bel-Abbes, this latter was a requirement for the data validity. At ages 6 to 8, children typically exhibit notable advancements in their cognitive abilities, including an understanding of social interactions. This period reflects an important phase in socio-cognitive development, characterized by the emergence of more advanced ToM capacities, such as the ability to infer others' beliefs, desires, and intentions. Moreover, children within this age range are actively engaged in acquiring their pragmatic skills, which include the ability to use language

effectively in various social contexts, interpret non-literal language (e.g., sarcasm, irony), and comprehend indirect speech acts.

2.2. Research Design

In this study, a mixed-method approach was applied to investigate the relationship between theory of mind and pragmatics among elementary school children. The study involved three tasks to assess the theory of mind, including unexpected content, change in location, and hidden feeling, an unstructured observation was conducted during ToM task to assess linguistic competence. A questionnaire was distributed to parents to assess pragmatic skills, to collect data related to personal profile and background information about the respondents, history of communication to gather information about the child's communication patterns, and social interaction to understand how well a child interacts with others, picks up on body language, gets jokes and figures of speech, acts their age, and using appropriate greetings and apologies, social context to evaluate the child's ability to navigate various or limited social settings, including the entourage (family), school, and public environments (the very closer to the family), language use and emotional awareness explore a child's communication skills across various environments (home, school, public) and their emotional intelligence, including recognizing emotions in others and expressing their feelings during communication.

For social behaviour, a questionnaire was given to teachers, as they are the primary observers of children's social interactions in their school environment. This teacher-reported questionnaire assesses a child's social adaptation by evaluating their behaviour and emotional well-being in various school settings. Lastly, an unstructured interview was conducted with parents on the family structure, the exposure to social and family settings and the environment.

Task 1: The "unexpected contents" task is a variation of the false belief task, which is used to assess a child's understanding of other people's mental representations and their ability to predict behaviour based on that understanding. In this task, children are shown a box that looks like it contains candies, but when it is opened, it is revealed to contain pencils. The child is then asked three questions after closing the box, memory question: "What was inside the box?"; to examine their memory skills, first-order false belief question: "when you first saw the box, what did you think was inside?" to observe if the child held a false belief on the

situation, second-order² false belief question "what will your friend think it is inside?"; to check what if they believe their friend, who has not seen the true contents of the box, will think is inside. The child passes the task if they respond to the three questions correctly, but fails the task if they were not answered correctly, especially the second-order false belief questions about other's beliefs in the situation.

Task 2: The "Change in Location" Task is a cognitive task proposed by Núñez in 1993 and used in psychological research to assess children's understanding of false beliefs. In this task, children are presented with scenarios where an object is moved from one location to another, and they are asked questions to evaluate their ability to infer the protagonist's false belief about the object's location. The task typically involves scenarios where a character places an object in one location, another character moves it to a different location, and then the first character returns. Children are then asked where the protagonist will look for the object, testing their understanding of false beliefs (Ghrear S et al, 2021). To implement this task, children also need to answer three questions correctly, false belief question: "Where will he look for his chocolate?"; to assess a child's understanding of the theory of mind, particularly the concept of false beliefs. The correct answer to this question reflects the child's understanding that the character will look for the chocolate where they falsely believe it to be, rather than where it is placed, memory question: "where did he put his chocolate?"; to assess the child's ability to remember past events and actions and a reality question: "where is the chocolate?"; to evaluate the child's understanding of current reality. These questions collectively assess various aspects of a child's cognitive development, including theory of mind, memory, and reality. (Wellman, H. M., & Liu, D. 2004)

Task 3: children are presented with a scenario where a friend is being bullied and is trying to hide his true feelings of being sad. They are then shown three expressions: happy, neutral, and sad, and asked to determine how the friend would look like trying to hide his true feelings and why, as well as to point out what he feels due to the bullying. Children pass this task if they correctly identify both the hidden emotion and the actual emotion, while also providing reasoning for their choices. This task assesses children's ability to understand and differentiate between expressed and hidden emotions in others, reflecting their emotional comprehension and empathy skills (Conte et al, 2019).

2.3. Scoring

To succeed in Theory of Mind (ToM) tasks and be credited with completing the experiment, children must complete at least two of the three tasks presented. For the 'Change in Location' task, participants must provide correct responses to false belief, memory, and reality questions. To earn credits for completing the 'Unexpected Content' task, participants must correctly answer both false belief questions and the memory question, while also explaining their choices. Lastly, to succeed in the final ToM task 'Hidden Emotion', children must accurately identify expressions and provide reasoning behind their choices. The table below illustrates the total number of students who passed and those.

2.4. Tasks Description

The results show that 40% of the participants failed to pass at least two of the ToM tasks, indicating a lack of developed ToM abilities. Conversely, 60% of the participants passed at least two tasks, suggesting a developing Theory of Mind understanding among this sub-group. The population is categorized by age, while ToM tasks are classified based on the experimented items. The number of children who successfully completed each ToM task is presented in the following table. (categorized by age and Theory of Mind items).

Age category	7 years old	8 years old	9 years old
ToM tasks			
Unexpected content	50%	60%	67%
Change in location	0%	20%	33.33%
Hidden feeling	0%	26.67%	0%

Table 1: percentage of children passing theory of mind tasks based on age

The table presents the results of theory of mind tasks administered to children at different ages: 7 years old, 8 years old, and 9 years old. The tasks are categorized into three types: Unexpected Content, Change in Location, and Hidden Feeling. Each cell in the table represents the number and percentage of children who passed the respective task.

At 7 years old, the results show that 50% of children demonstrated an understanding of unexpected content, indicating that they were able to comprehend and recognize when someone encounters unexpected information or events. However, none of them showed an understanding of changes in location or hidden feelings.

Notably, By the age of 8, there was a significant improvement in understanding unexpected content, with 60% of children demonstrating this ability. Additionally, 20% of children showed an understanding of location changes, suggesting progress in comprehending spatial perspectives. Furthermore, 26.67% of children in this age group were able to recognize hidden feelings, indicating a developing awareness of emotions that may not be overtly expressed.

Finally, at 9 years old, the results show continued progress in ToM development, with 67% of children demonstrating an understanding of unexpected content. Additionally, 33.33% of children were able to grasp location changes, indicating further improvement in spatial understanding. However, none of the children in this age group showed an understanding of hidden feelings.

2.5. Analysis of Findings

These findings suggest that there is a relationship between age groups and ToM test scores, with older age groups generally showing higher scores on the ToM test items. Children show an increasing ability to understand and interpret mental states, with notable improvements in recognizing unexpected content and changes in location. However, the understanding of hidden feelings appears to be less developed, particularly among younger children.

The remaining students did not complete the ToM tasks, indicating that their ToM abilities are still in the process of development. Alongside these ToM tasks, language use was

carefully observed during the experiments. This additional observation revealed interesting patterns: children who successfully passed the ToM tasks often explained their thoughts using full sentences, reflecting a good level of language proficiency. Conversely, a notable pattern emerged among children who failed to pass the tasks; many of them merely pointed to the correct answers without verbalizing their thoughts. Despite the researcher's efforts to encourage verbal responses, these children tended to rely on non-verbal cues, indicating a lower level of language development. This observation highlights the relationship between ToM development and language abilities, implying that the capacity to express thoughts and reasoning could aid in achieving better results in ToM tasks. These findings suggest that language is not only a prerequisite for ToM but also supports its development (Kobayashi,2010).

It was also noted that some children exhibited signs of anxiety when faced with meeting new individuals. This observation is noteworthy as it provides valuable context for understanding the larger socio-emotional dimensions of ToM development. This anxiety in response to unfamiliar social situations may influence participants' performance on ToM tasks and shed light on individual differences in socio-emotional and pragmatic development.

3. Description of the Questionnaire

The published questionnaire was aiming at treating interrelated aspect of cognitive abilities , competencies and skills. It focused on child pragmatics awareness and development, as well as on child's social reality and emotions.

3.1. Child Pragmatics

The questionnaire is designed to assess various aspects of a child's social and linguistic interactions in different environments. It includes questions about how the child communicates with family members, engages in conversations with peers, initiates and maintains conversations, understands non-verbal cues, adapts to social contexts, uses language appropriately, expresses needs for assistance, and demonstrates emotional awareness. It is also structured to gather information on the child's behaviours and skills across different scenarios, such as at home, school, or public places. It uses a rating scale to measure the child's performance.

3.2. History of Communication

This section aims to gather information about the child's communication patterns specifically within the family and with peers or siblings. The questions seek to understand the frequency and quality of communication interactions the child engages in within these two important social contexts.

Rate	Excellent	Good	Average	Not satisfactory
Interactive group				
family members	67%	33%	0%	0%

Q 1 : How does your child typically communicate with family members?

The majority of respondents (67%) rated their child's communication with family members as excellent, indicating a good level of communication proficiency within the family setting. One-third of respondents (33%) rated their child's communication as good, suggesting that while not all families perceive their child's communication as excellent, it is still generally positive. None of the respondents rated their child's communication as average or not satisfactory, indicating a generally favourable perception.

Q2.: Does your child engage in conversations with peers or siblings?

The second item questioned in the questionnaire was about child engagement in conversations with peers or siblings. All respondents (100%) reported that their child always engages in conversations with peers or siblings, indicating a consistent and active involvement in social interactions outside the family unit. None of the respondents indicated that their child only sometimes or rarely engages in conversations with peers or siblings, suggesting a high degree of social engagement and communication competence outside the family context or age category.

Q3.: How is your child's ability to initiate and maintain conversations

The findings indicate that 50% of respondents rated their child's ability to initiate and maintain conversations as “Excellent” reflecting a good level of proficiency in initiating and maintaining conversations. This suggests that these children are likely confident and skilled in

engaging with others in conversation, which can be an important aspect of social development. The remaining 50% of respondents rated their child's ability as "Good," indicating a moderate level of proficiency in initiating and maintaining conversations. While not rated as the highest level of skill, a "Good" rating still suggests that these children are generally able to engage in conversations effectively. The absence of responses in the "Average," "Unsatisfactory," or "Poor" categories suggests that none of the respondents perceived their child's ability to initiate and maintain conversations as below average or problematic. This could indicate that the surveyed children generally do not struggle significantly in this area.

3.3. Understanding Social Context

This section helps understand how comfortable and capable the child is in various environments like home, school, or public places. By asking about their behavior in different scenarios, the questionnaire aims to assess the child's social skills and adaptability

Q4: How does your child adapt to communication processes in different places such as school, home, or public places?

This data suggests that a majority of respondents (50%) reported that their child always adapts excellently to communication processes in different places such as school, home, or public places. Additionally, 33.33% of respondents indicated that their child adapts well, while 16.66% reported moderate adaptation.

Q5: How does the child behave in social situations such as celebrations or school events?

The data shows that the majority of respondents (66.66%) reported that their child always exhibits good social behavior in social situations such as celebrations or school events. Additionally, 22.22% indicated that their child behaves appropriately most of the time, while 11.11% mentioned that their child needs improvement in some social situations. No respondents reported that their child often behaves inappropriately or generally does not exhibit good social behavior.

Q6 : When your child is in different situations, such as home, school, or public places, how do they speak?

The findings indicate that a significant portion of respondents (16%) reported their children consistently using language appropriately in all situations. Additionally, a majority (50%) noted that their children mostly exhibit appropriate language usage, albeit with occasional deviations. However, a notable proportion (33%) mentioned that their children only sometimes use language appropriately, suggesting some inconsistency. Notably, no respondents reported their children often using inappropriate language or completely lacking appropriate language usage.

3.4. Emotional Awareness

The last section aims to understand how a child perceives and handles emotions. The first question assesses how the child reacts when they notice a change in mood in others. The second question explores how the child expresses their own feelings during communication

Q7 : When your child notices a change in mood in one of their friends or family members, how do they react?

The results suggests that the majority (61.11%) often show interest and asks their friend about the reason for the change, a smaller proportion (16.66%) always show interest effectively asks their friend about the reason for the change, and some (22.22%) may show interest intermittently. None reported never asking about feelings, indicating a general tendency towards empathy and emotional awareness among surveyed children

4. General Analysis of the Findings

Based on the analysis of the data collected from children who succeeded in Theory of Mind (ToM) tasks, it's evident that these children demonstrate a generally high level of pragmatic and social behavior skills. Examining pragmatic language skills, a key component of effective communication, reveals a clear advantage for children who succeed in ToM tasks. The data shows an advanced level of proficiency within the family setting, with most respondents rating their child's communication as excellent. This extends beyond the family unit, as all respondents reported consistent engagement in conversations with peers or siblings. While initiating and maintaining conversations showed some variation, with half rating it excellent and the rest good, the general pattern suggests strong conversational skills. Furthermore, these children reflected a good level in interpreting non-verbal cues, with most

respondents indicating their child understands them. This ability to grasp facial expressions, gestures, and other non-verbal communication is crucial for navigating social interactions effectively. Although understanding sarcasm and figurative language remained at a moderate level, it still demonstrates a developing ability to interpret more other communication forms.

Conclusion

The results have highlighted the significant impact of ToM abilities on children's pragmatic language use and social behaviour, emphasizing the importance of considering these interconnected factors in supporting children's social-emotional development. The findings suggest that children with advanced ToM skills tend to exhibit more sophisticated social behaviours, such as empathy, cooperation, and positive peer interactions. Moreover, the data from unstructured observations and interviews have enriched the understanding of the contextual factors that shape children's social behaviour, shedding light on the influence of the environment on their social skills development. In general, the present study aimed to discover how cognition, language and behaviour collide together to help the child develop good social behaviour. It was found that the older children get, the more they are likely to succeed in ToM tasks. The pragmatic level is strongly related to the success of theory of mind tasks in addition to the linguistic competence which was found to play a significant role during the experiments. The environment was also proven to have a major impact on the development of the theory of mind, pragmatics and social behaviour. Children with a higher exposure to a mixed social environment were found to have an advanced ToM and pragmatic level automatically reflecting good social behaviour, as opposed to those with limited exposure to such settings reflecting a developing societal skill.