

MIRROR NEURONS IMPACTING ON EMPATHY THROUGH STORYTELLING

IMPACTO DE LAS NEURONAS ESPEJO EN LA EMPATÍA A TRAVÉS DEL “STORYTELLING”

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Resumen

Esta investigación de tipo documental reportó el impacto de la técnica de “Storytelling” en el desarrollo de las neuronas espejo con respecto a la empatía en el contexto de la educación primaria. Este estudio buscó explorar la relación entre las neuronas espejo y el comportamiento para explicar cómo la técnica de “Storytelling” contribuye a su desarrollo mediante la descripción de los elementos principales incluidos en la teoría del desarrollo de las emociones. El estado del arte fue la base para comparar y analizar las diferentes relaciones emergentes entre la empatía y las neuronas espejo. La evidencia mostró que las neuronas espejo están relacionadas al proceso de construcción de la empatía, fortaleciendo la comprensión de los estudiantes respecto a los sentimientos de otras personas. También mediante el “Storytelling”, la literatura debe ser introducida en edades tempranas no solo para desarrollar habilidades de pensamiento sino habilidades abstractas relacionadas al comportamiento. En suma, la empatía es una habilidad que necesita ser promovida para preparar a los estudiantes de primaria a crear un entorno de paz y respeto en el cual ellos tomen consciencia de la inteligencia emocional para enfrentar los retos de día a día.

Palabras clave: comportamiento, empatía, neuronas espejo, Storytelling.

Abstract

This paper reports documentary research on the impact of storytelling in mirror neuron upgrowth regarding empathy in the primary educational context. The study aimed at exploring the relationship between mirror neurons and behavior to explain how storytelling might contribute to developing empathy by describing the main elements encompassed within emotions developmental theory. The state of the art was the basis to compare and analyze how different relations emerge from empathy and mirror neurons. Evidence showed that mirror neurons were linked to the process of empathy-building strengthening students' understanding of other people's feelings. Also, through storytelling, literature must be introduced at an early age not only to develop thinking skills but also abstract aspects related to behavior. In sum, empathy is a skill that needs to be promoted to prepare primary students to create a peaceful and respectful environment in which they become aware of emotional intelligence to face daily challenges.

KeyWords: behavior, empathy, mirror neurons, Storytelling.

Introduction

Self-consciousness enhancement is a priority of the new world and empathy within this new reality is one of the main aspects that need to be touched. Empathy is defined as a skill that needs to be introduced to kids in early stages due to the importance of relationships and socio-cognitive development, Empathy. (n.d.). United Nations. Although empathy is important in primary education, it is not included in regular lessons, showing a lack of emotional intelligence training that makes the population overlook tools to face social challenges and act impulsively. Emerging behaviors are affecting students in school contexts contributing to raising violent societies in which storytelling may be a tool for teachers to decrease aggressive replies. Schools are becoming violent daily, and many episodes are posted in the news, as in the reported fact of Semana (2020, May 2) in which a 13-year-old girl student from an educative establishment in the town of Ciudad Bolívar, Colombia, was sent to the hospital due to the aggressions she suffered; or even Quaden Byles', Semana (2020, February 21), the Australian kid who wanted to commit suicide, because at his school they made fun of him for his dwarfism. As is well known each student should adapt to each context in which they will face different situations, manifesting themselves in different ways that lead to mistreatment or the breakdown of interpersonal relationships. That is why the technique of storytelling focusing on mirror neurons might be important to increase and facilitate new ways of interaction, that can strengthen teachers' attempts to promote empathy in institutions because through those students will be able to experience processes to do catharsis by cultural connection through socialization

Calvin Morrill et al (2000). Elementary students should be allowed to write their stories because this will allow them to express feelings and thoughts, creating rich narrative dynamics and promoting empathy with their peers.

In addition, classes focus only on academic content and don't allow reflective moments to take place, which avoids students from getting into emotional intelligence experiences that could be a clue to preventing violent encounters in the school context. Previous research on an academic inquiry about violence has focused on bullying which is the shape that violence takes at school, it has been categorized, and depending on the field of study there are many conceptions. In the field of medicine, this is considered a problem of public health Kalogerakis, et al. (2021). That needs psychological treatment as it affects many young people, and not paying attention to it may create other psychiatric disorders. Mental health becomes an important aspect to talk about not only for those who are bullied but for those who do it, this has to do with topics that are out of schools' hands as in the investigation done by Shaath et al. (2021) in which the findings showed that causes of bullying have to do with familiar problems more than scholar context, in both cases the root of the problem is outside teachers and school control, however, empathy is a process that can be trained in schools, and this will contribute to improving social cognition processes linked to mirror neurons system Schmidt et al. (2021).

Decreasing impulsive behaviors is a process related to emotions that works on an internal cognition process that reacts to external stimuli. Mirror neurons are activated by

those stimuli that have to

do not only with emotions and behaviors but also with empathy as Mara, (2017) mentioned, mirror neurons are important when it comes to differentiating and understanding other human intentions and behaviors, as well as acquiring new skills through imitation. Understanding others is considered the first step in the empathy process, Hernandez (2012) that is needed to decrease bad behaviors as in the case of bullying, more empathetic pupils will react better to hard episodes. Empathy can be rehearsed with storytelling as in the report of Liao (2020) after using this technique the "intellectual empathy" improved in the groups applied.

Storytelling has been well known as a strategy that helps people to be engaged in the community, creating strong ties, where respect for differences prevails, and understanding others in terms of their emotions and actions to make them more empathetic. As it has been stated, mirror neurons have a direct impact on empathy, so the aim to activate them will show a positive change in students' behavior. Many studies on bullying had strongly recommended research on methodologies and strategies that can contribute to reflexive spaces from the school's scenery Shaath, et al. (2021). And storytelling had shown positive results, thus example the research of Freeman et al. (2020) that exposed this tool allowed elders and students to share their emotions, workshops, and solve problems as a team.

Discussion

This paper is documentary research based on the analysis of storytelling in the mirror neurons process regarding empathy in primary students. Hence, the following component describes the prior aspects embodying the nature of the research itself

from behavior, empathy, mirror neurons, and storytelling.

Behavior

In terms of behavior, it is important to have a conception given by the medical field, and even when it is not defined as an illness it has a component that impacts mental health and has to do with it, in this sense Kalogerakis et al. (2021) analyses the impact of bullying as a public health problem that affects one out of five adolescents and needs a treatment coming from schools, so the question is how to work with bullying at schools if there is not enough information and even when it is highly recommended few proposals had been created. Consequently, bullying does not only have an immediate impact on pupils as Ahmed et al. (2022) told, this imposes all along with students' life, the experiences lived can even stay until their adult life having a relationship to the psychiatric issues that they might present in the future, at this point is a must finding ways to ameliorate the quality of life for this population that experienced bullying by creating programs that can prevent and decreases its impact.

Wondering about the source of bullying in students', findings of Haath et al. (2021) research, show that the school community agrees with the idea that this depends on the family role in students' life, which means that most bullies are brought up in families that have no clear and good role models at home, these familiar contexts used to be problematic, many of the families a fragmented, and there's not a strong relationship in terms of communication among school and the parents.

Mirror neurons regarding empathy

Empathy has different meanings and conceptions, sometimes it is seen as a skill that is linked to feelings and emotions from the outside. However, González & Villanueva (2014) define it as a process

that has three steps; firstly, the individual needs to realize others' experience; secondly, interiorize it and finally, embrace it as his own. In this way, people will be able to reflect on others and communicate better.

Socialization is the basis of school life. Participants in a school context with positive collective emotions, such as empathy, caring for others, and compassion, among others, have a good repercussion on common spaces, Costa et al. (2021) agree that this suppresses violent and aggressive actions inside the community, that will result in better relationships. In addition, the findings of Schmidt et al. (2021) show a direct relationship between the mirror neurons system and empathy as when applying cognition test the same areas in the brain were highlighted during the process, showing that any project that regards whether the empathy or MNS are connected and find each other.

Mirror neurons are those that regulate their activity when an individual performs a specific action and when another individual observes the same or similar action. According to Immordino-Yang, M.H. (2008) at the most basic level, the mirror neuron system allows the internalization of other people's intentions, including actions that conflict with emotional states, and the real background of the human being. Consequently, mirror neurons allow activating the ability to anticipate the thoughts, intentions, and feelings of others. The mirror properties of certain areas of convergence, allow learning from the focused action of others, as long as that action makes sense within the framework of cultural knowledge and the development of each person. Immordino-Yang, M.H. (2008) Scilicet, mirror neurons act automatically allowing the human being a greater understanding of the intentions and

emotions of others.

Owing to the discovery of mirror neurons human beings have been able to analyze and reflect on how they act and how they interpret the actions of others, as a result, mirror neurons are important when it comes to differentiating and understanding other human intentions and behaviors, as well as acquiring new skills through imitation Mara (2017). Hence, assimilating other people's acts and intentions allows us to create good relationships with others, solve problems and establish more emphatic relations with others. Thus, efficient management of mirror neurons leads to good development in any context, in addition to greater emotional intelligence and empathy Mara (2017). When a person watches another act or feel, small electrical triggers are produced in the brain that activates that received signal, this allows humans to understand others' feelings. In addition, accordingly to Bernier et al., 2013; Lomoriello et al., 2021; Sessa et al., 2018 it is important to stress that individual differences in emotional recognition make it possible to predict the timing of neuronal duplication, which expands on earlier discoveries regarding the personal difference and imitation Birch-Hurst, K., Rychlowska, M., Lewis, M.B. et al., (2022). Therefore, emotional recognition is the ability to identify both your feelings as well as those around you, it implies paying attention and accurately decoding the emotional signals of the expressed facial and body movements.

Storytelling

Particularly for teaching kids social, cognitive, and emotional abilities, storytelling is an effective teaching method. It has a long history, has grown to become a vibrant, modern presence in a variety of situations, and can improve children's emotional

health by emphasizing easing concerns. Additionally, it aids kids in learning problem-solving techniques and expressing concealed, frightening emotions Zarifsanaiey et al. (2022). Moreover, storytelling encourages interest in listening to stories as well as speakin, writing

and reading about them by enabling students to explain how they make sense of their lived experiences and putting language abilities into perspective Morrill et al. (2000).

A study conducted on adolescents with T1D showed that self-management education delivered through digital storytelling improved subscales measuring collaboration with parents, communication with diabetes, and behavioral and self-management goals in them Zarifsanjani et al. (2022). Consequently, this strategy enabled people affected by diseases, such as special conditions with T1D, to better understand and find appropriate self-management strategies that could improve their empathy with people and with themselves. Furthermore, the different strategies that storytelling can be used in class like role-playing, have a greater impact on young EFL learners' narrative writing than the technique of reading a story aloud or even in the lecture classes Rashtchi (2018). The use of storytelling has had a positive impact on the role-playing that can be used with students in class. When role-playing has been shown to improve empathy among students, it has also improved the classroom environment and the attitude of each student.

During the time of quarantine, where the immediacy and interactivity of live presentations in school classes allowed for a sense of connection at a distance, which was especially relevant during the forced isolation of the COVID-19 pandemic, but showed that empathy, or role-playing, interpersonal relationships were affected. McGrath (2020). Because of the pandemic, it was necessary to create different ways to re-establish relationships between people, as the only way they had to communicate or make contact was while they were isolated. Thus, storytelling has been an opportunity to rebuild empathy and affection among

peers before and after the pandemic, in and outside the classroom.

The use of storytelling had a positive impact through roleplays used with the young Iranian EFL learners, showing that role-playing in class as a part of storytelling improved empathy and their socialization skills with others. The analysis of the results meant that the use of role-playing in Storytelling classes had a significant impact on the narrative writing of young Iranian EFL learners compared to the technique of reading a story aloud Rashtchi & Moradzadeh (2018).

Nowadays, due to technological advances, storytelling already has another facet of use in schools and that is narrative videos. These narrative video activities have positively affected the perception of all students and have facilitated the improvement of all their communication and learning skills that can be developed in the classroom. Moreover, the activities generated by the narrative videos can improve the communicative skills in English and the environment in class so it is highly recommended to include them in an English course Othman (2022).

Students must possess the critical thinking, problem-solving, cooperation, and communication skills necessary for success in today's technologically advanced society. Successful communication refers to more than just the delivery of information; it also refers to how the audience was captivated. Corporate storytelling is a communication approach that uses narrative tactics to convey a company's brand and values to an audience Othman (2022). According to this author, the result of millions of years of natural selection to produce experienced,

cheap, and effective adults, whole-body storytelling was a single great leap that would have allowed children to understand and prepare for experiences that might occur in their future. Later, as language developed, storytelling became more

convenient than full-body imitation. These youngsters became mature adults, well socialized, intelligent, and prepared for whatever might befall them in the course of their existence. This was achieved through natural selection, establishing a new evolutionary framework based on the selection of learned adaptations and culture, giving a very broad step to storytelling.

The core of civilization is information, which may be preserved over time. According to McBride (2014), telling stories is the most ideal method because it is inexpensive and appears to be effective. This is how forefathers have passed on their knowledge to the younger generations. The custom of telling stories must incorporate mimicry as well because it helps to make social memories rich, significant, and simple by using body language. People can learn a great deal of safe information from a culture's stories that would be impossible to obtain from direct experience. This author states that in the story of humanity, the experience bequeathed through storytelling, and communities, allowed more opportunities to survive in the natural world.

In this sense, we recognize that storytelling helps students to experience the world in a safe way avoiding dangerous actions related to behaviors so that they can grow up and adapt better. Nowadays, this strategy should also be a tool that kids in primary and high school can use to know how to react depending on the situations they live in.

The aforementioned constructs enable a deeper reflection that in the following component of this article will be analyzed

from the research methods and searching strategies to achieve a better understanding of the phenomenon persuaded.

Methodology

This article addresses documentary research. They gather data regarding initial documents in inquiry, and research antecedents from databases. Systematizing information, the categories were established bearing in mind axial codification at processing information involved in Atlas.ti Software to correlate emerging variables.

This is documentary research, defined as a systematic procedure that involves inquiring, data gathering, organization, analysis, and data discussion, address to get facts from bibliography as primary source Morales (2003) in this research the mentioned sources were used to get the information, many facts were taken to abroad the knowledge of categories to define and compile a single concept. The process of investigating, collecting, organizing, analyzing, and interpreting information on a particular topic Alfonso, (1988). The topic established followed the steps, using a scientific database mostly online and then analyzing and interpreting it with an informatics program for qualitative research.

Qualitative research includes documentary investigation as a technique to recollect information coming from papers, magazines, and other written sources, here the observation is an important process to find the link between the study's objective

and the procedure to achieve it, Guerrero, (2015) the resources found, showed the links regarding the categories which are qualitative as they treat human aspects as behavior, emotions, and literature. Another

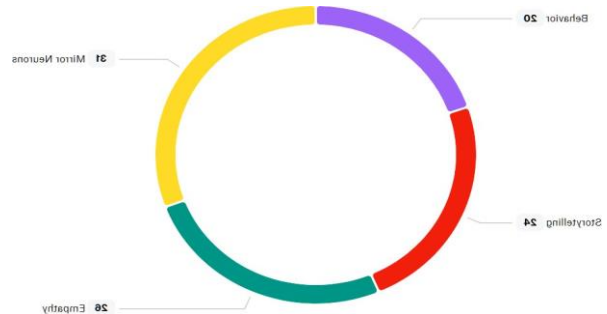
(5.2%).

The next figure evidenced that emerging categories from data analysis permit the following four aspects depending on the research phenomenon: Mirror Neurons, Storytelling, Empathy, and Behavior.

method for this kind of research is bibliography investigation in which data is the secondary source used to obtain facts. First, facts are related to previous data coming from different references and subsequently, it shows a wide and systematic perspective of a subject already considered in different publications according to Reyes Ruiz & Carmona Alvarado (Barraza, 2018). In exact sciences and others, a qualitative pathway is frequent and repetitive not linear. Hernández-Sampieri & Mendoza, (2019) during the elaboration of this paper many definitions and concepts from the topics were found by researching in the databases, keywords to find the information were behavior, bullying, storytelling, psychology related with MNS, empathy, sympathy and primary students. The papers found didn't show a direct relationship between the categories related at the beginning of the research. However, it was found that many authors defined similar concepts in different ways, but they get a relation that works to include and analyze.

This study explored an initial academic document compilation of nineteen sources, those that were discriminated against as follows. Sca, representing (78.9%). Ia, converging (15.9%) and Rb conveying

Figure 1. Research Categories.



Note: self-authorship recreated through Atlas Ti.

Análisis de la Figura 1.

Regarding the four categories mentioned, it is evidence that Mirror Neurons keeps been the most important construct conserving the relation that has been established in this

documentary analysis. Also, Empathy may be related to Mirror Neurons from the same type of text. However, Storytelling and Behavior which seem to address separate topics also may have a close variation from one to the other category. It is evident after analyzing one hundred and one reflective statement that most of the time researchers are focused on Mirror Neurons.

Conclusions

It is a must to go deeper into program creation that promotes empathy during childhood as this is directly related to mirror neurons, good behavior, and healthy practices in personal and social construction. As Mara, (2017) mentioned having a good development in any context regards good mirror neuron functioning, because this provides a higher thinking process related to emotions and a higher level of empathy.

Thanks to the technique of storytelling, it is possible to create spaces for reflection at school which benefits students because this will be a way where they can improve their empathy with people and with themselves. Considering, that developing empathy is a process that is connected to neuroscience, more specifically mirror neurons that allow children to differentiate and understand other peoples' intentions and behaviors schools can be an appropriate context to put into practice this technique, as while teachers narrate to kids, move and

gesticulate MNS is activated and thus empathy areas work to.

Nowadays, it is not indifferent that violence is increasing in schools leading to bad behaviors, this is an aspect that impacts the society of the future, finding ways where students can control their emotions is now a compromise with society. Kids and adolescents must start by understanding that their behaviors affect others in different ways and those can even impact adulthood. That's why teachers should provide during their classes with a healthy environment where students can create strong ties, being aware that the world has differences that are not a problem for them, and this even enriches the world. By using storytelling in a scholarly context emotional intelligence and good practices are implemented to heal the violent traditional methods that had been used.

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