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Once upon a time… Homo. From the book to the workshop: how to tell prehistory to children

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ABSTRACTS - The ability of humans to combine sounds, gestures, and signs sets us apart from other animals. Cognitive science and neuroscience, through neuroimaging, are studying the relationship between language structure and the brain. They aim to identify the neuronal connections activated during the process of reading. Reading, unlike innate abilities, must be learned since our primate brain did not evolve specifically for reading and writing. Creating children's books requires consideration of various factors related to cognitive development and the neurobiological processes involved in reading. When crafting a text for a general audience, it is important to simplify complex concepts without trivializing them, while still capturing the essence of the subject matter.

In this paper, I will discuss how I created a children's book and how it served as the catalyst for an educational project. This project was implemented in schools, bookshops, libraries, and particularly museums, providing an exciting and rewarding challenge. Like any good story, it begins with "Once upon a time..."

Keywords: reading; neuroimaging; language; communication; prehistory; human evolution; children's books.

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1. INTRODUCTION

Creating a children's book involves two essential elements: the ability to excite readers and the ease of readability. By "easy," I don't mean simplifying the content to the point of impoverishment, but rather ensuring that the content is accessible and understandable. In this paper, I will reflect on the value of reading as a form of communication throughout human history and its neurological and neurophysiological foundations. It is important to consider these aspects when constructing a communicative language that aims to be effective.

As humans, we are complex beings who have made language our prerogative and adaptive force. The ability to combine sounds, gestures, and signs has been the focus of research in neuroscience and cognitive sciences, including psychology, linguistics, and philosophy. These fields aim to understand the neural networks underlying language processing and how they function. Language is a multifaceted concept that encompasses communication, thinking, art, relationships, and emotional connections. It serves as a vehicle for conveying our emotions (Greco, 2021).

From a phylogenetic perspective, writing and reading are cultural inventions that have played a crucial role in the transmission of knowledge, freeing it from sole reliance on memory. Our brains did not evolve specifically for reading, but rather reading evolved to adapt to the functioning of the brain. Our primate brain developed in a world without letters and words, yet over time, it adapted to specific challenges related to word recognition. Neuroimaging studies have revealed a mechanism of neuronal recycling, wherein reading neurons can be repurposed for other functions through innate neuronal plasticity. The same neurons that recognize faces or objects can modify their selectivity to respond to artificial objects, fractal shapes, or letters.

Therefore, reading and writing are faculties that are learned at a later stage of cognitive development, when the brain has matured in linking various visual, auditory, linguistic, and conceptual information. The mechanism of reading is universal, as the same brain circuits are activated for individuals who practice alphabetic reading and those who read ideograms (McClelland et al., 1981; Tarkiainen et al., 2002; Dehaene, 2009; Keller et al., 2009; Nakamura et al., 2012; Fioroni, 2013).

2. METHODS AND TOOLS

The journey of creating children's books on prehistory

began in 2014 with the first edition of "C'era una volta Homo" (Once Upon a Time Homo) (Fig. 1). The book quickly gained popularity among young readers and educators, leading to subsequent editions and considerations for a fourth one. The initial idea stemmed from a recognized gap in the market, as existing textbooks on prehistory were outdated and often inaccurate in their portrayal of the subject matter. The book underwent a lengthy process of reflection and planning before reaching its final form.

The first step in the process was defining the target audience, which in this case was primary school children. The challenge was to find a way to engage and captivate this broad group of non-experts, introducing them to the fascinating world of prehistory and our origins. The goal was to visually present the long journey of human evolution through a combination of written words, drawings, and colors. As a science communicator, the exciting challenge was to simplify complex concepts without trivializing them, while still capturing their essence. By removing non-essential elements, it was possible to communicate directly and clearly.

To shape the narrative, the author began with questions that both adults and children often ask: How does evolution work, and what role did hands play? Which human species first ventured out of Africa to explore new territories? What were the key events that prompted a "brave" ape to embark on a path that eventually led to the birth of our species around 7 million years ago? These questions formed the backbone of the narrative, allowing the wonderful story of our evolution to unfold.

Graphic and editorial choices were guided by considerations related to the cognitive development of the target age group. The entire structure of the book was designed with young readers in mind, aiming to attract and excite them. The texts were deliberately kept short and written in simple and captivating language to avoid tiring the children while reading. The use of colourful and visually appealing graphics not only captured attention but also aided in the learning and memorization processes. Images played a significant role in facilitating understanding, as their immediate perceptual and communicative nature made abstract content more accessible to all readers. Careful attention was given to the choice of words, ensuring their relevance and connection to everyday life. This approach aimed to help young readers, who may not yet grasp the concept of time, perceive the ancient world of prehistory as something familiar and not too distant.

The strategic use of "guide" colours for words and specific sections of the book facilitated the memorization process. For example, important dates marking key moments in human evolution were highlighted in blue, geographical places in green, and in-depth pages on topics such as feet and hands, language, and spirituality were marked in orange. An engaging and useful tactic employed in the book was to have "famous" fossils tell their stories in the first person, bringing the reader closer to the distant world of prehistory.

Another valuable graphic tool from an educational standpoint was the inclusion of "identity cards" (Fig. 2). These cards provided a visual summary of the contents and aided in the memorization of ancestral characteristics, helping readers understand their evolutionary changes.

Following the success of "C'era una volta Homo," a narrative continuation was developed in collaboration

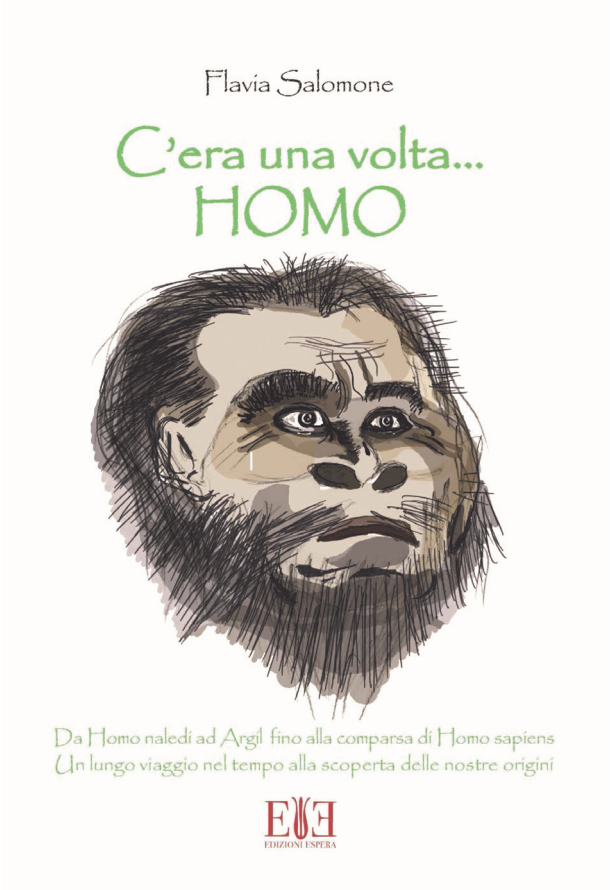

Fig. 1 - C'era una volta… Homo: third edition cover.

Fig. 2 - C'era una volta… Homo: identity card.

Fig. 3 - Cover of "Sulle tracce dei nostri antenati in Italia".

with Luca Bellucci and Giorgio Manzi, resulting in "Sulle tracce dei nostri antenati in Italia" (On the Trail of Our Ancestors in Italy) (Fig. 3). This second book took young paleontologists on a journey to explore their territory in search of remote Pleistocene evidence. The graphic layout of this volume maintained the same characteristics as the previous book and was accompanied by magnificent illustrations by Giada Giannetti (Fig. 4).

In "Sulle tracce dei nostri antenati in Italia," the second book in the series, the text component takes on a more narrative approach compared to the previous book. The aim was to tell the story of paleontological discoveries in the Lazio region of Italy, offering a unique perspective through the lens of journalistic reports. The book introduces a young explorer as the protagonist, who guides the reader through the Pleistocene landscape of Lazio, highlighting the dominance of volcanoes and the presence of early humans.

Through the exploration of fossil evidence, the young paleontologist shares captivating stories with the reader, providing insights into the ancient landscape and the lives of our ancestors. The narrative takes the reader on an imaginary journey through time, unravelling the mysteries of the past. The young explorer leads the reader to the actual locations where important discoveries were made, fostering a sense of connection and discovery.

Moreover, the book encourages readers to explore the museums in the Lazio region, where traces of our remote past can be found. By visiting these museums, readers can further engage with the subject matter and deepen their understanding of the prehistoric heritage of the area.

Fig. 4 - Reconstruction of the Pleistocene landscape of Lazio. Drawing by Giada Giannetti.

Through the combination of captivating narratives, vivid illustrations, and the integration of real-life locations and museums, "Sulle tracce dei nostri antenati in Italia" aims to inspire young readers to explore the fascinating world of paleontology and connect with their ancestral history tangible and exciting way.

3. FROM THE BOOK TO LIVE STORYTELLING WITH YOUNG READERS

The intention behind the publication of the books was not only to fill an editorial gap but to achieve something more ambitious: to bring children and adults closer to the fascinating topics of human evolution. The author believes that acknowledging our origins is crucial in understanding our place in the world and our connection to other living beings. Unfortunately, these topics are often neglected in school curricula. By exploring our roots and human biodiversity, we can learn about the importance of cooperation, cultural diversity, and adaptation to the environment, which are relevant and educational concepts for today's society.

The positive feedback received from young readers, teachers, and families during book promotions indicated a strong interest in these topics (Fig. 5). Recognizing the complexity of discussing evolution with children, the author developed educational activities that made children active participants in their learning process. These activities went beyond simple book presentations and included laboratory exercises focused on the evolution of language.

The success of these initial activities led to the creation of an educational project that has grown and expanded over the past decade. Initially targeting schools and families, the activities took place in various settings such as bookstores, libraries, archaeological areas, theme parks, and museums. Collaborations with institutions like the Casal de' Pazzi Museum (Fig. 6) and the Museum of Anthropology of the Federico II University of Naples allowed for the validation and enrichment of the educational offerings.

Popular programs such as "Mondays with the Anthropologist" or "Darwin Day for the little ones" became regular events due to their success. Even during the pandemic, educational activities continued with the Casal de' Pazzi Museum offering online courses. These courses engaged not only primary and secondary schools but also involved preschool children in discovering the vanished world of the Pleistocene through storytelling.

Furthermore, an integrated project was launched in collaboration with the preschool of the "Giovanni Palombini" Pre-school and Primary School and the "Fabrizio Giovenale" Library. This project, which is entering its third edition, features a series of interactive thematic meetings aimed at educating children about knowledge, respect for the past, the environment, and cultural heritage, fostering awareness among the "citizens of tomorrow."

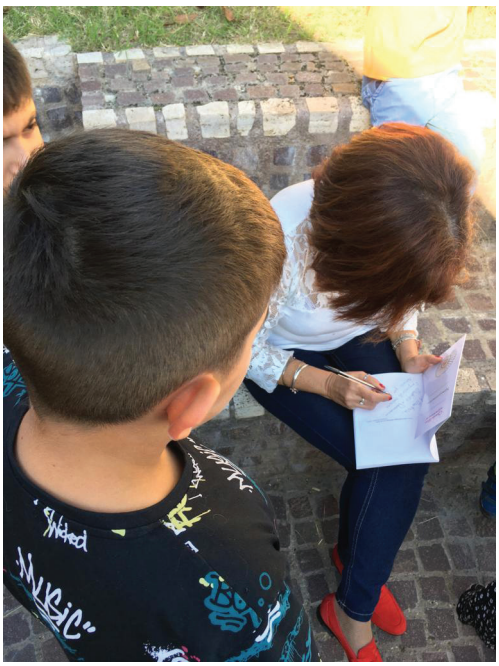

Fig. 5 - Book signing during an event at the Casal de Pazzi museum organized with the Lazio Region and Edizioni Espera.

Fig. 6 - Educational activity with schools at the Casal de Pazzi Museum.

4. ANALYSIS OF RESULTS

The collaboration with educational and museum institutions over 8 years has provided valuable data to analyze the impact of their educational activities on young readers. The analysis of results focused on two types of feedback: short-term feedback and medium/long-term feedback.

Short-term feedback was gathered immediately after

the activities and during their execution. The author monitored the degree of participation and engagement of the children during the activities to assess their immediate satisfaction. This feedback allowed for an initial evaluation of the effectiveness of the storytelling sessions and educational activities.

Medium and long-term feedback was analyzed to measure the lasting impact of the activities on the children and their subsequent engagement with the museum. This feedback considered the degree of affection for the museum, as indicated by the return visits of the children with their friends and family outside the school context. Additionally, the author considered the involvement of families and groups in promoting the museum's activities, which helped to expand its reach beyond the local neighbourhoods, province, and even region.

The data collected from over 400 schools and approximately 30,000 children provided a comprehensive overview of the outcomes of the author's efforts. The analysis of results highlighted the effectiveness of the educational project in generating enthusiasm and interest among the young readers, as evidenced by their continued engagement with the museum and their active participation in promoting its activities to others.

Overall, the empirical analysis of the results indicated that the live storytelling events and educational activities successfully achieved their goal of bringing children closer to the topics of human evolution and fostering a love for learning and curiosity. The positive feedback from both the children and their families demonstrated the impact and success of the approach in engaging young readers and creating a meaningful educational experience.

5. CONCLUSIONS

In conclusion, the author expresses their deep satisfaction and fulfilment in working with schools and engaging with young readers. The collaborative nature of the activities allows for the creation of specific educational paths that empower children and young people to take an active role in their learning process. Through hands-on laboratory experiences, participants gain self-confidence, contribute to the enrichment of the community, and develop a deeper understanding of themselves.

The author believes that there is no better way to convey the story of prehistory than by making it come alive. By immersing themselves in the lost worlds of the past, children and young readers can establish a strong foundation upon which to build their future. The connection to the local territory, both from a naturalistic and social perspective, is emphasized as an important aspect of the activities. By knowing and understanding their environment, participants develop a sense of responsibility and appreciation for their surroundings.

Throughout their collaboration with schools, the author has had profound experiences of discovery and emotional exchange with the children. They have learned a great deal from young readers over the years and have accumulated a wealth of experiences. Overall, the author's journey in bringing the topics of human evolution and prehistory to life through live storytelling and educational activities has been immensely rewarding. The impact and meaningful connections forged with the children and the community have left a lasting impression, contributing to a shared passion for knowledge, growth, and the preservation of our heritage.

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