

# Maria Skłodowska-Curie: A Product of Her Era, Family Upbringing, and Education.

## A Biographical Research Analysis Exploring How Contemporary Youth Publications Shape Students' Scientific Identity, Self-Development, and Attitudes Toward Gender Equality in STEM

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**Abstract:** This biographical research analysis examines how contemporary children's and young adult publications portray Maria Skłodowska-Curie as a scientific figure shaped by her historical context, family upbringing, and education, and how these portrayals contribute to students' scientific identity formation, self-development, and attitudes toward gender equality in STEM. The study analyses a corpus of modern youth-oriented biographies to identify dominant narrative frameworks, thematic emphases, and adaptive strategies used to translate Curie's life and achievements for different educational levels. Particular attention is given to representations of perseverance, intellectual autonomy, and commitment to science, and the negotiation of gender-based barriers. Through qualitative textual and discourse analysis, the research explores how Skłodowska-Curie's biography is reframed to align with contemporary pedagogical goals, including motivation for scientific inquiry, resilience in learning, and critical reflection on social inequality. The findings suggest that youth biographies do not merely transmit historical knowledge but actively construct role models that shape learners' perceptions of who can participate in science and under what conditions. By situating Curie simultaneously as a product of her era and an agent of change, these narratives foster historical consciousness while promoting inclusive values in STEM education. The study highlights the didactic potential of biographical narratives as tools for cultivating scientific curiosity, personal development, and gender-sensitive attitudes among young readers.

**Keywords:** Maria Skłodowska-Curie; youth biographies; scientific identity; STEM education; gender equality

The biography of an outstanding individual can play a significant role both in the didactic process and in school-based education more broadly. The life stories of people who achieved major scientific breakthroughs, transcended the limitations of their time, or developed exceptional moral character constitute particularly valuable material for educational analysis. One such figure is Maria Skłodowska-Curie, whose life has long fascinated researchers and inspired successive generations. Not only did this eminent scholar make groundbreaking scientific discoveries, but she also left behind a testimony to extraordinary strength of character, patriotism, social responsibility, and perseverance in the face of adversity.

As biographers consistently note, her attitudes were inseparable from her family background, her formative experiences, and the socio-political conditions in which she grew up. Authors emphasize that “many biographers of Maria Skłodowska-Curie highlight her exceptional patriotism and her constant engagement – alongside her scientific work – in the affairs of Poland, even during the period of its partition and political nonexistence. Her biography thus constitutes not only an example of personal heroism but also compelling evidence of the impact of family environment and education on the development of personality. In this sense, it can serve as an effective tool for educators and teachers.

The aim of this article is to examine the influence of the familial, educational, and socio-political environment on the development of Maria Skłodowska-Curie’s attitudes, and to demonstrate how elements of her biography can be used in school education as a means of shaping students’ values and dispositions. The discussion will incorporate both significant events from the scientist’s life and theoretical reflections on biography as a source of knowledge and inspiration.

Additionally, the article examines the ways in which contemporary children’s and young adult biographies of Marie Skłodowska-Curie articulate and negotiate her scientific identity, and investigates how these narrative constructions shape young readers’ dispositions toward science, persistence in the face of challenge, and conceptions of gender equity within STEM domains. By analysing the adaptive narrative strategies through which Curie’s life and work are reinterpreted for varied educational contexts, the research aims to clarify the pedagogical functions

of biographical storytelling in fostering scientific engagement, historical awareness, and broader personal development. The corpus comprises four publications that exemplify distinct generic conventions and instructional orientations.

## **Biography as a Source of Knowledge and a Tool for Education**

Many biographers of Maria Skłodowska-Curie emphasize her exceptional patriotic stance and her persistent engagement – beyond her scientific work – in matters concerning Poland, even during the period of its partitioned nonexistence. It is therefore worthwhile to examine to what extent this attitude arose from her own experiences, and to what extent it was the result of her embeddedness in the mental atmosphere of her family. It is significant that biographers of the future Nobel laureate also discern a kind of inheritance of convictions, even a quasi-genetic grounding of beliefs derived, among other things, from “the bonds of blood,” referred to as the so-called “heritage of blood.” Ultimately, Maria’s patriotic posture drew upon both the experiences of her family and those of the entire nation.

Across the centuries, the existence of characteristic traits ascribed to various communities –including nations – has been explained in different ways. Artur Sandauer views such explanations in terms of the so-called “heritage of blood,” a notion already present in the Old Testament, where it was believed that the nature of tribes, peoples, and nations derived directly from the biblical progenitors Shem, Ham, and Japheth (Sandauer: 1977, LXIV). A Polish counterpart to this tradition can be found in the legend of Lech, Czech, and Rus, a narrative that accounts for the shared past of Slavic tribes. For a nation to exist, it constructs its own mythology in such a way as to justify its origin and, above all, its continued endurance (Wierzbicki: 2010, 21). Interestingly, Joachim Lelewel states that these narratives were “absurdly fabricated” (Lelewel: 1859, 2).

Geographic determinism was also invoked in attempts to answer key questions concerning human mentality and the dispositions of the human mind. This concept attracted the interest of many thinkers – Hippocrates, Polybius, Strabo, Lucius Maternus, and Firmicus – and had already achieved popularity in ancient Greece. It posited that who we are is determined by the environment in which we live, that is, by factors such as the configuration of the land, climate, fauna, and flora. In her biography of Marie

Skłodowska-Curie, Ève Curie identifies the influence of the environment in which Maria was raised as a significant factor shaping her childhood and her lifelong attitudes:

“Terrible are the moral consequences of oppression. Terrible are the distortions it produces even in souls so pure, so sincerely good by nature. Somewhere deep in the hearts of these girls, feelings are stirred that will never arise in the hearts of free beings. Their ethics are shaped according to special laws – the laws of slaves. Hatred becomes a virtue for them, obedience – a disgrace. (...) This constant vigilance, this nearly soldier-like stance toward their surroundings cannot help but exhaust and drain these very young girls. How difficult it is to forbid oneself to like a truly pleasant companion – solely because she is Russian (...).” – translation from Polish (Curie: 1983, 44–45)

Andrzej Wierzbicki notes that some views regarding “geographical determinism” had undergone modification, and that definitions and their significance were increasingly understood in broader contexts, which also took cultural factors into account. Thus, human traits and the characteristics we possess are also influenced by the socio-cultural environment. Wierzbicki added that the most popular conception of the environment’s impact on humans was formulated by Montesquieu, who, in addition to the aforementioned “geographical determinism,” considered religion, law, principles of governance, customs, and historical examples as factors shaping the ultimate form and character of human personality – its spirit.

Herder regarded Montesquieu’s assumptions as incomplete because they did not explain the diversity of human types, and he emphasized a more significant factor for him: heredity. He states,

“The mother of all formations on Earth is the genetic force, while climate’s role is limited to either hostile or friendly interaction (...). The genetic factor (internal force), although demonstrating considerable persistence and stability, was not entirely immutable and completely independent of climate. Prolonged exposure to external conditions, albeit resistantly, nonetheless influenced the genetic code sufficiently that acquired traits, developed under environmental influence, became hereditary traits.” – translation from Polish (Wierzbicki: 2010, 15-17)

Ève Curie recalls difficult moments from her mother's life to convey the reality in which Maria grew up:

"She remains silent. She cannot shake off her melancholy. From shame. From the disgust she always feels toward pretense and falsehood, toward the necessity of concealing her essential thoughts and feelings; (...) she reads extensively, increasingly so. Easy and difficult books – without choice – boring and interesting, textbooks, novels, poems, thick volumes of technical works from her father's library (...). In this way, she somehow wards off the specters of dark thoughts (...). For the moment she stops reading, everything immediately comes crashing back upon her." – translation from Polish (Curie: 1983, 29,36)

In summary, the theory of geographical determinism highlighted the character of nations, subject to evolutionary, gradual transformations, set against a background of climate changes imperceptible to individuals. However, cultural factors (e.g., education, wars) appear to have influenced societies much more rapidly, while the theory of heredity allowed a more flexible explanation of formative moments of character, which can help account for individual behavior. Georg Brandes describes the former capital of Poland during the Russian occupation as follows:

"Warsaw is a city with a population exceeding 400,000. It is located, as is well known, on the Vistula River. In its winter attire, covered with gray ice floes, the river made a deeply somber impression on me. The urban area is extensive, yet its fallen grandeur and the terrible memories hidden within its walls, which a passerby encounters at every turn, create a painful effect. In the previous century, it was, after Paris, the most splendid city in Europe; today, it is a provincial Russian city. What was once a historically significant and magnificent city has now become neglected and diminished. Each day it declines further, and the authorities take no action to promote its external development or prosperity. One's heart aches at the sight of the poorly paved streets or the dreadful sandstone statues decorating the Saxon Garden, especially when arriving from a historically rich city such as Vienna, or from a rapidly developing city like Berlin. Elsewhere, capital cities are subjects of distinctive, almost paternal, care by the ruling authorities; elsewhere, the cities themselves, out of civic pride, ensure their beauty and comfort to impress both residents and foreigners. In contrast, Warsaw is the capital of a country whose existence the government refuses to acknowledge—a city whose pride it seeks to suppress by every means. It should be noted

that Warsaw lacks local self-government, municipal councils, or anything comparable. The Kingdom of Poland is, in general, a country without electoral rights: there is no parliament, no Sejm, and no autonomous municipal institutions.” – translation from Polish. (Brandes: 1898, 10–11)

Ignacy Włodek, in 1780, wrote about three factors influencing the development of individuals – those “existing within us, with us, and apart from us” (Włodek: 1780). The first factor comprises the dispositions and abilities with which a person is endowed at birth. Włodek referred to the inherent “potential” present in each individual. Only the obstacles encountered in life cause part of this potential to remain unrealized (Wierzbicki: 2010, 24).

Interestingly, Włodek identifies the “factors with us” as environmental influences, namely the home, school, and centers of authority. In his view, the “factors apart from us” referred to climate, topography, soil type, fauna, and flora. Another scholar, Franciszek Siarczyński, contesting the value of genetic determinism, argues that human traits are the same everywhere and that every society contains both good and bad individuals. A similar view is expressed by Ève Curie:

“There seem to be, in the history of families, periods of exceptional flourishing. Owing to some mysterious causes, a single generation may suddenly rise far above those that preceded it and those that will follow, surpassing them in the richness of its talents, beauty, vitality, and success.” She then asked: “Why did no one recognize Maria’s exceptional abilities when she was still a young girl? Why was she allowed to waste so many years in the unproductive work of a governess, instead of being sent—at any cost and with the greatest determination—to study in Paris from the outset?” – translation from Polish (Curie: 1983, 39)

In this way, Ève Curie underscored the lost opportunities her mother faced during the many years she spent in the provinces.

Wierzbicki emphasizes that reflections on the idea of the nation resurfaced after the third partition of the Polish – Lithuanian Commonwealth and the subsequent establishment of the Duchy of Warsaw. These changes gave rise to independence-oriented aspirations on Polish lands. In Poland, the approach to nationality evolved so that, ultimately, the concepts of *nation* and *state* ceased to be synonymous. They came to be associated with mutually exclusive values: the nation meant the people, whereas the state signified the *others* – the partitioning powers.

Wierzbicki recalls the words of Hugo Kołłątaj, who saw the causes of Poland's backwardness in its socio-economic anachronisms, the serfdom of peasants, the marginalization of burghers, technological underdevelopment in comparison with other European countries, and, above all, weak political authority. Kołłątaj observes: "It is a laughable arrangement that, as soon as personal animosities arise among us, we immediately abandon the interests of the country – abandon even the homeland – exerting all our effort to bring the King to ever greater impotence, forgetting that the nation's impotence cannot be separated from his fate" – translation from Polish (Wierzbicki: 2010, 39).

In the same context, the author cited the words of Stanisław Staszic, who argues:

"The conflict between the despot (the sole ruler, the king) and the magnates was an expression of a general regularity in the historical process. In England, France, Sweden, and Hungary, it reached its culmination centuries earlier and was resolved unequivocally in favor of the monarchs. In Poland, however, the nobles managed to retain their influence through obscure maneuvers. Frequently resorting to treason against the state's interests and to bribery, they set an example of moral decay. The nobility, striving for temporal goods, valued the favor of powerful patrons over the interests of the state." – translation from Polish (Wierzbicki: 2010, 43)

The roots of Poland's downfall were seen in the conduct of the nobility, who – numbering roughly one million – ruled a population of eight to thirteen million. They blocked necessary reforms, perceiving every change as a threat to their liberties, and consistently employed the *liberum veto* to protect their privileges. Reformist ideas articulated at the end of the eighteenth century failed to protect the weakened state from the first partition, and the Constitution of 3 May 1791, despite being an innovative legislative act, likewise did not prevent Poland's collapse (Brandes 1898: 26-27).

Susan Quinn describes this part of Polish history in detail, identifying in these historical events important influences on the Skłodowski family and, of course, on the young Maria (Quinn: 1997, 17-54). Lucjan Biliński likewise focuses on the scholar's ancestors, recognizing in their legacy formative influences on the later Nobel laureate's personality development (Biliński: 2003, 13-29).

At the moment when Maria Salomea Skłodowska was born, on 7 November 1867, everything on Polish lands – as Susan Quinn notes – carried a symbolic, national-patriotic meaning (Quinn:1997, 17). Quinn also identifies symbolic motivations in the choice of name given by the future scientist’s parents, Władysław and Bronisława Skłodowski, to their youngest child. In these post-partition times, the belief that Poland had been able to repel the Swedish invasion through the intercession of the Virgin Mary of Częstochowa held particular significance. Maria’s second name – Salomea, often mistakenly assumed to be Jewish (Biliński 2003, 156) – was linked by Quinn both to the name of her paternal grandmother, in keeping with family naming traditions<sup>1</sup>, and to a thirteenth-century princess, the founder of a Kraków convent who was beatified in the sixteenth century. Thus, the symbolic meaning of the names bestowed upon the future scholar reflected and united the mother’s religiosity with the father’s patriotism (Quinn: 1997, 18).

Quinn emphasizes that three years before Maria’s birth, the January Uprising had been brutally suppressed, resulting in tens of thousands of Poles being deported to Siberia. In the subsequent years, tsarist officials launched a wide-ranging campaign of Russification aimed at eradicating all expressions of Polish identity, particularly in education, administration, and culture. Another important issue was censorship<sup>2</sup> and restricted access to foreign materials<sup>3</sup>, as highlighted by Georg Brandes in his account of travels

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<sup>1</sup> The name Józef was borne by Władysław Skłodowski’s father and thus by Maria Skłodowska’s grandfather. Władysław’s eldest son was likewise given this name. The popularity of the name Józef in nineteenth-century Poland stemmed from the widespread veneration of Prince Józef Poniatowski.

<sup>2</sup> On the subject of censorship in the Polish lands, Brandes remarked: “I was invited to Warsaw to deliver three lectures in French in the great hall of the town hall. Even before my arrival, I had considerable difficulties with these lectures. I was required to send the manuscripts to Warsaw one month in advance. There, they were to undergo double censorship: the ordinary one and a special censorship applicable to public lectures. Since it was certain that a parcel containing the manuscripts would be detained indefinitely at the border if I sent it by post, I had to look for a more reliable route. Thanks to the courtesy of a certain embassy, I succeeded in sending the manuscript through St. Petersburg, and in this way, with only a slight delay, it reached Warsaw. Two copies were made there, and both were submitted to the dual censorship.” (Brandes: 1898, 9-10)

<sup>3</sup> The train stops at border. Here we are required to show our passports and submit our belongings for inspection. A gendarme appears in the carriage—a typical Russian blond in his ceremonial uniform, a long grey overcoat, a round cap without a visor, and a sabre at his side. He asks the passengers for their passports and leaves with them. (...) The first items found in my travel bag were two issues of the *Nouvelle Revue*, which I had taken for the journey. They contain various materials; each issue includes ten articles. It was therefore impossible to summarize in a few words what the journal contained. ‘In

through Polish territories. In his report from the Vistula region, Brandes – an external observer – was able to characterize the Russian partition with a degree of objectivity and detachment:

“Russian authority, unlike the Prussian, is neither prudent nor consistent. It is capricious, absurd, and often rests in highly incompetent hands. The oppression to which the part of Poland under Russian rule is subjected would be impossible to endure even for a single month if numerous decrees were not mindless and unplanned, others too detailed to be enforced, and still others circumvented through bribery. One must remember that the execution of some regulations is entrusted to people of such limited intellect that they are easy to deal with, while at other times one encounters officials so intelligent and educated that the regulations remain a dead letter.” – translation from Polish (Brandes: 1898, 8-9)

As Quinn observes, many members of the Skłodowski family engaged in political activity. She described, among others, Władysław Skłodowski’s brother, Zdzisław, who was twice wounded in the struggle for independence and later fled to France for fear of reprisals. Likewise, Maria’s maternal uncle, Henryk, who also took part in the uprising, was exiled to Siberia for four years (Quinn: 1997, 20). Similarly, Józef – the father of Władysław and Maria’s great-grandfather – served as an artilleryman and participated in the November Uprising and in the battle near Chmielnik, for which he was taken prisoner by the Cossacks (Quinn: 1997, 23). Ireneusz Sadurski emphasizes that Józef Skłodowski, in his capacity as school director, paid close attention to the patriotic attitudes of teachers and refused to hire unqualified individuals. Sadurski notes: “Director Skłodowski, as far as he was able, circumvented the regulations and directives imposed by the superior authorities. On various occasions, he personally taught Polish history to his pupils and transmitted to them the national tradition” (Sadurski: 2011, 14). Quinn argues that it was precisely these family experiences and

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that case, we shall take them and send them to the censor in Warsaw. Is this periodical forbidden? ‘Everything that I do not know is forbidden, and I do not know this particular book.’ The sight reminded me of an old lithograph depicting a large monkey rummaging through a traveller’s knapsack and inspecting his books. (...) Then the proper inspection began. Every pamphlet and every book was removed and set aside; every newspaper was taken out—even those in which I had wrapped my shoes—carefully smoothed out and placed into a separate bundle. Since my explanations proved insufficient, all printed materials were confiscated.” (Brandes: 1898, 5-6)

modes of upbringing that shaped the mentality of the young Skłodowski generation:

“The children of Józef and Salomea espoused even more liberal views than their parents. Some lived in Warsaw, others in the countryside, but all already belonged to the intelligentsia – a social group that, in the nineteenth and twentieth centuries, was in Eastern Europe strongly connected with the national cause. In Poland, the national question was inseparable from liberation from foreign domination. Józef’s children, however, like the contemporary intelligentsia, differed in their views on the paths leading to independence. Two positions prevailed within the family. These ideas contested for primacy in Poland throughout the nineteenth century. At that time, Stanisław Staszic, a leading reformer of the Enlightenment, repeatedly reminded Poles that handicraft, learning, commerce, and military force were essential, otherwise the nation would perish.” (Quinn: 1997, 24)

Thus, the memory of lost independence remained vivid within the Skłodowski family. Resistance to the occupier, as practiced by the father, could be realized only in the limited ways available at the time, which led him to undertake clandestine teaching – he refused to allow his children to be subjected to Russification. The home education provided by Władysław for his children functioned as a form of compensation and was partly motivated by his own sense of guilt, as he had invested the family’s life savings in a mill and lost the entire estate intended for his children’s education (Pasachoff: 1996, 12-13). As a consequence, he was compelled to send them to a state gymnasium, the only universally recognized school whose certificates enabled further study (Curie: 1983, 43). Ève Curie recounts an episode from her mother’s life:

“—And the monument! Let us go back; we forgot about the monument!’ And both girls immediately turn back, even at the risk of being late for school. For the matter was this: In the middle of the square stood an obelisk surrounded by eight lions, with the shameful inscription on its base: *To the Poles faithful to their monarch*. It had been erected by the tsar for the traitors of the November Uprising. Polish youngsters passing by customarily stopped and spat. If someone forgot to do so out of distraction, she would return to correct her mistake (...).” – translation from Polish – translation from Polish (Curie: 1983, 47)

As Brandes describes, two such monuments symbolizing tsarist authority existed in the city at that time: the monument to Paskiewicz – erected for the general who captured Warsaw and delivered it into Russian hands – and the obelisk bearing the names of Poles who had betrayed their homeland by collaborating with the Russians<sup>4</sup>.

Maria's patriotism can be interpreted through the lens of her family's experiences, as documented in numerous biographies (Curie, Quinn, Goldsmith, Pasachoff, Biliński, Emling, among others). The exemplary cases recalled here – the fates of various members of the Skłodowski family engaged in the struggle for independence and the consequences they endured – undoubtedly influenced Maria's personality from her earliest years. It is therefore understandable that her historically conscious attitude and profound patriotism – transmitted, in a sense, across generations – should not be surprising. Given the family's history, and the involvement of so many of its members in the fight for national freedom, it was almost inevitable that certain convictions would take shape within Maria. Growing up in the post-uprising era shaped the convictions she held as an adult and constituted the defining socio-political atmosphere of her formative years.

Lucjan Biliński observes: "The history of Maria Skłodowska's family may serve as an excellent contribution to research on the inheritance of intelligence and abilities" (Biliński: 2003, 13). For the purposes of his research, Ireneusz Sadurski outlines the profile of the scholar's grandfather, Józef Skłodowski—the eldest son of Urban Skłodowski, a landowner, and Małgorzata née Rykaczewska (Sadaj: 1982, 131–135) – who was born on 19 March 1804 and, at the age of eight, began his education at the elementary school in Zaręby Kościelne. The author points to the difficulties that marked Józef's educational trajectory, attributing their cause to the Russian occupation of the Duchy of Warsaw. For this reason, Maria's grandfather

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<sup>4</sup> "There are only two well-maintained monuments in Warsaw: the first is the colossal monument to Paskiewicz on Krakowskie Przedmieście, the city's main thoroughfare, erected by a grateful tsar to the man who was loyal, active, and as efficient as a knout in the hands of an executioner (Mickiewicz), and who in September 1831—when the last heroic defenders of the uprising blew themselves up—captured the ramparts of Warsaw and took the city. The second is a great iron obelisk bearing, for eternal remembrance, the names of the Poles who in 1831 betrayed their homeland and were, for that reason, hanged or shot by their compatriots. Four metal lions rest upon its splendid granite base. Around the foot of the obelisk gleam repulsive heraldic double-headed eagles of monstrous size. The inscription above the names, written in Russian and Polish, reads: *To the Poles who fell in loyalty to their monarch*. The erection of this obelisk in Warsaw failed in its purpose." (Brandes: 1898, 15-16)

interrupted his schooling, resuming it two years later at the District School in Łomża, where he obtained his secondary-school leaving certificate in 1823. Sadurski emphasizes the ambitions of the scholar's grandfather, who, immediately after passing his final examinations, enrolled at the University of Warsaw in the Faculty of Law and Administration with the intention of becoming a state official. Throughout his studies, he also received a government scholarship. Ultimately, however, due to his failure to sit for the final examinations, he devoted himself to a pedagogical career (Sadurski: 2011, 8). Sadurski underlines Józef Skłodowski's strong substantive preparation for teaching and noted that he taught history, geography, and German.

Józef Skłodowski's patriotic inclinations manifested themselves when, after the outbreak of the November Uprising, he joined the 5<sup>th</sup> Infantry Rifle Regiment (he took part in the Battle of Grochów). Thanks to the intervention of a senior official, Adam Sagatyński, Józef was able to return to the teaching profession – concealing his insurgent past (Sadaj: 1982, 139). Biographers identify the roots of the Skłodowski family's patriotism (and that of subsequent generations) primarily in the example set by Maria's grandfather, who, as a school director, promoted certain values among his staff and – certainly – among his own children (Sadurski: 2011, 30). These very experiences of Maria's forebears shaped her later political sensitivity and social consciousness, which ultimately translated into her patriotic commitment and her political involvement in the League of Nations (Pyćior: 1996, 449–467).

## **Maria Skłodowska-Curie's home**

Maria Skłodowska-Curie's origins were repeatedly invoked by the press, particularly in connection with the scandal surrounding her alleged affair with Paul Langevin, and again after her death, when she was once more ascribed Jewish ancestry. It was precisely at this moment that Polish newspapers – more often than foreign ones – responded to such allegations by reminding readers of her Polish roots and by emphasizing aspects of her childhood and youth that were unknown abroad (Brandes: 1898, 27). The Polish press highlighted that stage of the scholar's life which unfolded on Polish lands, though not yet in a Polish state, since the latter did not exist at the time. *Gazeta Domowa* reports that

“Tradition, upbringing, and many other conditions have combined to make a woman occupying a distinguished position among scholars in the exact sciences something exceptional—especially in the field of physics or

chemistry, where scientific inquiry must rely upon a distinctly experimental method. Such an exception among exceptions is the Polish woman and Warsaw native, Mrs. Maria Skłodowska-Curie, recently recognized in the scientific world, who—thanks to her work in chemistry—has joined the select group of the most eminent individuals worldwide honored this year with the Nobel Prize. (...) The participation of a Polish woman in such significant achievements of pure science, which shed new light on the nature of the universe, pleasantly flatters our national pride (...).” – translation from Polish (Gazeta Domowa: 1902, 4-5)

Stressing Skłodowska-Curie’s Polish heritage served to reinforce patriotic sentiment in the nation; such rhetoric was viewed as necessary for enduring the difficult years of partition and for nurturing future aspirations for independence. For this reason, Skłodowska-Curie’s youth was frequently invoked – particularly by Polish biographers – to anchor her identity firmly in Poland (Kaczorowska: 2011). Biographies dedicated to the scientist emphasize her exceptional qualities: her mode of thinking, her perception of reality, her determination in pursuing chosen goals – all presented in the context of her patriotism. Maria Skłodowska writes:

“I lived constantly with the thought – although I had little faith in its fulfillment – of witnessing the rectification of the injustice done to my homeland: the wrong that had divided its lands and peoples among its enemies and had kept it in bondage for over a century. I dreamed of the deserved revival of the Polish nation, which had never forgotten its proud past despite prolonged, nearly hopeless oppression. A dream so difficult to realize, yet so dear to me, came to fruition as a result of the upheaval that swept across Europe. Under these changed circumstances, I went to Warsaw to see my family after a long separation and to visit the free capital of Poland.” – translation from Polish (Kaczorowska: 2011, 141)

Contemporary scholars of child development likewise underscore the formative importance of her childhood for her later personality. Oliwia Brzeźniak points out that

“the earliest years of a person’s life shape their entire existence. The significance of the home environment, the cultivation of a positive attitude toward acquiring both humanistic and scientific knowledge, and the encouragement of continual self-development conveyed by parents and family cannot be overstated in the formation of any young person’s personality. Maria

Skłodowska was exceptionally fortunate; her family home, the conditions of her schooling, and her perseverance in self-education (for example, her ambition to broaden her scientific horizons as well as her translation of poetry)—that is, the overall atmosphere of her childhood and youth—created the solid foundation upon which she was able to develop her scientific passions and talent.” (Brzeźniak: 2013, 229)

Wierzbicki recalls Stanisław Staszic’s views as representative of the period, noting his advocacy of home education as an antidote to the occupying powers’ attempts to impose intellectual subjugation upon Polish youth. In this respect, an analysis of the scholar’s early years and their influence on her worldview appears fully justified “...in domestic upbringing, he saw (...) an antidote to all the deficiencies of public education during the period of foreign domination; he perceived it as a means to counteract efforts aimed at poisoning the minds of youth with hatred toward their fathers and contempt for their homeland” (Wierzbicki: 2010, 47). Information about this period of her life appears for the first time in her autobiography, originally intended as a tribute to her husband. Already in the opening pages, the author allows the reader to become acquainted equally with Pierre and with herself. Maria referred to her origins, invoking her Polish descent, while also highlighting the petty-noble lineage of her family: “In my country this social class consists of many small and medium landowners, often related to one another. Until recently, it was principally from this source that the Polish intelligentsia was recruited. My paternal grandfather was the first to leave the land and to devote himself to the teaching profession, which he practised mostly in the provinces, and finally as the director of a gymnasium in Lublin” (Curie: 2009, 11-12). Her sister, Helena Skłodowska-Szalay, clarified the family’s origins even further: “In the Łomża region there is the village of Skłody. It was the seat of the Skłodowski family. The petty, settlement-based nobility occupied it entirely. They worked in their farmsteads and cultivated small plots of land. Some practised crafts” (Skłodowska-Szalay: 1958, 8). Numerous publications on Skłodowska-Curie have subjected this period of her life to close analysis, regarding it as crucial to the later trajectory of the scholar’s development. The earliest account of this stage was provided by Zygmunt Lasocki, who conducted genealogical research and examined the origins of the Skłodowski family. He began by distinguishing between two families of Skłodowskis – the Podlasie branch bearing the Jastrzębic coat of arms, and the Nursk branch bearing the Dołęga coat of arms, to

which the scientist's family belonged. Drawing on his research, Lasocki described the heraldic lineage of Maria's ancestors and demonstrated their noble origins, which were formally recognized in 1843 thanks to the efforts of Maria's grandfather. He concluded that members of the Skłodowski family, unable to sustain themselves on the small landed estates they possessed in Skłoty in the Łęczyca region, dispersed across Polish territories, with some settling in Mazovia, where they founded the locality of Skłoty (Lasocki: 1936, 49). According to Lucjan Biliński, these are significant elements of the family's formation – elements that scholars analyze in an effort to identify those moments in Maria's life that were meaningful for the development of her identity. As Biliński writes: "Among the various factors influencing the emergence of exceptional talent, we must also consider the genealogy of abilities and interests within the Skłodowski family and, on the maternal side, the Boguski family. It therefore appears justified to present these two families more broadly against the backdrop of the very difficult era in which they lived" (Biliński: 2003, 13). In her autobiography, Maria herself emphasizes her intelligentsia background, and the reader may thus gain the impression that it was her father who shaped her future interests – interests unusual for a young girl growing up in the late nineteenth century – while her mother deepened her knowledge and sensitivity during childhood. Maria writes:

"My father, Władysław, after completing his studies at the University of St. Petersburg (at that time the Russian partition lacked higher education institutions), worked in Warsaw as a teacher of physics and mathematics in both public and private secondary schools. He married Bronisława Boguska, a woman whose way of life suited him, as she was, despite her young age, exceptionally well-educated for the time and served as the headmistress of one of the best girls' schools in Warsaw. Our mother, severely affected by the loss of a daughter and weakened by a long illness of the lungs, died at the age of forty-two, leaving her husband and children in profound grief. I was only nine years old at the time, and my older brother was merely thirteen. This loss was the first serious sorrow in my life and plunged me into deep despair. My mother was an extraordinary person. Alongside remarkable intelligence, she possessed a great heart and an unwavering sense of duty. Despite her boundless understanding and kindness, she commanded high moral authority within the family. She was deeply religious (both parents were Catholics), yet she remained tolerant of all, including those who did not share her beliefs. She exerted a profound influence on me, as in addition

to my natural love for her, I felt deep admiration for her.” – translation from Polish (Curie: 2009, 12-13)

Without exception, all studies devoted to the scholar’s childhood emphasize the significant role of her parents, and particularly her father, in the upbringing and education of the children. This was especially important for girls attending schools for young women, whose curricula were not designed to educate in the modern sense, but rather to prepare them for motherhood and the raising of future generations. Therefore, the father’s involvement in the education of all his children deserves special attention. Maria’s brother, Władysław, writes of their father:

“In his care for the children, he knew no bounds. He attended to our health and physical development, guided our education, and provided for our recreation. We managed our schoolwork independently, yet in every difficulty or doubt, he was always ready to help, despite his heavy workload, never excusing himself for lack of time. He additionally taught us physics and chemistry, read aloud to us in prose and verse, and during summer vacations, we began learning English with him, which later facilitated a more thorough mastery of the language. And even as we grew older, he never ceased to take an interest in our work. With my sister Maria, who before leaving for Paris had been a governess in a rural household, he conducted lessons in higher mathematics through correspondence. With me, once I had become a physician, he often assisted in translations from foreign languages.” – translation from Polish (Biliński: 2003, 36)

Whereas, Alicja Dorabalska highlights another aspect of Maria’s upbringing, linking the atmosphere of the Skłodowski household with the era in which the scholar grew up:

„She was raised in an environment of the Polish intelligentsia, in a household of profound culture, actively engaged in the scientific, intellectual, and also social life of its time. (...) Maria, the youngest of five siblings, developed rapidly in an atmosphere exceptionally conducive to the early appreciation of the essential values that intellectual life and scientific work can provide. Unlike the relatively frequent cases in which genius emerges against a spiritually alien background, Maria Skłodowska grew up among people, many of whom made lasting contributions to Polish intellectual life. It should not be forgotten that Professor Józef Jerzy Boguski, an eminent scientist and educator who devoted over fifty years to the development of chemistry

and physics in Poland, was her first cousin. The family also included the well-known novelist Helena Pajzderska, née Boguska, who wrote under the pseudonym Hajoty. Maria's older siblings were by no means unfamiliar with the world of scientific work: they pursued higher education, bringing into the family environment an active interest in science and its achievements." – translation from Polish (Dorabialska: 1935, 2-3)

Ève Curie writes extensively about the atmosphere in the Skłodowski household, providing the reader with an understanding of its unique character.

„It is five o'clock in the afternoon. The large dining table has already been cleared after afternoon tea, the lamp has been lit, carefully checked to ensure it does not "filuate," God forbid. The young Skłodowskis begin their lessons. A peculiar murmur slowly, gradually fills the entire house. Almost every room – particularly those occupied by the students boarding with Mr. Skłodowski – resonates with this sound. A strange murmur, a curious melody of murmurs and fragmented words, repeated – sometimes meaningfully, sometimes apparently or even truly nonsensically... Dates, numbers, names, and verses, words and individual syllables intertwine, forming intricate multilingual arabesques: Polish contending with Latin, French with German – but together, they cannot overcome one language: Russian. The atmosphere of diligent effort pervades the entire apartment. The space is transformed into a vast workshop of painstaking intellectual labor." – translation from Polish (Curie: 1983, 33-34)

Sister Helena, in describing Maria's exceptional qualities – already evident in her earliest childhood – recalls the following episode:

"She was once present during a reading lesson given to seven-year-old Brońcia and, watching with curiosity from the side, glanced into the book. Brońcia was reading a long sentence slowly and with difficulty. This irritated Mania, who suddenly read the sentence aloud, clearly and fluently. When she later saw the astonishment – indeed, the almost stupefied expressions – on her parents' faces, as well as the faint shadow clouding the brow of the embarrassed Brońcia, she burst into loud, sorrowful tears, apologizing and saying: "I didn't know I wasn't allowed to; that I was doing something wrong – but it was all so terribly easy." And so it was always: everything seemed to her so easy, so engaging, and so delightful. One could hardly tear her away from books; everything around her absorbed

her attention, and natural phenomena captivated her.” (Skłodowska-Szalay: 1958, 9-10)

Summarizing her reflections on her mother’s childhood in the biography, Ève Curie writes:

“The gymnasium – the boarding school – study – pupils: this is the leitmotif of Maria Skłodowska’s youth. Both she herself and everything around her are directly connected with learning and with school. Even her family home, because of the lodgers it hosted, is in a sense also a kind of school. Truly, the whole world must have seemed to Mania to be one great school, and people, in her view, were divided into only two categories: pupils and teachers, whose shared purpose in life is – exclusively and solely – study.” (Curie: 1983, 41)

In this way Ève Curie identifies in her mother’s early experiences the sources of her exceptional abilities and later scientific achievements, referring to them as the “high values of the environment” in which Maria grew up. She emphasizes that even at that time these abilities manifested themselves outwardly and were readily observable. The portrait of the scholar that she offered is multifaceted. The reader is allowed to see Skłodowska-Curie from various perspectives: as a child, an adolescent, a university student, a wife, a researcher, and ultimately a Nobel Prize-winning scientist of great renown. This effect arises from the narrative structure, whose task is to bring the figure of the scientist closer to us along with the components of her exceptional character. In biographical accounts, Maria appears from her earliest years as an intelligent child marked by a deep interest in reading. Brzeźniak observes that, in the case of Maria Skłodowska-Curie,

“The books she read in childhood and youth merit closer attention, although the surviving source materials say little about them. Biographers readily try to identify in her life story – primarily in the earliest years – signs of her later scientific success. They have mostly focused on issues related to the origins and development of her interest in physics and chemistry, while overlooking or only briefly noting her other fascinations.” (Brzeźniak:2013, 228)

The fascination with books displayed by the four-year-old girl was so intense that her educated parents feared premature maturity – premature, in their view:

“The parents tried, by various diplomatic means, to avoid giving her books. As experienced and wise educators, they were concerned about such early development, and whenever little Mania’s hand reached toward one of the many children’s books in the house, a suggestion was immediately heard: perhaps you would like to play with blocks? You know what—sing something to me! Where is your doll? – see, she needs to be dressed! Or, as today: ‘I would prefer if you went to the garden...!’” (Curie: 1983, 17)

This occurred because little Mania, from her earliest years, lost herself completely in books. These efforts, of course, did not diminish the future scientist’s interest in reading; under the influence of her father and the student lodgings he managed, reading became an integral part of her youth. Especially during her childhood and adolescence, Maria filled every free moment with reading, which – as Ève Curie explains – served as an escape into a world without the worries and difficulties of daily life. In a letter to her friend Kazia, Maria Skłodowska-Curie wrote:

“I am currently reading: (1) Daniell’s Physics, of which I have finished the first notebook, translated by Józef Boguski; (2) Spencer’s Sociology in French; (3) Paul Bert’s Lessons in Anatomy and Physiology, a wonderful book, which I have in Russian. I read several things at once, because concentrating on a single subject for too long would weary my already often exhausted mind. When I am absolutely incapable of productive reading, I work through algebraic or trigonometric problems, for these allow no compromise in attention and help to clear my mind.” – translation from Polish (Curie: 1983, 86-87)

Interestingly, Barbara Goldsmith notes that even as an adult, Maria Skłodowska-Curie – just as in her childhood – had the habit of losing herself completely in reading.

“Months passed before she stopped hiding in corners to cry – something she did in secret, away from her family and schoolmates. At school she did not display even a trace of sadness, remaining the best pupil in her class. Immediately after her mother’s death, Mania immersed herself almost completely in books, sometimes for hours and sometimes for entire days. She spoke very little. For her, the only way to endure was to reject the outside world and focus with unwavering determination on a single subject, thereby keeping the sense of emptiness at a distance. Many years later her daughter Ève recalled how, returning home at three in the morning, she noticed the light still on in her mother’s room. She entered, but her mother did not

even register her presence, absorbed as she was in scientific materials. Clearly, the depression and inner withdrawal of childhood left their mark not only on young Mania but also on the adult Curie.” – translation from Polish (Goldsmith: 2007, 21)

In her mother’s intense reading and self-education, Eve perceives individual attributes that later contributed to the scientist’s greatness. She emphasizes that, because the children were raised in an intellectual environment where knowledge was valued above all else, the family initially failed to recognize Maria’s exceptional abilities:

“In an environment of average minds, her astonishing individuality and intellect would have immediately stood out, sharply distinguished from the rest. But within her own family circle these qualities did not yet appear extraordinary. Her brother and sisters, all three, were themselves highly gifted, full of energy; they excelled in their studies as well, winning medal after medal. As a result, no one in the family imagined that she surpassed the others by far, that she was made of altogether different clay.” (Curie: 1983, 75-76)

The experiences of her childhood were not without significance for Maria; they left a lasting imprint on her personality and on the values she embraced as a young person – they helped shape her. Maria’s sister observed that the achievements of the Skłodowski siblings demonstrated the enormous influence their father Władysław had on their upbringing: on his son Józef – later a medical doctor and head physician at the Dzieciątka Jezus Hospital in Warsaw; on his daughter Bronisława – who became a medical doctor and long-time director of a tuberculosis sanatorium in Zakopane and the principal founder of the Radium Institute in Warsaw, whose establishment had been initiated by Maria; on his daughter Helena – a teacher and school inspector in Warsaw, later Szalay by marriage; and on the youngest child, Maria Skłodowska-Curie (Skłodowska-Szalay: 1958, 8). Lucjan Biliński comments: “I believe that if, during the lifetime and scientific career of Maria Skłodowska, Mensa – the association of people with high IQ – had existed, not only she but most of her immediate family would have been members. They were exceptional individuals, distinguished not only within their local environment, but far beyond” (Biliński: 2003 13). Maria herself repeatedly acknowledges the influence of her parents on her intellectual formation, writing in her autobiography: “I remember both my parents perfectly, bound to each other by love, respect, and collaboration. Two main

goals guided them in life: service to the homeland through the education and instruction of the youth entrusted to them, and the upbringing of their five children to be worthy people and good citizens” (Skłodowska-Szalay: 1958, 8-9). Several factors motivated her father’s extraordinary commitment to his children’s education. Aware of the ongoing process of Russification<sup>5</sup>, he sought – both as a pedagogue and as a father – to mitigate the detrimental impact of contemporary schooling on young minds, especially those of his own children. Not insignificant were the pangs of conscience that plagued him for years after losing his life savings, knowing he would be unable to finance his daughters’ education. He understood that such education would only be possible abroad (Curie: 1983, 62). Due to Russian restrictions, he himself had been unable to pursue his chosen field, and thus – one may presume – he transferred his own unfulfilled aspirations in the sciences onto his children, as Barbara Goldsmith observes (Goldsmith: 2007, 13). It was precisely these aspirations that fueled his determination to provide them with the best education available at the time. Thanks to their father’s instruction, he could look with hope toward the future educational opportunities of his children. “For many years Władysław reproached himself for having lost all his savings in this way and for depriving his children of the funds he had intended for their education. He found peace only in his later years, when he saw that somehow we were all managing. Perhaps at that point he realized that his own example and his constant pedagogical efforts had contributed to their success” – translation from Polish (Quinn: 1997, 28).

Marie Skłodowska-Curie articulates the nature of scientific work in the following terms: “A great discovery is not the ready-made product of a scientist’s mind (...) it is the fruit of accumulated preparatory work (...). The greatest achievements require something more than scientific training; they require that a person be made for a particular task.” Goldsmith adds: “Marie Curie, whose character had been shaped by discrimination, pressure,

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<sup>5</sup> “In Warsaw, everything that reveals a love for the native language is, as a rule, forbidden. One is not allowed, for example—strange as it may seem—to enlighten and educate the common people, for instruction may be given only in Russian, a language unknown to the simple folk. Ignorance is widespread: barely one-fifth of the population can read and write. This must strike any foreigner who has spent even a few weeks in Warsaw. Here one will never see, for instance, a cabman reading a newspaper, as is common in other cities; indeed, most coachmen do not even know their numbers. They are told the name of the street, instructed to turn right or left, and given a signal when the carriage is to stop.” (Brandes: 1898, 20)

parental ambition, patriotism, and emotional reserve, was precisely such a person” (Goldsmith: 2007,12). Ève Curie likewise emphasizes the role played by Maria’s father – her own grandfather – in the scientist’s education during childhood:

“Mania is not at all offended by these, admittedly minor, signs of her father's pedantry. She loves him with all her heart and is inclined to believe there is nothing he cannot do, does not know, or is unable to understand. And it must be admitted that she is not far from the truth, for her father’s erudition is indeed exceptionally broad. One is struck with amazement at how, under his material circumstances, burdened by professional duties and the upbringing of four children, he managed to keep pace with scientific progress, to obtain the latest books and journals—without limiting himself to his own fields (mathematics, physics, and chemistry)—and to deepen his knowledge of modern languages (in addition to Russian, he knew French, German, and English excellently) as well as Latin and Greek.” – translation from Polish (Curie: 1983, 60-61)

Marie’s brother Józef, in analyzing his sister’s exceptional qualities – which he believed were shared by all members of the family – points to seriousness, responsibility, and conscientiousness:

“I often wonder which spiritual qualities most closely link Marie Curie to her family home. If we set aside the scientific institution, which was, of course, her own unique and personal achievement, certain shared characteristics inherited from our parents appear identifiable and worthy of emphasis in all of us, despite our considerable individual differences. These are: a serious attitude toward life – manifested not only in form but in substance – a strong sense of responsibility, and conscientiousness in carrying out one’s obligations (...).” – translation from Polish (Biliński: 2003, 44)

Władysław inspired both respect and admiration in his children. As Józef recalled, their father knew French, Russian, German, and English. Maria mastered all these languages as well, which indicates the influence of her father on her linguistic abilities. His support did not cease in her early childhood but continued later, as he advised and assisted her with mathematical problems, while helping Józef with languages when the latter studied medicine (Quinn: 1997, 28-29). Ève Curie emphasizes that her mother was fully aware that she owed her knowledge to her father and to the intellectual atmosphere of the family home, which for years inspired her intellectual

development (Curie:1983, 61). Maria stresses the powerful influence of her father on her formation, writing in her autobiography:

“It is with constant gratitude that I recall my father, who, asking nothing for himself, yet through work often beyond his strength, secured for us everything that could support our physical and intellectual development. He was not satisfied with the level of the schools we attended, so he educated us privately at home. We took regular lessons in foreign languages – French, German, and English – and he supplemented our natural science instruction in the afternoons or evenings, making use of gymnasium textbooks. On Saturdays he always gathered us from seven to nine and introduced us to Polish literature. In this way we came to know the works of our foremost writers and poets.” (Sklodowska-Szalay: 1958, 13-14)

It should be emphasized that thanks to her father, Maria received a solid and wide-ranging education in both the humanities and the sciences. One could speculate about the possible influence of her mother on young Maria, or whether – had her mother not died prematurely – the future scientist would still have pursued a scientific career, with her father playing a somewhat lesser role in her upbringing. Maria Skłodowska-Curie writes:

“School-level mathematics and physics came easily to me. I received help in this field from my father, who enjoyed these subjects and taught them himself. He took every opportunity to explain some natural phenomenon to us. But unfortunately, he had no laboratory and could not carry out experiments.” Reflecting on her father later in life, as a renowned scientist and professor at the Sorbonne, she wrote: “We had a good father, and we owed him much. He fostered in us early independence and a love of work; he instilled in us a deep love of our homeland and an equally deep hatred of the partitioning powers, especially the Tsarist government, with which we had the most direct contact.” (Sklodowska-Szalay: 1958, 12-14)

All the Skłodowski children were thoroughly educated, completed university studies, and pursued the professions of their choice. The scientist recalls:

“We all had an aptitude for intellectual work. My brother, Józef Skłodowski, after completing his medical studies, later became head physician of one of Warsaw’s major hospitals. My sisters and I intended, following the example of our parents, to devote ourselves to teaching. However, the eldest,

Bronisława, later changed her mind and chose medicine. After receiving her medical diploma from the University of Paris, she married a Polish physician, Kazimierz Dłuski. A few years later, they jointly established a large sanatorium in the beautiful mountain town of Zakopane, then under Austrian rule. My other sister, Helena, later Szalay, worked for many years with great success in private schools in Warsaw. After the war, she was appointed to one of the state secondary schools in independent Poland.” (Skłodowska-Curie: 2009, 15)

The profound impact of her father on Maria is evident in the fact that numerous biographers never omit her childhood – in fact, they consistently return to it. Examples of such references in the literature are abundant. Quinn, for instance, observed that Maria, “raised on the poetry of Mickiewicz and in the spirit of patriotic ideals, tended to view life as a heroic struggle against great difficulties. The battle against adversity is one of the central themes of nearly all her non-scientific writings. And because her biography of Pierre and her Autobiography became foundational sources for later scholars, the overcoming of successive obstacles remained forever the central thread in the Curie story” (Quinn: 1997, 250). Barbara Goldsmith similarly stresses:

“Her painful experiences manifested themselves in what she called deep depression, the seed of a syndrome that would recur later in her life. In later years, as Madame Curie, under the gaze of the entire world, she expressed herself less openly, describing these episodes as fatigue, exhaustion, or nervous trouble. (...) She spoke little. The only way for her to survive was to shut out the world and focus with a manic determination on a single topic, thereby keeping the feeling of emptiness at bay.” (Kaczorowska: 2011, 21)

## Biographical narratives

Biographical narratives constitute a valuable pedagogical tool, as they provide learners with empirically grounded accounts of human experience that promote socio-emotional, cognitive, and cultural development. By examining the lived trajectories of influential historical and contemporary figures, students gain structured opportunities to cultivate empathy, as these narratives illuminate diverse experiences of adversity, resilience, and achievement. Such accounts also serve as case studies that strengthen analytical and critical thinking skills, enabling learners to evaluate motivations,

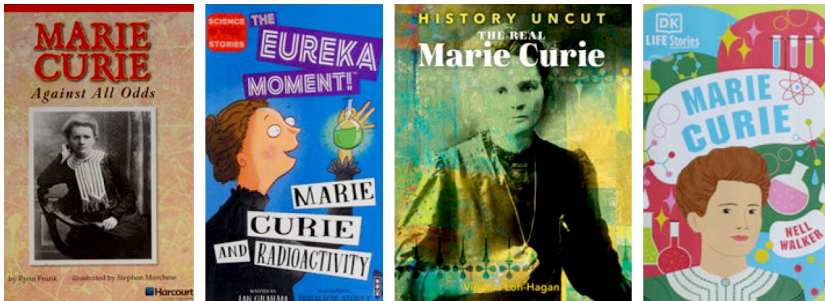
contextualize decisions, and draw connections between past and present phenomena. Furthermore, biographies broaden cultural and historical awareness by exposing students to heterogeneous cultural backgrounds and temporal contexts, thereby fostering global perspectives and intercultural competence. Collectively, the integration of biographies into educational settings supports the formation of reflective, informed, and socially attuned individuals.

Biographies function as powerful educational instruments by providing empirically grounded narratives that illuminate the complexities of human development, resilience, and social influence. Through detailed accounts of individuals' lived experiences, biographies facilitate cognitive and emotional engagement, fostering empathy, enhancing perspective-taking, and supporting the development of a growth mindset. These narratives allow readers to examine adaptive responses to adversity, derive lessons from documented successes and failures, and contextualize personal trajectories within broader historical, cultural, and sociopolitical frameworks. Moreover, biographies amplify diverse and often marginalized voices, thereby promoting inclusivity, challenging preconceived assumptions, and encouraging socially responsible behaviour. As accessible repositories of lived evidence, biographies not only enrich readers' understanding of human behaviour but also motivate positive action, leadership, and lifelong learning.

## The research

This study investigates how contemporary children's and young adult biographies of Marie Skłodowska-Curie construct her scientific identity and how these representations influence learners' attitudes toward science, perseverance, and gender equality in STEM fields. By analysing the adaptive strategies through which Curie's life story is reframed for diverse educational audiences, the research seeks to elucidate the didactic potential of biographical narratives in cultivating scientific curiosity, historical consciousness, and personal development among young readers.

The corpus consists of four publications representing distinct genres and pedagogical approaches:



Frank, R. (2008). *Marie Curie: Against all odds*. Harcourt School Publishers.  
 Graham, I. (2018). *The Eureka Moment! Marie Curie and radioactivity*. Salariya Book Company.  
 Loh-Hagan, V. (2019). *The real Marie Curie (History Uncut)*. 45th Parallel Press.  
 Walker, N. (2022). *Marie Curie (DK Life Stories)*. Penguin Random House.

Together, these works span narrative nonfiction, illustrated biographies, graphic storytelling, and hybrid activity-based resources. Their variations in length, visual composition, scientific depth, and narrative complexity provide a fertile foundation for comparative analysis.

## Methods

This research adopts a qualitative, interpretive design grounded in comparative content analysis. The dataset comprises textual, visual, and paratextual elements (timelines, glossaries, reflective prompts). Analytical dimensions include:

- thematic framing;
- narrative strategy;
- visual/iconographic representation;
- scientific and historical conceptualization;
- implicit pedagogical messaging.

This methodological framework enables a systematic examination of recurring motifs and distinctive pedagogical features across genres.

## Historical Context: Curie as a Product of Her Era

All four biographies foreground the political and educational oppression of partitioned Poland: Russian imperial censorship, systemic gender discrimination, and the exclusion of women from university education.

- **Frank (2008)**, aimed at younger readers (grade 5), simplifies geopolitical dynamics but highlights inequality as a formative force.

- **Graham (2018)** employs graphic storytelling to dramatize clandestine education, portraying the Flying University as an exciting act of intellectual resistance.
- **Loh-Hagan (2019)**, for grades 7–8, presents a balanced account combining accessible prose with critical reflection prompts that contextualize Russian oppression and institutional barriers.
- **Walker (2022)**, written for middle-grade readers (ages 9–12), offers substantial detail about Russification, the Flying University, and the prohibition of the Polish language instruction. The book’s expansive format allows for nuanced contextualization.

Across the corpus, Curie’s early environment is consistently interpreted as a crucible of resilience, intellectual defiance, and moral courage.

## Family Background: Intellectual Formation and Emotional Hardship

The books convergently depict Curie’s family as intellectually vibrant yet financially constrained.

- **Walker** underscores her father’s scientific instruments as catalysts of early curiosity and portrays maternal loss as a defining emotional trauma;
- **Frank** highlights her father’s pedagogical influence and simplifies emotional content for younger audiences;
- **Graham** dramatizes family tragedies through comic-style panels for heightened immediacy;
- **Loh-Hagan** situates Curie’s family within a transgenerational scientific legacy, noting five Nobel Prizes in the Curie lineage.

Texts for younger readers emphasise curiosity and diligence, while more advanced publications articulate the psychological impact of bereavement and economic hardship.

## Educational Trajectory: From Clandestine Learning to the Sorbonne

A central narrative across the corpus is Curie’s uncompromising commitment to education.

- **Walker** provides detailed accounts of governess employment, her pact with Bronya, and her impoverished living conditions in Paris;
- **Frank** condenses these elements, focusing on the sisterly arrangement and eventual academic success;

- **Graham** renders the Flying University and Sorbonne episodes dramatically through dialogue and visual sequencing;
- **Loh-Hagan** emphasises systemic exclusion, including Curie's prohibition from speaking at the Royal Institution.

Collectively, these narratives portray education as both the foundation and engine of Curie's scientific identity.

## Scientific Contributions and Ethical Identity

Curie's key scientific achievements – radioactivity, the discovery of radium and polonium, and the development of mobile radiography during WWI – appear across all texts in age-appropriate forms.

- **Walker** highlights perseverance, ethical choices (e.g., refusal to patent radium), and collaboration with Pierre;
- **Frank** simplifies scientific detail, emphasising discoveries and honours;
- **Graham** introduces technical vocabulary through accessible visual explanations;
- **Loh-Hagan** incorporates dimensions of controversy and exclusion, presenting Curie as both a scientific trailblazer and a social reformer.

Across the corpus, Curie emerges not only as a scientist but also as a moral agent and cultural symbol.

## Conclusion

The four publications exhibit a coherent didactic orientation, consistently promoting core educational values such as perseverance and grit, intellectual autonomy, scientific curiosity, ethical responsibility, and gender inclusivity in STEM. Each genre accomplishes this pedagogical work through genre-specific instructional strategies: the graphic biography (Graham) enhances emotional immediacy and affective accessibility; narrative nonfiction (Walker; Loh-Hagan) emphasises historical accuracy, contextual depth, and conceptual sophistication; the simplified instructional biography (Frank) scaffolds foundational scientific ideas for emerging readers through clarity and linguistic economy; and the critical biography (Loh-Hagan) cultivates socio-ethical awareness, and critical engagement with scientific culture. Taken together, these generic approaches demonstrate how biographical storytelling can be strategically adapted to accommodate diverse developmental, linguistic, and cognitive profiles, thereby maximising its pedagogical impact across age groups and learning contexts.

This analysis reveals that modern youth biographies of Marie Skłodowska-Curie collectively construct her as an individual shaped by socio-political constraints, familial intellectualism, and rigorous academic pursuit. Although the publications differ in narrative density, scientific complexity, and visual design, each contributes to shaping young readers' conceptions of scientific identity, historical continuity, and personal perseverance.

These works exemplify biography's dual role as narrative and pedagogy. When thoughtfully crafted, such texts not only introduce scientific concepts and historical conditions but also cultivate motivation, moral imagination, and an inclusive vision of scientific careers – particularly for girls and under-represented groups in STEM.

Despite their formal heterogeneity, the four examined publications exhibit a coherent didactic orientation, consistently promoting perseverance, intellectual autonomy, scientific curiosity, ethical responsibility, and gender inclusivity in STEM. Each genre mobilizes distinctive instructional strategies: the graphic biography (Graham) leverages visual dramatization and emotional immediacy; narrative nonfiction (Walker; Loh-Hagan) foregrounds historical accuracy and conceptual sophistication; the simplified instructional biography (Frank) scaffolds foundational scientific concepts for younger readers; and the critical biography (Loh-Hagan) encourages metacognitive reflection and socio-ethical awareness. These generic differences align with the study's hypotheses: the biographies overwhelmingly frame Curie's life as a narrative of resilience shaped by political oppression, gender inequality, and poverty; they foreground family influence – particularly parental pedagogical values and Bronya's cooperative role – as central to Curie's intellectual formation; and they consistently represent education as the primary engine of her scientific development. Furthermore, all publications incorporate motivational and ethical dimensions, positioning Curie as a moral exemplar whose life embodies perseverance, altruism, and intellectual independence. As anticipated, genre significantly modulates emphasis, with graphic texts privileging affective engagement, narrative nonfiction deepening historical and scientific contextualization, and activity-based materials emphasizing experiential learning and value transmission.

The analysis also underscores several structural limitations. The corpus is necessarily selective and cannot represent the full spectrum of Curie-related literature; the wide age range of target audiences necessitates careful contextualization in comparative interpretation; and genre-dependent

constraints – such as textual compression in graphic and activity formats – complicate direct comparison with more expansive narrative nonfiction. Moreover, the interpretive nature of qualitative content analysis introduces an element of subjectivity, while the absence of empirical classroom testing means that pedagogical impact must be inferred rather than validated. Nonetheless, the findings yield important implications for science education. Biographies emerge as powerful tools for fostering scientific motivation when they combine emotional engagement, narrative coherence, and conceptual accuracy. Curie's life story, in particular, offers a compelling case for illustrating the socio-cultural embeddedness of scientific practice, demonstrating how political conditions, gender norms, and family's support shape scientific opportunity. Graphic and illustrated formats show special potential for engaging reluctant or visually oriented learners, while activity-based resources can strengthen scientific reasoning through hands-on inquiry. Crucially, representations of women in science across these texts support gender inclusivity and provide aspirational models for girls. For educators, these insights highlight the need to select biographical materials strategically – depending on whether the instructional aim is to promote historical understanding, scientific process skills, ethical reasoning, or identity-building within STEM.

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**Abstrakt:** Tato biografická výzkumná analýza zkoumá, jak současné publikace pro děti a mladé dospělé zobrazují Marii Skłodowskou-Curie jako vědeckou osobnost formovanou historickým kontextem, rodinnou výchovou a vzděláním, a jak tyto obrazy přispívají k formování vědecké identity studentů, jejich osobnímu rozvoji a postojům k rovnosti pohlaví v oborech STEM. Studie analyzuje korpus moderních biografí zaměřených na mládež s cílem identifikovat dominantní narativní rámce, tematické důrazy a adaptační strategie používané k překlada Curieho života a úspěchů pro různé úrovně vzdělávání. Zvláštní pozornost je věnována zobrazení vytrvalosti, intelektuální autonomie, etického závazku vůči vědě a překonávání genderových bariér. Prostřednictvím kvalitativní textové a diskurzivní analýzy výzkum zkoumá, jak je biografie Skłodowské-Curieové přetvářena tak, aby odpovídala současným pedagogickým cílům, včetně motivace k vědeckému bádání, odolnosti v učení a kritické reflexe sociální nerovnosti. Výsledky naznačují, že biografie mladých lidí nepřenášejí pouze historické znalosti, ale aktivně vytvářejí vzory, které formují vnímání žáků o tom, kdo se může podílet na vědě a za jakých podmínek. Tím, že Curieovou představují

současně jako produkt své doby i jako iniciátorku změn, tyto příběhy podporují historické povědomí a zároveň propagují inkluzivní hodnoty ve vzdělávání v oblasti STEM. Studie zdůrazňuje didaktický potenciál biografii. Výsledky naznačují, že biografie mladých lidí nejen předávají historické znalosti, ale aktivně vytvářejí vzory, které formují vnímání studentů o tom, kdo se může podílet na vědě a za jakých podmínek. Tím, že Curie je současně představována jako produkt své doby i jako iniciátorka změn, tyto příběhy podporují historické povědomí a zároveň propagují inkluzivní hodnoty ve vzdělávání v oborech STEM. Studie zdůrazňuje didaktický potenciál biografických příběhů jako nástrojů pro rozvíjení vědecké zvědavosti, osobního rozvoje a genderově citlivého přístupu u mladých čtenářů.

**Klíčová slova:** Maria Skłodowska-Curie; biografie mladých lidí; vědecká identita; vzdělávání v oboru STEM; rovnost pohlaví

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