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Hidden in the Archive of Gender and Science: The *Agonistics* of Knowledge and Learning

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ABSTRACT

In this article the author looks at processes of becoming a woman philosopher and scientist in eighteenth-century Europe, by focusing on educational experiences, discourses and practices revolving around the Italian mathematician, scientist and philosopher Maria Gaetana Agnesi. The author uses the Arendtian notion of *agonism* as a lens through which she reads Agnesi's manuscripts at the Ambrosiana Biblioteca in Milan, by pointing to the non-discursive affects that these documents emanate. By tracing women mathematicians' historical emergence as subjects of knowledge, as well as creators of philosophy and culture, the author proposes a reconsideration of the history of women's science education as an agonistic process that has left traces in various archives of gender and science.

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Everything went according to His Highness's wishes. The evening after our arrival, the prince came to our house; he heard from me to his great enjoyment, a dispute that I made with Father Branconi about the cause of the motion of the planets, and another with Father Stampa, about the nature of colours. Then he heard Teresa singing and playing the harpsichord; and then both of us together also played for him a melody on that sweet musical instrument, which borrows its name from love, so that he could sleep well at night having filled his eyes with pleasurable visions.¹

On 9 December 1739, Maria Gaetana Agnesi (1718–1799) wrote a letter to her philosophy tutor Michele Casati, describing an evening at the family Palazzo, where she and her younger sister Maria Teresa had entertained the prince of Braunschweig-Wolfenbüttel. The prince, who had visited their city, had asked to attend a literary and musical soirée with the two Agnesi sisters performing for him and although they were both on winter vacation at their countryside villa in Machiago, they were hastily summoned back. According to the rather mischievous tone of Agnesi's letter above, everything went according to the desire of the visiting prince. Soon after the prince's visit, the two sisters performed again in a soirée at their villa for another prestigious visitor, Fredrick Christian, heir to the throne of Poland.

This event was described at length in the newspaper *La Gazzetta di Milano* in three consecutive issues, with details of the richness and luxury of the reception, the arrival of the prince in the company of the most erudite nobility of the Milanese society, as well as

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the impressive musical concert that opened the soirée.² Beyond the ceremonial details of the evening the newspaper also presented its scientific course, which started with a question about the origins of tides, raised by Agnesi's tutor Serafino Brancone, lecturer on theology in the monastery of San Pier-Celestino and later professor of philosophy in Naples. Agnesi demonstrated her deep knowledge on this subject and, speaking elegantly in Latin, "she explained all the systems by dissolving the objections made to them with profound theoretical arguments, as well as valiantly defending the system of the famous Signor Newton."³ The second question of the staged intellectual dispute was proposed in Italian, "to please the taste of the Royal Prince."⁴ This time it concerned the nature of spring waters, another theme of interest in the eighteenth-century scientific culture. Agnesi's opponent was her tutor Luigi Stampa, reader in philosophy at the monastery of San Vittore. Her erudition shone again in explaining everything by drawing on the system of Antonio Vallisneri (Valesneri in *La Gazzetta*).

In responding to both questions, Agnesi rigorously defended the scientific theories she was drawing upon and

she gave again on this occasion a clear understanding of how perfectly she was versed in Mathematics, and in the fine taste of modern Philosophy, and also made good use, according to the opportunity offered, of the Greek, German and French languages, which she possesses excellently beyond Hebrew.⁵

It goes without saying that the prince left utterly delighted, not only by the rigorous scientific atmosphere of the soirée, but also by its sonic pleasures, as Agnesi's younger sister Maria Teresa "played the most difficult Sonatas composed by her with excellent taste, and with so much speed and harmony that all those present remained softly enraptured and astonished."⁶ The spectacular success of the evening was not only a triumph for the Palazzo Agnesi but for the city of Milan, as the royal prince "graciously deigned to declare, that both sisters fully corresponded to the fame of their precursor value, and congratulated our Metropolis, because among its other qualities, it possesses in these two dames a union of sublime virtues, combined with modesty."⁷

Taking the epistolary and journalistic descriptions of a series of eighteenth-century cultural events as my starting point, in this article I look at processes of becoming a woman philosopher and scientist in the European early modern period, by focusing on educational experiences, discourses and practices revolving around the Italian mathematician Maria Gaetana Agnesi. The article emerges from a wider Leverhulme-funded project of writing a feminist genealogy of "automathographies," a term Paul Halmos has used to narrate the life process of becoming a mathematician.⁸ By tracing women mathematicians' historical emergence as subjects of knowledge, as well as creators of philosophy and culture, what I propose is a reconsideration of the history of women's science education as an agonistic process that has left traces in various archives of gender and science that need further excavation from different angles and perspectives.

The article unfolds in four parts: after this introduction, I look at the cultural and historical context of women's education in the Italian states during the early modern period, particularly focusing on the eighteenth century and the context of what has been configured as "the Catholic Enlightenment."⁹ Then, I chart Agnesi's educational experiences by using the Arendtian notion of *agonism*, as a theoretical lens through which I read her notebooks in the Ambrosiana Biblioteca in Milan. By way of conclusion,

I consider the effects of rethinking science education as an agonistic process in contemporary debates around women's marginalisation in the field of mathematical sciences.

In the Archive of *la querelle des femmes*

Women's right to education was an issue that was raised during the Renaissance, but some of the questions that were debated in the period between 1300 and 1700 remain unresolved today. As the dominant intellectual movement in Europe during the early modern period, humanism prepared the ground for the eighteenth-century Enlightenment and although led by males, it nevertheless created conditions of possibility for women's nature and social position to be re-examined. Although the dominant stance between humanists and Enlightenment male authors was women's biological and intellectual inferiority in relation to men, a closer study of their ideas reveals complexities, ambivalences, gaps and interstices that allowed the emergence of "the other voice."¹⁰

Published in 1405, Christine de Pizan's *Book of the City of Ladies*¹¹ is one of the earliest cultural expressions in the long process of re-evaluating the female sex and initiated a rich body of literature revolving around what is now known as the *querelle des femmes* or *the woman question*. There were four main issues at the heart of this debate: "the problem of chastity, the problem of power, the problem of speech and the problem of knowledge."¹² What is also important to note is that the debate over women's nature, as well as its possibilities and limitations, included philosophical and literary treatises and essays, but also an agonistic body of correspondence between opposing positions and views. Given the limitations of this article, however, the discussion will focus on the problem of knowledge and the correlated issue of women's science education, as an agonistic process, during the first half of the eighteenth century, the time when Agnesi became of age as a scientist. What must be noted here is that *agonism* is not taken only from the perspective that emphasises conflict, contestation or struggle in political, social and cultural arenas – a component that is prevalent in several theories of the political¹³ – but also and perhaps more importantly in its Arendtian configuration as affirmative action towards achievement, creation and recognition, as I will further discuss later in the article.

In the wider context of the *agonal* spirit then, while the majority of male authors from the Renaissance onwards held the view that it was useless for women to study natural philosophy and mathematics, there were others who encouraged science education for the women of the nobility. There were families who saw their daughters' education as a way to advance their prestige – as was the case with Agnesi – or simply allowed them to follow the scientific study and work of their fathers, or other family members. As Gabriella Berti Logan has noted, the figure of "the exceptional woman" was decisive in the fact that some women were encouraged to include science in their education, as it transpires from letters that some male humanist pedagogical authors wrote to advise "exceptional women" of the nobility in the Italian context.¹⁴ The advent of printing changed the form of the humanists' pedagogical advice and enlarged its audiences. It was not letters written in Latin any more, but rather treatises on education written in the vernacular and therefore facilitating their wider circulation and indeed translation.¹⁵

This democratisation of knowledge also meant that daughters were not so much dependent on their families' decisions concerning their educational futures. Here it is important to consider how the French Sophie Germain (1776–1831) and the Scottish Mary Fairfax Somerville (1780–1872) pursued their interest and indeed passion for mathematics, through their access to family and community libraries and despite the objections of their families, who would take away candles and blankets to make their daughters' night study unbearable and impossible.¹⁶

It goes without saying that the history of women's education is a history of exclusions, or rather of "marginalisations," as Ruth Watts has observed.¹⁷ Over the years, scholars in the field of gender and education have worked tirelessly to recover women's position in the history of education from different angles, perspectives and disciplinary fields, and in this context there is a rich body of literature around the history of women's science education in the West.¹⁸ This body of literature has identified important differences in women's opportunities for education even among neighbouring European states, given their social, cultural, political and religious differences, as well as the diverse philosophical movements and scientific trends that developed within them. In this context of diversity, there was a significant difference in the educational opportunities for women in the Italian states, during the seventeenth, eighteenth and nineteenth centuries. While women faced hurdles across Europe and their education mostly happened within the private domain, it was only in the Italian states that some women were allowed to be connected with formal scientific institutions, such as academies and universities. Here it is important to note that apart from the academies – both formal and informal – there was also a different tradition in the circulation of knowledge in the Italian states: the *conversazioni*, conversation clubs, where men and women gathered to talk mostly about literature, poetry, philosophy and science, but also to listen to music and play word games.¹⁹ As Logan has further shown, many official academies in Italy actually started as *conversazioni*. The Academy of Sciences of Bologna, for example, started from the Academy of the Inquieti, which was operating from the home of its founder, Eustachio Manfredi, with the involvement of his two sisters.²⁰

There were of course similarities between the *conversazioni* and the better known tradition of the *salons*, as social and intellectual platforms of women's active involvement in the political and cultural formations of modernity, as well as in their role in the dissemination of literary, philosophical and scientific knowledge in France and throughout Europe.²¹ Londa Schiebinger has emphasised that the Parisian *salon* was an "institution of science [while] French *salons* of the seventeenth and eighteenth century competed with academies for the attention of the learned."²² Although both forms of intellectual gatherings – *conversazioni* and *salons* – soon surpassed national and ethnic boundaries and became transnational and hybrid formations in the circulation of knowledge and culture, there was also a significant difference between them. While women's role in the *salons* was primarily to be promoters of literary and scientific knowledge, several women in the eighteenth-century Italian *conversazioni* made original contributions to the creation of knowledge. Marta Cavazza has pointed out that this was "a unique historical case" in the diverse histories of the European Enlightenment.²³

Cavazza has further shown that the "specularization" of female knowledge – as we have seen it staged at the Palazzo Agnesi in the introduction – was a literary phenomenon in eighteenth-century Italy and included many "cases of young women celebrated for

their knowledge in philosophical-scientific (and in two cases legal) subjects.”²⁴ Moreover, “specularization” paradoxically went hand in hand with the demand for “modesty,” the idea that while some “exceptional” women could be celebrated for their intellectual and artistic skills, this should not deviate them from their traditional roles as dutiful daughters, mothers and wives. Recall how the article in *La Gazzetta di Milano* concluded with the assertion that the two celebrated Agnesi sisters combined “sublime virtues . . . with modesty.”²⁵ As Cavazza has commented, the visibility of women philosophers and scientists in eighteenth-century Italy was difficult to reconcile “with the image of modesty and ‘seclusion (ritiratezza)’ to which women were supposed to conform according to the behavioural codes and their associated values prevalent in Italy at the time.”²⁶ While celebrating Agnesi’s impressive intellectual skills and linguistic talents, her first biographer, Francesco Frisi, has noted that the most wonderful thing about her was her “natural reluctance to appear in public; reluctance that she had to overcome, with a virtuous fight, so as to obey her Father’s wishes with total Filial submission.”²⁷

And yet it was in the space “between modesty and spectacle”²⁸ that ideas around women’s education in Italy changed and evolved during the eighteenth century, including the possibility of their admission to universities and formal academies. As Logan has commented, even conservative men had come to admit that women needed some sort of education and as “sciences were at the peak of their popularity, it made sense to have women study scientific topics, at least at the elementary level.”²⁹ In light of modesty, however, these ideas came hand in hand with long-held discourses that women’s education would keep them away from frivolity and would make them dutiful daughters, better wives and reliable mothers.

These ideas were adopted by educated women, but with different twists and arguments. In the preface to her translation in Italian of Descartes’s *Principles of Philosophy*, published in Naples in 1722, Giuseppa Eleonora Barbapiccola (c.1700–c.1740) drew on her auto/biographical experiences, to argue that the weaknesses of the female sex were not natural and could be surpassed through the study of philosophy and sciences:

I have been greatly inspired by the example of . . . famous women. They have led me to believe that I could one day overcome the weakness of my sex, which only studies in order to know how to play games and to speak knowledgeably of fashionable clothes and hair ribbons. Bad education, not nature, encourages this defect. I began first by cultivating languages and then, as much as my ability permitted, the sciences. Among the latter, I studied philosophy because its moral part makes us civil, metaphysics because it enlightens us, and physics because it informs us about the beautiful and wonderful architecture of this great palace of the world that God made as our home, since it is most indecent to live in it like brute animals.³⁰

After the publication of her *Philosophical Propositions* in 1738, Agnesi became an established scholar on her own right, and some years later she was asked by the Milanese archbishop Giuseppe Pozzobonelli to read and review the censured book *Politics, Law and Religion* in light of his interest in religious reforms within the horizon of Enlightened Catholicism. The book had created a stir in the Milanese church and the archbishop had asked a number of eminent scholars, such as the director of the Biblioteca Ambrosiana, to read it and report to him confidentially.³¹ In her report, which is long, meticulous and very carefully crafted – as its manuscript in the Ambrosian Library shows – Agnesi highlighted the positive aspects of the book, but she also suggested that “some points are made which

are pernicious.”³² She was particularly concerned with the fact that it was written in Italian – “the language familiar to the people”³³ – thinking that this direct accessibility of the book could “upset and perturb the piety of the weakest and most feminine minds.”³⁴ While Agnesi herself had been trusted with the review of this book – given the archbishop’s appreciation not only of her mathematical, but also of her theological knowledge – her recommendation was against it being given to the common mass of women, “the multitude.”

Luisa Anzoletti has commented that this report was not a contradiction to Agnesi’s ideas about women’s rights to education, but rather a discursive precaution against “those women of her time, little brains and chatterers, ignorant and scornful, exalted and gossipy, who then, as always, are the worst enemies of the female cause.”³⁵ What we have in Agnesi’s confidential report to Pozzobonelli, as well as Anzoletti’s interpretation of her stance, is a clear articulation of the “double-voiced discourse that simultaneously defied and affirmed misogynist constructions of femininity.”³⁶ Female authors and orators like Barbapiccola and Agnesi often deployed this discourse as an apology for the defects of their sex, but also as a defence for women’s right to education, as Rebecca Messbarger has pithily commented.³⁷

In the light of the “double-voiced” discourse, then, it was only “exceptional women” who should be allowed to study science, read censored books or translate philosophical works in the vernacular. Indeed, the image of “the exceptional woman” permeated the discourses concerning women’s science education from the early modern period throughout Europe, became very powerful in the eighteenth and nineteenth centuries and has reached the present day in different modalities and forms. Agnesi’s contemporary, Émilie du Châtelet (1706–1749) was described by her lover and collaborator Voltaire as “a great man whose only fault was being a woman,”³⁸ while Sofia Kovalevskaya (1850–1891) was hailed as “a princess of science”³⁹ when she arrived in Stockholm in 1883 to become the first woman professor of mathematics in Modern Europe.

Women would thus be separated into the ordinary and the extraordinary, in terms of their intellectual abilities as well as in terms of their socioeconomic status. Even the most misogynistic arguments against women’s education were addressed to “the multitude,” not to those of high rank and quality. At the same time, however, the figure of “the exceptional woman” not only prepared the grounds for defending women’s right to science education, but also for accepting that some “exceptional women” – like Agnesi – could contribute too to the creation and circulation of scientific knowledge through publications and teaching. It is precisely the discourse of “the exceptional woman” that a consideration of women’s science education in the light of the *agonal* spirit challenges and deconstructs. Women like Agnesi distinguished themselves in the world of science, not because they were “exceptional,” but because they embraced the *agonal* spirit of appearing in the public sphere of science and becoming recognised by their peers as important contributors in the world of knowledge. It is not accidental that several women mathematicians and scientists in the eighteenth and nineteenth centuries entered competitions in solving mathematical problems and addressing important scientific questions of their times, won highly prestigious awards and medals, and were included in major and influential publications.

In the context of the *agonal* spirit, then, Agnesi’s oration in defence of women’s ability to be educated in the liberal arts was included in the prestigious volume that the *Accademia de’*

Ricovrati in Padua published on the public debate it had raised in 1723, regarding whether women should be educated in the arts and sciences, as we shall see later in the article.⁴⁰ Du Châtelet became the first woman whose essay on the nature of fire was published in the proceedings of the Royal Academy of Science in a contest won by Euler.⁴¹ Mary Somerville was awarded a silver medal engraved with her name for a solution to a mathematical puzzle she submitted to the periodical *The New Series of the Mathematical Repository* in 1811, the first recognition in a series of many that she received throughout her life.⁴² In 1816, Germain was the first woman to win the Grand Prix of mathematics, awarded by the Class of Mathematics and Physics of the *Institut de France* for her mathematical theory of vibrations of general curved and plane elastic surfaces.⁴³ Last but not least, in 1888, Kovalevskaya won the *Prix Bordin* from the French Academy of Sciences,⁴⁴ and the list of such awards and recognitions goes well beyond the sphere of mathematics on which this article is focusing.

Apart from different discourses around women's access to science education, which have been comprehensively treated in Leigh Whaley's important study on the different debates in the history of gender and science in the western world,⁴⁵ there were also differences in how dominant trends and problems in philosophy, science and mathematics were circulating on the Italian peninsula. Luigi Pepe has written at length on the role that mathematical knowledge played in the scientific, philosophical and cultural formations of Italy at the beginning of the eighteenth century. Pepe has suggested that the new field of the infinitesimal calculus, which was born in the seventeenth century, when Newton and Leibniz – independently of each other – established its fundamental methods, elevated mathematics to a higher status in relation to the other sciences.⁴⁶

Agnesi was a Newtonian, although she moved between Newton and Leibniz in her scientific thought and work.⁴⁷ And yet, the reception of both Newton and Leibniz was very different in Italy than in other European countries. Massimo Mazzotti has noted that “Catholic philosophers shared a strong dislike for metaphysical disputes and for all-pervasive philosophical systems,”⁴⁸ given their possible clash with theological dogmas. Their reception of both Newton and Leibniz was thus “highly selective and mostly limited to the mathematical aspects of their arguments.”⁴⁹ As Logan has aptly put it, “Galileo’s condemnation by the Catholic Church did much to ensure that Italian natural philosophers separate at least in their publications, their physics from their metaphysics.”⁵⁰ Moreover, there were different takes on Newton’s and Leibniz’s theories within the Italian context. Mazzotti has noted that Newton’s ideas had many supporters in Rome, while they were much more “resisted or selectively received in institutions where the Galilean experimental tradition was liveliest, such as the University of Pisa.”⁵¹ Finally, there were institutions, such as the University of Padua, where Leibniz was the main influence.⁵²

It was in such a diverse context that the Italian scholar Francesco Algarotti published his book *Il Newtonianismo per le dame* in 1737. The book was the result of Algarotti’s replication of Newton’s optical experiments at the Institute for Sciences in Bologna in 1728 and was, interestingly, printed in Milan.⁵³ Despite his ties with the Milanese publishing world, however, Algarotti never met or corresponded with Agnesi and although he was on friendly terms with her tutor, Count Belloni, he was never invited to the Palazzo of the family in Milan. According to Mazzotti, “there were important differences between the uses of science, and Newtonianism in particular, in Algarotti and in the Agnesi conversazione.”⁵⁴

Algarotti's book was in the genre of encouraging women's engagement with science under a male gaze and guide. This genre was initiated in France by the publication of Bernard le Bovier de Fontenelle's *Conversations on the Plurality of the Worlds* in 1686. Fontenelle's attempt to popularise scientific knowledge was successful and influential, and as Findlen has commented his book created a new scientific persona: "no longer a man of the university, a scholastic master surrounded by male disciples, Fontenelle's philosopher was a charming seducer of women, a wit who made science comprehensible by cultural analogy."⁵⁵ In this context the image of the woman natural philosopher was shaped within a literary discourse, vacillating "between fiction and reality."⁵⁶ In Algarotti's book she was a Marchesa eager to learn and understand Newton's theories by asking questions:

And you ask me, who was truly the Marchesa of my dialogues? I respond: A grandniece of Fontenelle, or perhaps one of my own daughters, made by me just as I would have liked her, with a lively and sophisticated mind, very curious, and able to listen carefully. But if the Marchesa of my dialogues is imaginary, the one to whose judgment this work is now submitted, is not.⁵⁷

Agnesi's treatise, *Propositiones Philosophicae*, published in 1738, just a year after Algarotti's book, had a very different approach from what Newton's theories would mean for women. In the place of Algarotti's paternalistic tone of "explaining" Newton's theories to women, Agnesi presented Newton's "most beautiful and simple theory"⁵⁸ as an example to be followed in scientific experiments and laboratory practice. Her approach was not a "Newtonianism for women," but rather "a Newtonianism of women," Stefano Zen has emphatically suggested.⁵⁹ Her intervention was thus about facilitating women's involvement in the creation of scientific knowledge. In lieu of the literary image of the woman natural philosopher, who asks and understands, Agnesi wanted to constitute herself as an independent scientist by offering "a radically new perspective: women's right to regain possession of their time and to pursue any kind of knowledge in opposition to the idea of studying as a privilege."⁶⁰

Moreover, Agnesi's Newton should be seen in the context of what Mazzotti has configured as "the Catholic Enlightenment."⁶¹ In endorsing Roy Porter's idea of "the enlightenments,"⁶² Mazzotti has situated his study on Agnesi in a body of scholarship that aims to reconstruct "the many cultures that coexisted in Enlightened Europe,"⁶³ as well as their interaction with different religious and theological traditions. Agnesi was educated within the Milanese horizon of religious and social commitment, and therefore argued that the path of science should not necessarily be considered in conflict with the Holy Scriptures.

Despite its light nature, however, Algarotti's book became controversial for the Church and, as Mazzotti has suggested, "it lent itself to a radical political reading."⁶⁴ This was because Algarotti accepted the Copernican system and therefore the thesis that the earth moved, in his exposition of Newton's theories. Consequently, his book was eventually included in the *Index librorum prohibitorum* (index of restricted books) in 1739, two years after its publication. There was no room for such risks in Agnesi's education, which was carefully planned within the parameters of the Catholic Enlightenment in general, and its Milanese version in particular, as I will discuss in the next section.

Agonistic Learning

Agnesi was the eldest daughter of a rich silk merchant in Milan, who saw his daughter's linguistic talent, prodigious memory and sharp intellectual abilities as a way to advance his social position in the Milanese nobility.⁶⁵ Her education was thus a long and very carefully planned process and because money was not a problem, it encompassed some of the most prestigious intellectual figures in Milan at the time, as we have already seen in the introduction. Agnesi's linguistic talents emerged in her early childhood and as her first biographer wrote, "she was so gifted with such a very singular talent, an impatient natural genius for scientific notions, and an admirable memory that she almost drank with her milk the first elements of the charming French language."⁶⁶ Moreover, as there were several children in the Agnesi family, girls were educated alongside the boys by private tutors. While playing in the same room where her younger brother Giacomo was tutored in preparation for his college entrance, Agnesi displayed a surprising ease in retaining and repeating her brother's lessons in Latin just by listening to them, "with admirable order and precision."⁶⁷ This unusual phenomenon was duly noted by the tutor Abbé Niccolò Gemelli, who informed her father and was subsequently asked to take over her education in Latin.

Agnesi's progress in Latin was fast and soon reached the heights of perfection, as testified by her first appearance in public at a *soirée* organised in the Palazzo gardens, on 18 August 1727, where she defended women's ability to be educated in the liberal arts before a group of patricians.⁶⁸ According to Frisi, the oration was written in Italian by her tutor Gemelli, but Agnesi translated it into Latin and recited it from memory in front of her well-educated audience.⁶⁹ As already noted in the previous section, the oration was presented as part of a controversy on women's education addressing the themes that the *Accademia de' Ricovrati* in Padua had raised in 1723, by initiating a public debate on whether women should be educated in the arts and sciences.⁷⁰ Although guided by the Milanese intelligentsia gathered around her father's Palazzo, this debate was an initiation in the *agonal* spirit of science for the young Agnesi. The final text was subsequently published later in the same year, and it was then reprinted in 1729 as part of a collective volume on the debate around women's education, edited by the *Accademia de' Ricovrati*.⁷¹ Here it is important to note that although it is unclear how Agnesi's oration was selected for the *Ricovrati* publication, her contribution was one of the two essays written by women in the whole volume, comprising essays and disputations from six authors, most of whom were present at the actual debate that took place on 6 June 1723, at the Prefect's Palace in Padua.⁷²

Its *agonalistic* character and spirit notwithstanding, Agnesi's contribution to the actual composition of the text of the oration has been debated. Did she only translate it from Italian to Latin, or are there some of her own thoughts inserted in the text? When the oration was first published in 1727, Agnesi dedicated it to the Theatine priest Augustino Tolotae. In her short acknowledgement text, she addressed him as "the most literate and humane man, illustrious preacher and promoter of the practice of the arts" while configuring her work as "a girl's little gift."⁷³ Her dedication further mentioned that the oration was delivered by her at the Palazzo Agnesi, but in order to make her gift valuable she drew on others' work in the composition of the text: "what I could not do of my own, I added from others."⁷⁴ She finally hoped that should the gift be accepted, she would be inspired to make greater contributions to knowledge.⁷⁵

In her introduction to the English translation of the oration, Findlen has noted that it seems plausible that Agnesi's tutors "sketched the outline of the oration and suggested texts and themes to which she might refer, allowing her to contribute in some small measure to the final shape of the text."⁷⁶ Considering the difficulties of translating the text, Findlen has also remarked that while the overall content of the oration could not have been composed by a nine-year-old child, "the language of the oration in some places bears traces of an uncertain hand."⁷⁷ Findlen identifies grammatical errors, syntax awkwardness and unclear meaning in places, as possible signs that the author "was struggling to translate into her own words adult concepts and examples that her tutors and perhaps her father had given her."⁷⁸ The published oration, then, carries signs of an *agonistic* stance towards learning that started from her early education, as Agnesi's notebooks at the Ambrosiana manuscripts clearly show, but went through all the published works of her maturity, as I will further discuss. But how is *agonism* in learning to be understood?

As already briefly mentioned, *agonism* is an important notion in the philosophical thought of Hannah Arendt, underpinning her configuration of action and politics:

the urge toward self-disclosure . . . became the prototype of action for Greek antiquity and influenced, in the form of the so-called *agonal* spirit, the passionate drive to show one's self in measuring up against others that underlies the concept of politics prevalent in the city-states.⁷⁹

As its etymological root in the ancient Greek word *ἀγών* (struggle) indicates, *agon* presupposes appearance in the public sphere, where human beings actively engage in political discourses, debates and collective decision-making and in the spirit of *agonism* they enter processes of constructive contestation.

Here it is important to acknowledge that while *agonism* is a recognisable, albeit contested site in political philosophy, its transposition in the field of education is an emerging and yet critical area, although it is focused primarily on sociological, political and philosophical aspects of educational institutions, discourses and practices and not on the process of learning and dissemination of knowledge and understanding.⁸⁰ In thus transposing the Arendtian conceptualisation of *agonism* as affirmative contestation in the field of gender and science, I particularly consider the importance of plurality in a shared world of appearances, the world of what Karen Detlefsen has configured as "public science."⁸¹ In Detlefsen's analysis, the early modern period saw "a sharp rise in intellectual activities, including the study of nature, outside private institutions that were largely under the control of the church and formally closed to most members of the public."⁸² As Judith Zinsser has aptly observed, as science was increasingly practised by independent scholars outside the confines of institutions in the early modern period, "more women of the privileged classes had an opportunity to engage in the intellectual discourses of their day."⁸³

Thinking with Arendt's take on *agonism* in the sphere of public science, it is also important to consider that action in Arendt's thought is always unpredictable, contingent, boundless and difficult to prefigure or foresee, as Bonnie Honig has aptly observed.⁸⁴ It is precisely "the unruliness of action, its excess, its resistance to being captured – tamed – by any perspective, interpretation, or story"⁸⁵ that I have found crucial when using the *agonistic* lens in understanding women's engagement with science

and mathematics in the eighteenth and twentieth centuries. Indeed, working with Agnesi's notebooks in the reading room of the Ambrosiana Biblioteca threw me into the wilderness and unpredictability of educational and pedagogical actions in the world of science and mathematics.

In preparation for my visit there, in November 2022, I had studied the literature revolving around these manuscripts. During the pandemic, I had also obtained some digital copies of Agnesi's letters and essays to familiarise myself with her handwriting, but nothing could have prepared me for the affective experience of sitting in the *Sala Lettura*, looking at, touching and reading her notebooks and letters. Here it is important to note that I have always approached the archive as a living organism, a laboratory of feeling, thinking, remembering and understanding and I have written about it extensively.⁸⁶ It is from the epistemological perspective of "feeling the archive," which draws on Alfred North Whitehead's philosophy⁸⁷ and particularly his notion of "prehensions" or "feelings," that my reading and interpretation of Agnesi's documents emerges, as I will further discuss.⁸⁸

Agnesi's notebooks at the Ambrosiana Biblioteca have been read and interpreted from various perspectives over the *longue durée* of the various biographies and biographical sketches that have been written about her, mostly in Italian, but also in English. Her first biography was written and published in May 1799, only four months after her death, by Antonio Francesco Frisi. Despite its hagiographic approach it is still considered to be Agnesi's fundamental biographical source and has been used (and abused) in all subsequent biographies, often without, or with at best vague, references and citations.

Frasi's biography was only translated into English in 2017 by Antonella Cupillari and this important translation will certainly throw light on a series of confusions and misunderstandings concerning the sources of Agnesi's biographical material.⁸⁹ In her introduction to the English translation of the oration, Findlen for example, has noted that the idea that the oration was written in Italian by her tutor Gemelli and was subsequently translated into Latin by Agnesi is something that her twentieth-century "leading biographer" Luisa Anzoletti has suggested, but without providing "concrete evidence" or sources.⁹⁰ And yet, as I have already noted, this assertion comes from Frisi and not from Anzoletti, who simply used it without references.

Here it is important to note that, apart from writing his *Elogio* with fresh memories of his biographical subject, Frisi was not only an established eighteenth-century historian but also a friend of the Agnesi family, with easy access to private documents, such as letters and other written sources. He was thus inhabiting the position of both insider and outsider vis-à-vis his historical work. It is thus not surprising that Anzoletti describes his *Elogio* as "the most important biographical source . . . the port of safety which prevented the shipwreck of every confirmed memory of Maria Gaetana's life."⁹¹ While lamenting the fact that all biographies after the *Elogio* used it "without tracing later writings,"⁹² Anzoletti was not always careful in her own citations.

The fact that Anzoletti's biography – which is rich in both sources and interpretations – has not been translated into English is also a factor contributing to obscurities and confusions in the Agnesi literature. As Cupillari has aptly commented, "there is a paucity of material about Agnesi available in English."⁹³ Findlen's footnote comment is just one of several cases of diversions and discrepancies in the sources, which have not created any major errors or problems in the biographical literature around Agnesi, but which

certainly colour the overall backdrop of “legends and half-truths”⁹⁴ within which her notebooks have been read and evaluated. Interestingly enough, Cupillari seems to join the club of non-citation, as her introduction to the book in which the *Elogio* is translated includes extended extracts from Anzoletti’s biography, and other Agnesian scholars, without references.⁹⁵

Despite his immediate access to Agnesi’s personal documents, Frisi did not study the Ambrosiana manuscripts for the simple reason that Agnesi’s *fonds* had not yet been created. The manuscripts were donated to the Ambrosiana Biblioteca in 1831 by Lady Luigia Verri, widow of Confalonieri and Heir of the Agnesi.⁹⁶ They were collected in 25 codices of different formats and sizes, 0.180–0.204, and this organisation of the manuscripts still holds today.⁹⁷ Frisi’s biography thus draws on his own selection of documents, as well as his memories of his close friendship with his biographical subject. It was Anzoletti who first studied the Ambrosiana manuscripts in preparation for her voluminous biography, comprising almost 500 pages. As she wrote in her introduction, she studied the 25 codices of the manuscripts in detail, as she wanted to avoid repetitions and excavate what was hidden and silenced: “I thought it was my duty to examine them carefully, page by page, so as to be able to talk about them with the conscientious certainty of an eyewitness.”⁹⁸

In Anzoletti’s interpretation the manuscripts carry no signs whatsoever of Agnesi’s feelings or intimate thoughts:

never, never among her scholarly writings in the midst of the ceremonious and cold collections of correspondence, never the smallest chink presents itself, from where we can guess the intimate feelings . . . never either on the philosophical themes or on the Latin letters flashed a smile, fell a tear from Maria Gaetana’s heart.⁹⁹

Well, this was not at all my sense of the affective forces of her documents. Although they do not include intimate thoughts on personal circumstances, they burst with feelings, which are visually rather than discursively inscribed. While studying Agnesi’s notebooks “page by page,” I was indeed struck by a rhythm that I felt slowly vibrating in my reading.¹⁰⁰

The notebooks are clearly what we would now call “exercise books” and the flowery designs of their covers, as well as their titles, attest to this classification: they either state that they are courses or studies followed by Maria Gaetana Agnesi at an early age,¹⁰¹ or include the subtitle “written in her own hand for her own instruction.”¹⁰² Anzoletti’s commentary on them was that they were just elementary writings, somehow discrediting Frisi’s celebration of Agnesi’s extraordinary intellectual abilities during her very early existence.¹⁰³ Years later, Arnaldo Masotti, one of the editors of the reprint of the *Elogio* in 1965, also agreed with Anzoletti’s evaluation, stating that the notebooks were just “works of a school nature.”¹⁰⁴ Although there is no disagreement concerning the obvious nature of the notebooks, we cannot make the conjecture that Frisi had actually used them as evidence of his admiration for Agnesi’s “exceptional mind.” There is no indication for example that Frisi was referring to Agnesi’s notebook, “Pamphlet on Mythology,”¹⁰⁵ when celebrating the fact that she deserved the title of *Seven-Tongue Oracle* – like Elena Piscopia¹⁰⁶ before her – “by adding to her knowledge of Italian, Latin and French, the familiarity with Greek, Hebrew, German and Spanish.”¹⁰⁷ His proof was not Agnesi’s notebooks, but the translation of the oration, as we have already seen, as well as a list of

cited documents, some of which, but not all, found their way into the Ambrosiana manuscripts. Recall that the notebooks were donated to the Ambrosiana Biblioteca well after Frisi's biography was written, and we do not know which documents Frisi drew upon, apart from the ones cited in the *Elogio*:

A list of the brilliant proofs of the progresses the erudite lady was making in the study of Greek would include the evidence found in Father's Savonarola's writings showing that during this time she was working on the Greek translation of the opus titled *Il Combattimento Spirituale del P. Lorenzo Scupoli* [The Spiritual Battle of P. Lorenzo Scupoli]; a handwritten version still in her brother Don Pietro Agnesi's possession of a translation of two supplemental books for the *Quinto Curzio* by Freinsheim into Italian, French, German and Greek¹⁰⁸ . . .; three small volumes containing a Greek to Latin lexicon of thirteen thousand three hundred chosen words, which was compiled and written by Agnesi herself for her own use in memorising them;¹⁰⁹ and a translation from Latin to Greek of a mythological work, that is a treaty of fables,¹¹⁰ which seems to have been taken from the work of some of the authors who published a collection in German under the title *Mythologi Latini*.¹¹¹

Of the above documents, only the two supplemental books,¹¹² as well as two – not three – lexicons are included in the manuscripts.¹¹³ Lost or unseen documents of a woman scientist who died without heirs are thus a grey area that cannot prove or disprove any argument over their existence. In rebutting other exaggerations written in Agnesi's praise, Anzoletti also remembers having read “somewhere” that “at age nine she so well knew Latin and Greek that she translated a mythology into Greek.”¹¹⁴ As she does not give sources, again we cannot establish the link with Agnesi's notebooks or other documents.

Anzoletti has further commented on the neatness and calligraphic nature of Agnesi's notebook comprising the first and second book of Johan Freinsheim's supplements to Curtius Rufus's *Life of Alexander*, which is included in Frisi's list mentioned earlier.¹¹⁵ This notebook is, according to Anzoletti, “the most beautiful of the handwritten documents of the whole collection.”¹¹⁶ Composed of 34 pages (24 pages for the first book and 10 for the second), with 10 additional blank pages at the end, the document has an impressive layout: on the top of the left-hand page there is the Latin text and then, underneath it, there are two columns with its translation into Italian and French respectively, and then on the right-hand page, two more columns with translations into German (in gothic characters) and Greek. This layout is repeated throughout the notebook, with the exception of pages 13 and 14 where the two columns of the right-hand page translations are reversed to Greek and German, while page 24 is repeated at the beginning of the second book. These are the only two irregularities in the aesthetic presentation of the notebook, which otherwise carries no erasures, corrections, deletions or additions in the margins. I agree with Anzoletti that this is indeed a truly beautiful document, but at the same time it is the only one that is (almost) perfectly presented in the collection. The rest of the documents are rather scruffy and unruly, but it is precisely their unruliness that drew my interest, triggered my understanding and initiated new trains of thought around the process of becoming a woman scientist, within the *agonal* spirit of learning as action.

In his careful and detailed description of the Ambrosiana manuscripts, Masotti has remarked that apart from “the school level texts” written by Agnesi, there is another

conspicuous group of her early studies documents in the collection: the courses she followed in metaphysics and physics,¹¹⁷ physics,¹¹⁸ physics and mathematics,¹¹⁹ gnomonics,¹²⁰ cosmography¹²¹ and geometry.¹²² Masotti observes that these early study documents “are generally not written by her.”¹²³ However, how should “generally” be taken?

Having gone through these “early studies documents” page by page, my impression is that they are lecture notes, which she studied and indeed grappled with *agonistically*. The syllabus and structure of the courses has obviously come from her eminent and erudite lecturers, who were mostly ecclesiastical scholars: Gerolamo Tagliazucchi, later professor of eloquence and rhetoric at the University of Turin for her studies on algebra and rhetoric; Francesco Manara, later professor of experimental physics at the University of Pavia; and Michele Casati, later professor at the University of Turin for her studies on Euclidean geometry, general and experimental physics, as well as metaphysics and logic. These stellar lecturers were an addition to the tutors of her early years: Ludovico Voigt, later a teacher for the public schools in Milan (Scuole Palatine), for her studies on German and Greek; and Count Carlo Belloni, who was her personal adviser, had coached her in disputation techniques and had introduced her to the study of algebra and geometry, as well as Newton’s theories. We should finally not forget Serafino Brancone and Luigi Stampa, her opponents in the *conversazioni* that we have already discussed in the first section of this article.¹²⁴ As Mazzotti has commented, Agnesi’s father, Pietro, “made sure that his talented daughter was guided by prominent figures in the contemporary philosophical scenes.”¹²⁵ With the exception of Belloni, Agnesi’s tutors were all influential theologians and were actively involved in contemporary debates over religious and educational pedagogical reforms within the horizon of the Catholic Enlightenment.¹²⁶

Here it is also important to note that Agnesi’s much admired competence in the *conversazioni* and her elegant Ciceronian rhetoric, as well as the logical structure of her argumentation, was also the result of intense study and meticulous preparation. Amongst the Ambrosiana documents, there is a study book of 155 pages, entitled “Repertorio di diverse Tesi sostenute da Donna Maria Gaetana Agnesi in diverse Academie tenute nella propria casa” (Repertoire of various theses supported by Donna Maria Gaetana Agnesi in various academies held in her own home).¹²⁷ It comprises a list of the most frequent topics of the *conversazioni*, including light and colours,¹²⁸ the movements of the sea,¹²⁹ gravitation theory¹³⁰ and Newtonian doctrines,¹³¹ the nature of cold,¹³² anatomical organs, such as “on kidneys,”¹³³ minerals, such as “on salts,”¹³⁴ chemical elements, such as “on mercury,”¹³⁵ as well as mythological figures, such as “on Janus”¹³⁶ amongst others. Each topic includes the subject matter of the area and importantly follows a strict logic of argumentation: it is subdivided into sections and each section includes an introduction to the topic, a number of propositions and the final “absolute argumentation” (Absoluta argumentatione). Some of its pages are very densely written, as in the topic on “Light and Colours” (De Lumine et Coloribus),¹³⁷ which somehow gives the impression that the author was running out of writing space. There are also several underlined sections, sometimes whole or half pages, erased paragraphs, blank pages in between and numerical repetitions, as well as inconsistency in page numbering, amongst other textual symbols of unruliness.

Overall, the notebooks reveal that Agnesi did not just passively receive the transmitted knowledge, but rather engaged with it in the *agonal* spirit of affirmative action, in this case the attempt of a young woman not only to understand, but also to intervene in how knowledge was presented and structured. *Agonism* indeed jumps from the pages of these documents in a most forceful visual way: continuous underlining, frequent erasures and deletions, followed by repetitions and superscriptions, scribbles in the left, right and bottom margins, discontinuous page numbering, as well as rough drawings of physical phenomena and geometrical shapes. There is also a spatio-temporal rhythm in the textual signs of the documents: while they mostly start with neat, firm and calligraphic fonts, the handwriting increasingly becomes unstable and the pages uneven and convoluted in terms of smudges, scribbles, jottings and other textual marks.

What I therefore suggest is that although the Ambrosiana notebooks have been rightly discredited as scholarly texts by Agnesi's twentieth-century biographers, their value lies elsewhere: they most forcefully unveil intense processes of *agonistic* learning. Read from this angle, the notebooks demonstrate that it was not through the often exaggerated exceptionality of her mind, but rather through hard and meticulous work, but also through her desire to appear in the world of public science, compete with her peers and excel in it, that Agnesi became a mathematician, philosopher and scientist in an era of harsh gendered exclusions and limitations.

Most importantly, far from being dry, revealing no signs of Agnesi's feelings – as Anzoletti has suggested – the documents burst with affects emanating from the agony of learning: anticipation, impatience, frustration, disappointment, but also hope and resolution to persevere in the process of learning and understanding. Agnesi's notebooks unleash visual forces that momentarily illuminate a young girl's *agon*, to make sense of a world of knowledge that had been unexpectedly opened to her, but which she had to tread and explore in isolation, like the mythical goddess Minerva,¹³⁸ and not as simply a girl who, like her brothers, should merely have the right to be educated.

It goes without saying that the filial duty to perform and display her knowledge publicly was an additional burden, too heavy to bear; hence “the mysterious illness” that fell upon her, thus disrupting her father's plans to exhibit his talented daughter. All her biographers have speculated extensively on the seizures that tormented young Agnesi at around the period that her early studies were concluded: “she was in a short time taken by a convulsive sickness, whose strength forced her several times a day to start hopping all by herself, making it hard for her family aides to hold her down.”¹³⁹ Although she eventually recovered from this “obstinate illness,”¹⁴⁰ her own long-term resolution was to take the veil and retreat from the wild world of the knowledge spectacle. Under the pressure of her father's insistence, however, a compromise was reached: she would continue living in the Palazzo under three conditions: “to dress simply and modestly, to be able to go to church at her discretion, and to stop completely her attendance at dances, theatres and other profane amusements.”¹⁴¹ This compromise, however, was also the beginning of her serious engagement with the study of algebra and geometry, “as the only provinces in the literary world where peace reigns.”¹⁴² Here the *agonal* spirit of affirmative contestation manifests itself in her negotiations with her father, but also in her strange decision to engage with the abstract world of mathematics, thus disproving misogynistic objections to women's abilities for abstract thought that were prevailing in the most humanistic philosophical trends of her time.¹⁴³

By retreating from the world of knowledge as spectacle, Agnesi continued in the process of *agonistic* learning that eventually established her as a prominent scholar of mathematics in Italy and throughout Europe and granted her an honorary chair in mathematical analysis at the University of Bologna, which she never actually took up. When her *Analytical Institutions for the Use of the Italian Youth* was published in 1748, it was hailed as an important contribution to mathematical sciences, in terms of its clarity, precision and synthetic qualities. Indeed, Agnesi had excelled in the disciplinary area she had chosen to devote herself to in light of the *agonal* spirit. Moreover, and as its subtitle indicates, the book was written “for the use of the Italian youth.” In her Preface, Agnesi explicitly stated that the book emerged from her *agonistic* experiences in navigating the world of mathematical sciences: “notwithstanding the strong inclination I had to this science and the great application I made use of to acquire it, I might still have been lost in a maze of inextricable difficulties,” she wrote.¹⁴⁴ The book was thus written in the *agonal* spirit of affirmative action, as a pedagogical tool for the study of mathematics, and is still considered one of the finest and rarest textbooks of its time, as a lengthy review, published in the *Giornale de Letterati* (Journal of Scholars) in Florence in 1750 powerfully demonstrates:

Order clarity and precision govern in all the parts of this Opus; and up to now we have not seen in any Language works on the Fundamentals of Analysis, which are able to conduct so quickly and so far, those who will want to penetrate the Analytical Sciences. We consider it as the most complete Treatise, and the best produced in this genre; and we believe that the Academy will not contradict us, and it will affirm that it is most deserving of its approval and of its praise.¹⁴⁵

The Emergence of the *Agonal Spirit* in Learning in the Affective Worlds of Documents

In this article I have traced the emergence of an *agonal* spirit in learning through my engagement with Maria Gaetana Agnesi’s educational notebooks in the archives of the Ambrosiana Biblioteca in Milan, but also through a re-reading and interpretation of her historical biographies and scientific publications that frame the understanding of her archival documents. Although Agnesi’s notebooks do not include thoughts and feeling in the canon of women’s diaristic intimate writing, they unleash affective forces, which powerfully express a young girl’s *agonistic* experience in becoming a scientist at a time of harsh restrictions, limitations and exclusions.¹⁴⁶

In using the Arendtian notion of *agonism* as a lens through which I have read Agnesi’s notebooks, my suggestion is that the *agonal* spirit emanating from Agnesi’s documents challenges prevalent discourses around exceptionality in real and fictional constructions of the woman mathematician and scientist then and now. Thus, instead of putting women mathematicians and scientists on pedestals, glorifying their rare talents and skills, and hence separating them from “the multitude,” we should better study and examine the minutiae of the *agonistic* processes they entered in grappling with the world of science and mathematics – an ongoing struggle that reaches the modern day in various modalities and forms.

As I have shown throughout the article, *agonism* highlights the boundlessness, messiness and unpredictability of learning and pedagogical actions in the field of gender and education and throws fresh light on how we can begin to understand the persistent condition of women's marginalisation in the world of science in general and mathematics in particular. What I finally suggest is that excavating *agonistic* moments in the troubled histories of gender, science and mathematics not only interrogates its present sore state, but also sketches actions for radical futures, responding to the question: how can women become "other" as mathematicians, philosophers and scientists?

Notes

1. Maria Gaetana Agnesi to Michele Casati, December 9, 1739 [VBA. 0.201. SUP]. Unless otherwise indicated all translations from Latin and Italian are mine.
2. *La Gazzetta di Milano*, 48, 49, 50, December 2, 9, 16, 1739, cited in Masotti, "Seminario," 98 n.2.
3. *La Gazzetta di Milano*, 48, December 2, 1739, cited in Anzoletti, *Agnesi*, 191.
4. *Ibid.*
5. *Ibid.*
6. *Ibid.*
7. *Ibid.*
8. Halmos, *Automathography*.
9. Mazzotti, "The Making of the Catholic Enlightenment."
10. King and Rabil, "The Other Voice."
11. de Pisan, *City of Ladies*.
12. King and Rabil, "The Other Voice," xxv.
13. See amongst others, Mouffe, *On the Political*; Rancière, *Dissensus*.
14. Logan, "Italian Women in Science," 65–7.
15. Findlen, "Translating the New Science."
16. Libri, "Notice sur M^{lle} Sophie Germain," 12; Somerville, *Personal Recollections*, 74.
17. Watts, *Women in Science*, 1.
18. See for example Wills, *Women in the History of Science*, for a recent overview of this field, as well as the rich website, <http://siefar.org/la-siefar/> of the Société Internationale pour l'éducation des femmes de l'Ancien régime (accessed May 19, 2023).
19. Logan, "Italian Women in Science," 81.
20. *Ibid.*, 94.
21. Goodman, *The Republic of Letters*.
22. Schiebinger, *The Mind*, 30.
23. Cavazza, "Between Modesty and Spectacle," 279.
24. *Ibid.*, 280.
25. *La Gazzetta*, in Anzoletti, *Agnesi*, 191.
26. Cavazza, "Between Modesty and Spectacle," 286.
27. Frisi, *Elogio*, 11.
28. Cavazza, "Between Modesty and Spectacle."
29. Logan, "Italian Women in Science," 86.
30. Barbapiccola, "Preface," 55.
31. Mazzotti, *The World*, 85.
32. Agnesi [VBA/0.203. SUP].
33. *Ibid.*
34. *Ibid.*
35. Anzoletti, *Agnesi*, 362.
36. Messbarger, "The Italian Enlightenment Reform," 18.
37. *Ibid.*

38. Voltaire to Frederick the Great, letter dated October 1749, in Voltaire, *The Complete Works*, 179.
39. Kovalevskaya, *Memories and Letters*, 276.
40. Agnesi, "The Studies of the Liberal Arts."
41. Du Châtelet, "Dissertation sur la nature et la propagation du feu."
42. Stenhouse, "Being and Becoming a Mathematician," 28–33.
43. Germain, "Recherches sur la théorie des surfaces élastiques."
44. Kovalevskaya, "On the Rotation of a Solid Body about a Fixed Point."
45. Whaley, *Women's History as Scientists*.
46. Pepe, "Il Calcolo Infinitesimale."
47. Zen, *Agnesi*.
48. Mazzotti, *The World*, 59.
49. Ibid.
50. Logan, "Italian Women in Science," 41.
51. Mazzotti, *The World*, 60.
52. Ibid.
53. Findlen, "Translating the New Science," 185.
54. Mazzotti, *The World*, 57.
55. Findlen, "Becoming a Scientist," 59–60.
56. Ibid.
57. Algarotti, cited in Findlen, "Becoming a Scientist," 59.
58. "[P]ulcherrima et simplicissima theoria," Agnesi, *Propositiones* [cxvii, 81].
59. Zen, *Agnesi*, 55.
60. Ibid., 15.
61. Mazzotti, *The World*.
62. Porter, *The Creation of the Modern World*.
63. Mazzotti, *The World*, xix.
64. Ibid., 57.
65. For extended biographical details in English about Agnesi and her family, see amongst others, Mazzotti, *The World*; Cupillari, *A Biography*.
66. Frisi, *Elogio*, 8.
67. Ibid., 10.
68. Agnesi, *Oratio quâ ostenditur*.
69. Frisi, *Elogio*, 10.
70. Messbarger, *The Century of Women*, particularly Chapter 1, "The Debate," 21–48.
71. Volpi, *Discorsi*. This reprint did not include a series of poems defending women's education and celebrating Agnesi's achievements, which were part of the first edition.
72. Messbarger, *The Century of Women*, 21–48.
73. Agnesi, "Oratio," 92.
74. [quod ex meo non poteram, ex alieno addidi], *ibid.*, 93.
75. Ibid.
76. Findlen, "Translator's Introduction," 120.
77. Ibid., 121.
78. Ibid.
79. Arendt, *The Human Condition*, 194, emphasis added.
80. Koutsouris et al., "Agonism in Education," for a comprehensive and critical review of the literature in this area.
81. Detlefsen, "The Rise of a Public Science?"
82. Ibid., 128.
83. Zinsser, "Introduction," 4.
84. Honig, "The Politics of Agonism."
85. Ibid., 529.
86. Tamboukou, "Archival Research"; Tamboukou, "Archives, Genealogies and Narratives."
87. Whitehead, *Process and Reality*.

88. “Prehensions” in Whitehead’s philosophy are fundamental components in how subjects among other entities interact with the world and incorporate aspects of their environment – the archive in our case – into their own subjective experience and understanding. Expanding on Whitehead’s notion of “prehensions” in relation to the archive goes well beyond the limitations of this paper, but as already noted, I have written about it extensively: Tamboukou, “Challenging the Bifurcation of Nature”; Tamboukou, “Feeling Narrative in the Archive.”
89. Cupillari, *A Biography*.
90. Findlen, “Translator’s Introduction,” 120 and 120 n.11.
91. Anzoletti, *Maria Gaetana Agnesi*, 43.
92. *Ibid.*
93. Cupillari, *A Biography*, iii.
94. *Ibid.*
95. *Ibid.*, 3–5.
96. Masotti, “Seminario,” 92.
97. See Agnesi’s catalogue at the Ambrosiana Biblioteca. <https://ambrosiana.comperio.it/manoscritti/search?q=Maria+Gaetana+Agnesi&sort=items> (accessed January 13, 2023).
98. Anzoletti, *Maria Gaetana Agnesi*, 41.
99. *Ibid.*, 123.
100. For an elaboration of rhythmanalysis in archival research, see Tamboukou, “Archival Rhythms.”
101. See for example, 0.185. SUP: Corso di filosofia seguito da Maria Gaetana Agnesi nella prima sua età: metafisica e fisica, and 0.195.SUP: Studi di cosmografia seguiti da Maria Gaetana Agnesi nella prima sua età.
102. See for example, manuscript 0.183. SUP: Opuscolo mitologico d’incerto autore tradotto in greco da Maria Gaetana Agnesi e scritto di sua mano per propria istruzione.
103. *Anzoletti Agnesi*, 114–18.
104. Masotti, “Seminario,” 95.
105. VBA. 0.183.SUP.
106. Elena Lucrezia Cornaro Piscopia (1646–1684) was the first woman in the world to receive a PhD from the University of Padua in 1678.
107. Frisi, *Elogio*, 14–15.
108. VBA.0.183. SUP.
109. VBA.0.181-0.182. SUP. There is no third volume in the Ambrosiana manuscripts.
110. This translation is not included in the Ambrosiana manuscripts either.
111. Frisi, *Elogio*, 16–17.
112. VBA.0.183.SUP.
113. VBA.0.181-182.SUP.
114. *Anzoletti Agnesi*, 115.
115. “I due libri di supplemento a Quinto Curzio colla traduzione in italiano, francese, tedesco e greco, di Maria Gaetana Agnesi e scritti di sua mano” [The two supplementary books to Quinto Curzio with translation into Italian, French, German and Greek, handwritten by Maria Gaetana Agnesi], VBA.0.184. SUP.
116. Anzoletti, *Agnesi*, 117.
117. VBA.0185. SUP.
118. VBA.0186–191. SUP.
119. VBA.0.192–193 and 199–200. SUP.
120. VBA.0194. SUP.
121. VBA.0195. SUP.
122. *Ibid.*
123. Masotti, “Seminario,” 95.
124. For more biographical details of Agnesi’s tutors, see Frisi, *Elogio*, 16, 21–2; Anzoletti, *Agnesi*, particularly Chapter 3; Masotti, “Seminario,” 94, 95; Mazotti, *The World*, particularly Chapter 2, “Catholicisms.”

125. Mazotti, *The World*, 33.
126. Ibid.
127. VBA.0.198. SUP.
128. Ibid., ff. 26–33.
129. Ibid., ff. 35–7.
130. Ibid., ff. 38–51.
131. Ibid., ff. 81–5.
132. Ibid., ff. 96–105.
133. Ibid., ff. 105–8.
134. Ibid., ff. 114–16.
135. Ibid., ff. 117–18.
136. Ibid., ff. 121–30.
137. Ibid., ff. 26–33.
138. See Anzoletti's reference to Agnesi as "la Minerva di via Pantano," *Agnesi*, 138.
139. Frisi, *Elogio*, 18–19.
140. Ibid., 28.
141. Ibid., 29.
142. Conte di S. Rafaele, cited in Frisi, *Elogio*, 30.
143. According to Kant for example, women were incapable of abstract thinking as they had a different kind of mind from men. See Clark, *Misogyny in the Western Philosophical Tradition*, 147.
144. Agnesi, *Analytical Institutions*, vol. 1, xxi.
145. *Giornale de Letterati* 6, part 1, artic. 1 (1750): 7–8, cited in Frisi, *Elogio*, 42, translated in Cupillari, *A Biography*, 59.
146. There is a growing body of literature around the importance of affects, emotions and feelings in educational discourses and practices in general and women's involvement in science education in particular, but this area is beyond the scope and limitations of this paper. For an overview, see amongst others, Pekrun and Linnenbrink-Garcia, *International Handbook*.

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Archival Documents

Veneranda Biblioteca Ambrosiana, Manoscritti, Agnesi, Maria Gaetana <1718–1799>, 0.180-0.204. SUP.

Bibliography

- Agnesi, M. G. *Oratio quâ ostenditur: atrium liberalio studies a femineo sexu neutiquam abhorrere, habita de Maria de Agnesiis Rhetoricae operam danno anne aetatis suae nononondum exacto die 18 Augusti 1727* [Oration in which it is proved that the studies of liberal arts are not at all incompatible with the feminine sex, written by Maria Agnesi who publishes this work in rhetoric before celebrating her ninth birthday, on August 18, 1727]. Milan: Malatesta, 1727.
- Agnesi, M. G. “Oratio quâ ostenditur: atrium liberalio studies a femineo sexu neutiquam abhorrere, habita de Maria de Agnesiis Rhetoricae operam danno anne aetatis suae nononondum exacto die 18 Augusti 1727.” In *Discorsi accedemici di vari autoriviventi intorno agli studidelle donne; la maggior parte recitati nell’ Academia de Ricovrati di Padova*, edited by G. A. Volpi, 89–105. Padua: Giovanni Manfrè, 1729.
- Agnesi, M. G. *Propositiones Philosophicae*. Milan: Malatesta, 1738.
- Agnesi, M. G. *Istituzioni analitiche ad uso della gioventù italiana*. Vol. 2. Milan: Nella Regia-Ducal Corte, 1748. Translated as *Analytical Institutions for the Use of the Italian Youth*, by John Colson, London: Taylor and Wilks, 1801.
- Agnesi, M. G. “The Studies of the Liberal Arts by the Female Sex are by No Means Inappropriate.” Translated by Paula Findlen. In *The Contest for Knowledge: Debates over Women’s Learning in Eighteenth-Century Italy*, edited by R. Messbarger and P. Findlen, 117–40. Chicago: University of Chicago Press, 2005.
- Anzoletti, M. L. *Maria Gaetana Agnesi*. Milan: Cogliati, 1900.
- Barbapiccola, G. E. “The Translator to the Reader: Preface to René Descartes Principles of Philosophy (1722).” In *The Contest for Knowledge: Debates over Women’s Learning in Eighteenth-Century Italy*, edited by R. Messbarger and P. Findlen, 47–66. Chicago: University of Chicago Press, 2005.
- Cavazza, M. “Between Modesty and Spectacle: Women and Science in Eighteenth Century Italy.” In *Italy’s Eighteenth Century: Gender and Culture in the Age of the Grand Tour*, edited by P. Findlen, C. Sama, and W. Rowarth, 275–302. Stanford: Stanford University Press, 2009.
- Clack, B., ed. *Misogyny in the Western Philosophical Tradition: A Reader*. Basingstoke: Palgrave, 1999.
- Cupillari, A. *A Biography of Maria Gaetana Agnesi, an Eighteenth-Century Woman Mathematician: With Translations of Some of Her Work from Italian into English*. New York: Edwin Mellen Press, 2007.
- Curtius Rufus, Q. “Alexander Magnus duobus tomis repraesentatus quorum hic historiam Q. Curtii Rufi. Cum supplementis et indice copiosissimo complectitur alter Commentarios.” In *Q. Curtii Libros Superstites Exhibit*, edited by J. Freinsheim. Vol. 2. Strasbourg: Zetzner, 1639–40.
- De Pizan, C. *The Book of the City of Ladies*. Translated and edited by Rosalind Brown-Grant. London: Penguin Classics, [c.1405] 2000.
- Detlefsen, K. “The Rise of a Public Science? Women and Natural Philosophy in the Early Modern Period.” In *The Cambridge History of Philosophy of the Scientific Revolution*, edited by D. Marshall and D. Jalobeanu, 128–45. Cambridge: Cambridge University Press, 2022.
- Du Châtelet, É. “Dissertation sur la nature et la propagation du feu.” In *Recueil des Pièces qui ont Remporté le Prix de l’Académie Royale des Sciences en 1738*, edited by l’Académie Royale des Sciences, 85–168. Paris: Imprimerie Royale, 1738.
- Findlen, P. “Translating the New Science: Women and the Circulation of Knowledge in Enlightenment Italy.” *Configurations* 3, no. 2 (1995): 167–206.

- Findlen, P. "A Forgotten Newtonian: Women and Science in the Italian Provinces." In *The Sciences in Enlightened Europe*, edited by W. Clark, J. Golinski, and S. Schaffer, 313–49. Chicago: University of Chicago Press, 1999.
- Findlen, P. "Becoming a Scientist: Gender and Knowledge in Eighteenth Century Italy." *Science in Context* 16, no. 1/2 (2003): 59–87.
- Findlen, P. "Translator's Introduction." In *The Contest for Knowledge: Debates over Women's Learning in Eighteenth-Century Italy*, edited by R. Messbarger and P. Findlen, 117–27. Chicago: University of Chicago Press, 2005.
- Fontenelle, B. L. B. D. *Conversations on the Plurality of Worlds*. Translated by H. A. Hargreaves. Berkeley: University of California Press, [1686] 1990.
- Frisi, A. F. *Elogio storico di D^A Maria Gaetana Agnesi, Milanese Dell'Accademia Dell' Instituto Delle Scienze, e Lettrice Onoraria di Matematiche nella Università di Bologna*. Milan: Presso Giuseppe Galeazzi, 1799. Reprinted with an introduction and additional notes by Arnaldo and Giuseppina Masotti. Milan: Scuola Tipografica del Pio Istituto dei Figli della Provvidenza, 1965. Translated by Antonella Cupillari in *A Biography of Maria Gaetana Agnesi, an Eighteenth-Century Woman Mathematician: With Translations of Some of Her Work from Italian into English*, 33–106. New York: Edwin Mellen Press, 2007.
- Germain, S. *Recherches sur la théorie des surfaces élastiques* [Researches on the theory of elastic surfaces]. Paris: Huzard-Courcier, 1821.
- Goodman, D. *The Republic of Letters: A Cultural History of the French Enlightenment*. Ithaca, NY: Cornell University Press, 1994.
- Halmos, P. *I Want to Become a Mathematician: An Automathography*. New York: Springer, 1985.
- Honig, B. "The Politics of Agonism: A Critical Response to 'Beyond Good and Evil: Arendt, Nietzsche, and the Aestheticization of Political Action' by Dana R. Villa." *Political Theory* 21, no. 3 (1993): 528–33.
- King, M. L., and A. Rabil Jr. "The Other Voice in Early Modern Europe: Introduction to the Series." In *The Contest for Knowledge*, Edited and Translated by R. Messbarger and P. Findlen, xi–xxxi. Chicago: University of Chicago Press, 2005.
- Koutsouris, G., L. Stentiford, S. Benham-Clarke, and D. Hall. "Agonism in Education: A Systematic Scoping Review and Discussion of Its Educational Potential." *Educational Review* 74, no. 5 (2021): 1029–54.
- Kovalevskaya, S. "Sur le problème de la rotation d'un corps solide autour d'un point fixe." [On the problem of the rotation of a solid body around a fixed point.] *Acta Mathematica* 12, no. H2 (1889): 177–232.
- Kovalevskaya, S. *Воспоминания письма* [Memories and letters]. Moscow: AN SSSR, 1951.
- Libri, G. "Notice sur M^{lle} Sophie Germain." [Notice on Sophie Germain.] In *Considérations Generales Sur l'Etat Des Sciences Et Des Lettres Aux Différentes Époques de Leur Culture* [General considerations on the state of the sciences and the letters at different times of their culture], 11–16. Paris: Lachevardière, 1833.
- Logan, G. B. "Italian Women in Science from the Renaissance to the Nineteenth Century." PhD diss., University of Ottawa, 1999.
- Masotti, A. "Maria Gaetana Agnesi." *Rendiconti del Seminario Matematico e Fisico di Milano* [Reports of the Mathematical and Physics Seminar in Milan], 14 (1940): 89–127.
- Mazzotti, M. "Maria Gaetana Agnesi: Mathematics and the Making of the Catholic Enlightenment." *Isis* 92, no. 4 (2001): 657–83.
- Mazzotti, M. *The World of Maria Gaetana Agnesi, Mathematician of God*. Baltimore: Johns Hopkins University Press, 2007.
- Messbarger, R. *The Century of Women: Representations of Women in Eighteenth-Century Italian Public Discourse*. Toronto: University of Toronto Press, 2002.
- Mouffe, C. *On the Political*. London: Routledge, 2005.
- Pekrun, R., and L. Linnenbrink-Garcia, eds. *International Handbook of Emotions in Education*. New York: Routledge, 2014.

- Pepe, L. "Il Calcolo Infinitesimale in Italia agli inizi del secolo eighteenth." [The Infinitesimal Calculus in Italy at the beginning of the eighteenth century.] *Bollettino di Storia delle Scienze Matematiche* [Bulletin of the History of Mathematical Sciences] 1, no. 2 (1981): 43–101.
- Porter, R. *The Creation of the Modern World: The Untold Story of the British Enlightenment*. New York: Norton, 2000.
- Rancière, J. *Dissensus: On Politics and Aesthetics*. London: Continuum, 2010.
- Schiebinger, L. L. *The Mind Has No Sex? Women in the Origins of Modern Science*. Cambridge, MA: Harvard University Press, 1989.
- Somerville, M. *Queen of Science: Personal Recollections of Mary Somerville*, edited by Dorothy McMillan. Edinburgh: Canongate, [1873] 2001.
- Stenhouse, B. "Mary Somerville: Being and Becoming a Mathematician." PhD diss., Open University, 2021.
- Tamboukou, M. "Archival Research: Unravelling Space/Time/Matter Entanglements and Fragments." *Qualitative Research* 14, no. 5 (2014): 617–33.
- Tamboukou, M. "Feeling Narrative in the Archive: The Question of Serendipity." *Qualitative Research* 16, no. 2 (2016): 151–66.
- Tamboukou, M. "Archival Rhythms: Narrativity in the Archive." In *The Archive Project: Archival Research in the Social Sciences*, edited by N. Moore, A. Salter, L. Stanley, and M. Tamboukou, 71–95. London: Routledge, 2017.
- Tamboukou, M. "Challenging the Bifurcation of Nature: Women Workers' Education through Process Philosophy." *History of Education* 49, no. 3 (2020): 313–26.
- Tamboukou, M. "Archives, Genealogies and Narratives in Women Workers' Education." *Women's History Review* 29, no. 3 (2020): 396–412.
- Volpi, G. A., ed. *Discorsi accademici di vari autoriviventi intorno agli studidelle donne; la maggior parte recitati nell' Accademia de Ricovrati di Padova* [Academic discourses of various living authors regarding the studies of women; the vast majority of which was read at the Academy of the Ricovrati of Padua]. Padua: Giovanni Manfrè, 1729.
- Voltaire. *The Complete Works of Voltaire/Oeuvres Complètes de Voltaire*, edited by Theodore Besterman. Vol. 95. Geneva: Institut et MuséeVoltaire, 1970.
- Watts, R. *Women in Science: A Social and Cultural History*. London: Routledge, 2007.
- Whaley, L. *Women's History as Scientists: A Guide to the Debates*. Santa Barbara: ABC-CLIO, 2003.
- Whitehead, A. N. *Process and Reality* [Corrected Edition], edited by David Ray Griffin and Donald W. Sheburne. New York: The Free Press, [1929] 1985.
- Wills, H., S. Harrison, E. Jones, R. Martin, and F. Lawrence-Mackey, eds. *Women in the History of Science: A Sourcebook*. London: UCL Press, 2023.
- Zen, S. *Maria Gaetana Agnesi: tra Newton e Leibniz* [Maria Gaetana Agnesi: Between Newton and Leibniz]. Roma: Aracne editrice, 2017.
- Zinsser, J. "Introduction." In *Men, Women and the Birthing of Modern Science*, edited by J. Zinsser, 3–9. DeKalb: Northern Illinois University Press, 2005.