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Creation / Representation / Transmission: Culture and/of Mathematicians' Autobiographies

Odile Chatirichvili*

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Introduction: Against a Certain Image of Mathematics

In many cultural representations, mathematicians are often stereotyped. Studies of books, films and series featuring characters (real or fictional) of mathematicians show that they are frequently portrayed as obsessive and withdrawn geniuses, unfit for social interaction[11, 27, 36]. In the broad collective imagination, mathematics has a degraded, or at best ambivalent, image; it is not insignificant that several mathematicians explain, in their autobiographies, that they wish to combat the apprehensions raised by mathematics and reveal its beauty to the general audience.

In the words of Edward Frenkel:

[...] most people are daunted by math. It has become, in the words of poet Hans Magnus Enzensberger, “a blind spot in our culture – alien territory, in which only the elite, the initiated few have managed to entrench themselves.” It’s rare, he says, that we “encounter a person who asserts vehemently that the mere thought of reading a novel, or looking at a picture, or seeing a movie causes him insufferable torment,” but “sensible, educated people” often say “with a remarkable blend of defiance and pride” that math is “pure torture” or a “nightmare” that “turns them off.”[13, p. 1]

One function assigned by mathematicians to their autobiographical narrative is therefore to give an adequate image of themselves and their work.

Nowadays, mathematicians tell their stories in many ways: there are popular books on mathematical work and creation[5], exhibitions, conferences for the general public, Youtube channels, websites, apps, festivals, etc. Working on autobiographical narratives in particular, I am convinced that those texts are a very interesting way to think about the social and cultural representations of mathematics within the world.

It might seem weird to a lot of people, but there are indeed a relatively large number of autobiographies and Memoirs¹ by mathematicians, that is to say narratives written by

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1 In French literary studies, the term “Memoirs” refers to a particular autobiographical genre, which has been defined by researcher Jean-Louis Jeannelle:

mathematicians themselves in order to relate their personal and professional lives and to describe how their relationships to math are linked with their biographical journey.² These texts are commonly used as primary documents for historical[28] or sociological[4] research. But, contrary to autobiographies written by scientists of other fields[30, 33, 34], they have almost never been studied as a literary production per se, as a part of the vast field of “self writing” and as texts contributing to the building of mental and cultural representations.³

In this paper, I will present the basis of my work (which is still in progress) on mathematicians’ autobiographies from a literary and cultural point of view. I will propose different hypothesis to examine the role of such texts as literary works and cultural objects, likely to help the building of a “mathematical culture” or a “culture of mathematics.” How can tools from literary studies and discourse analysis allow us to establish a deeper understanding of these texts? How can the specific genre that is mathematicians’ autobiographies contribute to build a culture of mathematics and help in improving the accuracy or the creativity of what people imagine about math?

Building an Image of the Self: Life, Writing, and *Ethos*

Within the various forms of dissemination of mathematics and mathematical works, the genre of Memoirs broadens the focus from what is generally seen by placing this research work in a temporal and biographical perspective marked by greater depth. It includes stories from childhood, entry into mathematics, evocations of personal and intimate life, passions outside mathematics that are likely to feed research, etc.

Let me develop a very striking example of this diversity: the French mathematician Laurent Schwartz opens the Foreword of *Un mathématicien aux prises avec le siècle* [31]⁴ with the sentence “I am a mathematician. Mathematics have filled my life [...]”[32, p. vii]. A few lines later, he continues: “I have been involved in many activities besides mathematics, sometimes to such a point that my research suffered”[32, p. vii] and then talks about his political commitments and his passion for entomology. On the next page begins a second introductory text, which is entitled “The Garden of Eden”: over nearly 30 pages, Schwartz describes the garden of his

If autobiography is the story that “someone makes of his own existence, when he emphasizes on his individual life,” according to Philippe Lejeune’s formula[21], Memoirs, on the other hand, are the story of a life in its historical condition: an individual testifies to his journey as a man carried along in the course of events, both as an actor and a witness, carrying a story that gives meaning to the past. Autobiography reflects what distinguishes a subject, i.e. an identity such that it has gradually been constructed in a given family and social context; Memoirs attest to a life in its public and collective dimension[...] [19, p. 13]

2 I am currently working on establishing a list of those texts on my personal website:

<https://odile.chatirichvili.fr/automathographies.html>.

3 An interesting exception would be [12] about the autobiography of G.H.Hardy [18].

4 Published in French in 1997; I will quote the English translation by Leila Schneps published in 2001. Apart a few exceptions which will be notified, other quotes from French texts in this paper are translated by myself.

family home in Autouillet, near Paris. What is apparently a bucolic digression allows him in fact to talk about his parents, brothers, wife and children, that is to say a family environment which contributes to his intimate identity. The allusions to mathematics are very limited and are mainly used to draw, like in a watermark, a portrait of the mathematician as a gardener in love with nature:

Mathematical research still procures me my greatest pleasure. But mathematics in Autouillet has more charm than mathematics at my desk in Paris.[32, p. 28]

With this anecdote, mathematical research is shown as a concrete and embodied activity. We are far from the image of the mathematician in his ivory tower; here the mathematician seems to be an accessible man seeking simple pleasures, someone with whom a non-mathematician reader could, to some extent, identify.

This example is no exception; the texts I study often use narrative and rhetorical processes to make their narrator/character “closer” to the reader, to show a “normal” and simple life, and thus to reverse the cliché of the mathematical genius who breaks away from the real world. Yvonne Choquet-Bruhat gives her children a central role in the prologue and epilogue of her Memoirs: they are at the same time “the essential part of [her] life”[9, p. 9] and the main recipients of the text, written “at their request”[9, p. 9]. Benoit B. Mandelbrot ends his narration with two family photos, one with his wife and grandchildren, the other with his wife[24, p. 301], at the end of a book which contains a lot of visual elements, mainly used to illustrate mathematical concepts (such as fractals).

According to a “rule” of the autobiographical genre, all of this is presented as a way of unveiling oneself: when writing an autobiography, one is supposed to show oneself in the most authentic and sincere way. Schwartz thanks his proofreader:

She read all the chapters with the competence of a translator, which enabled her to help me polish the style, without losing anything of my thought or my personality, so that everyone who knows me recognizes me in the book and feels, as certain readers have told me, that they can “hear the sound of my voice”. [31, p. viii]

The ideal objective of autobiography is expressed here, or at least its claimed objective of building through the written text an honest and trustworthy image of oneself, up to the sound of a voice.

But in reality, a life story is a construction. This is inherent to the narrative form: any story is built by selecting and ordering events in a particular way. This construction is sometimes deliberately and consciously studied to reflect a certain self-image. In any case, according to researcher Ruth Amossy who articulates rhetorical and sociological analysis, “self-presentation, or what rhetorical tradition calls “ethos”, is an integral dimension of discourse”[3, p. 7].

This concept of “ethos” is used in different fields and is very important both in the elaboration of autobiographical and memorial texts, but also in scientific practice. The term comes from ancient rhetoric, where it more specifically refers to a component of argumentation: beyond the

arguments (the *logos*) and the emotions created by the discourse (the *pathos*), there is the image (the *ethos*) projected by the speaker, who must inspire confidence and ensure his or her authority over the audience.

In its general definition, “ethos refers to a set of principles and values that shape behaviour. [...] all the ways of being and doing, with an ethical dimension”[2, p. 200]. To be short, it is everything, in a text or speech, that contributes to building a certain image of the person who is writing or speaking, a certain “self-presentation”.

Finally, one can speak of “professional ethos”, that is to say how you are suppose to act, talk, write in a specific professional context. By extension, there is of course an “ethos of science” (which Robert K. Merton defines as “that affectively toned complex of values and norms which is held to be binding on the man of science”[25]) and more particularly of mathematics as a “profession”[37].

The author of an autobiography works with rhetorical tools to build his or her own image through the text. Let us quickly examine two examples of how a passage explicitly showing the mathematician in a modest light could in fact be stylistically serving his enhancement, his own distinction

Laurent Schwartz devotes a long chapter to “The Invention of Distributions”[32, pp. 209–254], the mathematical object that earned him the Fields Medal in 1950. Before describing the moment of discovery, he first lists the mathematical research and concepts, which were known or unknown to him at the time, that constitute “preliminaries” to it.

[...] the enumeration of my many precursors is impressive, and the dates of their inventions are closer and closer to 1944. The discovery was bound to come, and I was merely an “instrument of destiny” (one must obviously have suitable ability to become such an instrument!). Further on, I will discuss the question of why destiny fixed itself upon me.[32, p. 224]

The expression “to be an instrument of destiny” refers to the idea that there would be a power superior and external to the mathematician (in this case, a kind of fatality of mathematical discovery, an inevitable sequence of events happening in the mathematical community towards a necessary advancement of ideas and knowledge) and that the mathematician would be relatively passive, a simple intermediate figure, a vessel allowing the discovery to come into being. But then there is, in the parentheses and last sentence, a discursive work of distinction through election: “destiny” allows the mathematician to have a life that is not ultimately the mere result of chance. The writer underlines, under a rhetorical claim of modesty (the restrictive word “merely”), the remarkable scope of his work. The fact that Schwartz places the expression “instrument of destiny” in quotation marks shows that he keeps his distance from this statement: he is indeed aware that he is a brilliant mind, and retrospective writing, by establishing a teleological coherence of life, changes causality: it is easy to see how you were able to reach a peak when you have actually already managed to reach it. Schwartz shows such retrospective explanation in other places in his text: “I always possessed the spirit of research. And it is a fact that I became a researcher. It was predictable from my earliest childhood”[32, p. 29].

This “fake modesty” of the mathematician can even taint the ethos of the writer. In his preface, Norbert Wiener points out that the writing of his Memoirs will not bring him any socio-professional advantage:

[...] I must wait for the judgment of the public in order to be sure that I have achieved a measure of success. Why did I assume this uninviting labor, which at the best can add little to my stature as a working scientist and at the worst must offer new opportunities for those who may be inclined to criticize me? All in all, I don't know.[35, p. 10]

In this passage which perfectly fits the form and objective of the rhetoric process of *captatio benevolentiae*,⁵ Wiener seems to be abandoning the authority that competence is likely to give him in the scientific world. He does this to submit himself and his text to the judgment of an audience that he is not used to addressing and with whom he has other types of duties. In the mathematical community, he must be exact and rigorous, whereas with a lay audience he has to be clear and understandable. Writing his autobiography radically changes his very role as a scientist. However, it is precisely this endangering which, under an apparent humility, enhances the author's stature: a failure would be explainable, a success all the more impressive.

A Genre for Whom?

Norbert Wiener's quotation raises an essential question about the public of mathematicians' autobiographies: for whom does a mathematician write his or her autobiography or Memoirs? What objectives and responsibilities do he or she have towards these public(s)? How are the abstraction, rigor, and extreme complexity of twentieth-century mathematics to be articulated in light of a demand for accessibility?

In the case of mathematicians' autobiographies, there are at least two different types of “real readers” (that is to say “empirical readers”, as opposed to the “ideal readers” of some part of the reception theories): the “mathematician reader” and the “non-mathematician reader.” In fact, each real reader is endowed with a more or less developed mathematical culture, with a polarization between “expert reader” and “profane reader” (a distinction made by several authors in various terms in my corpus). Even a mathematician working in a certain field of math would not be able to understand the research of a colleague working in another field.

Alexandre Grothendieck, for example, begins some technical footnotes of *Récoltes et Semailles*[15] with an address showing different degrees of precision: “the non-mathematician reader,” “the mathematician reader,” “the geometer reader,” “the algebraic geometer reader,” etc. These details show that the author is aware of the existence of a “real reader” and integrates it in differentiated ways into his narration.

The first approach of this question is to study the relationship between the origins of the writing project, the intentions and objectives expressed, and the methods of publishing and

5 From Latin “seeking benevolence,” it is a rhetorical technique aiming at provoking and attracting the benevolent attention of an audience.

disseminating the texts.

Yvonne Choquet-Bruhat, as we have said, writes “at the request” of her children: this is the origin of the autobiographical project, which is very common in family circles. However, these stories and memories are published by Odile Jacob, a French publishing house whose name is “often associated with that of high-level scientific popularization”[23, p. 21]. According to a paper studying the catalogue of publications, the publisher “acts as a symbolic converter for the benefit of authors recognized in their field but unknown to a wider readership”[23, pp. 35–36]. A writing practice that presents itself as an encounter of the private and intimate, with editorial institutionalization, is to be explored.

Laurent Schwartz and Edward Frenkel both mention, in the preface of their book, the difficulties that a potential lay reader might experience in understanding mathematical passages; but Schwartz proposes a fragmented reading program where the reader skips pages, while Frenkel claims he wants to make his “dear reader” understand mathematics. The first one is more of an elitist than the second one, who expressly wants to contribute to scientific popularization.⁶

As one last example of the reader’s inclusion in the writing project: Norbert Wiener underlines his “duty of exegesis”[35, p. 10]: with his autobiography, he wants to “explain” and “translate” in order to “make [an] understanding available” to himself and to the others, especially future scientists but also “the larger intellectual public.” The use of the term “exegesis,” which connotes the literary and even religious field, underscores the interpretative work of a hidden reality⁷ unveiled by the mathematician, but it is also a term used in reference to popularization.

Of course, there is not a single common goal for all mathematicians’ autobiographies. But comparing the opening pages can help us to highlight the objectives each writer claims to follow. This does not mean that he is absolutely honest nor right, nor that he will manage to achieve those goals through the text. Between intentions and real effects, there is often a gap. Online comments about Frenkel’s *Love & Math* show that the enthusiastic project of the mathematician—who is very active in popularizing math—is not always successful from the readers’ perspective. A “customer review” on the Amazon page of the book says:

By Salvatore R. Mangano on January 4, 2014 I love math and really wanted to love this book but... [...] as the book progresses Frenkel drags the reader through murkier and murkier waters until all but the most well schooled mathematician could hope to see but a fraction of what Frankel is trying to show.

Successful or not, the mathematician who writes and publishes his autobiography engages his reputation and his scientific identity in the task. This contract between the author of an autobiography and the reader, is called “autobiographical pact” by French theorician Philippe Lejeune:

6 In [8], I further analyze this comparison.

7 Expression from the title of [13].

The autobiographical pact is the affirmation in the text of this identity, ultimately referring to the author's name on the cover.

The forms of the autobiographical pact are very diverse: but all of them express the intention to honour his signature. The reader may argue about similarity, but never about identity.[21, p. 26]

This pact, created by the very fact that the name on the cover is the name of the narrator and the main protagonist of the story, is an essential part of the possibility that there could be an autobiography at all. What is specific in the autobiography of a scientist, especially when the author aims at explaining his work which is a constitutive part of his identity, is of double nature:

1. the name has a very strong and complex importance in science because of the articulation between objectivity and subjectivity on one hand, and between the individual parenthood of a scientific discovery and the process of research in a global community on the other hand;
2. there is generally a gap of technical and cultural competence between a mathematician and the reader. The extreme abstraction of contemporary mathematics makes it almost impossible to explain its content to the layman or to give an image of it.

That is why the questions of the public and of the writing project are linked, to some extent, to the process of popularizing science. Which aspects of mathematics or mathematical research are to be transmitted through autobiographies?

Transmitting a Specific Image of Math

Where "literary" autobiographers seem to follow the purpose of "knowing themselves," mathematicians (but they are not the only ones) aim towards the objective of "making the other understand": with this in mind, autobiography would be part of strategies to popularize or disseminate knowledge and practices by entering inside a "black box."

The possible and/or claimed functions of these works could be very roughly summarized as follows:

1. stating concrete aspects of mathematical work
2. describing the processes of mathematical thought
3. exposing and explaining mathematical content

The first and second points are linked when research is shown as an investigation (as a methodical process) and a quest (as an inner process). As Georges Gusdorf writes:

Science is an adventure, and the beautiful order of accomplished science must not hide the epic of science in the making, with its trials, errors, failures, and triumphs. Autobiography restores the living movement of the quest for truth, according to the perspective of the man of knowledge, who searches for something other than what he is searching for, and who, in searching, search for himself.[16, p. 412]

The moments of mathematical discovery⁸ are sometimes a key step in a book's structure: as was previously stated, Schwartz devotes a whole chapter to "The Invention of Distributions."

8 The mathematical discovery has been studied in a psychological and sociological perspective in [17].

This illustrates how texts can more or less discreetly use terms and narrative structures from different textual forms, including investigation, artistic creation, even biblical revelation (through illumination or auditing). But the autobiography is first of all a textual form that enables to shed light on the research process that are usually hidden: meanders, “zig-zags”[32, p. 256], accidents, blocks, and bifurcations that lead to the theorem, theory, or formula as it was made public in the mathematical community in its “finished” form (scientific publications, courses, conferences, etc.). Some passages also stress the difficulties and pains of research: errors, hurdles, or disappointments[7].

The exposition and explanation of precise mathematical content, however, seem harder to manage, because it is complicated and often boring. Edward Frenkel’s book explicitly aims to articulate a life narrative as well as a popularization of mathematics, with the latter being presented and highlighted as an essential and unjustly misunderstood cultural object:

Mathematics is as much part of our cultural heritage as art, literature, and music. [...] This book is an invitation to this rich and dazzling world. I wrote it for readers without any background in mathematics. [...] My goal is to explain this stuff to you in terms that you will understand. I will also talk about my experience of growing up in the former Soviet Union, where mathematics became an outpost of freedom in the face of an oppressive regime.[13, pp. 5–6]

Frenkel addresses very advanced mathematical concepts in his book, seeking to capture the reader’s attention in many ways.

Chapter 15[13, pp. 166–183], “A Delicate Dance,” which is devoted to Langlands’ program (the subject of Frenkel’s PhD thesis) is thus presented in the form of a screenplay. First, there is a dialog between Edward, a doctoral student at Harvard, and his supervisor, Drinfeld. The apparatus of the screenplay is announced as such and visually marked by a change of font reproducing the traditional “typewriter” font of such document.

To explain what “the group $SO(3)$ of rotations of a sphere” is, the teacher refers to “the cup trick”; the next “scene” is a flashback featuring Edward discovering this “cup trick” during a student evening, before returning to the initial scene in the teacher’s office where the technical dialog goes on. This tour is also illustrated by a series of photographs of Frenkel who reenacts himself, with his own body, the story which has just been told as a movie scene[13, p. 171].

At the end of this scenario, the “first” narrative, in the usual font and layout, continues to intertwine mathematical explanations and references to cinema: *The Matrix*,⁹ which is explicitly cited, and, more discreetly, *Casablanca*¹⁰ when the mathematician uses, as an example of particular attributes of a rotation, a love story between two fictional characters called Rick and Ilsa, as the protagonists embodied by Humphrey Bogart and Ingrid Bergman. The use of the cinema creates a complicity with the reader by linking mathematics to a more familiar cultural field; cinema does not help to explain mathematical content as such, but it enables what could be a reassuring setup for the understanding of the mathematical concepts.

9 Movie by The Wachowskis (1999).

10 Movie by Michael Curtiz (1942).

The mathematician described his state of mind at the time: “It was exciting and also a little scary”[13, p. 176]. This ambivalence between fascination and frustration is an aspect that can be found many times in his book, as well as the attraction of cinema and romantic relationships. These different elements culminate in the last chapter, “Searching for the Formula of Love”[13, pp. 229–241], where Frenkel tells how he came to make an erotic-mathematical short film based on a film by the Japanese writer Yukio Mishima.¹¹

Reading *Love & Math*, we cannot help but notice the mathematician’s fascination with his research subject, which he seeks to convey to his reader in many ways. This is an essential aspect of the popularization of science:

[...] the relationship between knowledge, the popularizer and his public is organized as a particular pedagogical relationship where the exercise of popularization is very often associated with an exercise of seduction [...][29, p. 12]

In Frenkel’s case, seduction is based on seductive “tools” (references to cinema, use of pictures, omnipresence of the vocabulary of love), but also on rhetorical strategies of self-denial as part of his ethos. I analyze more precisely in an other article[8] how the mathematician shows that he undergoes, just like the reader, moments of misunderstanding and frustration, all the while remaining very insistent on the strength and beauty of the emotions that research provides him. This allows the reader to identify with Frenkel: “I don’t understand everything, but maybe the mathematician doesn’t either; he likes mathematics, so maybe I do too.” Misunderstanding is thus shown as being simultaneously negative and positive, inevitable and frustrating, inevitable and seductive. This process could prove to be a way to positively formulate the relationship to mathematics by showing it as an emotional, potentially erotic object, at least embodied in the body.

What Would a “Mathematical Culture” of Autobiographies Consist of?

From the perspective of the humanities, the word “culture” is very polysemic. Ruth Amossy distinguishes two main meanings:

Overall, we can distinguish 1) an elitist meaning of the term (but which is commonly used), where “culture” refers to the body of knowledge that distinguishes the cultured man from the uncultivated, namely a philosophical, artistic and literary heritage; 2) a non-hierarchical conception inherited from ethnology where the term culture refers to all symbolic systems that can be transmitted in and by any community, including primitive societies.[1, p. 129]

As with the concept of “ethos,” there is also a “disciplinary” dimension to the concept of “culture” which concerns both meanings. One can speak of the “musical culture,” the “scientific culture,” or the “mathematical culture”: it is a symbolic system one must master to enter a group, to understand and be understood by the others within it.

¹¹ One can also read Frenkel’s own presentation of his film in *Imagine Math 2*[14].

The expression “mathematical culture” is mainly used in regard to the teaching of mathematics in academia. The OECD (2001) defines “mathematical culture,” or “mathematical literacy” as such:

Mathematical literacy is defined in the Programme for International Student Assessment (PISA) as the capacity to identify, understand and engage in mathematics, and to make well-founded judgements about the role that mathematics plays in an individual’s current and future private life, occupational life, social life with peers and relatives, and life as a constructive, concerned and reflective citizen[26, p. 369].

Mathematical culture is not just about knowing how to handle basic competences with numbers, calculus, geometry, etc., i.e. having “technical” skills. It is also about knowing that mathematics is a human construct and placing it within a historical perspective, knowing that mathematics play a role in other disciplines (informatics, economics, etc.) and developing a representation of math that avoids clichés (that many representations of mathematicians in pop-culture transmit).

Ways of representing and transmitting the scientific culture to a non-scientific audience are closely linked to the idea of popularizing science. Yves Jeanneret explains that science popularization had different definitions and objectives, depending on the historical period and its ideological issues. It can be seen as a way to “make public what is hidden”[20, p. 19], to “share one’s own culture with others”[20, p. 14], “scientific ideas” being “an element of heritage, in the same way as major works of literature and art or achievements of our history”[20, p. 162]. To this extent, science is part of culture in the first meaning distinguished by Ruth Amossy.

We have seen previously that autobiographies can aim at elucidating concrete aspects of the mathematical work, describing the processes of the mathematical thought and explaining mathematical content. Mathematicians’ autobiographies can obviously play a role in transmitting a living and humanized image of the discipline by making effort to enable a process of identification and familiarization; but the main difficulty is to find a proper way to talk about math, by being clear and interesting without over-simplifying or losing rigor. Authors of autobiographies often face this problem, especially when it comes to engaging their “academic self” in an unusual form of writing. Michael Shortland underlines that it is hard to “release [...] the subjective voice” in a professional field where objectivity and rationality are essential part of the ethos[33, p. 171].

Aside from some exceptions, like Frenkel’s book, it is hard to say that autobiographies and Memoirs are works of popularization as such. Most of the time, they do not try to make the reader understand math. But Yves Jeanneret evokes a definition of science popularization as

[...] a very particular discourse practice, linked to the history of exegesis, whose components are the transcendence of a text, the plurality of reading levels, the elaboration of a second text addressed in a singular communicational situation to a particular reader.[20, p. 20]

The idea of a “second text”, which is close from the tradition of the “second book” written by

ethnographers¹², and the importance given to the “communicational situation” are two aspects that also function to describe autobiographies. As we have already said, these “second texts” (parallel to the academic production) are especially oriented towards a public of non-specialists. Even without explicit popularizing intent, autobiographies remain a part of this process in that they contribute to building the narration of an history and a culture of mathematics.

Moreover, autobiographies can be seen as “original contribution[s] to culture,” an expression used by Jeanneret to evoke the “poetic character” claimed by some works of popularization[20, p. 163]. How could this idea of “poetic character” be pertinent to talk about mathematicians’ autobiographies? Their literary dimension is not about the esthetic quality of their style. Erwin Chargaff would write that “[a scientific autobiography] belongs to a most awkward literary genre,” among other reasons because scientists “lead monotonous and uneventful lives and [...] besides, often do not know how to write”[6, p. 1448]. The “poeticity” is not linked to how beautiful or creative the text is, but rather to the collective and specific ways to shape one’s own life, research, and discovery into a narration. Lejeune says that autobiographies are “language phenomena”[21, p. 10] and “historical facts”[22, p. 23] that merit study not only one in their singularity but also “through series of texts.” This is because they build original images and collective imaginaries both in the broad non-mathematical audience and within the mathematical community.

The role of autobiographies in the building of a narrative culture among the mathematical community is the last form of “culture” I want to evoke in this paper, as a lead for later research. Autobiographies can be marks of a reflexive exercise, in a field where auto-reflexivity is not that frequent. An sociological and ethnographical study of the reception of those texts among mathematicians would be of higher interest to tackle the fact that stories contribute to building communities, be they institutionalized or imagined.

Conclusion

Mathematicians’ autobiographies and Memoirs are likely to transmit a historical culture of math, insofar as they are testimonies of individual life journeys through working communities in specific periods of history. By discovering how Schwartz had to hide from the Nazis, how

12 See [10]:

[...] upon their return from fieldwork, most twentieth-century ethnographers produced, in addition to the expected scholarly monograph, a second book, a book that was often more “literary,” or at least freer in its form and intended for a wider audience than specialized publications.[...] it may also happen that the second book has no direct relationship to the scholarly work: it is neither a refutation, nor a rectification or a supplement, but a mere testimony. In that case, it simply fulfills the elementary need to recount the fieldwork experience or to make use of the elements that the scholarly work left aside. It is just that the (very badly named) ethnographic “encounter” is tremendously richer, more complex, and more multilayered than a scientific event, and it is much more than the reference it will become in the conversations among experts in which ethnographer engages with his peers.[10, pp. ix and xi, Preface to the English Edition]

Frenkel could only continue to study math by leaving the USSR, how Choquet-Bruhat had to manage familial issues during her career, the reader can no longer think of math as purely abstract knowledge: it is a discipline subject to political, historical, and ideological issues.

Mathematicians' Memoirs can also be a way to embody their research and give math a more "human" side. Some authors use strategies to build proximity and identification with the reader. Some create ways to make their research more understandable or relatable. Some, finally (but I cannot elaborate on this particular subject in the present article) insist on the relationships between math and other forms of cultural productions, outlining the imbrication of science and math in the daily and collective human and social life.

They are not always able to achieve their goals, but it seems clear that mathematicians' Memoirs are contributing, in specific ways, to transmitting and creating a culture of mathematics. They are doing so by addressing a public outside the community, by turning research into narration, and by showing themselves, with sincerity or narcissism, as (almost) "normal" people.

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