Lesemaschinen – Reading-Machines

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Abstract: This contribution discusses the performance piece “Lesemaschinen” [Reading Machines] developed by the musician Molly McDolan. The piece is a musical-experimental exploration of Wittgenstein’s questions on reading and understanding he contemplates in the Philosophical Investigations. In §§156-169 Wittgenstein introduces the thought experiment of a reading machine [Lesemaschine] in order to discuss differences between mere mechanical rule following and mental processes of reading and hence forward, of understanding. McDolan has staged this thought experiment as a performance piece and deployed Natascha Gruver as a Lesemaschine to read these respective paragraphs prima vista in three languages: in German, French, and Hungarian while being audio recorded. In a next step McDolan assembled these three recordings into one audio stream, with each layer of reading on top of each other. The audio program Adobe Audition denominates a primary tone from these layers, thus providing a score for the oboist McDolan to play. That way the voice of the oboe is another kind of Lesemaschine as it sets into music the vocal sound of the audio recordings. In the performance McDolan is playing the oboe live while the readings are streamed from a computer. The result is a blurry sound cloud that passes on the task to the listener: what do I hear, what do I understand? The piece creates an astonishing live experience of processes of reading and understanding and is a compelling example of artistic research opening innovative ways of approaching Wittgenstein.

Keywords: Artistic Research, Meaning, Performance, Philosophy of Language, Reading, Translation, Understanding, Wittgenstein

1. Preliminary Remarks – The Problem Of Reading

“Lesemaschinen”, developed by the oboist Molly McDolan, is a musical-experimental exploration as well as an artistic interpretation and translation of Wittgenstein’s thoughts on reading and understanding as
particularly contemplated in the §§156 to 169 of the *Philosophical Investigations*. The piece premiered at the *Festival for Performative Philosophy* in Naumburg, Germany, at the Nietzsche Dokumentationszentrum, in September 2013.

My contribution to the volume *Wittgenstein on/in Translation* sets itself apart from the volume’s general dedication, as it does not deal with the question of how to translate Wittgenstein’s work within a linguistic context. It does not deal with the problem of translating Wittgenstein into another language. Yet this article deals with the topic of translation, but in a different context: the context of artistic research and exploration. My aim is to show that artistic research is able to render results a mere academic or mere theoretical study is not able to accomplish. Following Wittgenstein’s own style of writing, I do not refer much to secondary literature. The primary reference for this article is Wittgenstein’s *Philosophical Investigations*, being aware that this ‘minimalistic’ style does not necessarily comply to what is nowadays expected in academic writing.

In the following, I will discuss the performance piece that derived its name from the respective §157, where Wittgenstein introduces the thought experiment of a reading machine/Lesemaschine in order to clarify the difference between reading as mechanical rule following of uttering letters and reading as a mental act in humans. After some introductory remarks in Section 1 on Wittgenstein’s problem of reading, Section 2 will introduce the performance “Lesemaschinen” in which I was deployed as a Lesemachin and describe my experience as such. Section 3 shows how the performance relates to the problems Wittgenstein is occupied with in the *Philosophical Investigations*. Section 4 discusses a few more conceptual aspects of the performance.

In §157 Wittgenstein introduces the thought experiment of a reading machine and due to its importance I am quoting a large part of this paragraph:

Oliveira, Paulo; Pichler, Alois; Moreno, Arley (guest eds.). Wittgenstein in/on Translation, Coleção CLE, v. 86, 2019, 342p.
157. Consider the following case. Human beings or creatures of some other kind are used by us as reading machines. They are trained for this purpose. The trainer says of some that they can already read, of others that they cannot yet do so. Take the case of a pupil who has so far not taken part in the training: if he is shown a written word he will sometimes produce some sort of sound, and here and there it happens ‘accidentally’ to be roughly right. A third person hears this pupil on such an occasion and says: “He is reading”. But the teacher says: “No, he isn’t reading; that was an accident”. – But let us suppose that this pupil continues to react correctly to further words that are put before him. After a while the teacher says: “Now he can read!” … Which was the first word that he read? This question makes no sense here. … If on the other hand we use “reading” to stand for a certain experience of transition from marks to spoken sounds, then it certainly makes sense to speak of the first word that he really read. He can then say, e.g. “At this word for the first time I had the feeling: ‘now I am reading’.”

Or again, in the different case of a reading-machine which translated marks into sounds, perhaps as a pianola does, it would be possible to say: “The machine read only after such-and-such happened to it – after such-and-such parts had been connected by wires; the first word that it read was …”.

But in the case of the living reading-machine “reading” meant reacting to written signs in such-and-such ways. This concept was therefore quite independent of that of a mental or other mechanism. – Nor can the teacher here say of the pupil: “Perhaps he was already reading when he said that word”. For there is no doubt about what he did. – The change when the pupil began to read was the change in his behavior.”

Note that in this paragraph the question is about reading and not about reading and understanding of what is read. That the act of reading
does not (always) need to correlate to understanding, Wittgenstein states in the preceding paragraph:

156. First I need to remark that I am not counting the understanding of what is read as part of ‘reading’ for purposes of this investigation: reading is here the activity of rendering out loud what is written or printed; and also […] playing from a score and so on.

Wittgenstein is interested in our ordinary word of “reading” and the language-games in which we employ it. Paragraphs 156 and 157 however are part of a larger section of the PI, in which Wittgenstein explores the use and meaning of the words ‘understanding’, ‘knowing’, ‘can’ and ‘to be able to’. He asks for the mental processes and internal states (seelische Vorgänge) that correlate to these cognitive faculties. From §156 onwards he isolates the faculty of reading and asks for its mental states and specific experience (besonderes Erlebnis). This concerns on the one hand the specific internal experience of a reader as she/he reads, on the other hand it concerns the question of how an external observer is able to determine if a reader is really reading, and not just mimicking or uttering sentences learned by hard. As the end of §157 suggests, Wittgenstein concludes that a certain kind of behavior indicates if a reader is really reading or not.

§157 conceives human reading machines, pupils trained to utter a certain sound at the sight of certain signs or letters. In that sense, these pupils are comparable to a machine that is programmed to translate certain marks into sound. This suggests that the act of reading is a mere mechanical process, independent from mental or emotional states; yet, according to Wittgenstein, a certain behavior seems to correlate with reading. Although Wittgenstein meticulously explores the mechanisms of reading, knowing and understanding in the §§156-169 and beyond, he
omits the relationship between reading and understanding. We humans learn to read the alphabet, letter by letter, by uttering a certain sound at the sight of a certain sign, but we do not stop there. As we learn how to read a word (like in elementary school) – this word bears meaning to us. By learning how to read a word we do not just learn how to connect the letters A-P-P-L-E to the word “apple”; we at the same time learn that the word “apple” refers to the object apple. For a mechanic (non-human) reading machine however the letter combination A-P-P-L-E does not bear any meaning and for a machine it makes no difference if it gives of the sound of APPLE or EPLPA. A machine executes instructions mechanically. For a machine the question of meaning does not apply. This seems to be important to keep in mind: the concept of reading does not necessarily entail understanding, but understanding that accompanies reading is an important feature in the act of human reading.

Stuart Shanker (1998) relates Wittgenstein’s thought experiment of the reading machine to Alan Turing’s analysis of calculation in ‘On Computable Numbers’. Turing develops a mechanist thesis on the question if human cognitive processes like thinking, learning, or rule following, can be mechanically explained as processes of computation. Turing’s mechanist framework does not shed light on the internal states or inner senses of a human mind, e.g. if these states are conscious, intentional or not. Shanker suggests that Wittgenstein is relating in the PI to Turing’s computing machines, because reading

can serve as an example of a rule-governed procedure at its most mechanical. [...] But, whereas Turing’s goal was to break calculation down into its elementary psychic units, Wittgenstein was looking to clarify the criteria which license us in speaking of possessing a cognitive ability at its most primitive level. (Shanker 1998, p. 54).
Wittgenstein distinguishes between three dimensions of reading: 1. Causal, as it applies to a machine reading signs; 2. Primitive, as it applies to someone who reads but does not understand a word of what she/he is reading; and 3. Paradigmatic, as it applies to reading and understanding what one is reading.

While Wittgenstein argues that in some situations it is difficult to distinguish between 1 and 2, he also questions if a similar ambiguity exists between the reading dimensions 1 and 3. According to Turing’s continuum picture, stages 1 to 3 lay on a continuum, where “the internal mechanisms guiding the machine’s operations are a simpler version of the internal mechanisms guiding the organism” (Shanker 1998, p. 54). However, this continuum picture (cf. Turing 1936, pp. 117ff) is what Wittgenstein scrutinizes. He responds to this problem by an attempt to clarify the criteria for ‘reading’ in primitive contexts and by trying to identify the basis on which we distinguish between if someone reads, or only seems to read, or reads and understands.

In any case, the relationship between reading, understanding, internal mental states and external observer is intricate and not clearly spelled out by Wittgenstein. It needed to be explored how reading and understanding are linked with each other. If they are separable, then what are the respective inner mental states of the reader, and what does an external observer observe? How is reading detachable from understanding after all?  

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1 A similar question could be raised for meaningful versus meaningless speaking. See Wittgenstein Ms-180a,6r: “Insofern sich das gedankenlose Sprechen vom nicht gedankenlosen durch etwas unterscheidet, was während des Sprechens stattfindet, so ist dies von der Art dessen, was ausdrucksvolles vom ausdruckslosen Sprechen unterscheidet”. [Insofar as thoughtless speaking differs from non-thoughtless by something that takes place during speech, this is of the kind that distinguishes expressive from expressionless speech.]

Oliveira, Paulo; Pichler, Alois; Moreno, Arley (guest eds.). Wittgenstein in/on Translation, Coleção CLE, v. 86, 2019, 342p.
2. The Performance Piece “Lesemaschinen”

To tackle these questions, Molly McDolan staged the thought experiment of the reading machine as a musical performance in the following way: I was given instruction to show up at a sound studio at a given time. The only information I had was that I will be given three texts to read out loudly, each at a length of about 15 minutes and that my reading will be recorded. I did not know what kind of texts I will read nor in which language. There was no preparation or rehearsal whatsoever – it would be a prima vista reading for me. At the sound studio the operator gave me the first text. It turned out it was the paragraphs §§156–169 of the Philosophical Investigations in its original German version. As German is my mother tongue, this task was easy to accomplish and so I read these paragraphs with ease and amusement while being recorded. I did fully understand what I was reading.

After the first recording I was handed the second text: it was the same paragraphs but now in French. Regarding my proficiency in French McDolan knew that I did not speak this language, but that I was able to understand it partially due to my competence in Spanish. When I started to read these paragraphs, I was aware that I didn’t know how to pronounce the French words I was reading. Therefore, my reading was in the first sections rather inhibited and stagnated. But what happened after a couple of minutes of reading? I made a decision about how to pronounce the words I was reading. I knew it wouldn’t be the correct French pronunciation, but in order to read fluidly I felt I had to make a decision of how to pronounce these words, especially for recurring ones like ‘lire’, ‘entendre’ or ‘disciple’.

Once a pronunciation decision was made it became a rule for the rest of the French reading, no matter if this rule was correct in real French or not. Spontaneously and intuitively I had performed Wittgenstein’s con-
cept of rule-making and rule-following. I knew I had made up my own ‘private’ French on the basis of a vague idea of how to pronounce it since I had heard this language before. So I simply mimicked my reading in French, not concerned if pronouncing it correctly or not, and due to my knowledge in Spanish I understood a large part of what I was reading.

After the French reading recording the third text was given to me. It was again the same §§156-169, but this time in Hungarian, a language of which McDolan knew I did not speak nor understand and did not have much contact at all. My first sensation when I looked onto this text was the sight of endless chains of letters. I could not derive any meaning from these strings of letters I now started to read. At this point I realized I had become Wittgenstein’s Lesemaschine: reading one letter after the other, uttering out loud chains of letters I had no clue what they meant. The fact that I could neither understand what I was reading nor derive any (self-made) rules for pronunciation was unsettling. How did this reading sound? It sounded slow and broken in the beginning and developed more fluidity and intonation towards the end as there I tried to fake some speech melody and fluidity when I became aware that I sounded like a robot, like a machine reader indeed. In sum, the entire reading session was about a progression or rather regression from a competent reading and understanding experience (the German reading) to a Lesemaschine experience (the Hungarian reading).

In a next step McDolan assembled these three reading recordings into one audio stream with the three layers of reading on top of each other. The result is a blurry sound cloud of voices. However, the audio program Adobe Audition is able to derive a primary tone from that sound cloud, denominating it as a musical note (e.g. D, C, G). This way the program produces a score for a musician to play (see Fig.1 and Fig. 2 screenshots from Adobe Audition calculating the score).
Figure 1: Lesemaschinen Spectral Analysis Frequency

Figure 2: Lesemaschinen Spectral Analysis Pitch – Score
McDolan plays this score on the oboe and the oboe playing (=reading) the score is thus another kind of reading machine that sets into music the vocal sound of the recorded readings. The oboe’s voice refers to the sound and rhythmic material derived from the readings. That way, the oboe, in itself a voice-like instrument that simulates human voice and the vocal reading recordings enter a dialogue. This transition from vocal sound to musical sound is made possible with the computer program as yet another reading machine – and in fact the only machine involved – that reads the frequencies of the voices and calculates a score from it. Hence the piece’s name is “Lesemaschinen” in plural.

First performed in Naumburg (see above) Molly McDolan played the score live on the oboe while the assembled reading voices were streamed from a computer. The live performance is a polyphonic sound cloud of oboe and voices that passes on the task of reading and understanding to the listener: what do I hear, what do I understand?

The piece brilliantly stages Wittgenstein’s thought experiment because it translates his concept of a reading machine into a sensual, emotional and mental experience for all subjects involved. Thus, the artistic approach creates a live experience of the problems related to Wittgenstein’s reading machine a mere intellectual debate would never be able to render.

3. The Sound of Reading and Understanding

From a musical point of view, it was astonishing that each reading produced a different kind of sound quality as tempo, rhythm, and speech melody varied significantly with the different levels of reading and understanding competences. Thus, Wittgenstein’s suggestion in §157 “…The change when the pupil began to read was the change in his behavior” can be completed with: this behavior shows in a specific sound. In fact,
the entire phrase can be reformulated as “the change when the pupil began to read was the change in how it sounded”.

Instead of asking for a certain behavior, one can ask: “What does reading sound like? How does it sound, when one reads and understands? How does it sound when one is reading without understanding what is read? – The answer is: it produces different sounds; different sounds in terms of speech melody, intonation, flow and rhythm.

From the internal mental perspective of what is going on in the reader while reading it is remarkable to note, that where no understanding is possible, the effort of ‘trying to understand’ is what sets the human mind apart from a machine. A mechanical reading machine does not try to understand nor does it try to fake that it understands what it reads. The features of trying to understand, of faking (of speech melody in my Hungarian reading) and mimicking and self-made rule making (in my French reading) that the live experience of prima vista reading brought about, could serve as an compelling argument against Turing’s mechanist approach. Turing was convinced that a machine could computationally model human cognitive states. He viewed the difference between machine and human as a continuum, from simple to complex. Wittgenstein in contrast, who questioned that continuum picture, was looking for the very mental states, the seelische Vorgänge (cf. PI, § 154) that occur during reading, but do not occur in machines. With the help of the performance “Lesemaschinen” these mental states/seelische Vorgänge can now be identified. In terms of the internal experience of the reader as a “reading machine” they are: the features of trying to understand, of faking and mimicking, of spontaneous rule-making. In terms of behavior the different reading dimensions (1, 2 and 3) bring about different sound qualities, and an external observer or listener is able to hear.
Hence the performance “Lesemaschinen” delivers a genuine and innovative way to address and answer Wittgenstein’s quest of the behavior and *seelische Vorgänge* of a reader when she *really* reads.

The most important feature of McDolan’s Lesemaschinen piece is that it creates a live experience of processes of reading, understanding and meaning creation at three levels and for three agents: the reader, the musician, and the audience – the listeners. The first level was my experience of a competent reader turning into a reading-machine. The second level is the musical reading, the live oboe that is playing the score translating the vocals into musical tones. Here the correlation of letters and context becomes visible as for example the letter G in a score has a different meaning and causes a different reaction for a musician than the letter G in a text. The letter G in a score produces a musical tone; the letter G in a word produces a particular spoken sound. The third level of reading and understanding concerns the listener: What kind of hearing experience is created for the audience listening to this piece? While the oboe’s tones can be clearly perceived as music, or rather, as the listeners are trying to hear it as music, the blurry sound cloud of three layers of languages is overwhelming and forces the listener to derive meaning on his/her own. For example, listeners capable of French would perhaps hear and understand the French snippets; but what about the fake pronunciation? Would the private rules for pronunciation I had made up during the French reading render it unintelligible for those fluent in French? Listeners with mother tongue Hungarian would perhaps understand the Hungarian snippets but perhaps not the others if not fluent in them, and so on. That way the piece creates an individual hearing experience according to the language capacities of each listener.

These various dimensions of reading could also be understood as processes of translation: e.g. when I simultaneously tried to understand the French text while I was reading it; the experience of failed translation.
while reading the Hungarian text; the audio program that translates the recorded readings into a score; the oboe that translates the score into musical sound; and at last the listeners, trying to understand what they hear, trying to translate the sound they hear into what it might mean.

Does this struggle of trying to understand demonstrate how trained, in the Wittgensteinian sense ‘abgerichter’ we are, to look for meaning whenever we read? It might show that reading and hearing and the effort to understand seem to be intrinsically interwoven within the human mind.

4. Further Conceptual Aspects

McDolan understands her performance as a musical demonstration or musical exploration rather than a musical piece. From her practice in historic performance (early music and baroque) she compares the piece to medieval texts, where one finds marginalia and ornamentation, excesses (Ausschweifungen), alongside a text. Due to McDolan, the pieces’ multi-layered polyphony challenges the listener in a similar way as a musician in historic performance practice is challenged: to decide what and where the meaning and importance is in a score: what is marginalia, ornamentation, what is primary text? – This the listener of the Lesemaschine piece has to decide like the musician. When an excess of information is provided – three layers of reading recordings plus oboe at the same time – information and thus meaning is disappearing as the auditory overflow overwhelms the brain. As the listeners get everything at once, the hearing experience is such that one finds herself wrestling with listening (as auditory reading), trying to understand and to differentiate as to what is text/meaning, what marginalia, what musical commentary. As the transition from meaning to music is blurry, listeners have to find their own path through the Lesemaschinen piece.

Oliveira, Paulo; Pichler, Alois; Moreno, Arley (guest eds.). Wittgenstein in/on Translation, Coleção CLE, v. 86, 2019, 342p.
Another analogy that McDolan offers for the piece is that of a graffiti picture, loaded with information, yet open to interpretation as viewers have to decide for themselves what is relevant and what is not. In opposition to medieval marginalia as cross-referential texts is the modern idea of clean and clear, unambiguous texts as a sign of improvement and progress. But by deciding for one interpretation or meaning other amazing possibilities are ruled out. By making a text clean and clear, excesses and meanderings and what they could tell us, get eliminated. In that sense, McDolan’s piece also asks how the form of a text or piece contributes to its meaning creation. It demonstrates how we are cognitively trained (in the Wittgensteinian sense ‘abgerichtet’) to find clean and clear solutions when we read or hear, how we seek to determine non-ambiguous meanings and how unsettling it is for us human readers if this process is disrupted or inapplicable.

Regarding the relationship of hearing and understanding in music, McDolan points out that one cannot hear music if one at the same time tries to understand it. From sound to language it is a one-way street: once a sound has been understood and identified as a word, one can never go back to merely hear it as sound. For example, if listeners only spoke German, they would only hear and understand the German as words and the French and Hungarian as sound. But if one told them, that this word in French or Hungarian means this and that, it will from then on be perceived as a word and not any longer as a mere sound.

Back to textual reading, Wittgenstein asks for the characteristic experience and the mental process (seelischer Vorgang) of reading (e.g. PI, §§ 165-169) and states: “that the letters and words come in a particular way.” We are trained (abgerichtet) to link a certain visual sight of a symbol, e.g. of an “A” to a particular sound. In §168 Wittgenstein describes the act of reading as: “The eye passes, one would like to say, with particular ease, without being held up; and yet it doesn’t skid. And at the same time in-
voluntary speech goes on in the imagination.” §169 is dealing with the feeling of reading: of how it is tangible that a particular letter, e.g. A causes us the utterance of a particular sound, related to that letter A, as if the sight of the letter A provides us the reason why we read that letter. Consequently, the performance Lesemaschine ends with:

§169. – Denn, wenn mich jemand fragt: “Warum liest du so?”, so begründe ich es durch die Buchstaben, welche da stehen. [For if someone asks me “Why do you read such-and-such?” – I justify my reading with the letters which are there.]

5. Conclusion

In its artistic translation of Wittgensteinian thought into a performative framework the piece Lesemaschinen renders insights a purely intellectual analysis of the *Philosophical Investigations* would never be able to provide. As the piece enables a live experience of processes of reading, understanding and meaning creation in the Wittgensteinian sense, it is an ingenious example of artistic research, a growing field that applies alternative ways (sensory, embodied, experimental) of exploration. As a piece of performative philosophy it delivers an innovative approach and

2 For similar examples in Experimental Music see: Alvin Lucier: “I am sitting in a room” (1969), or Anri Sala: “Ravel, Ravel, Unravel”, 55th Venice Biennale (2013). In “I am sitting in a room” Lucier records himself reading a text that starts with the lines “I am sitting in a room...”. He then plays the tape recording back into the room, re-recording it. The new recording is then played back and re-recorded, and this process is repeated over and over again, until words and meaning dissolve into a stream of noise and sound. Anri Sala’s video installation of left-hand piano playing is an exploration of sound spatialization and the silent language of the body. The piece further pushes Sala’s experiments on the relation of space and sound. The work appeals as much to the viewer’s intellect as to his or her body, creating a powerful physical and emotional experience, submerging the viewer in its music.
a valuable contribution to the academic scholarship on Wittgenstein because it helps us to understand as we experience the Wittgensteinian question of what it means, to understand.

References


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