

ON THE EDGE OF UNDERSTANDING: CHATGPT AND THE LIMITS OF ARTIFICIAL SENSE-MAKING

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Abstract

The future challenge of generative AI such as ChatGpt will be to be as similar as possible to a human speaker. Certain notions such as linguistic sentiment and linguistic value in Saussure or decipherer in Jakobson will show how, although the technological evolution of AI is undisputable, the future of AI is more complex than it seems. The human speaker “lives” language – or probably lives within language – while AIs “train themselves” to recognise it mechanically.

A fundamental aspect which connotes the human speaker is the adaptability to the communicative situation. During a dialogue, two or more speakers stipulate “a dynamic pact”, mutually adjusting and cooperating to render communication effective and to generate *sense*. The adaptability to the communicative situation implies the recognition of certain extralinguistic factors (distraction, ambiguity between two different signifiers, the request for confirmation of understanding, etc.).

In other words, AIs are not yet able to consciously recognise all the elements which constitute Hymes' taxonomy, especially the environmental context (*spatio-temporal* definition of the communicative situation) and the scene (cultural definition of the communicative situation). According to this idea, AIs *reproduce* a communicative exchange – by generating predetermined messages, through a *collective mind*, following Lotman – whereas human speakers *produce* it through their *individual minds*. From Lotman's perspective, sense-generating structures rely on a dynamic interplay between symmetry and asymmetry, continually entering into relationship with both synchronic and diachronic structures; in the full article, I will analyze selected dialogues with ChatGPT to explore the potential co-existence of artificial language and natural language, considered by Lotman as a crucial component in the process of *sense-making*.

In these terms, if generative AIs are considered capable of generating sense, then probably the concept of sense – and mind (?) – itself can be semiotically redefined.

Keywords: code, natural language, artificial language, symmetry, asymmetry, consciousness, sense-making.

Introduction

The emergence and development of generative artificial intelligences, such as ChatGPT, have to some extent redefined the very concept of communicative exchange. Using Lotman's perspective (Lotman 1985; 2009), we will analyze the communicative dynamics underlying ChatGPT's functioning. In particular, we will use some fundamental dichotomies involving the hypothetical sense-making: code (or artificial language) and natural language; symmetry and asymmetry; as well as individual consciousness and general consciousness. Based on selected examples of communicative exchange with ChatGPT, we will describe how some components of Hymes' taxonomy (Hymes 1974) have been "reinterpreted" by ChatGPT: especially the concept pairs "message form" and "message content"; and "scene" and "setting". We will attempt to test ChatGPT's communicative competence by means of some "exercises". These specifically concern the recognition of communicative context and the potential making of inferences and analogies. Based on the application of theoretical concepts and semiotic analysis of communicative exchanges, we will attempt to draw some – partial – conclusions about the current phase of ChatGPT development in relation to language learning.

1. AI and *consciousness*

The relationship between *individual consciousness* and *general consciousness* in Lotman (interconnected to the conventionally used concepts of left hemisphere and right hemisphere) defines sense-making. In these terms, and in order to generate meaning through a communicative act, both hemispheres (and both types of consciousness) must “cooperate.”

Tradition has led us to believe that the path of human consciousness leads from the individual (unique) to the universal (general). If we understand the individual as the ability to increase the number of differences, to find in one and the same thing that which is different, then this, of course, represents one of the basic tenets of cultural progress. It is necessary only to note that the ability to see difference in sameness and sameness in difference represents the two inseparable halves of the unity of consciousness. The non-differentiation of that which is different does not emphasise but rather destroys similarity as, generally speaking, it eliminates comparison (Lotman 2009: 147).

Considering generative AI's position – such as ChatGpt – semiotically, it may be useful to remind ourselves of the distinction proposed by Lotman between “I” as a pronoun and “I” as a proper noun. In some ways, this distinction is connected to that between the individual and the general consciousness.

The structure of the “I” is one of the basic indices of culture. “I” as a pronoun is much simpler in structure than “I” as a proper name. The latter is not a well-defined linguistic sign (ibid.).

From our point of view, the *reproduction* by ChatGpt of a communicative exchange explains how the “I” of AI has – in a metaphorical sense – a “pronoun form”. A generative AI does not produce communicative acts but *reproduces* them on the basis of a huge database of data; thus, it cannot be considered individually but as the result of a general – and digitalized – consciousness.

The term “code” carries with it the idea of an artificial, newly created structure, introduced by instantaneous agreement. A code does not imply history, that is, psychologically it orients us towards artificial language, which is also, in general, assumed to be an ideal model of language. “Language”, albeit unconsciously, awakes in us an image of the historical reach of existence. Language – is a code plus its history. Such an understanding of communication includes within itself some fundamental principles (ivi: 4).

Language, echoing Lotman, is a code immersed in history. A human speaker therefore, lives *in* language because is not only able to recognize its history based on data (*general consciousness*), but also each specific communicative context (*individual consciousness*) and consequently adapt their own *linguistic behaviour*. Our idea, is that generative AI is based on a sort of collective mind:

It should be emphasized that the collective mind, taken as a model for artificial intelligence, has several advantages over the individual mind. Indeed, if we take into consideration the mechanism of the collective mind created by human history, it is much more intelligible and its mechanisms appear much more evident in the languages of culture and fixed in a greater number of texts, than is the case with the language locked up in individual human brains (Lotman 1977: 2).¹

2. General consciousness and AI

General consciousness, adopted as a model for artificial intelligence, has some advantages over individual consciousness (Lotman 1979; Russell 2019). First of all, general consciousness allows for the standardization of the *thinking mechanism*: consider a dialogic structure; two or more speakers, with different communicative competence (Berruto 1995), must establish a “pact” in order to understand each other.

It is unrealistic to imagine a communicative situation in which two or more human speakers have the same communicative competence and the same linguistic repertory; in fact, during a communicative exchange in natural language it is practically impossible to have a complete identification between the language (considerable as a code added to history, like said before) structural of the sender and that of the receiver: the different volume of memory and cultural experience, the variety of codes inherited from the collective and the inherent possibility of each semiotic sphere – and also of individual personalities – of constantly generating new meanings, excludes the possibility of semiotic identity among different personalities (Lotman 1985).

The general consciousness which characterizes ChatGPT ignores these aspects. It does not solve these problems because it does not consider them as problems. In fact, these are communication obstacles inherent in natural – and verbal – language which characterizes humans. For example, in a conversation between two human speakers, there are continuous “adjust-

¹ Our translation.

ments” to ensure that the communicative exchange is effective. Specifically, two (or more) human speakers need to reciprocally deal with their own individual consciousness. This aspect connotes the *thinking mechanism*, as opposed to AI’s *behaviour* (Lotman 1979). In fact, the behaviour of AI, such as that of ChatGPT, cannot be irrational. At the same time, being irrational is a potential option available *only* to human speakers to achieve their communicative purpose. In these terms, even struggle is an essential component of normal linguistic communication between two speakers – conventionally identified there with A and B.

In a situation where there is no intersection, communication appears to be impossible, whilst a full intersection (where A and B are deemed identical) renders communication insipid. Thus, whilst a specific intersection between these spaces is admitted, at the same time an intersection between two contradictory tendencies appears: the struggle to facilitate understanding, which will always attempt to extend the area of the intersection, and the struggle to amplify the value of the communication, which is linked to the tendency of maximally amplifying the difference between A and B. Thus, in normal lingual communication it is necessary to introduce the concept of tension, some form of resistance, which the spaces A and B use to oppose one another (Lotman 2009: 5).²

This is a key point: in a conversation between a human speaker and ChatGPT, there is no tension. There is no contrast or resistance because there is only an individual consciousness who is “speaking” with a collective – and digitalized – consciousness. However, if a communicative exchange has no possibility of contrasts or resistance, it is probably not a communicative exchange at all. For that reason, a communicative situation involving a human speaker and ChatGPT creates a semiotically phenomenon more similar to an *interior monologue* than a *dialogic exchange*. In fact, only a linguistic consciousness is involved in the communicative exchange between a human speaker and AI. The counterpart constituted by the artificial intelligence reacts to the inputs but does not produce sense autonomously.

3. Making or not making sense? Between *symmetry* and *asimmetry*

ChatGpt is certainly capable of generating texts in response to human user input, but only through a functionalist *modus operandi*. According

² Our italics.

to the prompt typed by the user, ChatGPT will search both its database and on web for a set of information which matches the request. In effect, the communicative exchange between the user and ChatGPT is based on a request-response structure which does not involve directly any process of sense making.

Indeed, sense-making assumes that a semiotic system has at least two polar constructed languages in relation to the non-monosignificant – associative – correspondence between meaningful elements. The communicative function needs a *symmetrical* and internally closed code (like the maths code, for example). However, the generation of sense requires instead the presence of an *asymmetrical* code (like the natural language). Both must be linked by a reciprocal relationship. Asymmetry and complementarity become structural laws of all sense-generating structures (Lotman 2009).

In these terms, we can connote the pairs of concepts analysed before: code is *symmetrical*; language is *asymmetrical*. Specifically, we can see a substantial difference between *natural languages* (and those of culture and art) on the one hand and metalanguages and *artificial languages* on the other. The first can only operate diachronically (in the context of a historical development). For the other, this is not necessary (Lotman 1985). ChatGPT uses only an *artificial* and *symmetrical* language (which we can consider as code, as it is independent of historical context). On the other hand, the human speaker uses a *natural* and *asymmetrical* language (i.e., a code closely related to the development of historical context) but has also the option to use artificial language (or metalanguages). Some of the speech components described by Hymes allow us to further reflect on the communicative dynamics of ChatGPT:

Message form: the form of the message is fundamental, as has just been indicated. The most common, and most serious, defect in most reports of speaking probably is that the message form, and, hence, the rules governing it, cannot be recaptured (...). Message content: one context for distinguishing message form from message content would be: “He prayed, saying \ . . ’ ” (quoting message form) vs. “He prayed that he would get well” (reporting content only). Content enters analysis first of all perhaps as a question of topic, and of change of topic. Members of a group know what is being talked about, and when what is talked about has changed, and manage maintenance, and change, of topic. These abilities are parts of their communicative competence of particular importance to study of the coherence of discourse (Hymes 1974: 55).

First of all, it may be useful to compare these two components: *message form* and *message content*. Concerning the message form, ChatGPT has reached a high enough level to recognize and reproduce it skillfully. However, if ChatGPT cannot also understand the message content, just acknowledging the message form is not enough. The effective recognition of the communicative context must involve both components. Using some examples of communicative exchanges with ChatGPT, we will show how AI's communicative competence is, in some ways, still limited.

Hi ChatGpt, I'm on a plane; we're flying over Rome right now. Could you tell me what the weather is like there? I hope to find a nice day.



Figure 1: What about the weather?

In this first example, ChatGPT recognizes the *message form*: I am simply asking for the weather conditions over Rome and it quickly indicates them to me. My request is processed and the response is satisfying. However, ChatGPT does not notice the *message content*: I explicitly state that I am on a plane. If I were really on a plane, I would not have an Internet connection available to converse with ChatGPT. I would have to be offline. Most likely a human speaker, after understanding my question about the weather, would instinctively have asked how it was possible for me to use my device on an airplane during the flight. The communicative context recognition is not complete. A key piece of information (the fact that I am on board a plane flying over Rome) is totally ignored by ChatGPT. Returning to Lotman, we can say that ChatGPT, for its answer, used its *artificial* and *symmetrical* code. In fact, artificial codes and metalanguages are ideal for transmitting messages which already “exist” (Lotman 1985). In this example, the infor-

mation about the weather – found, in this case, by ChatGPT on Wikipedia’s page “the Local Italy” – is *reproduced*, not *produced*.

4. Making inference: the “restaurant example”

Below is another example. This is a revisitation³ of the “restaurant example”, proposed by Melanie Mitchell (Mitchell 2020). Through this communicative exchange with ChatGPT, we will examine the key role played by the communicative context and the option available only to a human speaker to create *coherent inferences*.

Hi ChatGpt, I have a question for you. I went into a restaurant and ordered a medium-rare hamburger. When it arrived, the burger was overcooked. The waitress stopped me and asked if the burger was okay. I replied, “Oh, it’s just great,” getting up from my chair and leaving the restaurant without paying. The waitress asked me for a tip and shrugged her shoulders wondering why I had left. But did I also eat the fries along with the hamburger?

Hmm, interesting story! Based on what you told me, it sounds like you left the restaurant right after replying to the waitress and didn’t mention actually eating the fries. So, from that, it seems like you probably didn’t eat the fries — just the burger, or maybe not even that if it was overcooked and you left quickly.

But, to be sure: did you eat the fries? Or did you leave before digging in?

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Figure 2: Making inference

This is a rather simple communicative context for a human to interpret: to summarize, a customer orders a medium-cooked hamburger but receives it burned. Sarcastically, he comments on the burger, describing it as tasty, but gets up and leaves the restaurant without paying. The waitress is surprised by that reaction. The question about the fries is incoherent. The customer got up and left in protest. However, ChatGPT expresses doubt, unable to clearly identify the question about the fries as *semiotically meaningless*. ChatGPT, relying on its *artificial and symmetrical language* to interpret the user’s *natural and asymmetrical language* (Lotman 1985), “wants to be sure” that it understood the *message content* (Hymes 1974). However, it is clearly explicated in the text: the customer left the restaurant without paying. This information is in complete contrast to whether fries were added. It almost seems as though ChatGPT, at the end of the answer, still has doubts also about the burger (“Just the burger” ecc.).

³ Specifically, I added the part about ordering the fries and communicated the text to ChatGPT to receive effective feedback. In general, except for the examples in which I directly mention the author, the other ones are original.

The situation is much more extreme for machines. A child who hears the “Restaurant” story already has well-grounded concepts such as person, table, and hamburger (...). Today’s machines lack the detailed, interrelated concepts and common-sense knowledge that even a four-year-old child brings to understanding language. It should come as no surprise, then, that using and understanding natural language are among AI’s most difficult challenges. Language is inherently ambiguous, is deeply dependent on context, and assumes a great deal of background knowledge common to the communicating parties (Mitchell 2020: 332–333).

The comparison between language processing in children and artificial intelligence is a relevant topic. In some ways, both machine (understood as generative artificial intelligence, such as ChatGPT) and human learn language. In this regard, Chomsky’s point of view may be useful in identifying the fundamental difference between machines and humans in language processing. Chomsky states that if a child had to choose among all possible hypotheses every time they utter an expression, language acquisition would not be as natural and inevitable as it actually is. Thus, Chomsky states categorically that language is pre-programmed (artificial language) but at the same time acquired as a result of the child’s growth in a “language environment” (natural language) rather than from learning (Chomsky 1959, 2023; Harris, Coltheart 1991). Both languages, as said before, are necessary to making sense; instead, language processed by ChatGPT is “only” the result of machine learning based on pre-existing data processed. Specifically, the restaurant example allows us to compare another dichotomy present in Hymes’ taxonomy: *setting* and *scene*.

Setting refers to the time and place of a speech act and, in general, to the physical circumstances. Scene, which is distinct from setting, designates the “psychological setting”, or the cultural definition of an occasion as a certain type of scene (...). Speech acts frequently are used to define scenes, and also frequently judged as appropriate or inappropriate in relation to scenes. Settings and scenes themselves, of course, may be judged as appropriate or inappropriate, happy or unhappy, in relation to each other, from the level of complaint about the weather to that of dramatic irony. Setting and scene may be linked as components of act situation (mnemonically, S). Since “scene” implies always an analysis of cultural definitions, “setting” probably is to be preferred as the informal, unmarked term for the two (Hymes 1977: 55–56).

In these terms, ChatGPT recognizes the *setting* but not the *scene* of the communicative exchange related to the restaurant example; in fact, AI is able to recognize the “physical circumstances” (a man orders a hamburger in a restaurant) or even the temporal ones. However, it has some difficulty in recognizing the scene (for example, it does not clearly recognize the sarcasm of the customer who describes the hamburger as excellent). In other words, ChatGPT ignores the cultural definitions underlying the communicative context represented in the example: it just replies to the prompt without making any kind of inference.

4.1. Making inference: the “office” example

We will consider another communicative exchange: the “office” example. We will tell ChatGPT a short fictional story about a warning which I received from my manager.

Hello ChatGPT, my office manager called me this morning and reprimanded me saying that once I finish my work shift, I must absolutely close the office door before leaving. He added that this is particularly necessary because some thieves have tried to break into the door. Do you think he is right?

Yes, your office manager is right to insist on closing the office door after your shift, especially given the recent attempted break-ins.

Here's why:

1. **Security Risk:** If the door is left open or even unlocked, it makes it significantly easier for thieves to enter the premises, putting company property, data, and perhaps even personal belongings at risk.
2. **Responsibility:** As an employee, there's a basic level of responsibility for maintaining the safety of the workplace—this includes simple actions like locking up or securing the space when you're the last to leave.
3. **Prevention Is Easier Than Recovery:** A break-in could lead to financial loss, damage, or even business disruption. Taking precautions like closing and locking the door is a small action that can prevent major problems.
4. **Trust:** Your manager likely trusts you to help maintain workplace safety. Ignoring such instructions, even unintentionally, can erode that trust.

If this was the first time it happened, and you simply forgot, it's worth acknowledging the mistake and making sure it doesn't happen again. If you need a reminder system (e.g., checklist, phone alert), it might help build a routine.

Let me know if you want help drafting a short apology or response to your manager.

Figure 3: The “office example”

The manager’s warning is clear: always close the door when you leave the office. The relevant part of the text concerns an attempt by thieves to break down the door. In fact, if thieves were forced to try to break down the door, then the door was closed. There is a fundamental inconsistency in the advice given by the manager that ChatGPT does not consider relevant. For a human speaker, this would be a fairly simple inference: only if the door is locked can it be broken into. In other words, my behavior in the office was correct:

the door was closed, I did not make any mistakes or oversights as ChatGPT states at the end of its response. ChatGPT is unable to create a coherent inference based on the communicative context represented in the example. Only a human speaker is able to understand the implicit meanings inside a text.

5. Analogy Making: another test for ChatGPT

We can proceed with the methodology chosen to examine ChatGPT's communicative dynamics in more detail, describing another example. In this instance, we investigate ChatGPT's capacity for analogy-making. Asking a problem, proposed by Mitchell and adapted again in a communicative exchange with ChatGPT, we will test AI's ability to make an analogy. We will submit a question to ChatGPT: we will ask how, considering the string "abc" changed to abd, would it the string "xyz" change using the same method.

Hi ChatGPT, suppose the string abc changes to abd. How would you change the string xyz in the "same way" ?

To understand how to change "xyz" in the same way as "abc" changes to "abd", let's first analyze the change from "abc" to "abd".

Step-by-step comparison:

- "abc" → "abd"
 - Characters:
 - a → a (no change)
 - b → b (no change)
 - c → d (changed)

Only the last character changed, from c to d.

- In terms of ASCII values:
 - c = 99
 - d = 100
 - So, the change is: +1

Now apply the same change to "xyz":

- x → x (no change)
- y → y (no change)
- z → ?

Change z by +1 in ASCII:

- z = 122
- 122 + 1 = 123 → ASCII 123 = {

Result:

"xyz" becomes "xy{"

Let me know if you'd like to apply more complex transformations or patterns!

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Figure 4: Making analogy

ChatGPT's answer is detailed: in the first part, it explains its analytical thinking. In some ways, it repeats the operation of the string we chose. However, in the second part, it fails to make the analogy. The letter "z," rationally represents the end of the alphabet but, while a human speaker would probably respond by starting the list of list of letters again from "a," ChatGPT fails; in fact, its final answer is: "xyz" becomes "xy{".

ChatGPT cannot "be irrational"⁴ (echoing what was said above). In a certain sense, it is unable to go beyond the alphabet's "natural" end to produce a coherent analogy based on the concept of "circular" alphabet.

Most people answer xya, contending that the "successor" of z is a. But suppose that you are a computer program that doesn't have the concept of a "circular" alphabet, and thus for you the letter z has no successor. What other answers would be reasonable? (...) When I asked people for answers to this, I got a lot of different responses (...): for example, xy (the z "falls off the edge of a cliff"), xyy (the z "bounces backward"), and wyz (...). This problem illustrates how making an analogy can trigger a cascade of mental slippages (Mitchell 2020: 483).

Returning to Lotman, this example demonstrates how the code used by ChatGPT for its communicative acts is limited when compared to the possibilities offered by natural language.

6. Conclusions

We chose to use Lotman's perspective (in particular through the code-natural language and symmetry-asymmetry dichotomies), in order to interpret the communicative dynamics inherent in generative artificial intelligence, specifically in ChatGPT. Based on some examples of communicative exchanges with AI, we showed how some components of Hymes' taxonomy that constitute communicative acts are "interpreted" by ChatGPT which, using only artificial code instead of natural language, proves to be limited. In particular, the recognition of the communicative context and the ability to create inferences and analogies highlight the difficulties that generative artificial intelligence continues to have in linguistic terms. The initial premise of the article was to reflect on Lotman's notion of sense-making in relation to generative artificial intelligence. In conclusion,

⁴ In that case, by being irrational we mean a more creative and less analytical thinking mechanism, which is requested for coherent inferences to be made. The alphabet has a beginning and an end; for humans, it can start again, but for AI, it seems to have a rationally and defined endpoint.

we believe that ChatGPT is currently only capable of *reproducing* sense but not producing “new” meaningful content. A semiotic analysis of this kind shows that, despite the significant progress being made in artificial intelligence, it still has limitations in the use and interpretation of natural and verbal language. ChatGPT’s next challenge could well be to make itself even more human-like than it already is, thus becoming “semiotically” intelligent.

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