
Inducing Comprehension and Emotions Through Discourse Multimodality: The Use of Language, Image and Sound

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Abstract: This article aims to highlight the multimodal features which underlie the architecture of meaning, emphasizing that the use of images and sounds in the construction of the text is a powerful tool to help the reader to make sense of any text genre. It is a well-known fact that communication is a complex process due to the fact that it comprises many steps. Since any text is just a proposal for the construction of meaning, the recipient's role is very active, continually pairing their long-term memory with the coded message to cognitively reconstruct the meaning accordingly. Therefore, we claim that since the spoken language has a strong neural basis, which dates back to the first months of life, and the written language is intrinsically related to the visual system, the use of figures of speech (images) and figures of sound (syntactic stylistic devices) trigger both the right and left hemispheres of the brain and cause them to work in harmony, inducing comprehension and emotion. In this sense, the classic style, based on functional and cognitive principles of information structure, is highly recommended for a more generic readership of any kind of text genre, not only literary but also non-literary. In fact, some authors have recently argued that it seems to be easier for readers to make sense of texts when they evoke images and the feeling of sound, a phenomenon called phonesthetics, in which the aesthetic features of individual sounds and sound clusters of words and even structures reverberate in our minds, enhancing the understanding of an idea.

Keywords: Multimodality, Cognition, Comprehension, Emotion, Images (Figure of Speech), Sounds (Figure of Sound)

1. Introduction

That figurative language is highly pervasive in our everyday communication is a well-known fact. We use idiomatic expressions, proverbs, sayings, figures, and tropes on a regular basis since they help us promote the understanding of a concept, of an idea, or even of a point of view easier, faster, and, depending on the context, better. However, we are early taught that figurative language is appropriate only for creative writings, being highly recommended for literary text genres, but not for academic or scientific ones. The reason is that academic and scientific texts must employ language precisely and accurately and, therefore, they must be objective, impersonal, and technical to convey a serious tone. Academic writing should follow a

writing style of prestige, making use of formal language. Some figures of speech, such as metaphor and analogy, are allowed in introductory scientific texts to make reading comprehension easier for novices in the field. This paradigm, however, has been changing for the sake of readability - a writing style that is, at the same time, more interesting and easier to read and understand.

The so-called New Rhetoric [1] is set up on the idea that since the main objective of argumentation is to achieve the greatest adherence of the audience (particular or universal), the communicator has to decide what information and which approaches will work better. According to this theory, the use of the magical nature of language is essential to the art of persuading and convincing, and this "magic" is related to the creation of "presence". Presence refers to the body of ideas

that are agreed upon by a certain audience from which the communicator may decide to stress (lend presence) while disregarding others. As Perelman [1] explains:

Things present, things near to us in space and time, act directly in our sensibility. The orator's endeavors often consist, however, in bringing to mind things that are not immediately present... To make "things future and remote appear as present", that is, to create presence, calls for special efforts of presentation.

But at that time, the authors didn't know how to build the magic of presence, nor did they know why it worked. In this sense, the advent of Cognitive Neuroscience comes in handy to help us understand not only how the brain creates and controls thoughts and language, but also the relationship between the different parts of the brain to process information and acquire knowledge.

We claim that rhetorical resources such as induction of multimodality and the use of sound and image figures configure the way in which we want to present our ideas and argue. As says Coulson [2] about image figure of metaphor, "in fact, metaphoric expressions seem to reflect the way we think and feel about arguments."

Therefore, in this article, we propose that whenever producing any kind of oral or written text, regardless of the text genre - and it includes not only literary but also non-literary genres, such as academic and scientific ones - we should keep in mind that if we are able to successfully access the reader's right hemisphere of the brain through the use of figures of speech and figures of sound, we will accomplish our communication objectives more accurately, effectively and aesthetically as writers and speakers/orators.

2. Text and the Architecture of Meaning

For some time now, both scientists and literary people have discussed the most appropriate styles to publish texts in the academic field. Unlike earlier times, when it was crucial to write in a "serious style" as if the author consistently had to follow a dress code to try to impress his/her peers, nowadays, the important thing seems to be, in addition to clarity and simplicity, to try to adapt the language to what Oakley [3], inspired by the so-called new rhetoric calls presence. He states that:

Certain ideas map onto certain grammatical structures. When one wants to communicate that idea, one uses that grammar. When one uses that grammar, it prompts others to think of that idea. Presence refers not only to linguistic phenomenon but also to more general cognitive operations. Their doctrine of presence presupposes that human beings distinguish figure from ground, a doctrine shared by cognitive linguists.

This has to do with finding the best words and structures to convey your ideas so that communication really takes place. And what is communication? According to the Oxford English Dictionary, communication means "The imparting or exchanging of information by speaking, writing or using other medium. The successful conveying or sharing of ideas

and feelings" [4]. At first glance, it may sound very simple and ordinary since, as social human beings, we are always interacting with other individuals. However, the effective and unambiguous sharing of thoughts, information, knowledge, feelings, you name it, is actually a very complex process.

What does successful communication imply? It implies that the message intended by the sender will be effectively interpreted and understood by the recipient, and it definitely involves much more than simply encoding and decoding the text.

From the sender's perspective, it means that s/he will be able to level not only with the recipient or the audience but also the context or situation and the communication channel at hand. From the recipient's perspective, it means that s/he will have to reconstruct the message first decoding the text, be it verbal, nonverbal or visual, and then attributing meaning to it, based on his/her prior knowledge of the subject, the sender, and the world itself. Therefore, the sender's role is to convey his/her text appropriately so that it can be effectively and accurately understood, whereas the recipient's role is to make sure s/he has interpreted the text correctly, clearing it up when necessary. The result of this reconstruction of the message is called discourse.

At this point, another question emerges: what makes communication so complex? The answer is simple: the way our brain works - even though languages are indeed a complex system, our brains and our minds are far more complex. The interface between text and discourse is not even and the interpretation of any given text involves its multimodal features.

Coming across a sentence such as After a long fast, Cristiano Ronaldo scored for Manchester United against Chelsea, on the newspaper, we would decode it as if the soccer player Cristiano Ronaldo had, in fact, abstained from eating for a long period when he scored his goal. However, within this context, the reader must interpret 'long fast' not as abstaining from eating, but as abstaining from scoring goals.

Actually, a text is just a proposal for the construction of meaning. The listener or reader, whenever faced with a text, continually pairs his/her long-term memory with what s/he hears or reads, and then builds its meaning within his/her minds.

In a situation of face-to-face conversation, in addition to articulated language, the speaker also uses multimodal resources, such as facial expression gestures and intonation. And the listener also pairs these resources with his/her long-term memory. After all, we have already experienced facial expressions of pain, anger, or love before. But gestures can also have a cultural origin. The same hand movement that, in the United States, means 'goodbye', in some parts of Europe, might mean saying 'no'. Even the understanding of multimodality, therefore, is linked, in part at least, to people's past experiences.

3. Building Meaning over the Senses

According to Bergen [5] "When people read sentences,

they construct visually detailed simulations of the objects that are mentioned". If I hear my father saying that he has nailed a nail to the wall, I imagine it in a horizontal position; if I hear my father saying that he has nailed a nail into the floor, I imagine it in a horizontal position. If I hear someone saying that a seagull was soaring overhead, I imagine it above my head, its wings spread, exposing its underside. But, if I hear someone saying that a gull was feeding the chicks, I imagine it on the ground, or in its nest, wings folded.

But there is more. If someone says s/he heard a horn while crossing a street, the listener brings to mind the sound of a horn, according to his/her past experiences. If someone says s/he took a bitter medicine, the person who listens reconstructs the feeling of putting something bitter in his/her mouth. If someone says s/he smelled burning wood, whoever hears it reconstructs that smell in his/her minds. Likewise, if someone says that s/he wrapped a piece of barbed wire around his/her arm, the listener reconstructs the past experience of feeling the pain of the tips of the barbs on his/her skin. The conclusion is that the speaker or writer, when speaking or writing, induces, in a multimodal way, the simulation of the five senses of his/her listener or reader. Let's see now, according to modern neuroscience, how all of this actually happens inside our minds.

4. The Construction of Multimodality Within the Two Hemispheres of the Brain

It is a well-known fact that our brain is divided into two hemispheres. The right hemisphere is responsible for seeing the whole. The left hemisphere is responsible for the vision of the parts [6]. As we know that the whole is not just the sum of the parts, the two hemispheres have to work in a harmonious and balanced way. We don't see paws with hooves, heads with horns, and udders with teats to arrive at the image of a cow. We see it as a whole, through the right hemisphere. It is the left hemisphere that will divide it into what we perceive as its components and, based on that, build a concept of a cow that will enable us to recognize every single cow.

The left hemisphere, more specifically Broca's area, is also responsible for the human language. This makes human beings try to explain everything that the right hemisphere perceives, through words and syntax. In fact, words originate from images produced in the right hemisphere, many of them linked to embodied experiences, and start to be vocally produced in the left hemisphere. Over time, this word-image association fades away and words lose the ability to induce their original image. An interesting example is the word 'immaterial'. According to McGilchrist [7]:

Even words like 'immaterial', 'insubstantial', 'abstract' and 'virtual' refer ultimately to embodied experience. Immaterial comes from the Latin *materia*, meaning 'wood', and even further back, from *mater*, 'mother', in the sense of an origin: the immaterial is that which has no mother.

At the beginning of human history, the left hemisphere's linguistic account of what the right hemisphere saw was given through myths. In Greek mythology, when it rained, Zeus, Cronus' only child who had not been swollen by him, threw on the Earth lightning bolts created by Hephaestus or Vulcan. At the time of the pre-Socratic philosophers, but mainly after the Enlightenment, with the emergence of science, narratives began to be woven from the empirical perception of facts. We have mentioned perception of facts and not facts. It was one thing to create a narrative about biological phenomena before the discovery of the microscope, but another to build a narrative after the discovery of the microscope. In science, therefore, theories are narratives constructed from a "photograph" that was taken by the left hemisphere of the brain based on the reality captured by the right hemisphere at a certain moment in history. When the "photograph" changes, the theory must be changed.

Throughout Western history, intergenerational education was responsible for passing on knowledge about reality only by its parts, through the narratives drawn by the left hemisphere. McGilchrist [6] states: "I believe that nowadays we live no longer in the presence of the world, but rather in a re-presentation of it!"

5. The Hearing and the Brain

Although both hemispheres of the brain process hearing, it is the right hemisphere that processes intonation and voice quality. Endogenetically, the mother's speech is the first experience in a child's life. Until nearly two years of age, children do not understand any of the words they hear, but, socially and emotionally, they process the tonality and rhythm of their mother's voice, associated with the experience of receiving affection and being nurtured. When language appears, it already appears within the niche of this kind of music. Real music! Even when we talk to children, we use a language studded to music, with great variation in pitch, intensity, duration, and timbre which is called nursery language.

The universal character of this fact can be understood by what Mlodinow [8] says: "all languages, whether tonal or atonal, employ similar ascending intonation for questions."

In addition to being responsible for processing the nuances of speech, the right hemisphere of the brain is also responsible for understanding the meaning of words within sentences and for their occasional figurative meaning. When we read a sentence, two tasks are demanded nearly simultaneously: to identify the meaning of the words in their context and to assign them their syntactic function. When someone tells us something like 'Newton was a giant', we have to identify 'Newton' as the physicist who discovered the universal gravitation, identify that he is the syntactic subject of this attributive sentence and that the 'giant' attribute, in that context, means only that he was a 'remarkable scientist'. This is called parsing. According to researches on neuroimaging conducted by McGilchrist [6, 7], someone who

has had a stroke or a tumor in the right hemisphere of the brain will not be able to understand the context. S/He will simply think that Newton was physically a huge person. Still, according to the author, this person will have enormous difficulty in processing the intonation of sentences and in understanding questions, since all of them are distinguished by ascending intonation.

6. How to Make Text Easier and Catching, Using Sounds and Images

Since the dawn of mankind, communication has been key to our survival and life in society. The first form of conventional communication is widely considered to have been visual, through drawings, paintings, and engravings cavemen used to register their religious rituals, their lives, animals, plants, and battles. Due to its ephemeral feature, the emergence of human language has long been a topic of discussion, although it is well-known and accepted that through the oral tradition of storytelling and sharing technology linked to our ability to build artifacts, verbal communication has been paramount to our species survival. More recently, the need to have a more permanent means to register and perpetuate information led to the development of writing systems. Nowadays, with the advent of the Internet and social media, we have been massively exposed to written texts. According to Pinker [9] “More than ever before, the currency of our cultural and social lives is the written word. And no, not all of it is the semiliterate rating of the Internet trolls”, stating that even though internet language makes use of instant-messaging abbreviations like *C U L8TR* and *BTW*, it does not threaten written languages in general. In fact, the poem Katie Jay [10], published in 1867, uses phrases such as:

I wrote 2 U B 4
 He says he loves U 2 X S
 U R virtuous and Y's
 In X L N C U X L
 All others in his i's

It only proves how languages are versatile and allow us to play with them. Some of the changes stay, whereas other changes just fade away.

After all, does style still matter? Absolutely!! Thomas & Turner [11] state that:

To write without a chosen and consistent style is to write without a tacit concept of what writing can do, what its limits are, who its audience is, and what the writer's goals are. In the absence of settled decisions about these things, writing can be torture.

It means that if the writer does not select a conceptual stand to follow, the writing process itself will be a torment simply because everything we do is done in a certain style – in the authors' own words “because style is something inherent in action, and not something added to it” [11]

Therefore, before starting to write, evaluate which style fits your text intentions better: classic, practical, plain, contemplative, romantic. A clearer and sharper interface

between text and discourse is also a matter of the text style chosen to convey your ideas.

According to common sense, readability, which is the result of a writing style that is, at the same time, interesting, easy to read and understand should be restricted to informative texts. It means that newspaper and magazine articles must convey clear and objective information so that they can be easily understood by ordinary readers. The use of figures of speech, such as imagery and metaphors, and syntactic stylistic devices (or figures of sound), such as anaphora and chiasmus, which in fact are rhetorical devices, are considered literary tools, being allowed only in literary genres. On the other hand, other non-literary genres, such as scientific, technical, and legal texts, also following a traditional trend, do not have to put a premium on clarity since their readers are supposed to be experts in the field of knowledge. As a result, these specialized texts are full of jargon, scientific terminology, specific language and constructions, used mainly to impress rather than to inform the audience. Keeping its fidelity to the genre, these texts present high accuracy of content in order to show off the authority of authorship looking forward to impressing these authors' peers.

This scenario, however, has been changing. Nowadays, the new paradigm is based on the belief that any text should present high readability and hold aesthetic features. It does not mean, nevertheless, that we have to go back to the baroque text style. Functional and cognitive principles of information structure underlie this change of paradigm since all and every text should be functionally clear so that it addresses an intelligent but nonspecialist reader. We must avoid what Pinker [9] calls ‘the curse of knowledge’, which is straightly related to the fact that the more experience or knowledge you have on a topic or subject, the less you are aware of the difficulties your reader or listener will go through to grasp it. And that is where the classic style comes into play.

According to Thomas & Tuner [11], the classic style is highly recommended for a more generic readership of any kind of text, be it a scientific article, a blog post, or a novel. Actually, the authors metaphorically compare the classic style to two daily ordinary human experiences: seeing the world and engaging the reader in a conversation. The first is related to the sense of sight, while the latter to the sense of hearing. Inducing discourse multimodality is key not only to make readers understand a text processing preexisting concrete information from the senses and body already stored in their minds but also evoking feelings and emotions. In Pinker's words “The guiding metaphor of classic style is seeing the world. The writer can see something that the reader has not yet noticed, and he orients the reader's gaze so that she can see it for herself. [...] prose is a window onto the world.” [9] It means that the writer has all the steps clearly defined in his mind beforehand, and will lead the reader step by step into the conversation. The reader, on the other hand, is considered competent enough to collaborate on the construction of meaning and should ‘engage in the conversation’ set up by the lines.

In fact, some authors [6, 12, 13] have recently argued that it seems to be easier for readers to make sense of texts when they evoke images and the feeling of sound, a phenomenon called phonesthetics, in which “the best words not only pinpoint an idea better than any alternative but echo it in their sound and articulation.” [9]. According to the author, style is the “effective use of words to engage the human mind” [9], thus, in the next section we will see how the use of images and sounds endorsed by the classic style can enhance comprehension and arouse emotions both in literary and non-literary genres.

7. Images and Sounds

Images and image figures, as we have seen, are processed in the right hemisphere of the brain. Using them, in any text genre, provides greater readability and even enchantment. In his book *The Emperor of all the Maladies*, Siddhartha Mukherjee could have described the surgeons’ approach to fighting cancer simply by saying that they were committed to performing as many surgeries as needed, but instead he wrote: “Surgeons returned to the operating table and cut and cut again, as if caught in a cat-and-mouse game, as cancer was slowly excavated out of the human body piece by piece.” [14].

By using the cat-and-mouse game, the author induces the readers to use the right hemisphere of the brain, causing them to experience the intensity of mutilating surgery in the treatment of cancer. Later on, talking about the beginnings of surgery, he puts into these words: “In the 1870s, when Halsted had left for Europe to learn from the great masters of the art, surgery was a discipline emerging from its adolescence.” [14].

The adolescence metaphor leads the reader to understand the medical conduct of surgery as something alive, anthropomorphic, accessing the frame of a child’s development. Afterward, when Mukherjee wants to describe the replacement of the breast cancer treatment paradigm, which was that of radical surgery defended by Halsted, with the conservative treatment, due to advances in chemotherapy, rather than literally saying that doctors were no longer accepting Halsted’s conduct, he writes: “But by the mid – 1960s, with Halsted’s theory teetering uneasily on its pedestal, mammography reentered X-ray clinics in America, championed by pioneering radiographers such as Robert Egan in Houston.” [14].

Halsted’s theory metaphor, as a sort of statue dangling from a pedestal, leads the reader to imagine the bust of the great American surgeon on top of it, within the concept of the primary metaphor - UP IS GOOD; DOWN IS BAD.

In addition to figures of speech, figures of sound are also linked to the right hemisphere of the brain, relying primarily on the repetition of sounds of a word or phrase, as we have previously seen.

Pinker, early in his book *Sense of Style* [9], gives a glowing analysis of the beginning of the book *Unweaving the Rainbow* by the British biologist Richard Dawkins:

We are going to die, and that makes us the lucky ones. Most people are never going to die because they are never

going to be born. The potential people who could have been here in my place but who will in fact never see the light of day outnumber the sand grains of Arabia.

Says Pinker:

The reader of *Unweaving the Rainbow* opens the book and is walloped with a reminder of the most dreadful fact we know and on its heels a paradoxical elaboration. We’re lucky because we’ll die? Who wouldn’t want to find out how this mystery will be solved? The starkness of the paradox is reinforced by the diction and meter: short, simple words, a stressed monosyllable followed by six iambic feet. [9]

And the author goes on:

Most people are never going to die. The resolution to the paradox—that a bad thing, dying, implies a good thing, having lived—is explained with parallel constructions: never going to die ... never going to be born. The next sentence restates the contrast, also in parallel language, but avoids the tedium of repeating words yet again by juxtaposing familiar idioms that have the same rhythm: been here in my place ... see the light of day. [9]

Pinker tells us about the meter, the rhythm, the repetition of equal syntactic structures (parallel structure) which is called isocolon. Dawkins uses the stylistic of repetition.

In order not to go too far in this paper, let’s cognitively work just on the foundation of this feature. Repetition has been part of our lives since we are born. Most of our learning is done by repetition. Whether learning multiplication tables, learning to play a musical instrument, learning to play a sport. Science itself is done by repetition. As Friesen says: “Whenever the mind notices that certain elements repeatedly occur together, then this set of connections becomes accepted as truth. This definition of truth forms the basis for both common sense and science.” [15] It is for this reason that, involuntarily, we find trustworthy proverbs that repeat the end of a word. The proverb ‘Who steals an egg steals an ox’ in English has lower “credibility” than in French, language from which it was translated, since in its original version, ‘*Qui vole un oeuf vole un boeuf*’, ‘*oeuf*’ rhymes with ‘*boeuf*’, which doesn’t happen between ‘egg’ and ‘ox’. Repetition also brings symmetry that, according to McGilchrist [7], is part of the universe itself.

Repetition brings us cognitive comfort. And, consequently, it can also be used to manipulate people. As everything we learn in this world comes to us by repetition, we unconsciously believe that everything that is repeated is true.

Metric, rhyme, and figures of sound are based on the repetition of sounds, rhythm, words, and syntactic structures, such as isocolon.

According to Forsyth [16], one of the most famous repetition figures is the answer that the literary character 007 gives to those who ask him his name in the novels and films: ‘Bond, James Bond’. This figure of sound is called diacope. A classic example of stylistic repetition – which also includes isocolon – is the following excerpt from the speech of the American suffragist Susan B. Anthony, in 1872, after being fined one hundred dollars for having illegally voted for an American presidential election:

It was we, the people, not we, the white male citizens, nor yet we, the male citizens; but we, the whole people, who formed this Union. And we formed it, not to give the blessings or liberty, but to secure them; not to the half of ourselves and the half of our posterity, but to the whole people—women as well as men. And it is downright mockery to talk to women of their enjoyment of the blessings of liberty while they are denied the use of the only means of securing them provided by this democratic-republican government—the ballot. [15]

Ah! Susan B. Anthony never paid the one hundred dollar fine.

8. Conclusion

All these features, both the figures of speech and the figures of sound (syntactic stylistic devices), trigger the right hemisphere of the brain, making the left hemisphere work in harmony with the right, inducing reason and emotion. For this reason, any text, whether merely informative or scientific, can benefit from these procedures. We live in a moment, based on cognitive science, in which it is necessary to break paradigms in favor of more efficient intergenerational education—education for the 21st century knowledge society.

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