Perception and Interpretation of Emoji in the Pedagogical Process: Aposterior Features of Artificial Digital Language

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Abstract: This study is experimental. The investigation is based on data collected from an experiment that was conducted involving participants in the educational process. The essence of the experiment is to test the artificial digital language of emoji in the learning process from the standpoint of both teachers and students in the field of education. But the experiment was augmented by representatives of other professions (programmers, economists, artists, writers), which helped to expand the object of the study, extrapolating the findings of the experiment on different areas of activity surveyed. The results were obtained for the following categories of respondents: age, profession, knowledge of foreign languages. Experimental data helped revealed the following issues: 1) artificial emoji language reproduces polylaterality in structure (elements of sign generation) and semantics (multi-vector perception and interpretation of the sign). This explains the scale of differentiation of emoji characters; 2) the polylateral perception and interpretation of emoji depends on the speaker, which in study was classified according to the above categories. It was concluded that the perception and interpretation of the emoji sign depends on all the highlighted categories with an advantage to the professional activity of the speaker and their experience in a particular profession. The concept of a priori and a posteriori of artificial languages was also revealed for the purpose of the research. Language of emoji we categorize as an apriori-posteriori since by form and meaning digital emoji signs display features of both types: the shape of the components of the emoji sign refer to other semiotic systems (such as cuneiform or Morse code); in terms of content, the emoji sign in digital communication can be interpreted depending on individual verbal skills, which, in turn, was considered through the prism of frame semantics (P-semantics) of Charles Fillmore. The experiment results demarcated perceptual characteristics and interpretation of digital emoji signs by respondents depending on the nature of their professional activity. Thus, it was concluded that representatives of the humanities and social sciences (both in service teachers and applicants for the pedagogical profession) and representatives of sciences (economists, programmers) have antithetical properties of perception and interpretation of emoji in digital communication. This coincides with the concept of mental frames embedded in the thinking structure of each individual. The prospects of this research consist of bringing other educational professionals into the experiment, as well as non-teaching professionals to determine the deductive hypothesis of the role, function and influence of digital language of emoji on teachers and non-teachers. The latter will make it possible to identify the advantages and disadvantages of digitalization of society both in the educational process and outside its framework.

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1 INTRODUCTION

Modern specialists in the field of computational linguistics (Anber and Jameel, 2020; Annamalai and Abdul Salam, 2017; Brody and Caldwell, 2019; Chichón and Jiménez, 2020; Schmidt et al., 2021),

test the idea that emoji is now a promising means of pedagogical communication. Evans (Evans, 2015) emphasizes that emoji have enormous potential in transferring meaning of the phrase and its shades of emotions (Piperski, 2020). In the conditions of modern globalization and digitization, which the philological sciences have not escaped, the use of visual elements in messages has become the norm. The approach has changed to interpret many of the problems of text linguistics. Recently, researchers have begun to actively study ways of transmitting and perceiving information using semiotically complex or creolized text. By *semiotically complicated text* we mean a non-linear (palindrome in form and perception) text, the content of which can be transmitted by one or more optical signs. This creation of the text refers us to pictographic and hieroglyphic writing, which is characterized by an emphasis on visual reading of the content.

However, it should be noted that the digitalization of the traditional text with the help of ICT reveals a new communicative barrier – the problem of sign interpretation. In our article (Makhachashvili et al., 2020) the technology of visualization of the text of fiction (poetry) with the help of emoji symbols on the Emoji-Maker platform was presented. During the research we came to the conclusion that such an emoji ICT experiment activates students' thinking, develops creative attention, gives an opportunity to concisely reproduce the meanings of poetry (Makhachashvili et al., 2020). However, at the same time, the above-mentioned problem of sign interpretation was revealed, since the mental frames of a person, which depend directly on the genetic structure of thinking, take part in the generation of an optical sign. This, in turn, leads to the fact that not only the perception of the sign will have differences, but also the basis of its generation (geometric shape, color, emotion, association). Makhachashvili and Bakhtina (Makhachashvili and Bakhtina, 2019) consider this problem through the prism of L. Wittgenstein's hypothesis about individual language ("Sprachspiel"): "Note that the human brain copies the structure of only one language (genetic), despite the possession of two or more people. foreign languages. Therefore, if the dialogue takes place between people in one language, it does not mean that they reflect the structure of the symbolic system of dialogue. Genetically (mentally – in L. Wittgenstein) they structure and, accordingly, perceive and interpret the text differently. And this distinction occurs due to the neural network formed in the structure of genetic language in the human brain" (Makhachashvili and Bakhtina, 2019).

Since this digital technology is of great interest in the field of philological communication today, we believe that the further development of text visualization technology will contribute to the effective study of fiction by students of philology. However, in our opinion, it is worth paying more attention to the problem of interpretation of the sign, because in the global sense, the level of understanding between humanity depends on it. Therefore, appealing in the article (Makhachashvili et al., 2020) to the experiment with students generating optical text on the material of fiction (Fane, 2017), the team conducted another experiment. Its purpose is identifying features of posteriori construction of an artificial sign in digital communication, dependent on perception of both students and teachers.

The objective of the paper. Systematic analysis of the empirical method in the study of interpretation of the optical emoji sign during its generation and perception, which will trace the semiotic transformation in the analysis of transgression of signs from natural languages into digital artificial (a posteriori) ones, in particular emoji. Determining the pedagogical perception of the optical sign is made possible by the fact that the experiment involved not only teachers and students of philology, but also representatives of various fields: historians, economists, programmers, mathematicians and others, which allows to compare perceptions and interpretations of artificial emoji.

First of all, let us define what is meant by the aposteriori nature of artificial languages. We use this definition through the work "Construction of languages: from Esperanto to Dothraki" (Piperski, 2020), in which the author explains the difference between a priori and a posteriori artificial languages: "Most early artificial languages were created by philosophers and had an a priori nature; this means that they were not based on existing languages, but were created on arbitrary principles... Beginning in the XIX century, artificial languages were usually a posteriori, i.e. to some extent created in existing languages..." (Piperski, 2020). However, note that we refer the emoji language to some extent to apriori-posteriori type because that language is originated in the computer being (hereinafter – CB) – a complex, multidimensional field of synthesis of reality of human experience and activity mediated by digital and information technologies; technogenic reality, a component of the technosphere of existence (Makhachashvili, 2013). Thus, like a priori languages, emoji is classified as a logical language (loglang) – a programming language. This dual nature is prompted by the fact that emoji was first created by a Japanese designer Shigetaka Kurita (Negishi, 2014), who became the first 176 charac-

ters for Japanese users of the i-mode mobile platform. The pictures he created (12x12 pixels) correlated with the lives of the inhabitants of the city of the founder (Gifu Prefecture, Japan), reproducing the most common discourses of real communication. Therefore, taking as a basis the idea of manga – one of the forms of Japanese art, Kurita reproduced pictographically elements of Japanese culture, and the phonetic coincidence of the word emoji is accidental. Already in Unicode Consortsium emoji received the meaning of emotional characteristics.

In our study (Makhachashvili et al., 2020) the role of the reader-interpreter is emphasized, which allowed us to conclude the following: recipient (reader-interpreter), using specific technological tools, a visual iconic sign (smile) reproduces the polylateral metalinguistic functionality of the meaning of the sign on the basis of the artistic word (Makhachashvili et al., 2020). The results, on the one hand, complicating the structure of semiotic field of artificial sign, on the other hand – expanding mental frames of human thought, explicates the emoji sign as universal rather than local or mental (the latter, in turn, is confirmed that, once adopted by the Unicode Consortsium, emoji transgressed into the international language of characters, the creation of which has become purely digital). Versatility and digital conditionality of emoji provides multi-vector semantic load of the sign. Addressing this issue, Makhachashvili and Bakhtina (Makhachashvili and Bakhtina, 2019) introduced the linguistic concept of "polylateralism" – (from the ancient Greek πολύ – many; from the Latin latus – side) – a category that reflects in the digital emoji sign versatile, multi-vector reproduction of emotions through logical-structural, lexical-grammatical, morphological, etc. means (Makhachashvili and Bakhtina, 2019).

So, appealing to the logic (a priori) and a posteriori of the artificial digital emoji language, and based on research on this topic, we propose the rundown of the pedagogical experiment. We aim to trace how emoji is used in the learning process through digital communication, what criteria are used by educators and learners when constructing an artificial sign, which plays a special role in the interpretation of a particular emoji.

2 RESEARCH METHODOLOGY

To solve the delineated tasks, the following methods were used: analytical review – for the study and analysis of scientific and methodological literature, curricula, generalization of information to determine the theoretical and methodological foundations of the

study; pedagogical modeling – for the study of pedagogical objects through the modeling of procedural, structural and substantive and conceptual characteristics and individual "aspects" of the educational process. Empirical method – in order to study the phenomenon through experiment and rational processing of the obtained data. Structural method – in order to identify and analyze structural elements, individual components, categories, etc., which form the emoji-sign. The method of component analysis – in order to identify the minimum semantic (semantic) elements that form the semantic component of the sign. Semiotic method – in order to study the sign from the standpoint of its organization, the properties of its elements and categories. Descriptive method – in order to describe in detail, the language units in the inventory and systematization. Dialectical method as a way to find a theoretical construction of the linguistic picture of the world, the study of the true criteria for the coexistence of language and the world, language and man, language and machine. Logical-analytical methods, namely the method of induction and deduction, which allows to consider the content of the object, specifying and generalizing its concept; the method of formalization as the study of an object by reflecting their structure in symbolic form.

3 RESEARCH RESULTS

In order to identify differentiation in the interpretation of emoji, we conducted an experiment involving 110 respondents aged 10 to 70 years (figure 1). Such a large-scale coverage of the age category allowed to fundamentally reflect the picture of the world and digital literacy of mentally different representatives, and also allowed to distinguish groups of people whose linguistic pattern differs significantly from respondents of other age categories. All this is directly reproduced in the interpretation of the optical digital sign. Thus, the results of the experiment show that emoji is used more by respondents whose age range is from 10 to 20 years, and to a lesser extent – from 40 years (figure 2). Accordingly, such results explain the verbal skills of the recipients, depending on the professional and mental qualities, which will be discussed later.

Since the experiment was conducted in order to identify functioning of digital emoji language in the pedagogical process, divided into various narrow fields, the part was taken by representatives of the following professions: philology (educators (lecturers, teachers) and students). However, the validity of the experimental field increases due to the participation
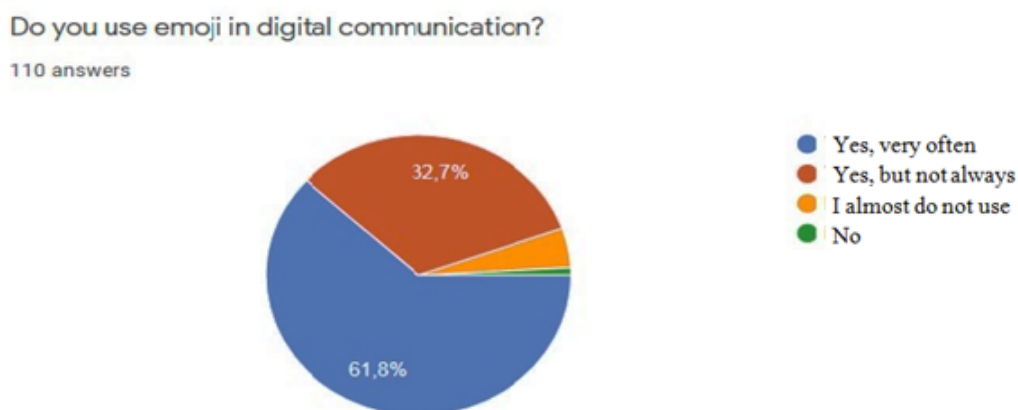
Do you use emoji in digital communication?

110 answers

Figure 1: Frequency of emoji usage in digital communication.
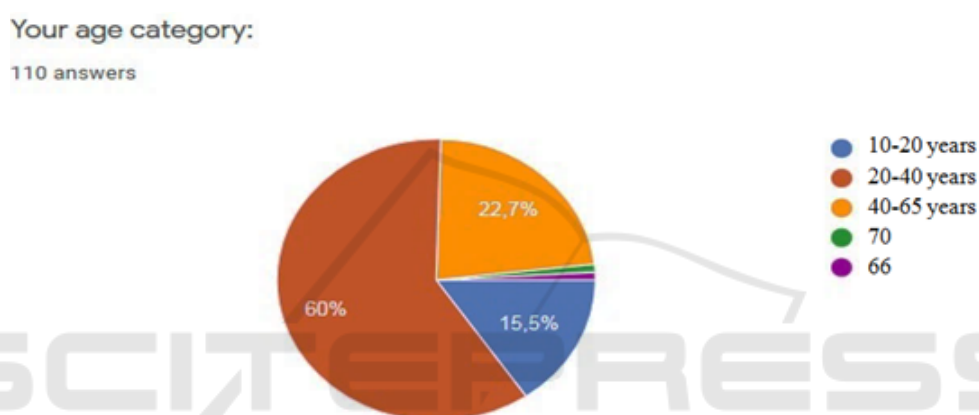
Your age category:

110 answers

Figure 2: Age brackets for emoji users in digital communication.

in the experiment of representatives of the following fields: history, IT, mathematical modeling, publishing, choreography, psychology, economics, diplomacy, archeology, IT, fine arts. The status of the respondent varies from student to habilitated doctor. The wide scale of profile differentiation fractalizes semantic shifts in the interpretation of a sign in more detail. This is characterized, in addition, by the choice of social network, where the respondent uses emoji (figure 3). We can see that most age groups of recipients use Facebook, Instagram, Twitter. However, the age group of up to 20 years tests artificial languages on other platforms (Tik-Tok, Discord, Tumblr), which is also reflected in the verbal skills of the recipients. In terms of professional affiliation, Facebook is more used by the teaching staff of various universities (59.1% of respondents); Instagram – by students of different universities – 67.3%, other social networks – by the lowest percentage of respondents, which is fractalized to all categories of respondents.

Another important characteristic of differentiation and fractalization of answers is mastery of foreign languages. Among the respondents were experts in

the following languages: Russian (99%), English (98%), Spanish (74%), Italian (49%), French (49%), German (23%), Chinese (4%), Japanese (2%), Korean (1%), Czech (1%), Polish (1%), Georgian (1%), Armenian (1%), Hebrew (1%), Turkish (1%). Therefore, the results concluded that the use of emoji in digital communication (both in everyday life and in the professional sphere) is more pertinent to recipients with knowledge of two or more foreign languages (table 1). However, the interpretation of a particular sign varies and depends on a particular foreign language (and / or on professional skills). Emoji is a typical visual complement to the content of text / speech in digital communication for experts in Oriental languages, including Mandarin Chinese, Japanese and Korean, which, in turn, refers us to the mental frames of Oriental language structures. Fillmore (Fillmore, 1985) classifies frames as P-semantics, which operates with the concept of interpretive description of the semantics of tokens, grammatical categories and text. Such semantics includes three components: compositional semantics (frame structure of the text), practical reasoning based on the use of frame knowl-

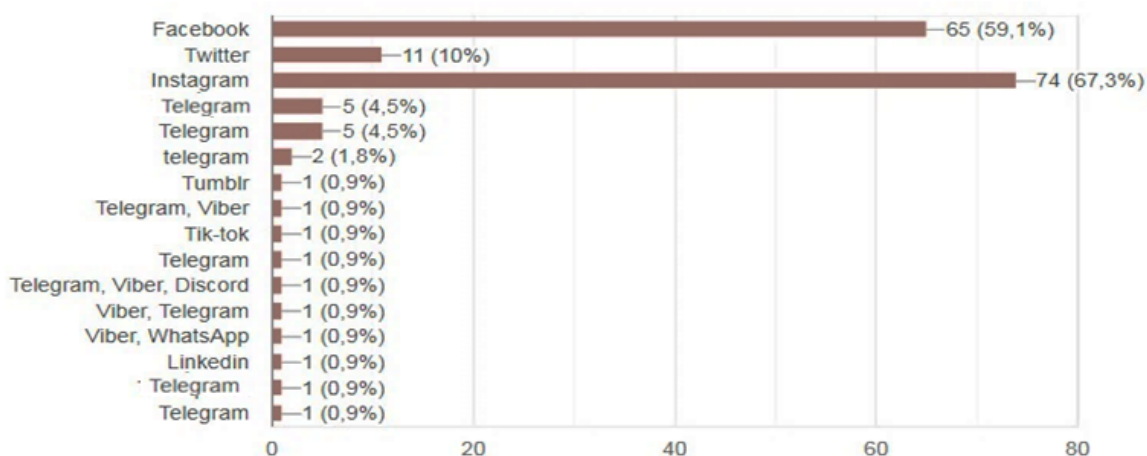## What social networks do you use most often?

110 answers

Figure 3: Choice of social network, where the respondent uses emoji.

edge (knowledge of reality) and provides identification of implicit semantic connections between utterances in the text; reasoning based on knowledge of communicative intentions represented in frame form. In the situation of reasoning, natural-linguistic inference is considered as a set of operations on the elements of frames (Fillmore, 1985). Reliance on the frame structure also applies to experts in the Spanish language (74%). However, it's worth noting that in Hispanic communication emoji has emotional presupposition: Spanish language professionals a priori interpreted emoji of a psycho-emotional meaning, mostly adiaphorizing rational structure components of the sign. The positive attitude and use of emoji is also observed in the professional specifics, in particular, artists who, unlike experts in Romance languages, appeal to real causal (implicit and semantic) connections both between utterances in digital communication (emoji) and between components of one sign.

The most unexpected among the results of the survey were the responses of computer science specialists, whose attitude to emoji was twofold. However, we can assume that experts in the field of IT completely include emoji in the loglan, which apriori cannot have an emotional substrate. Computer science specialists, in turn, perceive not so much a language as its matrix. Under such conditions, the logical indicator is that the most extensive use of emoji is in the humanities (philologists, historians, philosophers), the specifics of whose profession refers to information as a tool of influence, which is directly inferred from the emotional substrate. To a lesser extent, emoji is used by the exact sciences specialists,

Table 1: Distribution of native languages spoken by emoji users.

What languages do you speak?	% of respondents
Ukrainian	100%
Russian	99%
English	98%
Spanish	74%
Italian	49%
French	49%
German	23%
Chinese	4%
Japanese	2%
Korean	1%
Czech	1%
Polish	1%
Georgian	1%
Armenian	1%
Hebrew	1%
Turkish	1%

the results of whose activity are represented by numerical data. The smallest percentage – computer science specialists, where the result is a matrix. The same effectiveness, as in the above case, applied to the interpretation of the concept of emoji (table 2). Artists and / or Oriental and Romance languages professionals emphasized the iconicity / ideography of the sign in digital communication, the graphic visualization of which is independent of the narrative form, but performs the contractual function of an auxiliary non-verbal explicant. Specialists in the humanities focused on the emotional characteristics of the sign, which is designed to enhance the effect of the com-

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municative act in digital medium.

We mentioned above the verbal skills of the recipients, which, like the previous features, depend on age, professional activity and knowledge of foreign languages. In order to trace the differentiation of the perception and interpretation of the emoji sign, 10 most used emoji in different operation systems and digital platforms were added to the survey in order to trace how the respondent understood each sign. In addition to the characteristic of popularity, the dual or polylateral nature of the sign was an important factor in choosing emoji for the experiment, which hypothetically refers to the conclusion about the differentiation of the perception of signs by each recipient. Thus, the sign #1 (figure 4) for 99% of respondents is interpreted unambiguously, with deviations of the semantic load in 1%: ok, good, cool, great, well done, good job, very good, super, perfectly etc. However, from recipients aged 10 to 20 we have answers that reflect age-related deviations in perception, for example, "I like it (smiley is not very much, my grandmother throws me and teenagers use for this ☺)"

Figure 4: Emoji sign #1.

A similar perception applies to the sign #2 (figure 5), the interpretation of which is 100% synthesized with a negative connotation and explicated within one semantic field. However, given the scale to differentiate the characteristics of respondents, the verbal definitions of the sign can be traced to the structure of the linguistic ousia of answers, hypothetically deducing the nature of the category / profession / status / experience of a particular answer (table 3).

Figure 5: Emoji sign #2.

The sign #3 (figure 6) in digital communication embodies the polylateral structure of perception and interpretation. The answers to this sign are radically different (table 4).
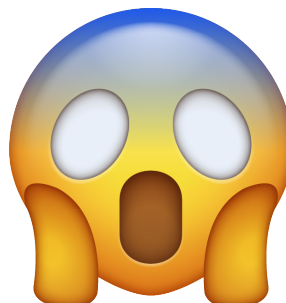
Figure 6: Emoji sign #3.

Perception and interpretation of the sign varies within the concepts of "horror", "shock", "fear", "surprise". Accordingly, it will be appropriate to emphasize the characteristics of the recipient to trace the frame structure of speech and verbal skills of respondents. Thus, the sign #3 is interpreted and perceived as horror in the category of 20 to 40 years (60%), shock – from 10 to 20 years (15.5%), fear – from 40 to 65 years (22.7%), as well as 66 years (1%) and 70 years (1%), surprise – from 40 to 65 years (22.7%). According to professional characteristics, the answers are fractalized into all categories evenly.

The situation with the sign #4 is more unambiguous (figure 7). However, it should be noted that the age categories 10 to 20 and 20 to 40 years in most cases interpreted the sign in terms of CB exclusively, emphasizing the digital continuum, in contrast to other categories that described the sign purely emotionally in the real ontological dimension (table 5).

Figure 7: Emoji sign #4.

The sign #5 (figure 8) expresses an error in interpretation and perception of 2%. Among the most typical – "sadness", "tears", "sadness", "fiasco", "pain". The sarcastic connotation of the use of the sign in digital communication (age category from 40 to 65 in the humanities) (table 6) has to be emphasized, as well as despair, depression, fatigue (age category 10 to 20

Table 2: Interpretation of the concept of emoji by respondents.

How do you understand what emoji is?	
Emoticons	Facial expressions in social networks
Emoticons	A kind of graphic language
Emoticon	Mood display
Smileys	Face sticker to emphasize or express your emotions in the message
Expressing emotions with pictures	The language of various graphic signs
Small pictures used to indicate emotions	A picture that reproduces feelings, understandable to both the recipient and the author of the statement
Signs	A graphic sign, an illustration that conveys a certain concept, is used when communicating online
A symbol for conveying the emotional side of communication	Psychological state that reflects the instantaneous reaction to external factors
Graphic symbol for emotions and states	Coloring of the written text and accessible expression of emotions
A picture depicting a certain emotion	Emotions that help to convey more clearly our emotions, state, attitude to the situation, feelings, and sometimes due to emotions you cannot even write a text.
Emoticons designed to facilitate communication and convey different states / emotions	Mini drawings to indicate emotions, objects through which it is possible to convey information
Expression of emotions with the help of visual images	Use of digital symbols to demonstrate emotions, feelings, personal reaction to messages, photos in online communication
A picture that helps you show your own emotions in text messages	Auxiliary ideographic record

Table 3: Generalized definitions of Emoji sign #2.

What does the following emoji mean to you?	In what context could you use it?
Surprise	Means surprise, used as a reaction to a message, be it a photo, video or news
Shock	When I realized that 1 course had already ended
Oh really!	You can go crazy, but really
Wow	Surprise. Hidden irony (rare)
To indicate surprise / astonishment, but mostly with a positive connotation	Incredible!
Surprise, admiration	Surprise from the written (description of actions in the message)
Horror! Shock! What is happening!	Surprise from the situation or from the words spoken

Table 4: Generalized definitions of Emoji sign #3.

What does the following emoji mean to you?	In what context could you use it?
What a horror!	Omg! Strong surprise with hints of feelings for the interlocutor
Stupefaction	Horror; surprise in a negative context
Cannot be	Madre mia! in a bad way
"Horror" – wrote a work on one topic, and it was necessary on another))	Drip! It is too much! I'm shocked!
Horror! / Reaction to something very unpleasant	Oh my God!
To indicate surprise / shock, but not only with a positive connotation. Sometimes as a synonym for the expression "Oh, only!"	Reaction to unexpected news, surprise
Oh no! What?	Something fascinating
People are good, the house is white	Surprise. Negative or jokingly negative context.

Table 5: Generalized definitions of Emoji sign #4.

What does the following emoji mean to you?	In what context could you use it?
Love	I really like it, I support it very much, thank you very much
I like something	I like you
I love you!	Support, admiration
Wonderful	"Magical!" (positive warm attitude, especially to something sweet, sweet)
"With love" – especially a warm relationship, thank you	What I see is beautiful
Fascination with news / comments from a close person / child / friend	When I saw the puppy
See something cute, beautiful	Friendship compassion
Fascination with news / comments from a close person / child / friend	It has many meanings: it conveys pleasant amazement, joy, admiration for beauty, love

years – students) – with appropriate explanation by the recipients of their interpretation and perception: term finals at the university).

Figure 8: Emoji sign #5.

The sign #6 (figure 9) is identically interpreted and perceived by the respondents, but there is a differentiation in the verbal reproduction of the sign. Thus, respondents with an age category ranging from 10 to 20 years, as well as specialists in Germanic languages have the signification "*kiss*"; from 20 to 40 years (respondents of the humanities) – "*flirtation*", "*love*", and respondents of exact sciences – "*Air kiss*", "*I kiss and love*". "*You are very dear to me*". Respondents between the ages of 40 and 65 provide a more detailed lexical field, giving the signifier an explicit character: "*You are my good, thank you. A sign of support, gratitude, approval, support*". The results showed that such an explication would be more typical for teachers with sufficient experience in educational institutions, mainly in the humanities. It is noteworthy that IT professionals do not visually perceive the sign for two reasons: 1) this symbol can be used only with the close social circle; 2) visually do not like the symbol. This perception once again concludes the structure of thinking of specialists in the exact sciences, the result of which is a number / calculation / matrix.

An ambiguous picture is observed with the sign #7
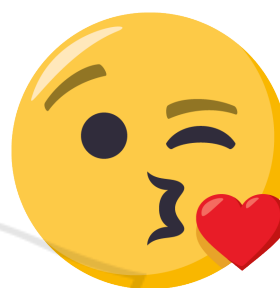
Figure 9: Emoji sign #6.

in digital communication (figure 10), because according to previous experimental empirical data, it was stated that the sign has a latent negative connotation. In order to confirm or refute the station, the mentioned sign was placed in the questionnaire. The results showed a proportion of 60/40: 60% of respondents, whose age category is mainly from 20 to 40 (23%) and from 40 to 65 (37%), perceive and interpret the sign, emphasizing the neutral and / or positive connotation that explains approval of something ("okay", "good", "super", "yes" etc.). However, 40% of respondents (mostly humanities students – age group 10 to 20 years, as well as representatives of creative professions – artists, writers) see in the sign a negative connotation, which is characterized by several expressions: either sarcasm, or contempt for the interlocutor, or attempt to maintain one's opinion (table 7).

It was experimentally interesting for the authors of the study to trace the emotional characteristics of the sign #8 (figure 11).

Undoubtedly, the sign is an identifier of the global civilizational phenomenon of modernity, which led to the global pandemic – the coronavirus in COVID-19. Specified sign, in fact, with appeared in digital communication usage at the beginning of the quarantine, which covered virtually the whole world. However, computer being eliminates any locality, leaving in the

Table 6: Generalized definitions of Emoji sign #5.

What does the following emoji mean to you?	In what context could you use it?
I'm crying	When I want to emphasize my fatigue from something, irritation, helplessness
Very sad	Difficult situation
Sadness / crying	Sorry, pain, injustice
Tears, sadness, can be sarcastic	Notification of bad news, reaction to something sad
"Sorry" – disappointment, sadness	I forgot to attach the file to work
Disappointment when something failed, but this smiley still has a humorous connotation. In my opinion, it cannot be used as a reaction to the news related to the deterioration of human health, or, God forbid, death.	Something tragic
frustration in life	"but not what the stars are so united, I will not give up" + hyperbolization of real disappointment
frustration in life	When something is difficult / impossible to change, but I would like to.
sadness or tears with irony / sarcasm (any context)	Personal correspondence or friendly, reaction to the message

Table 7: Generalized definitions of Emoji sign #7.

What does the following emoji mean to you?	In what context could you use it?
Like	Keep it up, super
Super	Short answer to the sign of approval, support, acceptance of information
OK	Very good, or sarcastic
"good idea"	"approval" (neutral)
Well done! – approval	Means that the above seen cool (accompanied by other emojis can mean causticity, on the bag, generally expressing both good and evil)
Well done / class! / Great job! / OK	Approval of user message (actions described in message)
Class, great, thanks! All is well! Most likely, it is a response / reaction to someone's fulfilled request or reaction to the news and carries approval, or sometimes this smiley is a neutral response.	Again, it can mean either satisfaction and approval, or I use it in an ironic sense
postironia	good job; consent

Figure 10: Emoji sign #7.

Figure 11: Emoji sign #8.

substrate a psycho-emotional factor of sign perception. Thus, according to the results, we obtained the following disclosure: 70% of respondents of all categories explained the sign as "disease", "epidemic", "temperature". However, the answers of humanities

teachers, as well as students aged 20 to 40, were typical. The signifier of the #8 sign of the mentioned respondents is "silence" or "I do not use". Representatives of exact and natural sciences mostly emphasized that the sign does not belong to their digital contin-

uum (table 8).

The sign #9 (figure 12) is not characterized by popularity in use in computer being, therefore a priori it was placed for the purpose of revealing of differentiation of a lexical field of respondents that is projected on perceptual sensations.

Figure 12: Emoji sign #9.

A remarkable point is that the less popular (almost unknown emoji sign) was 100% interpreted unambiguously and with one (in this case – negative) connotation. This is important information, because popular characters have many semantic branches in recipients of different categories, which again confirms the open aposteriority of artificial emoji language with the emergence of new connotations in digital communication and expansion of the lexical field of the respondent (table 9).

The sign #10 (figure 13) in our experiment is the key optical sign in digital communication.

Figure 13: Emoji sign #10.

The sign is quite popular, however, as the results of the experiment showed, it is popular not for the denotation, but for the psycho-emotional characteristics of the respondent. 99% of respondents answered that the sign has a negative connotation and optically reflects the state of anger, rage and rage. In fact, this sign is mental in location – a sign of Japanese origin to express a sense of triumph (in Unicode Consortium – "Face with Look of Triumph"). Thus, we conclude that the mentioned mental frame was not read by computer science specialists, artists or connoisseurs of oriental languages. The sign was interpreted and perceived according to the universal psycho-emotional

state – the state of anger, rage, anger (table 10).

The respondent who provided the only correct answer is a historian by profession. Hypothetically and deductively, we can conclude that in this case the emotional nature of the artificial language emoji prevailed, which, in fact, is one hundred percent embedded in the concept of Unicode Consortium. Correct disambiguation of this sign is an exception to appeal to the respondent's profession when it comes to text as information. For linguists the text was perceived as a structure for computer science specialists – a matrix, representatives of the exact sciences – hypothesis. Perceiving the text as information, the representative of the historical profession did not notice the emotional nature of the sign, relying in general on the information about this sign, which is its (sign) English name "Face with Look of Triumph".

The final stage of the survey was the question "Can emoji replace natural language?". In fact, the last question is an additional result of previous conclusions on the use of emoji in the pedagogical process, depending on the different categories of respondents. The results of the survey show the following picture: 5.5% (6 respondents) answered "Yes, in full"; 29.1% (32 respondents) – "50/50"; 59.1% (65 respondents) – "No, they can't" (figure 14).

Note that the answer "Yes, in full" belongs to the respondents, whose age category is mostly from 10 to 20 years, to a lesser extent – from 20 to 40 (students and teachers of philology and artists). In the first case, such results are explained by the nature of the humanities (mostly literary studies), where emoji is an a priori fact of the aposteriori continuum (for example, a work of fiction), and therefore is one hundred percent significant and signifier at the same time. In the second case, the object of fine art is essentially synonymous with emoji pictographic (visual, optical) result of creative activity.

The answer "50/50" belongs to philologists (linguistics), as well as representatives of sciences (economists), social sciences (psychologists), humanities (archaeologists, publishers). Philologists-linguists appeal to the nature of their profession, considering the text (including art) as a structure – in particular in syntagmatics and paradigmatics, and thus, this explains the interest in the differential verbalization of the polylateral emoji sign as an apriori-posteriori system of thinking (Makhachashvili and Bakhtina, 2019). Hypothetically, we explain the position of the representatives of economic sciences, appealing to the ergonomic ousia of language and speech resources in digital communication. In the case of the social sciences and humanities, a fundamental factor is the understanding of emoji as a sup-

Table 8: Generalized definitions of Emoji sign #8.

What does the following emoji mean to you?	In what context could you use it?
Quarantine	Warning or description of the current situation
I'm sick	I'm in a mask)))
I do not use	Mask on the face, silence
Coronavirus	Wearing a mask is mandatory, something related to the hospital
Laughter under a mask	COVID-19
I'm sick. But I would call such an emoji would not use	Self-isolation
I'm silent	Limitations of opportunities
I'm silent	I'm sick or I'd better keep quiet
She fell ill. But in the conditions of quarantine - observance of safety rules.	Someone is sick and has to SIT AT HOME. (obvious influence of recent events)
Keep your distance	I would have written earlier: I can't speak! now it is possible: we adhere to a mask mode. Didn't use this emoji.
Safety measures during the epidemic	I do not use this, but now it is relevant, fashionable to use as a reminder of protection

Table 9: Generalized definitions of Emoji sign #9.

What does the following emoji mean to you?	In what context could you use it?
Head turn	In alcohol intoxication
tired, broken, confused	This is my face every morning
Amazingly	I do not use it because it is disgusting
incomprehension	An unusual, extraordinary situation; uncertainty
"Hangover" / "sleep deprivation" – a reaction to questions about the condition	Expresses stupidity, play, intoxication
Fatigue, inability to concentrate	Confused
condition of students after the session	Crazy situation
I don't even know. when I swelled dumplings...	I have never seen such a thing, he is a bit drunk

Table 10: Generalized definitions of Emoji sign #10.

What does the following emoji mean to you?	In what context could you use it?
Malice	Lots of work, boring, maybe annoying
Malice	"evil", "dissatisfied", "not in humor", "offended"
I'm angry	I'm outraged
Fatigue	I would kill!
Very emotional	Horror
I'm boiling	the last stage before anger, I can barely restrain myself from breaking
Anger, resentment, but again, I would use it to denote my reactions in not very serious situations. In addition, I read that this smiley is not an expression of dissatisfaction, but has a different connotation, but for me it is an expression of these emotions.	"God forbid she's still something" XD (stock up on patience)
Dissatisfaction, anger, the tram was late	overflowing with negative emotions, I want to let off steam

plement to the basic layer of information in digital communication.

The answer "No, they can't" belongs more to the humanities, in particular to philologists, whose age category is from 40 to 60, as well as 66 years. This is probably explained by the temporal limits of the emergence of the digital continuum in the former Soviet republics, which in the long run prolonged the universality, ideality and completeness of natural languages.

Figure 14: Interchangeability of emoji sign system and natural language.

A big surprise was the position of computer science specialists, which expresses the impossibility of artificial languages (including emoji) to be a substitute for natural. We have already emphasized this unexpectedness above. Thus, we finally conclude that computer science specialists, studying language as a digital palindrome and an atemporal matrix, classify emoji as a loglan, which a priori cannot have an emotional substrate. 7 out of 110 respondents expressed a desire to express their opinion on the question "Can emoji replace natural language?":

1. *They can only supplement / diversify.*

2. *Replace no, but they give the correspondence cool emotions. One emoji can convey your mood.*

3. *It is only a supplement to the written conversation, although it can be a substitute for emotions in the same conversation.*

4. *For me, emoji is more of a complement to ordinary language, but not a replacement for it. It's like a picture book. Without pictures it is not so colorful and fun.*

5. *They create an analog language, but natural language is better, because you can operate live with a newly created expression of emotions. Emoji create boundaries within which you can express yourself, but it is often impossible to find an exact match for your emotions.*

6. *Partly, but it is worth the vicinity ' favorites, each emoji treated every person differently. And this can lead to misunderstandings. And natural language cannot be completely replaced, it is rather a supplement to the expression of emotions.*

7. *To some extent. But some have already replaced* ☺

The respondents' detailed answers were subject to digital content analysis via an open source Voyant corpus/text mining toolkit (https://voyant-tools.org/). Two instruments were used specifitaly for 1) key words identification (quantavely calibrated word cirrus, featuring foregrounded concepts and notions) – figure 15, and 2) key words frequency estimation (key words trending in the horizontally segmented corpus of responses) – figure 16. The key words of the respondents' detailed answers in equal proportions are "language", "emotions", "emoji", "expression", which hypothetically appeals to the conceptualiazation of natural languages as perfect, and therefore artificial languages, in particular emoji, are an optical supplement to the expression of a particular context. Consequently, emoji becomes not so much an artificial language as a form of language, a frame of writing that enhances and / or explains human feelings and emotions, but at the same time can create misunderstandings of the explication of the signifier, which depends on many factors: conditions, modality of expression etc.

Figure 15: Digital content analysis: calibrated word cirrus.

All the stated above, given the specifics of the respondents' answers, allows to conclude that in terms of expression emoji is not an independent language. Despite a clear and logical algorithm for generating and codifying artificial language in computer being,
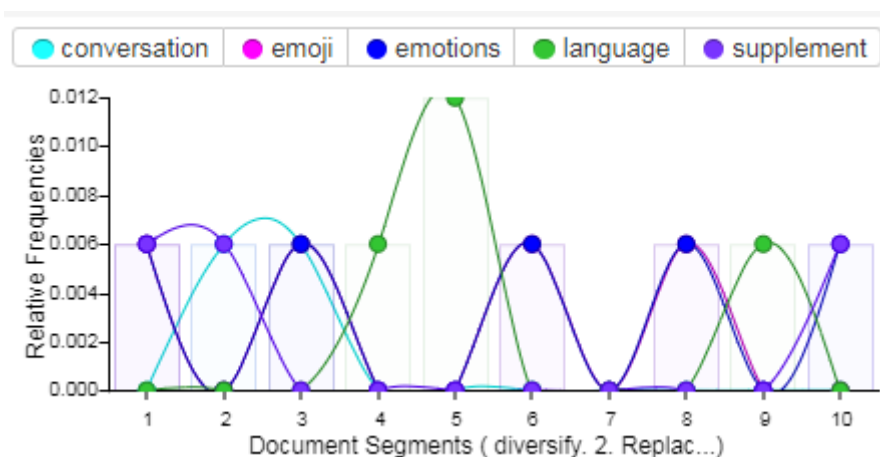
Figure 16: Digital content analysis: key words frequency.

the perception and interpretation of a particular emoji sign varies depending on its use by a particular person. However, it is this feature of the emoji language that involves updating the content and form of academic writing in the pedagogical educational process with the involvement of the ICT generated and implemented emoji language in a specific context. After all, the use of graphic signs will promote the development of visual (photographic) memory in students, as well as the development of emotional intelligence (EQ), necessary for awareness and understanding of one's own emotions and the emotions of others. According to theory of Bar-On (Bar-On, 2010), emotional intelligence is defined as a set of various abilities that provide the ability to act successfully in any situation (Goleman, 2005). In addition, under lockdown through COVID-19 timespan, the use of emoji in the pedagogical process can prevent stressful situations, and therefore provide for better and more effective learning, because emotional intelligence involves the activation of the following functions: interpretive, regulatory, adaptive, stress-protective, activational.

Thus, summarizing all the empirical data collected through the survey, we can trace the effectiveness of the use of artificial languages in the pedagogical process, taking into account the specifics of the professional activities of the respondent. However, we should note that, summarizing the experimental data, we get another question: why use the emoji language in the pedagogical process? As the survey showed, emoji are an integral part of modern digital communications. Moreover, the digitalization of the educational process by its nature appeals to the codification of the semantic field of the communicative act. Therefore, we consider emoji not so much a new as a newer, modernized format of the sign system, which allows different systems in its structure (cuneiform – hiero-

glyphics – Morse code) in digital communication.

4 CONCLUSIONS AND PROSPECTS OF FURTHER RESEARCH

Through an experiment, which consisted of surveying participants in the educational process, we concluded the following:

1. Artificial digital emoji language reproduces polylaterality in structure (elements of sign generation) and semantics (multi-vector perception and interpretation of the sign). This explains the scale of differentiation of emoji signs, taking into account mental frames and universal characteristics at the same time.

2. The polylateral perception and interpretation of emoji depends on the speaker, which the team of authors classified in the study into the following categories:

   • Age
   • Profession
   • Knowledge of foreign languages
   • Choice of social networks.

First of all, our empirical experiment was created for teachers and educators in the pedagogical field. This would allow us to trace the speed and direction of the process of introduction of the digital continuum into the pedagogical activity (artificial languages, in particular emoji) in order to identify the feasibility and effectiveness of learning at the intersection of natural and artificial languages and digital communication. However, representatives of other professions

also joined the experiment: computer science specialists, economists, artists, poets and prose writers, which gave us the opportunity to expand the subject of our study, appealing not only to antithetical professions (humanities and sciences), but also to the nature and specifics of each profession. The latter, in turn, is encoded in the structure of the speaker thought by mental frames that professional experience generates a verbal language system and speaking respondents and ideographic optical pattern embedded in the artificial language of books existence – language emoji.

According to the results of the experiment, we also conclude that 100% of respondents (110 people) use emoji both in everyday life and in professional activities. Although, the ousia of emoji in digital communication has significant shades of meaning for each profession (not excluding age and language skills). Thus, the representatives of the humanities and social sciences when using emoji appeal to the psycho-emotional load of the sign, considering it as a supplement to the text in order to express emotions in digital communication. Therefore, emoji for these representatives can replace natural language for the most part by 50%, as evidenced by the experiment to reproduce the content of poetry on the basis of Emoji-Maker platform (Makhachashvili et al., 2020).

Only a small percentage of respondents are convinced of the equivalent replacement of natural language with artificial. Such respondents include philologists and linguists. However, it should be emphasized that it was linguists who provided detailed answers regarding the perception and interpretation of emoji signs, which confirms the vision of the emoji language as an a priori-a posteriori system. Consequently, emoji can be both a supplement to the main text and an independent language with a full reproduction of meaning.

Representatives of sciences (mathematicians, economists, programmers) consider emoji as an independent language to the least extent, the explication of which is the frame P-semantics of the thinking structure of the representatives of the specified professions, which is as follows. For the outlined speakers, the auxiliary element of the effectiveness of their professional activity is the natural language itself, which a priori puts artificial languages in the position of auxiliary symbols to obtain the result of work in the form of digital content and matrix grid. Therefore, most of the exact sciences use emoji, without giving clear and unambiguous connotations to the sign during digital communication.

In further research it is necessary to expand the classification of respondents by professional activity even more, involving the following representatives in the experiment:

1. Teachers: specialists in physics, biology, law, political science and others who were not involved in the experiment.

2. Non-teachers: other professions that are not related to educational and pedagogical activities.

Such scale and heterogeneity of respondents will allow to outline Gaussian with normal (statistical) distribution of emoji language ousia, fractalizing the effect of the exponential function of artificial language onto a quadratic function. Thus, we will have a deductive hypothesis of the role, function and impact of emoji language on teachers and non-teachers, which will trace the advantages and disadvantages of digitalization of society both in the educational process and outside its framework. In addition, this approach appeals to the selection of the third subject of study – the linguistic construction of individual "Sprachspiel" (term by Wittgenstein (Wittgenstein, 2007)) using natural and artificial languages with an emphasis on the apriori-posteriori nature of emoji in digital communication.

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