Modelling the Impact of the Pandemic on Online Communication: Textual Semantic Analysis

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Abstract

The concept of pandemic has been considered in the paper. In order to linguistically represent the current state of today's 'pandemic' situation, the model of pandemic impact on the online communication has been introduced. Firstly, the Reddit social media had been regarded as a basis of the research. Secondly, the most commented as well as the least commented posts concerning the concept of pandemic have been allocated. Thirdly, only those posts referring to the communication process being influenced by the pandemic have been considered. Then, semantic analysis of the pandemic-oriented posts has been conducted. The following steps of semantic analysis have been provided: 1) manually, interpreting each user's statement thoroughly, 2) using new LIWC-22 program which has been more scientific than its previous version. All these research stages have been implemented into the final research product – linguistic model of semantically studied pandemic impact on the Reddit online social discussion posts. Digital communication strategies have been taken into consideration. Comparison within semantic groups has been provided both statistically and in an interpretative way. The statistic representation of textual semantic analysis towards the pandemic-oriented Reddit posts has been considered.

Keywords [1]

pandemic, digital communication means, online platforms, linguistic model, online communication, Reddit, digital communication strategies, linguistic markers, new LIWC-22, textual semantic analysis, implicitness, explicitness, comparison, statistic representation, semantic groups, impact, commenting, post, interpretation, discussion

1. Introduction

Recently, the necessity to share information all over the world has developed increasingly due to the rapid involvement in digital platforms for the data dissemination. Still, the most viral priority refers to social communication via a variety of social media, especially under such tough social isolation pandemic condition. Even if there is a must to stop infection, social separation may involve mental effects which result in mood shifts, anger, stress, etc. One should take into consideration the amount of social support mediated by social networks. The latter foster belongingness and boost self-esteem as well as reduce loneliness and such common feelings as irritability, anxiety, anger, boredom and depression. Current lockdown situation differs from the previous one: today, there are lots of technological facilities helping us to interact and be involved into the very heart of social services.

Being an eager representative of social platform, one must adhere to certain digital communication 'rules' and follow online communicative strategies in order to avoid misunderstandings and illiteracy. It is

also worth mentioning that modern social media may play a role of both social connection and separation. On the one hand, online communication may lead to decreasing empathy, on the other hand – it increases individualism. All these social features depend on both internal and external factors caused by pandemic. Adapting to the process of online social discussion allured by user's utterances in a form of statements, textual semantics is taken into consideration. Apart from linguistic positive and negative tone of social media statements, moralization is of significance. Most of all, online users tend to preach and lecture others about personal general truth or what is better to do under certain lockdown state. The frequent usage of digital technologies during pandemic may have a tendency to nurture users' social support. The latter may moderate the impact of social separation and distance. The purpose of this study is to introduce the modelling structure of pandemic-affected digital communication on the basis of such social media as Reddit by semantically analyzing online statements within discussion posts allocation among them those ones referring to the semantic pandemic-oriented groups ranging from being the most commented to the least commented. Linguistic interpretation, comparison within semantic groups and statistic data are followed

2. Studies Referring to the Issue

During the pandemic, a variety of forms and extent of outbreak measures were involved all over the world. According to such measures, World wide web and online platforms application has been explored to their greatest extent if to compared with the period which was at the beginning of the pandemic [1]. Such those prominent layers of Internet usage have already had undoubtful mental influence. Online platforms could have a significant and both positive and negative impact by granting a media for users to disseminate information and find peers close to their thoughts as well as to represent relevance concerning the virus state. Moreover, the latter fosters a ground for declaring angst and panic concerning the lockdown. Mitigating awareness is the outcome of a positive tone of online discussion statements being affected by the factors caused by pandemic situation [2]. In terms of COVID-19 pandemic, yet, another linguistic and psychological pattern has evolved. The angst of contagion and, even more, of fatal outcome has been presented as the speculation of coronavirus anxiety [3]. Angst and fear that is combined with an obvious menace as recognized by human. Such a menace is a swiftly addressing hazard that people are hereditary supplied to spot and to react to such a menace's motion, notwithstanding the fact whether linguistically a concept of threat gains the semantic danger or it semantically conveys the feeling of support. In terms of current pandemic situation, such an angst and anxiety emerge in regard to motional shift instead of menace or danger it possesses. As adjustment patterns, which decrease the negative effect of menaces, do not happen overnight so as to be the outcome of such a strength, emotional reactions are at length sharpened as the obvious menaces grow. This linguistic pattern calls for ultimate unreliability. The latter lies in hindering people in order not to provide reasonable semantic interpretation of contrarily restricted as well as bewildering information [4].

Regardless of the undisclosed, such data and determined surplus may result in unreliability to capture human cognitive processes. In particularly variable environment of the virus state all over the world, such hazards are aggravated. It results in a common state of linguistic and cognitive unreliability [5]. In papers referring to cognitive linguistics studies, the contrast between distinguished awareness, e.g., people's background knowledge, their preferences and dislikes, and genuine awareness, referring to real state of knowledge, has taken a lot of time and has been conventional long before the establishment of online platforms. Generally, cognitive linguistics explorations have revealed correlation between such double awareness and proved it to be comparatively shallow [6]. Nevertheless, in terms of an objective threat such as the virus danger, as well as in the period under which online platforms seem to be highly ranked, the shift between distinguished awareness and genuine awareness is predisposed to expand remarkably and, simultaneously, has to be cross-questioned firmly.

Having once discovered in detail all possible social medial communication features [7], there is a model concerning linguistic cognitive processes, which is aimed at distinguishing particular mental processes and allows to interpret their nature linguistically. In agreement with the transparent susceptibility model (TSM), human tend to gain apprehension shaping anticipation statements concerning the contiguity of a menace as well as its distinguished motion. If one claims that people's separation retains them disconnected towards somewhat inherently detrimental consequence, subsequently reasonably their angst and anxiety have to be eliminated. Such own contemplation of awareness concerning the menace is a crucial constituent to be sustained even as one is after apprehending reactions to the worldwide pandemic. Furthermore, it has to be regarded along with the application of online platforms. The reason is that it is relevant although specific starting point of comprehension concerning such a menace. There is a speculation that the angst and fear of online platforms consumers who are subject to an undetermined threat may develop in a pair of ways: regarding disability, both mental and physical (a lack of power above the surrounding) or with regard to strength. Ineffective information sources frequently evoke contradictory more than impetuous measures [8, 9]. To put it in another way, the position of disability (both mental and physical) may be interpreted linguistically and cognitively in order to render a comprehension of transparent susceptibility. The latter requires a biased apprehension underlying being vulnerable towards motion of swiftly expanding menaces [10]. In this way, no matter how adaptive and empathetic a personal external and inner nature is, social support will not resemble the desirable effects. Being subject to negativism, users may no longer productively evolve the statements under discussion leading the latter to a standstill or endless illiteracy communicative loop.

Users with elevated magnitude of collective interconnection – those who are representatives of immense and sophisticated online platforms, are by and large anticipated to deploy an excessive magnitude of collective and cognitive support [11, 12]. Along with the establishment of social online platforms, similar way of support could be considered in the Internet communities. A range of studies on social media networks have been provided [13]. One of the prominent case studies concerning media worldwide [14] stated that Facebook being one of the most viral media in modern world gained an immediate success in terms of sharpening a feeling of undivided awareness amidst residents and ideologists. The researchers [14] represent a narrative undivided reaction, by which residents applied Facebook in order not only to curb correspondence in the territory, and, similarly, to be in touch with authority mistreatment over activists worldwide.

One essential characteristic in such paper as [15] describes the evolvement of Common Internet awareness (CIA). It is initiated by the impetus of composite interconnections amidst users allocating ordinary objectives and handled with regard to a global agreement and support. Such a nourishment of collective binds in the course of adversity seems to be a general characteristic within flexibility processes. Moreover, it may be enlarged by the interconnection provided by online platforms. It is worth mentioning that online platforms (the one that is under investigation – Reddit, or than one mentioned - Facebook) tend to be effective not only concerning binding users, similarly, in terms of strengthening the mitigating reaction.

The distinguished model of anxiety mitigation, related to collective maintaining consequences, gains a lot of characteristics which may be mirrored within the CIA model. The anxiety-mitigating model introduced by [16] consists in four support tasks which may be interchanged into a part of social media:
1. Psychological support with regard to personal respect
2. Linguistic and cognitive support related to data dissemination as well as maintenance through cognitive morale
3. Circulating support spread by a certain collective community with the feeling of inclusion in it
4. Influential support based on visible assistance granted to users being affected by pandemic.

In proportion to the model, if a user treats a state of affairs as a form of menace, his or her anxiety magnitude increases. What is more, a user, to a greater extent, requires a suitable reaction to such a state of affairs. That is how the correlated nourishment of ineffectiveness and the following threatening of personal respect is substantiated. Within such a state of affairs, the advantages provided by collective maintaining interferences are dual-oriented:

1. Such advantages block or diminish the assessment of a state of menace affairs
2. If comprehensive avoidance of such an assessment is impractical, the mentioned advantages provide functional manageable plan of action within easy reach.

In the event of the viral pandemic, since the state of affairs is practically inevitably assessed as demanding and under pressure, which has been mentioned above, the worldwide extent of the affair provides it with an objective threat. Additionally, the essence of the COVID-19 and numerous restrictions inflicted sequentially indicate the fact that most of collective maintenance, if to consider a variety of interaction means, has been recently provided via virtual as well as social networks. The TSM model requires the fact that stress, fear and angst may lead to an enhancement of the possibility or contiguity of menaces. Such an approach is supposed to linguistically, mainly, semantically, interpret stressful states, fear, anxiety and angst caused by viral pandemic, in case of lack of mitigating patterns prone to be demonstrated by online platform communication features. It has been speculated that online platforms may be regarded as a substitute for social flexible mechanisms and patterns adjusted by linguistic and cognitive as well as mental emotional constituents within the ongoing viral situation worldwide.

An integral part of all social community tools remains digital communication with its particular 'rules', principles and strategies. After the development of conventional technological tools, up to date means of online communication have been proliferated unaccompanied regardless of their long-established platform peers. Such online means have generally gained such a recognition nowadays that it has no sense to keep in mind which means of interaction and communication tools existed long before their appearance. One can enumerate such social media as Reddit, YouTube, Instagram, Facebook, Twitter, WhatsApp, and others. All these forms of online interaction have extremely been enlarged. This process is on due to the way a certain amount of data is accumulated and shared. What is taken into account is the following: the representative of information dissemination; the sphere and common ground for data sharing; the audience of targeted information, means of information dissemination amidst a variety of users, who are eager to apprehend it and accumulate in order to further share it. Apart from these peculiarities of digital communication in brief, there are more which face shortage of conventional and topographical characteristics which have been reversed towards traditional communicative means, along with comprehensive outcomes in terms of the above patterns and mechanisms of vulnerable communities or those users being affected mentally on purpose. The effect such computer tools impose on communicative 'sharp' situations has to be further apprehended more through linguistic and cognitive paradigm than the conventional extent of data. To rephrase the mentioned above, thorough textual semantic analysis of online communicative data has to be conducted including the users who provide, impart and obtain community discussion statements theoretically referring to as digital communicative data [17].

Online communicative means provide an extensive scope of procedures for the accumulation and circulation of data which is supposed to be regarded as an inflexible circumstance [18]. Critics of the linguistic mechanisms concerning computerized area have attributed to the abundance of online communications as a revolt which has standardized the accumulation of information and it impart, having been untied by the autocratic authorities or community agencies and shifted to simple people.

In contrast to the hierarchical and manifold essence of traditional media, online communications own a levelled composition. On the one hand, data is disseminated smoothly by a lot of users to their like-minded people (accumulation of 'face-to-face' proportion). On the other hand, by a lot of like-minded people to their communities (accumulation of abundance proportion). Occasionally users, e.g., through Reddit, or

users' communities impart information to organizations (accumulation of 'abundance towards face-to-face' proportion, as well as bottom-up data circulation).

Virtual interactions have a wide range of characteristics in common which are relevant to every communicative means in pandemic-affected and vulnerable communities. Notwithstanding the external accrediting of several data streams towards a certain starting point, e.g., the Reddit discussion post, the recognition and objective of the info-creator might be considered undisclosed or ambiguous. Such vagueness raises one of the key issues concerning interactive means although not particularly with regard to vulnerable and pandemic-affected communities. In order to gain productive sources of knowledge, data is aimed to be, first of all, refutable. Such sources, this way, are supposed to be trustworthy towards users and their informative statements accumulated online. It is supposed to be tough for recipients of online information to differentiate between:

1.   Trustworthy sources of knowledge
2.   Social deception which interpreted as feasibly deceptive or even imprecise information in order to manipulate users and their opinions leading to illiteracy mechanism of communication
3. Inaccuracy that is described as intentionally distorted and ambiguous source of knowledge. The objective of such feature of digital communication is to call for suspicion of the user's purpose of a communicator or even to make sure if the source of knowledge is considered undisputed [14]. Credibility is formed in a way of private awareness towards either the interlocutor, which is called intrinsic trustworthiness or the info-creator depending on whether information is positively or negatively imparted. The latter mechanism is called extrinsic trustworthiness. It is associated with the extent of certainty which emerges amidst the sides in a digital communication discussion process. Nethermost magnitude of trustworthiness remains if only the sides exchange integral trustworthiness according to which all parties constantly observe the advantages of keeping in touch with like-minded users. Considerable magnitude of trustworthiness exists only if conversationalists discover the fact that they have integral trustworthiness in common according to which the sides manifested other users' preferences and objectives [14]. In case if there is a lack of both intrinsic or extrinsic trustworthiness, sources of knowledge are prone to be disregarded or discharged.

The flow of imprecise or mistrustful source of knowledge in pandemic-affected domains may encompass strengthening pressure mechanisms amidst unanimously doubtful online social groups, as well as growing angst and anxiety, or even stirred mechanisms on the basis of resolutions arisen out of the effects [2].

Fear, angst, anxiety and stressful patterns generated by swift and undemanding proliferation of social deception and inaccuracy via, e.g., Reddit, has a tendency to similar gossips outspread rather than the information headlines suggest. In Reddit social network, public opinion is generated via the gossips outspread be it found through news channels, by talking to like-minded users or even by reposting measures. Meticulous online interactive mechanisms have the magnitude to resemble face-to-face gossips. Having specified the applicable intensity of recognized trustworthiness, they spread sources of knowledge which may be regarded credible [14]. The probable effect of such digital means of communication in vulnerable or pandemic-affected communities is provoked by approaching several means of virtual computerized tools which empower a user with the slightest ability and facility to, sequentially, enhance the accumulation process of trustworthy sources, social deception, or inaccuracy.

Being facilitator of collective and cognitive alternations in digital interaction [4], the interdependence amidst virtual communicative means and cognitive human essence is relatively relevant instead of being instrumental one.

Within the crucial textual analysis domain of collective and cognitive alternations in digital interaction, a lot of deliberate cognitive shifts are distinctly tangible and calculable. For instance, in Reddit digital communication in terms of being pandemic-affected, has to be thoroughly semantically interpreted by allocating semantic groups of digital discussion statements, thus, comparing them, statistically verifying

and calculating the most pandemic-commented section and the least one. However, is it still complicated to precisely model an immediate causality and causal thread between cognitive interchange and interactive digital means aimed at shifting revealed cognitive processes both upwards and downwards. Digital communication may evoke a shift adjusting to a wide range of different constituents – elements which conversationalists have to consider, although which are hard for them to consolidate as an entire concept into their computerized model pattern. As it has been mentioned in one of the recent studies concerning further contemporary digital tool usage patterns, the impact of up-to-date computerized media on cognitive process interchange is drastic still vague [19]. On a global scale, such a study aims at uniting both scientists and decision makers to shift from the fatigues dispute over the fact whether modern computerized means of communication guide or hinder the expansion of self-government. The research also discloses the fact that persistent governmental ramifications toward the mentioned digital media are supposed to be diligently determined [19].

The author [20] claim that the correlation amidst computerized means of communication and cognitive processes has a relation to the case of menacing discourse, which the author tends to differentiate from hate speech. According to that researcher, if there is a case when an utterance tends to have logical prospect of yield or intensifying cruelty by one users' community in opposition to another, such digital communication discussion statements altogether seem to be considered a menacing discourse. Of course, it is worth taking into consideration state of affairs under which such a statement was shared/posted or reposted/commented. The following features of state of affairs will be applied in our further paragraphs to conduct textual semantic analysis of pandemic-affected peculiarities of digital communication. They are distinguished as follows:

1. Capacity manifested either in trustworthiness or affect towards the user within the social media discussion
2. Existence of unfairness and angst in terms of the users' digital 'surrounding' (to which extent a user may cognitively generate stressful emotions)
3. Communication transparency in a form of exclamations or visual linguistic explicit or implicit markers, e.g., cruel or tough utterances
4. Emergence of appropriate verified circumstances to encourage a user's surrounding to be responsive to a menacing discourse
5. Magnitude of impact of a particular tools of communication circulation. The scientist [20] highlights the fact that a menacing discourse has to be assessed within the whole range of computing features, although not all of them are in the same manner significant within the following conditions. The influence of discourse on cognitive processes is determined by computing features corresponded amidst the state of affairs features mentioned above. Out of those features above, the latest discloses distinctively a position of digital media tools. The latter refer to the fact that the impact of to some degree of these communicative tools is considered a contemplation of the types and amount of digital computerized means inherent to today's pandemic-affected community. The more substantial the diversity of views, the slighter dominant any discussion statement is supposed to occur. Therefore, despite the fact that up-to-date computerized tools can be served as means applied in theoretical issues of cognitive process, they cannot be the source of cognitive processes exclusively by morality of computerized tools. Given the examples of Reddit domain worldwide [21], limited access to social media is purposeless towards removing the capacity of sides in communication process to interact. Having designated the fact that nearly all online interactive means sense is supposed to be unable to be managed apart from by the verified info-creator of that information sense, it is increasingly prolific to fit the stage of virtual communications within cognitive processes through communicating the users as a substitute to computerized capacity of motion of cognitive processes. Thus. the aim of mediation has to be concentrated on raising a vulnerable community's capacity to endure viral pandemic. What affects digital communication in such social platforms as Reddit is the impact of COVID-

19. Concerning the opinion, perspectives of online communicative tools and cognitive processes are the basis for the key fundamentals of modeling the current pandemic-affected digital communication through the usage of textual semantic analysis.

Among all digital communication principles mentioned above, in this research virtual interactive means strategies are of importance as well. Currently, virtual communication capabilities have gained expository issues similarly to offline interaction. Digital online communication effectiveness is evaluated through its appropriate way of applying netiquette [22] and magnitude of statement tone while discussing particular posts with a certain degree of moralization. Considering themselves untrustful, troublesome, impolite, digital users have to tackle the illiteracy issue among, e.g., Reddit 'surrounding'. Users lack most of non-verbal patterns of communication leading their act of 'speech' to plain textual fragment without any emotional tone or degree of moralization. Instead, the following strategies, common for digital communication, are considered dominant while conducting online discussion statements within post commenting: while considering a comment to the previous online statement, suitable time periods should be taken into account in order to reply, e.g., soundly instead of using rude means of communication; when trying to reply, it is worth not being inessentially verbose, i.e., not to become obsessed with personal prejudices concerning what was meant indeed under a particular statement. It is recommended to ask more questions to clarify the user's statement in order to avoid misunderstanding [23]; it is worth avoiding capitalized letters or even wholly capitalized statements which may seem awkward and ambiguous, either referring to exclamatory marks or expressing anxiety-stressful markers; sarcastic utterances, usually followed by rhetorical questions or elliptical forms, may also be regarded rude as most users use them in private conversation being close to each other; it is also important to pay attention to the amount of comment statements and their expressive tone as long posts may gain inappropriate interpretation for the textual semantic analysis; there are lots of ignored posts or those left uncommented because of lack of information, all topic disclosure, banned statements, irrelevant information support, etc. All in all, a key factor of digital communication principle is, however, keeping a smooth and delicate statement tone, either positive or negative, without cruel expressions and manipulative posts.

3. Studying Pandemic-affected Online Communication Posts by Conducting Textual Semantic Analysis

Linguistic scope in terms of online communication being affected by pandemic is designated as an awareness of the mitigation that social networks may involve in modeling the state of social digital discussions semantically interpreting the extent of pandemic influence on social groups. The latter may be subjected to vulnerable mental states such as anxiety, mental trauma, psychological risks or even mental threats. Pandemic has been observed to be, first of all, a mental concept, which will be further analyzed by textual semantics.

The Reddit social media (https://www.reddit.com/) has been designated to be a source of research. It has recently become the most popular platform for opinion exchange and sharing the latest news on a variety of relevant topics. The most dramatic and thorny issue concerns worldwide pandemic. This topic has been chosen in order to show viral impact on online communication within the Reddit posts (Fig. 1). In Reddit, all discussion commented posts have a levelled composition, which has been mentioned in previous paragraph. So, preferably, information is shared by users and their peers in a form of 'face-to-face' proportion, although multiple users' inclusion into the same statement commenting process is also observed. The research principle considered in the paper is in statistic finding of the most commented posts concerning pandemic, which are marked by 'upvotes', and those with the least commented sections. Such differentiation allows to further interpret similar as well as opposite semantic groups within the posts and statistic data.

The most commented pandemic post (https://www.reddit.com/r/AskReddit/comments/ri4ov7/whats_surprised_you_the_most_about_the_pandemic/) entitled "What's surprised you the most about pandemic" enumerated 16.7k comments (Fig. 2) is supposed to be interpreted semantically as a willingness to block the spread of COVID-19 all over the world. The next step is to thoroughly allocate those pandemic statement fragments or even whole pandemic statements referring to five digital communication peculiarities, mainly using linguistic markers to determine expressive tones of explicit or implicit 'moods' of either positivity or negativity, or some other cognitive processing mechanisms and patterns. Each such allocated semantic group is followed by interpretations concerning pandemic influence on these posted comments, which will further foster conclusion towards representing such an impact on general state of digital communication within Reddit social media.
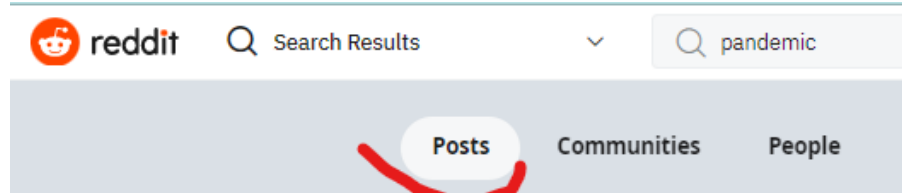

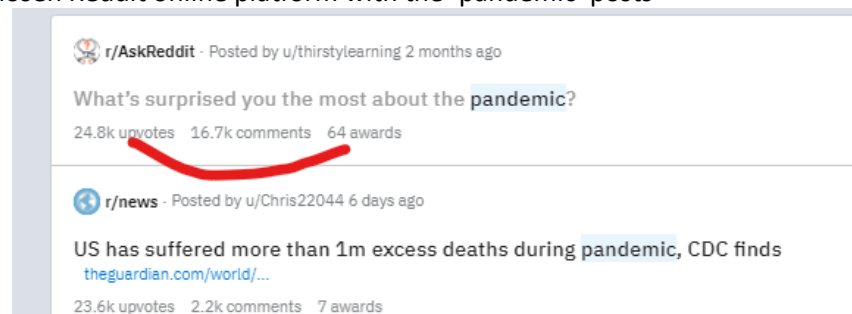**Figure 1:** The chosen Reddit online platform with the 'pandemic' posts

Figure 2: The most commented Reddit pandemic post

Here, conducting textual semantic analysis of the commented post statements the following semantic groups are allocated:

1. Positive-statement tone: *My **productivity** at home with **no distractions** has **nearly doubled*** (explicitness of pandemic influence for good); *Got **glowing review during all** of it* (explicitness of personal situational satisfaction); ***found** a WFH **job** that **pays for** my insurance, is a **billion dollar company** and **offers unlimited time off*** (explicitness of both alluring tone of 'cool' offer and personal situational satisfaction); *and others **gaining** a **new perspective on life*** (explicitness of pandemic influence for good). Linguistic explicit markers allow to interpret semantic group of positive tone as an attempt to find a looming hope for good among unpleasant and hindering live processes pandemic.

2. Negative-statement tone: ***short staffed*** (explicitness of COVID-19 obstructive consequence); *We're **short staffed*** (explicitness of repetitive statement, of viral obstruction); *I come in **second** place **in many areas*** (implicitness of regret); ***Fire** me* (explicitness of being in a bind); *I had a **2+ hour commute** on **3 buses** each way **before Covid*** (explicitness of blame, personal situational dissatisfaction); ***So I quit** in August* (explicitness of losing tone, implicitness of obstructive viral affect); *No matter **how strong you feel**, everyone has a **breaking point from stress*** (explicitness of self-defense mechanism, stressful tone); ***Oh look, apparently** the **vaccine I got against** the first variants **isn't working so well** against this one* (explicitness of COVID-19 obstructive consequence, desperate tone); *Every step I **thought we'd taken towards victory**.... it **feels like we've just backslid*** (explicitness of both being in a bind and cognitive mechanisms); ***I've heard of many people** becoming **socially anxious, depressed*** (explicitness of both cognitive mechanisms and stressful tone involving angst, fear and anxiety); ... ***This shit** is **still absolutely***

awful *though* (implicitness of obstructive viral affect); *people **started going out in public again** and **being social again, depression and anxiety hit me like a ton of bricks*** (explicitness of both cognitive mechanisms and stressful tone involving angst, fear and anxiety); ***Staying in lockdown removed any and all frame of reference*** (explicitness of COVID-19 obstructive consequence, of both cognitive mechanisms and stressful tone involving angst, fear and anxiety). The dominant explicit linguistic marker of semantically negative-tone group is aimed at determining threatening personal states of users, mainly their inner psychological world, as everyone was somehow restricted. Implicit marker only intensify the disclosure of experienced amount of stress.

3. Statements concerning cognitive processes: *I was **most afraid of losing** her as **she is everything** to me* (explicitness of stressful tone involving caring pattern); ***No seriously**, I'm **exhausted** and **tired** of **wacky hours** and **working weekends*** (explicitness of self-negation and burnout); ***Started** a **new company during the pandemic** and we are **exclusively remote*** (explicitness of both positive tone of personal situational satisfaction and implicitness of being affected by viral condition); ***How weirdly quiet** it was **at first*** (implicitness of mechanism of adaptation and situational unawareness); *Living in a city of half a million people it was so **insanely quiet*** (implicitness of mechanism of adaptation and situational unawareness); ***Makes you realize** how much **noise cars really make*** (explicitness of ecology concern); *What I **remember about the start of the quarantine** is… is **how quiet** it was* (implicitness of mechanism of adaptation and situational unawareness); ***Agreed**. When things **first went into lockdown mode** I would take **walks through the city** …we would see only **a handful of cars or people** over the course of an hour. **So quiet*** (implicitness of mechanism of adaptation and situational unawareness); ***Agreed**. Drove through the middle a city …and i was **the only one**. It was **almost humbling*** (implicitness of mechanism of adaptation and situational unawareness); *.. Two years in and **I don't have any idea where the end will be**, now* (explicitness of stressful tone involving self-negation); ***How crazy amounts of stress impacts people*** (explicitness of stressful tone involving angst, fear and anxiety); ***Somehow** this **whole experience helped me overcome** a lot of my **issues, seek help**, and ultimately **I feel like a much stronger person*** (explicitness of both positive tone and attempt to admit personal recognition); *Man, **I thought** I was **doing ok*** (implicitness of mechanism of adaptation and situational unawareness); ***thought** I was **taking it all in stride and handling it*** (implicitness of mechanism of adaptation and situational unawareness). Semantic group denoting cognitive mechanism occurring while pandemic online communication embodies realization of stressful factors for communication online. People share their concerns, guesses and memories of experienced troubles.

4. Allured statements: *I **take a break** and **collect unemployment** for awhile* (explicitness of personal downward shift, implicitness of personal escape*); I'm **40** and the **longest I've gone **not working** is a **12 day vacation*** (explicitness of outward ridiculous situation, implicitness of hard-working state of mind and desperate tone of ongoing career shift); *I **proved** I could **do my job from home for 16 months*** (explicitness of both positive tone and exclamation of situational satisfaction); *We **hire talent** that can **manage itself wherever it is*** (explicitness of both positive tone of personal situational satisfaction and implicitness of mechanism of adaptation); ***Saves me a fortune**, and I'm **stealing high level employees** from fortune 500 companies and huge national shops* (explicitness of both positive tone of personal situational satisfaction and implicitness of personal advantage). This semantic group marked linguistically as allured one is interpreted as a 'cry' for personal 'advertisement' which may be equal to a willingness of standing out and express personal opinion in an arrogant and sometimes rude way.

5. Statements with degree of moralization: *Either **I stay working from home** or you **fire** me* (explicitness of rude order and emotional instability affected by a dead end); *I **work from home** or you **fire** me* (explicitness of repetitive statement, of rude order and emotional instability affected by a dead end). Moralization semantic group marked explicitly as well proves its willingness to rule, order, advise in a rude way, and advocate personal opinion.
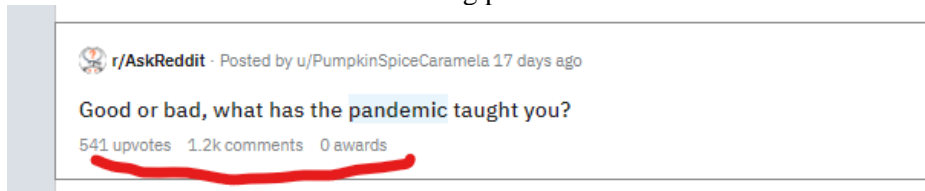
Having allocated 150 textual fragments represented in a form of commented post statements within the Reddit social media, it must be stated that explicit linguistic markers of identifying emotional negative statement tone prevail. It is substantiated by the fact that communication under the Reddit discussion thread – pandemic – is obviously a thorny issue, and all the statements commented to a more or less extent relate to general desperate emotional situation or speculations over it in an open way. Moreover, the principle of repetitiveness in negative-tone statements, moralized statements and revealed cognitive processes is observed. Semantically it is interpreted as an attempt of users to highlight personal concern about the viral situation and avoid negative mode of inner world.

In order to demonstrate the semantic analysis results, new Linguistic Inquiry and Word Count 2022 (LIWC-22) software is applied (https://www.liwc.app/). It has been processed up-to-date and allows to conduct statistics on the basis of linguistic matches for comparing social media textual fragments with the average indicators related to the social media language [24]. Below there is a Figure 3 resembling the same semantic groups which have been manually and interpretively allocated and commented. Apart from analyzed semantic groups and their brief overview, it is worth mentioning such traditional LIWC dimension as I-words (I, me, my) (Fig. 3). Even if all mentioned textual fragment examples cannot fully represent all I-oriented statements as some of them have been previously partly reduced, it is proved by the computerized linguistic tool that personal factor is prevailing (indicating 9.26 points) over the average indicators for social media language (5.44 points). Unlike I-words, social words are within the range of average social language indicators (2.66 points). It is justified by the fact that most of the above statements have a reference to personal factor covering own experience and personal-oriented utterances.

Traditional LIWC Dimension	Your Text	Average for Social Media Language
I-words (I, me, my)	9.26	5.44
Positive Tone	2.34	5.93
Negative Tone	3.09	2.34
Social Words	2.66	6.74
Cognitive Processes	13.83	8.86
Allure	7.87	8.62
Moralization	0.11	0.27

Figure 3: Semantic groups concerning the most commented pandemic-affected online communication posts allocated and interpreted manually and proved by LIWC software

The following step of the linguistic analysis in the paper is to perform the same procedure mentioned above, but this time interpretation will change according to the least commented pandemic Reddit post (https://www.reddit.com/r/AskReddit/comments/sll94f/good_or_bad_what_has_the_pandemic_taught_yo u/) entitled "Good or bad, what has the pandemic taught you?" covering 1.2k comments (Fig. 4). After profound semantic analysis the same semantic groups are singled out and followed by explanatory comments in terms of viral state of affairs concerning pandemic-affected Reddit communicative posts.

Figure 4: The least commented Reddit pandemic post

In our case, Now, the process of textual and semantic analysis of the commented post statements encompasses the following semantic groups:

1.   Positive-statement tone: *I LOVE being home* (explicitness of pandemic advantages, cognitive mechanism of adaptation); *I suppose that's a fair point* (explicitness of both cognitive process and agreement with other users); *Well, yes, but obviously this isn't the worst it can get* (explicitness of both hope for good and cognitive mechanism of mitigation). Explicit linguistic markers allocated do not fully represent exact semantic positive tone of statements affected by pandemic. In these examples and others not mentioned here, there are no positive modes towards ongoing situation. It may be substantiated by the fact that there is no positivity in virus concerns, that is why only mixture of cognitive processes are observed here.

2.   Negative-statement tone: *If something like a disease causes this much division and animosity, when the shit really hits the fan, we're fucked* (explicitness of viral obstruction consequences and vulgarism); *How awful and unnecessary having to commute to work is for most office jobs* (explicitness of viral obstruction consequences); *That I don't go out nearly as much as I should* (viral obstruction consequences); *And that most people have no hope of understanding either* (explicitness of lack of hope for good). Semantic negatively expressed group presented by allocated linguistic markers is dominated by sharp outcomes caused by pandemic and its concern. Here, desperate rude moods are embodied into fearful, anxiety and stressful mood of users.

3.   Statements concerning cognitive processes: *Home is where the heart is* (explicitness of cozy atmosphere, implicitness of mechanism of adaptation under certain circumstances); *It didn't cause the division and animosity, but it exposed and deepened it* (explicitness of viral obstruction consequences); *kids who were finishing high school who had the "normal" experiences flipped to the younger kids who were suddenly isolated at home and dealt with remote learning* (explicitness of negative COVID-19 consequences, implicitness of degradation, stressful tone); *they're adults and working with different age groups there will be a common bond with those their own age with what they experienced and how it affected them* (explicitness of emotional stressful tone, implicitness of common sense and concern); *The thing that is so sad today is that we are facing a viral outbreak now and can't even unify as a country to get past this as quickly as possible while saving as many of our fellow citizens as we can* (explicitness of desperate tone, fear, angst, anxiety); *So the covid experience may aggravate the existing trend of young people seeming to be more sensible than previous generations* (explicitness of both positive tone and desperately obstructive viral consequences); *When the pandemic first started and we first went into lockdown, I realized about a week in that my lifestyle barely changed* (explicitness of both negative tone and desperately obstructive viral consequences); *I learned a lot more about epidemiology and virology than I otherwise would have* (explicitness of new source of knowledge, implicitness of 'positive' gain); *it's almost like people may have the technical capacity to understand, but they don't have the emotional capacity* (explicitness of lack of mechanism of adaptation and refuse to reconcile). Cognitive mechanisms constitute the semantic group full of explicit linguistic markers allocated to denote similar negative tone of statements to the previous negative-tone semantic group. The same emotional tone is observed: fear, angst, anxiety, stress and desperate mood prevail. However, the attention here is focused more on speculative processes, how each user perceives and apprehend the pandemic state lacking appropriate psychological support.

4.   Allured statements: *It's where all my stuff is!* (implicitness of exclamatory proof of fact available under pandemic condition, arrogant tone); *Na na na HOME IS WHERE YOU MAKE IT* (explicitness of willingness to stand out, personal situational emphasis, mechanism of adaptation); *I spent 3 years commuting 3 hours per day to my job. I paid for wear and tear on my car, ridiculous gas prices, parking fees, and a transit pass* (explicitness of outward ridiculous situation, implicitness of hard-working state of mind and desperate tone of ongoing shift); *I now work the exact same job with the exact same company*

100% from home (explicitness of both positive tone of personal situational satisfaction and implicitness of personal advantage). All these exemplified statements semantically denote personal 'showing off' concerning their situational success and achievements. Some exclamatory expressions are overwhelmed with emotional arrogant tone, capitalized-capsulated statements are also interpreted ambiguously. On the one hand, there is a willingness to proclaim own position, on the other hand, there is an appeal to aggravate the discussion statement in order to provoke other users.

5.   Statements with degree of moralization: ***pandemic*** *is going to be the **defining event*** *for the **generation that's growing up today*** (explicitness of community advise, social instruction); *That's **possible***, *but not **inevitable*** (explicitness of community logo, social adjustment); ***Don't look up*** (explicitness of self-negation, user's shift of statements); *it's **telling them*** *they **shouldn't go*** *somewhere or see someone, and they **can't handle it*** (explicitness of community advisory prohibition). Instructively advisory tone of moralized semantic group is observed. Explicit linguistic markers are allocated in order to denote warning signals of expression as well as to put general community emphasis.

This least commented Reddit has also enumerated 150 textual fragments with statements. The same semantic groups referring to the previous most commented statements are provided. Even exemplified material seems to illustrate similar moods and willingness of users, thus, creating a dominance of negative-tone statements over the positive ones. Cognitive processes brightly represent the stressful speculation situation of pandemic. Moralization semantic group is, on the contrary to the previous most commented posts, marked with cautious measures. The most vivid semantic group is that of allure statements. They are full of exclamatory marks and stressful emotional tone.

To prove textual semantic analysis outcomes conducted manually, the same LIWC-22 software tool is applied. In Figure 5 one can find the same previously allocated manually semantic groups. In addition to them, there are also more LIWC dimension like I-words (I, me, my) and social words. (Fig. 5). What is surprising is that, unlike previous the most commented pandemic posts, personal factor is within the average indicating groups (3.54 points), whereas social words prevail that average one (6.97 points). It may be interpreted in a way that this time, i.e., within the least commented pandemic posts, there are statements which constitute general information concerning pandemic situation.

Traditional LIWC Dimension	Your Text	Average for Social Media Language
I-words (I, me, my)	3.54	5.44
Positive Tone	2.32	5.93
Negative Tone	2.77	2.34
Social Words	6.97	6.74
Cognitive Processes	12.94	8.86
Allure	7.63	8.62
Moralization	0.44	0.27

Figure 5: Semantic groups concerning the least commented pandemic-affected online communication posts allocated and interpreted manually and proved by LIWC software

To compare these both the most and the least commented pandemic statements having previously applied the textual semantic analysis to them and interpreted the textual fragments using digital communication features in terms of social media pandemic menacing discourse, it must be proved that in most semantic groups mixed semantic features are involved, like cognitive processes and positive tone of statements, or cognitive processes and negative tone of statements. What is more, the linguistic markers of explicitness and implicitness are also similar, e.g., viral obstruction consequences and emotional tone, or

fearful, angst, anxiety and stressful tone. The pattern of repetitiveness of post statements denotes the importance of users to be 'heard', trusted in pandemic situation and supported not only within Reddit social media but also real life.

4. Linguistic Model Resembling Pandemic-affected Digital Communication in terms of Reddit Social Media

The objective of the current paragraph of the paper is to interpretatively compare in detail both pandemic commented post statements according to the preliminary conducted textual semantic analysis, as well as statistically provide a comparison of those two most and least commented Reddit pandemic posts. Based on such comprehensive comparison, a model of the impact of pandemic on online communication is introduced.

According to the anxiety-mitigating model mentioned in the second paragraph, there are four support tasks inherent to any social media. They may be applied to Reddit social network as well. On the basis of the conducted linguistic analysis, the first model task is applicable in terms of the research. Mental support concerning personal respect correlates with such semantic groups of the first post as I-words involving personal factor, statements of which are interpreted with the call for users' appeal to hinder the pandemic state; cognitive processes referring to speculations on finding solutions to pandemic block; negative-tone statements causing a willingness to avoid desperate pandemic moods and deeds; alluring statements pointing at mitigating moods of users' rude and arrogant behavioral patterns concerning pandemic restrictions. What concerns the second post, the following semantic groups refer to the first model task: negative-tone statements expressing total neglect and restricted-oriented motions; social words including common community utterances and general known truths; statements with degree of moralization referring to warning signs under ongoing viral condition. The second model task – linguistic and cognitive maintenance in terms of information dissemination and support via cognitive mechanisms – is thoroughly disclosed within both commented posts with semantic group of statements concerning cognitive processes. Here, users share pandemic experience and news information providing a thoughtful process for others to support and comment. The third and fourth model tasks (circulating support spread by a certain collective community with the feeling of inclusion in it as well as influential support based on visible assistance granted to users being affected by pandemic) are also semantically close to the previous semantic group, moreover, to such ones as allured statements and statements with degree of moralization. The latter are vividly illustrated with asking for mental assistance states or even simply expressing users own pandemic recovery stories so that other Reddit users may empathize with and share. So, Reddit social support within digital communication is of importance and netiquette rules mentioned in the second paragraph should be followed as well.
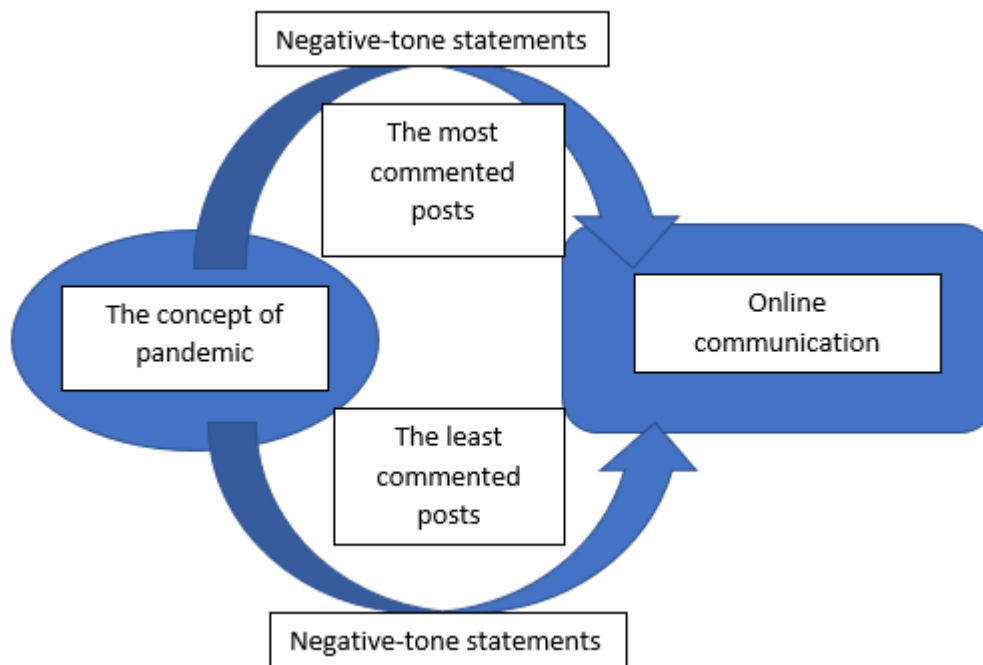
Table 1
Table of semantic groups concerning the most and least commented pandemic-affected online communication posts allocated and interpreted manually and proved by LIWC software

Reddit commented posts	I-words (I, me, my)	Positive tone	Negative tone	Social words	Cognitive processes	Allure	Moralization
1	9.26	2.34	3.09	2.66	13.83	7.87	0.11
2	3.54	2.32	2.77	6.97	6.97	7.63	0.44

Now, the comparison and contrast of commented Reddit pandemic posts is considered above (Table 1). The first string refers to the most commented Reddit pandemic-affected statement post, the second – the least ones.

The first Reddit commented post in the first I-words LIWC dimension prevails over the second one as the title of the first one embodies users' pandemic 'stories' whereas the second one illustrates common truth worldwide. Positive tone in the first Reddit post is not as much statistically higher than the second one, although the second one has nothing to do with pandemic positivity, only single commenting agreement with other users and reduced statements. Negative tone in the first Reddit post is not as much statistically higher than the second one as the same explicit linguistic markers are applied to the statements, however, more rude and vulgar tone is inherent to the second one. Social words, similarly to the personal factor LIWC dimension, dominate in the second Reddit commented post as not so much personal opinion and 'stories' about pandemic have been stated. Cognitive processes prevail in the first Reddit post as they include a mixture of other semantic groups leading to complicated conceptual mechanisms of explicit stressful pandemic unawareness and its factual unacceptance. The second one is similar but full of emotional concern and users' psychological support. Allured statements dominate in the first Reddit commented post but with different semantic tone: the first one aims at personal situational successful proliferation, the second one - cognitive adaptivity mechanism to pandemic situation followed by sharp emotional tone. Moralization has more statistic points within the second Reddit commented group as warning factors have advisory prohibitive nature of statements, whereas the first one – emotional tone of statements without real call for action while pandemic.

Figure 6: A model of the impact of the pandemic on Reddit digital communication

Having contrasted and compared semantic analysis outcomes in an interpretative and statistic way, a modelling representation of the Reddit pandemic-affected online communication posts is introduced (Fig. 6). It is claimed that the concept of pandemic has been thoroughly analyzed through the Reddit online communication posts by application of textual semantic analysis and is disclosed as a media of physical suffering, social restriction, career shift and obstructive viral consequences depending on user's social preferences. Digital communication has been affected by pandemic and specific semantic groups with its prevailing allocated explicit and implicit markers are considered. In most cases, online communicative

means prove to be under stress, emotionally more negative colored with high speculative magnitude. The latter is proved and highlighted within the analyzed semantic groups of negative-tone statements as in the most commented Reddit posts as in the least commented Reddit posts

5. Conclusion

To conclude, the effect computerized linguistic tools have on cognitive processes must thus be apprehended in terms of the linguistic and cognitive rather than structural dimension of information, i.e., it is always significant to discover who produces information, how to disseminate it, who will get and share it and, most of all, how to appropriately and trustworthy use the data. Social digital communication through a variety of social media was considered. Different theoretical fundaments of social support and digital communication postulated were explored. In practical paragraphs some of the enumerated digital communication features and existing social and cognitive model tasks were applied.

The concept of pandemic and its influence on digital communication was discovered by conducting textual and semantic analysis towards the Reddit commented posts. The most and the least Reddit commented statements were allocated manually and then proved by LIWC software tool. It was examined that allocated semantic groups within both Reddit posts were the same in form, outwards, but different in sense, inwards. It was proved by using linguistic explicit and implicit markers allocated in order to denote particular semantic interpretation of the Reddit pandemic-affected statements. Such cognitive mechanisms followed by mental states as fear, angst, anxiety and stress were established. Social support patterns were identified and interpreted according to the allocated and analyzed semantic groups of the Reddit pandemic-affected digital communication posts. All necessary illustrative material was provided.

The comparison and contrast procedures of the semantic groups of the Reddit pandemic-affected digital communication posts as well as of the LIWC statistic indicators were produced. All research steps were generalized and summarized upon presenting linguistic model resembling pandemic-affected digital communication in terms of Reddit social media.

In perspective, more sophisticated and semantically complicated linguistic model of social media complex worldwide may be introduced and contributed into further linguistic and cognitive studies.

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