Sentiment Analysis: From Psychometrics to Psychopolitics

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Abstract

The data about our affects, the so-called emotional data, constitute nowadays a valuable commodity, collected and marketed by digital communication platforms. Among the interested in obtaining it are financial and political corporations that base their decisions on information about network user's affects. There are different ways to generate emotional data, one of which is the sentiment analysis. This article addresses some characteristics of this tool, clarifying its operation and the psychometric knowledges that constitute it. Sentiment analysis is understood not only as a tool for detecting affects, but also for emotional production. It is in this sense that it is possible to outline it — beyond a psychometric instrument — as a psychopolitical apparatus, a technique that operates by instrumentalizing emotions for a capitalization beyond the individual. In this sense, concepts such as "control society" (Deleuze, 1992), "confessional society" (Bauman, 2012/2014), and the very notion of "psychopolitics" (Han, 2014/2014b), are useful to understand aspects of emotional production based on new communication technologies. This article, therefore, aims to contribute to the understanding of an important factor which is still somewhat neglected in studies on big data and surveillance: the monitoring and production of affects as a form of subjective control.

Keywords

emotions, sentiment analysis, psychopolitics, big data, surveillance

Análise de Sentimentos: Da Psicométrica à Psicopolítica

Resumo

Os dados sobre nossas emoções, os chamados *emotional data*, constituem hoje uma valiosa *commodity* coletada e comercializada por plataformas de comunicação digital. Entre os maiores interessados em obtê-la estão corporações financeiras e políticas que, entre outros usos, baseiam suas decisões em informações sobre os afetos dos usuários das redes. Existem diferentes formas de se gerar *emotional data*, e uma delas é a análise de sentimentos. Este artigo aborda algumas características dessa ferramenta, investigando o seu funcionamento e os saberes psicométricos que a constituem. A análise de sentimentos é entendida não apenas como uma ferramenta de detecção de afetos, mas também de produção emocional, uma técnica que opera instrumentalizando as emoções para uma capitalização alheia ao indivíduo. É dessa maneira que é possível delineá-la — para além de um instrumento psicométrico — como um aparato psicopolítico. Neste sentido, conceitos como "sociedade de controle" (Deleuze, 1992),

"sociedade confessional" (Bauman, 2012/2014), além da própria noção de "psicopolítica" (Han, 2014/2014b), são úteis para compreendermos aspectos da produção emocional assentes nas novas tecnologias da comunicação. Este artigo, portanto, pretende contribuir para o entendimento de um fator importante, mas ainda algo negligenciado nos estudos sobre *big data* e vigilância: o monitoramento e a produção de afetos como forma de controle subjetivo.

Palavras-chave
emoções, análise de sentimentos, psicopolítica, *big data*, vigilância

How does sentiment analysis detect and classify new communication technologies users' emotions? Beyond that: how it also contributes to the production of those affects? To introduce an answer to these problems is this article's main objective. Being one of the most developed and applied emotional surveillance tools in the present, sentiment analysis is constituted as a complex research object, which could be deployed in countless useful investigations to better understand, among other themes, contemporary subjectivation processes. This article focus, therefore, on the theme of surveillance, control, and the production of affects through a theoretical-critical appreciation of the problem.

The method developed for this study was the attentive and relatively exhaustive analysis of technical mechanisms that constitute sentiment analysis, as well as the taxonomies used by this tool in its affective classification processes. This sort of information was obtained, above all, in articles published in the field of computer sciences, generally written by sentiment analysis algorithms developers themselves. In examining these technical elaborations, we had two basic questions in mind: what knowledge's are involved in detecting emotions? What consequences can they have to affective production?

Throughout the study, these technoaffective knowledge proper to algorithms creators, as well as their practical applications, could be understood in a renewed way by the light of a series of concepts, such as "control society" (Deleuze, 1992) and "confessional society" (Bauman, 2012/2014). The assemblages between technical knowledge and conceptual considerations allowed us to conclude that, in fact, sentiment analysis works not only as a psychometric tool — for detecting, identifying or measuring emotions — but also as a psychopolitical apparatus, which enables control and production of affects through two strategies: their registration in communication platforms design and the use of algorithmic-semiotic procedures for directing content (microtargeting).

"You Are Not Alone. Wanna Talk?"

Someone who frequently posts sad comments about his own life on Twitter could suddenly be surprised by a message like "you are not alone. wanna talk?" on his computer or smartphone screen. If he attended the empathic and mysterious call, he would then be directed to a private chat, in which he could exchange messages with a volunteer

trained to dialogue with subjects in extreme situations and to remove them from their potentially suicidal affections.

In a general way, this is the approaching method of Code of Hope, a program implemented in 2019 by the Spanish Twitter in partnership with Teléfono de la Esperanza, a non-governmental organization that presents itself as specialized in intervening in "emotional crisis situations" (https://www.telefonodelaesperanza.org). A publicity video released by the two organizations explains the Code of Hope a little better:

> young people with depression constantly post signs of their emotional states before taking desperate actions. Signs that humans can barely notice. But if humans don't notice them, who could do it? Code of Hope – the artificial intelligence that detects suicidal behavior. (Reason Why, 2019, 00:00:33)

According to the video, when analyzing a database composed of posts from users who actually committed suicide, an emotional pattern was identified. This made it possible to create an algorithm that detects this same pattern in active profiles, so that, afterwards, these users can become objects of affective intervention. According to what was disclosed, even after starting the dialogue with volunteers, Twitter users continue to have their posts monitored by the algorithm, which then starts to "report emotional changes". If no significant improvement is detected on the affects tracked by the platform, Code of Hope then calls Teléfono de la Esperanza, so that the non-governmental organization can perform other measures, presumably more invasive ones.

The emotional surveillance over Twitter users could, in common sense, be understood as "well intended". After all, the social network would be working to protect lonely internet users, in psychological distress, about to commit a definitive act against their own lives. But this hasty moral judgement overshadows an unsettling question: why did a media company, like Twitter, provided itself with the ability to monitor and regulate our emotions? Without any embarrassment in disclosing the existence of the algorithm that oversees what we feel, Code of Hope was, on the contrary, used with marketing functions. The initiative was even awarded at "El Sol", an Ibero-American advertising festival (Marques, 2019). It was naturally accepted that Twitter had developed a system to detect emotions that, at least in the past, we tended to consider as absolutely personal and subjective — and, for that reason, of exclusively intimate interest. No analyst was surprised by the fact that the company had implemented a series of procedures to actually change users' emotions, and even to monitor whether these changes were taking place or not.

The moral imperative that obliges us to show sensitivity to the suffering of others may have minimized this sort of critical reflection — Twitter was taking care of its users, and that was the idea that the company wanted to highlight. But the naturalness with which the initiative was received may also have to do with a notion, increasingly widespread among specialists, that monitoring users' emotions is part of the routine work performed by social networks. For those who follow the emerging trends on this

field, what Twitter accomplished was not surprising at all. More controversial episodes, more easily questionable from an ethical point of view, were displayed by Facebook a few years earlier, for example. In one of them, which took place in May 2017, a journalist from *The Australian* published details of a leaked document, in which two Australian Facebook representatives stated, to a potential advertiser, that the social network was able to identify profiles from teenagers who felt "insecure", "worthless" and needing "a confidence boost" (Levin, 2017, para. 1). According to the document, Facebook would be able to monitor, in real time, image and text posts to identify when young people were feeling "stressed", "defeated", "overwhelmed", "anxious", "nervous", "stupid", "silly", "useless" and a "failure" — exactly in this terms (Levin, 2017, para. 2). These precarious emotional states were available in "internal data", not accessible to the general public. The document did not clarify how this sensitive data could be exploited in a practical way by advertisers. But the fact that they were offered by top Facebook executives to a major banking institution does not leave much room for imagination.

The data about our emotions — *emotional data*, in technocratic jargon — has become a relevant commodity in the market of digital communication[1]. At the limit, this commodification of emotions[2], as sociologist Luke Stark (2018) points out, would have already outlined a big business, explored by countless companies and other organizations.

> Facebook is by no means the only digital actor turning to mood tracking as part of a broader effort to collect behavioral and psychological data about users. Exemplified by a number of converging trends in human-computer interaction design, applied psychology, data science and advertising, the extraction, collection and analysis of data regarding human emotion is a bigger and bigger business. (Stark, 2018, p. 208)

This commodity's value lies on the fact that the supposed numeric precision provided by emotional data enables to inform, for example, companies' and political parties' strategic decisions. It is constituted, therefore, as a sort of emotional capital that, to be generated depends on technological tools that have been rapidly developed by specialized knowledge. These tools strive to capture and measure the expression of individual emotions, forming sets of metadata about the collective psyche. Facial expressions identification in photographs shared online; the recording of information about our sleep, blood pressure, movements and mood carried out by sensors and health applications on smartphones — emotional surveillance becomes more and more extensive as the

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[1] The term "emotional data" is commonly used in computer sciences articles to refer, in a generic way, to any data related to emotions (Fathullah & Willis, 2018; Luo et al., 2017; Matsumae et al., 2020). It is important to note, however, that there are no purely emotional data, but information that is algorithmically interpreted in its affective quality. For example: the frequency of a heartbeat can be used to assess one's health condition, but, in another context, this same information can be interpreted in its emotional valence, indicating states of anxiety, fear or stress. This is how emotional data can be generated from the most varied sources: texts, videos, audios, physiological signals, among others.

[2] Not restricted to the scope of new technologies, sociologist Eva Illouz (2018) has created an interesting neologism to refer to the product of emotional commodification: "emmodity" (p. 8).

devices to which we connect daily, and sometimes 24 hours a day, are equipped with these and other techniques for capturing and classifying emotional data.

According to computer scientist Bing Liu (2012), among these techniques, the so-called sentiment analysis has caught most of the developers' attention.

> Since early 2000, sentiment analysis has grown to be one of the most active research areas in natural language processing. It is also widely studied in data mining, web mining, and text mining. In fact, it has spread from computer science to management sciences and social sciences due to its importance to business and society as a whole. In recent years, industrial activities surrounding sentiment analysis have also thrived. Numerous startups have emerged. Many large corporations have built their own in-house capabilities. Sentiment analysis systems have found their applications in almost every business and social domain. (Liu, 2012, p. 5)

In the USA alone, and just until the year 2012, there were about 60 startups dedicated to sentiment analysis, and giants such as Google, Microsoft and Hewllet-Packard had already created their own divisions for their development and application (Liu, 2012, p. 9). This expansion and technical development took place as the culture of big data — the processing of data on a gigantic scale — was spreading, being consensually understood as relevant to business and political decision-making.

As one of its enthusiastic researchers states, exhaustive affective monitoring on the internet can generate "very valuable information", both for companies that can "better promote" their products, and for political organizations[3] interested in "clarifying their strategy" (Gomes, 2012, p. 10). According to him, in the web competitive landscape,

> knowing what customers think about the organization or what happens daily on the internet is a challenge that everyone has in the fight for their survival in the market. Bearing in mind that decision making is a process that results from previous research and data analysis, it is essential to obtain qualitative information that contains high added value, in order to create differentiation. This situation is only possible if there is a constant monitoring of reality, which will always have to be done using automated processes, since the amount of data generated [online] is, every second, gigantic. It is in this particular way that Text Mining (TM), in special Sentiment Analysis (SA), has gained great interest in recent years, since it allows to treat

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[3] When mentioning political organizations, we basically refer to parties, movements, associations and other public sphere agents — and, in the case of sentiment analysis, especially to candidates running for democratic elections. There are several companies that provide sentiment analysis services to political figures in electoral dispute, one of the most recognized being Majoritas, whose portfolio includes politicians from countries such as Brazil, USA, France, Congo, Indonesia, among others (Moise, 2017). Experts on the subject debate how sentiment analysis can even be effective in predicting election results (Ceron et al., 2015). Attesting the dissemination of sentiment analysis for electoral purposes, some authors go so far as to affirm that "it can be expected that sentiment analysis will be part of every campaign in the future" (Ringsquandl & Petkovic, 2013, p. 40).

and analyze large volumes of unstructured data in an automated way and, hence, generate knowledge. (Gomes, 2012, p. 10)

In general, sentiment analysis refers to a series of computational procedures used to identify affective states presented on texts. These textual databases can be formed, for example, by sets of posts on social networks, forums and blogs, comments on news, reviews posted on websites specialized in cinema, gastronomy, tourism, among others. In any digital situation in which the user is encouraged to express himself emotionally through texts, sentiment analysis finds a promising field to exercise its affective surveillance.

The first operational procedure performed by sentiment analysis is precisely the collection of textual data that will be further analyzed in its emotional valence, and the component that captures those texts is commonly called "crawler" (Malheiros, 2014, p. 64). Companies like Twitter and Facebook offer crawler services, selling posts published on their social networks and even pre-screening texts according to the client's interests. After this stage, captured texts usually go through an automated "cleaning" stage, in which messages are reformatted, variations and misspellings are standardized, and other patterns are applied to make them readable by the next component, usually called sentiment classifier.

An essential stage of the analysis, sentiment classifier works based on supervised machine learning or, as an alternative, based on lexicons. In the first case, it starts with a database composed of texts that have already been labeled (usually by human beings) according to the emotional states apparent on them — and then what the machine does is simply to categorize new messages based on this initial labeling. In its turn, when the sentiment classifier is based on lexicons, it starts from a database which is similar to a dictionary, where different words are labeled according to their emotional content. In this linguistic-affective index, curses and verbs like "hate" or "cry" are generally attributed to emotions understood as negative, while words like "fascinating" or verbs like "love" and "worship" are linked to positive affects, and so on. Detecting the appearance of indexed words on messages, the classifier performs calculations to define which emotions they refer to.

Superficially, these are the technical steps that allow digital platforms to scan, on a large scale, their users' emotions. From the results of a hypothetical sentiment analysis, if a percentage X of users from a social network presents the emotion "sadness" in relation to a certain topic, an interested company can target specific niche ads that promise, in some way, to solve the problem through the consumption of its products. Likewise, if a percentage Y of users demonstrates the emotion of "joy" in relation to a public event, interested powers can direct them advertising messages that link this affect to the achievements of a particular political party, for example. Microtargeting — the microscopic targeting of advertising messages, made possible through algorithms — is the technique that most perfectly complements sentiment analysis. Their combination

allows them to direct, modulate and capitalize on emotions. It is even possible to try modifying them through not only advertisements, but also hiring digital influencers or the so-called opinion spammers — undeclared emotional operators, who by emitting messages loaded with affects, seek to influence the emotions of their "friends", "followers", or circumstantial public.

A Psychometric

It is very clear that sentiment analysis, as a tool for emotional detection, has technical limitations. Specialists point, for example, to a certain algorithmic difficulty in evaluating the emotional valence of ironic, sarcastic or semantically ambiguous texts (Deng et al., 2017; Ferrara & Yang, 2015). Other studies also report reduced levels of accuracy in some affective rating systems (Islam & Zibran, 2017; Khoo & Johnkhan, 2018). These and other operational problems are subject of studies by algorithm developers, who have been working to overcome or minimize them (Bosco et al., 2013; Hernández-Farías et al., 2015). It is therefore plausible to imagine that sentiment analysis technical procedures tend to be sophisticated over time, gaining accuracy and including other factors to support emotional data collection and classification. However, in order to understand the phenomenon, it is interesting paying attention not only to its technical characteristics, but also to the emotional taxonomy used in its analysis — that is, the categories in which our affects are framed, the ways in which those interested in our emotions classify them on their charts and diagrams.

In this sense, it seems possible to invent and apply the most varied classification schemes, according, certainly, to the purposes of each sentiment analysis operation. Many of these schemes are freely inspired by academic knowledge, originally produced in psychology. One of them, called POMS-ex (Bollen et al., 2011), used for sentiment analysis on Twitter posts, is based on an emotional scale entitled *Profile of Mood States*, which was developed in the 1970s by North American researchers (McNair et al., 1971). Its adaptation to emotional surveillance on social network frames users' emotions in six categories: tension, depression, anger, vigour, fatigue and confusion. Also used on Twitter, in its turn, PANAS-t (Gonçalves et al., 2012) is based on the *Positive Affect Negative Affect Scale*, created in the 1980s also by researchers from the USA (Watson & Clark, 1994). It classifies posts into 11 emotional categories: joviality, self-confidence, serenity, surprise, fear, sadness, guilt, hostility, shyness, fatigue and attention. In the case of Code of Hope, the anti-suicide algorithm, the scale is potentially more thorough, adopting for classification the 32 emotions described by evolutionary psychologist Robert Plutchik in 1980 (Plutchik, 1980).

It is curious to notice that, in these three examples, developers apparently adapted the emotional taxonomy from the original scales not worrying about the methodological and theoretical contexts in which they were created. Emotional scales adopted in POMS-ex and PANAS-t, for example, were originally designed to be detected through extensive

questionnaires applied individually, and not through the massive analysis of small texts like those on Twitter. The 32 emotions proposed by Plutchik (1980), similarly, are part of an elaborate psychoevolutionary theory of affects, which is certainly disregarded on the schematic application performed by sentiment analysis. Not to mention the noise that cultural, historical and linguistic differences can cause when carrying out these transitions that, at first sight, seem to be poorly reflected.

However, it would be a mistake to think of these conceptual and methodological gaps as some kind of intellectual carelessness on the developers' part. In reality, the original epistemological contexts in which these emotional scales were developed do not interest algorithm creators. The purpose of sentiment analysis is not to create a theoretically consistent representation of a group of people's emotional life, but to provide the financial and political powers with useful information that enable them to take decisions. The aim of the contemporary emotional surveillance is to generate metadata with which it is possible to establish correlations and define strategic positions — in the experts' vocabulary, to generate actionable results, that is, results whose ultimate purpose is action. As Mark Andrejevic (2011) writes, "sentiment analysis pushes beyond the goal of representing or modelling the populace. The goal is not to describe but to affect and effect – to stimulate word of mouth, to promote engagement and, in some cases to thwart it" (p. 616). The tool would thus participate in a common conception nowadays, according to which "qualitative contexts were increasingly unnecessary; uncontextualized correlations emerging from the 'raw' data would be sufficient to produce actionable results" (Stark, 2018, p. 216).

Sentiment analysis, thus, does not necessarily deal with scrupulous emotional discretions, nor with considerations at the level of an individual subjective ecology. The singularity of what we feel, the idiosyncratic content of our affections, is not among the primary objects of its measurements. For this reason too, there is generally no reason why digitally monitored emotions should be framed in very specific markers, or that emotional taxonomy should be composed of numerous and complexly described categories. In fact, most sentiment analysis operations classify our affections in a ternary numerical scheme: *negative* (-1), *neutral* (0) or *positive* (1) emotions. In countless cases, for the marketing *intelligentsia* practical reason, it is enough to describe the polarity of an emotion in relation to a given product, be it an item of daily consumption or a political figure in an electoral dispute. The somewhat coarse ordering of our emotions already seems to be sufficient for the effectiveness of affective monitoring and controling[4].

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[4] Without mentioning affective control directly, some studies may suggest interesting ways to counter the subjective domination exercised through algorithms. Tiqqun proposes, for example, that subjects objectified by cybernetic systems should produce noise as a way to confuse the devices that try to capture them (Tiqqun, 2020). This is what researchers Matteo Pasquinelli and Vladan Joler (2020) also seem to suggest when describing the so-called "adversarial attacks": "the traditional techniques of obfuscation against surveillance immediately acquire a mathematical dimension in the age of machine learning. For example, the artist and researcher Adam Harvey has invented a camouflage textile called HyperFace that fools computer vision algorithms to see multiple human faces where there is none" (p. 15). A similar tactic in the area of emotional detection and control is the one used by artist Ben Grosser and described by sociologist Luke Stark (2018). Grosser is the creator of Go Random, "a web browser extension that randomly chooses an icon for the user to post and thereby obfuscates a user from the site's collection of emotional data" (Stark, 2018, p. 229).

It is with this pragmatic characteristic that sentiment analysis is established as one of the most celebrated contemporary psychometric techniques. Traditionally, psychometrics is defined as a branch from psychology dedicated to constitute and apply subjectivity measuring mechanisms. This field's origin seems to be located at the end of the 19th century, especially after the investigations made by Francis Galton and James McKeen Cattell. From an early age, psychometrics approached mathematical sciences, especially statistics. In fact, there are those who define it not so much as a branch of psychology, but of statistics itself (Pasquali, 2017). The development of this kind of knowledge, a psycho-mathematical hybrid, has endowed researchers with the ability to represent various subjective elements, including emotions, through numbers. But as we have noticed, on sentiment analysis, the computational version of psychometrics moves towards an atrophy of its representative quality at the expense of a specific practical purpose: to inform decisions in a neoliberal society, in which capitalistic and political interests converge to subjectivity control.

In this scenario, the psychometric project performed by sentiment analysis is not so much concerned with unveiling the subject's truth — rather, it is interested in producing subjectivities according to categories established by itself. As Luke Stark (2018) notes,

> a lack of accurate descriptive power does not mean the applied psychological techniques within digital systems lack a standardizing, prescriptive or even proscriptive power; it is precisely the constructed and performative nature of "descriptive" models which produces those effects. (p. 222)

In other words, even if one does not agree with sentiment analysis' reduced emotional taxonomy, or even if one doubts its relatively fragile methods or remains skeptical about the results obtained by the technique — still, the practical application of those same results will productively act over him.

This contemporary subjective production does not happen only through semiotic tactics, used in messages that assault us with microtargeting precision. The platforms' design itself encourages the production of specific emotions that are able to be capitalized. In this sense, what is expected is that the users' affects present a clear, readable, easily identifiable quality, so that it can be located in an emotional diagram as polarized as possible. An authentic, elusive affect, irreducible into a negativity or a positivity, is not so useful for those interested in capitalizing on our emotions. How could a political organization, for example, benefit from an ambiguous, singular affect that does not obey a polarizable logic? Perhaps this is why social networks encourage users to be affected according to a previously established taxonomy. The "reactions" available on Facebook interface are a clear example of this. In all posts viewed, we are encouraged to affect ourselves in one of six possible manners: to like, to love, to laugh ("haha"), to be surprised ("wow"), to be sad or to hate ("grr"). It is not vetoed to demonstrate other affects: it

is always possible to resort to texts, images or other media to generate more complex emotional data — the contemporary production of subjectivities does not work so much through interdictions, prohibitions, but through encouragements.

On this subjection strategy, we are encouraged to feel, and to express what we feel, according to the affective categories that can be better instrumentalized by platforms and their corporate partners. At the social networks' design, these categories are "then represented back to individual users as a norm against which they should perform" (Stark, 2018, p. 214). The ideal user, thus, is the one that has his affects produced in line with the subjective program implemented by the developers. Over time, he becomes "fluent in the emotional expressions, behaviors and gestures aligned with a platform's models" (Stark, 2018, p. 214).

Because of this logic, we can understand sentiment analysis not so much as a representational tool or even as an apparatus for affect detection, but as a technique developed for emotional production, a computational mechanism whose purpose is an active control over emotions, beyond mere surveillance. The tendency is that, with its effective application, users' subjection results in an affective standardization. In an ideal scenario, one starts to feel nothing beyond a *clear positivity* (1) or nothing less than a *dark negativity* (-1), while the platform is able to capitalize on both affects. In this scenario where every emotion is disposable, even a *gray neutral value* (0) is approached by the subjectivating powers as a transient emotional state, which should be directed to one of the poles as soon as possible — and never as a singular, intractable chromatic difference, unusable to algorithmic appeals.

A Psychopolitic

As a contemporary psychometric technique, sentiment analysis differs from its predecessors because it is not based on surveys or other psychological tests, but on a collection of data which is generated on communicative processes. When posting, social network users are not fully aware that their emotions are being monitored and modulated. After all, they imagine to be just communicating, and not being scrutinized on psychic indicators. Off guard, they are encouraged to express themselves as much and as emotionally as possible — but never coerced, forced to do so. The subjection strategy put into practice on digital media is not essentially oppressive or repressive, it does not oblige to say and only punctually censors what is said[5]. For it to work, users must believe

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[5] Censorship on digital platforms is a widely debated phenomenon that has already yielded several interesting studies (Heins, 2013; Hintz, 2015; Silveira, 2015). But perceiving this issue from a psychopolitical perspective implies understanding that, despite the existence of censorship mechanisms, digital media were not created with the primary purpose of preventing communication between subjects (as in the case of disciplinary society institutions, like prison). On the contrary: in general, these communication technologies are gratuitous, seek to attract and engage users and encourage them to interact and share as much content as possible. After all, their profit and expansion are based on the exploitation of large amounts of data provided by users. That is why communication, and not censorship, is its fundamental mode of operation. In this sense, digital media seem to follow the cybernetic principle in which control becomes viable due to communicative processes themselves: "cybernetics intends that the control of a system is obtained by the optimum degree of communication between its parts" (Tiqqun, 2020, p. 53).

that they are acting freely. That is why it encourages the freedom of an excess, and only occasionally constrains a punitive contingency: the more numerous and affected the speeches produced, the more it is possible to capitalize on them. That is the reason why sentiment analysis benefits from an environment in which individuals feel motivated to expose themselves. In contemporary times, the "confessional society", as Zygmunt Bauman (2012/2014) calls it, is part of the subjection mechanism in which sentiment analysis functions as a component.

> Adolescents equipped with portable electronic confessionals are nothing more than apprentices training (and being trained in) the art of living in a confessional society; a society that stands out for eliminating the frontier that previously separated the private from the public, for making public exposure of the private a virtue. (Bauman, 2012/2014, p. 25)

Voluntary emotional display, which accrues from this sort of contemporary confessional desire, is fundamental for affective control. In this context, subjectivity monitoring and production are not carried out through restriction on freedom, but only possible through their exercise. Control becomes possible precisely where expressions are freely exposed. Bauman (2012/2014) characterizes this current surveillance form as post-panoptic. By this, he refers to a change in the panoptic paradigm, as it was idealized by Jeremy Bentham (1791/2019) and analyzed by Michel Foucault (1975/2014). In this classic conception, individuals are ostensibly watched over by a central, oppressive and identifiable power, which subjects them to total scrutiny regardless of their will. According to Bauman (2012/2014), this subjection strategy is not widely disseminated on contemporary society, but restricted to its "unmanageable" parts, such as prisons, confinement camps and psychiatric hospitals. At these institutions, individuals would continue to be subjected to a form of control based on their lack of freedom. On the other hand, in a broader social scenario, control would be configured in the post-panoptic mode — on this sophisticated arrangement of massive control, individuals have the feeling to be exercising unlimited freedom and, therefore, they actively cooperate for their own subjection, happily providing a multitude of information to the very systems that subject them. "With the old panoptical nightmare ('I'm never alone') now transformed into the hope of 'I'll never be alone again' (abandoned, ignored and scorned, banned and excluded), the fear of exposure was drowned out by the joy of being noticed" (Bauman, 2012/2014, p. 21).

As the philosopher Byung-Chul Han (2012/2014a) accurately observes, control society works precisely when

> its subject is stripped out not by external coercion, but by virtue of a need generated in himself, that is: when the fear of having to renounce his private and intimate sphere gives way to the need of showing off shameless. (p. 67)

"If I don't expose myself enough, I'll become socially isolated" – today, this is the impression that encourages us to communicate without rest everything we are doing,

thinking or feeling. It is in free communication that surveillance and subjective production are established. And it is through communication, for example, that sentiment analysis detects our affects to simultaneously produce them.

> Unlimited freedom and communication become total control and surveillance. (…) At the moment we have just freed ourselves from the disciplinary panoptic, we have entered into another, new and even more effective one. The inmates of the Benthaminian panoptic were isolated for disciplinary purposes and were not allowed to speak to each other. Residents of the digital panoptic, on the other hand, communicate intensively with each other and expose themselves on their own initiative. They actively participate in the construction of the digital panoptic. (…) Thus, data transmission does not occur due to coercion, but because of an inner need. (Han, 2014/2014b, p. 17)

Operating as a technical component of this subtle control mechanism, sentiment analysis is configured not only as a psychometric tool (for measuring) but also as psychopolitical apparatus (for subjection). The concept of psychopolitics, as proposed by Han (2014/2014b), concerns control strategies aimed at instrumentalizing individuals' psyche. Their goal is not to dominate them through an oppressive negativity of the body, for example, but through a positive production of subjectivity elements, which includes emotions. Thus, psychopolitical control operations do not happen to establish mandatory permanence and coercive institutions, but creating communication platforms in which individuals wish to participate. In this sense, the success of digital media, especially social networks, leads to an unprecedented effectiveness of psychopolitical methods.

> We are on the way to a digital psychopolitics era. We are advancing on the path that leads from passive surveillance to active control. (…) Big data is an extremely effective psychopolitical tool that allows to acquire comprehensive knowledge of the dynamics inherent to communication society. It is a domination knowledge, which allows to intervene in the psyche and condition it to a pre-reflexive level. (Han, 2014/2014b, p. 21)

This subjective psychopolitical conditioning is carried out based on computational data, information about ourselves that we generate when using digital communication devices in an unrestricted way. By acting inadvertently, we generate a *data double* — a duplicate of ourselves that becomes available to information system managers (Haggerty & Ericson, 2000). At this numerical representation, it is possible to detect elements of our subjectivity that often escapes our own consciousness. It is a sort of a digital unconscious upon which is possible to act programmatically. Part of this data double is constituted by affects, emotions that often go unnoticed even by users themselves, but which are identifiable in the form of emotional data. It is in this sense that psychopowers seek to access and condition not our conscious opinions, rational thoughts or reflected affiliations — psychopolitics is a practice of power that operates in a pre-reflexive

environment, in the unconscious emotional territory, in what Félix Guatarri had already called an "infrapersonal dimension" (Rolnik & Guattari, 1986, p. 27).

Psychopolitic subjective assemblages become possible at a historical period when Bentham's (1971/2019) panoptic model gives way to Bauman's (2012/2014) post-panotic model. In a broader conceptual perspective, we could also talk about a transition from "disciplinary society", as described by Michel Foucault (1975/2014), to "control society", as indicated by Gilles Deleuze since the 1990s (Deleuze, 1992). While disciplinary society would be defined by an ordering of bodies in various normative and confinement spaces, control society would take place in an open environment, occupied by flows and connective networks. "At this context, the panopticon model, as a power diagram, is replaced by the network model, which is located beyond institutional boundaries and is marked by continuous connections and disconnections" (Hur, 2013, p. 209). As noted by Byung-Chul Han (2014/2014b), it was essential for disciplinary society to govern populations through biopolitics, which was concerned with regulating bodies through norms of health, hygiene, birth, among others. But in contemporary control society, powers would act mainly in the subjectivity field, through psychopolitics. With this change, subjection mechanism attention would shift from the body to the psyche:

> Biopolitics, which is based on population statistics, has no access to the psyche. It does not provide any material for the population's psychoprogram. Demography is not a psychography. It does not explore the psyche. This is where resides the difference between statistics and big data. From big data, it is possible to construct not only an individual psychoprogram, but also the collective psychoprogram, or even, perhaps, the unconscious psychoprogram. In this sense, it would be possible to illuminate and explore the psyche down to the level of the unconscious. (Han, 2014/2014b, p. 30)

As a psychopolitical apparatus, sentiment analysis enables to exercise control over this unconscious emotional latitude. Emotions even seem more intrumentalizable if individuals are not fully aware of their existence. After all, in this way they can be driven to action without further resistance. As the Brazilian philosopher Charles Feitosa (2018) states, psychopolitics can be precisely understood as the "control and management of actions through affective conditioning" (para. 2). In other words, on the horizon of psychopolitical operations resides the production of subjects who act — who consume a certain product, who engage in a specific demonstration, who vote for a stipulated candidate, and so forth. The psychopolitical trick is to move individuals to action not through reasonable arguments, explicit explanations or convincing tactics. What psychopolitics promotes is an emotional mobilization: the individual acts obeying an affect that crosses his subjectivity, propelling him towards that movement.

> Emotions are performative insofar as they evoque determined actions. Emotions, as inclinations, represent the energetic and even sensory basis for action. They are regulated by the limbic system, which is also the

impulses' headquarters. They constitute a pre-reflective, semi-conscious, bodily instinctive level of action, of which we are not explicitly aware. Neo-liberal psychopolitics captures emotions to influence actions through this pre-reflexive level. It reaches the bottom of individual through emotion. Thus, emotion represents an extremely efficient mean of individuals' psychopolitical control. (Han, 2014/2014b, p. 57)

Final Considerations

With this pragmatic subtlety, sentiment analysis is characterized as a psychometric technique, but with psychopolitical purposes. It is based on affective surveillance and control, and can be directed even at an unconscious level. The ultimate goal of its operations is to induce individual to perform emotionally informed actions. This emotional production, aimed at actions, is carried out both through microtargeting semiotic tactics and affective conditioning programmed in communication platforms — the emotional design, so fashionable in contemporary times, that frames the user as a reproducer of the emotions stipulated by the system.

In this context, emotion as a practice of freedom is explored without our conscience. "Acting according to one's emotions" becomes a risky imperative, since we can hardly know if our affects are really authentic, originating from an ungovernable singularity, or the results of a program that instrumentalizes them, directing emotions to some kind of capitalization. As Baruch Spinoza (2014) wrote, if a stone hurled into the air suddenly gained consciousness, it would certainly imagine that it was exercising the freedom to fly. Likewise, in the contemporary world, the practical exercise of emotions can be a programmed movement, originated somewhere alien to our conscious will.

Therefore, the theme of emotions in contemporary times needs to be inserted in a broader scenario, in which it seems urgent to rethink the way freedom is exercised on the open circuits of control society, reevaluating, for example, if "the emergence of participatory forms of interactivity has coincided with dramatic forms of economic or political empowerment" (Andrejevic, 2011, p. 620). As Gilles Deleuze (1992) observed, in control society, it is up to new generations "to discover that they are being led to serve, just as their predecessors discovered, not without pain, the purpose of disciplines" (p. 226)[6].

Translation: Felipe Melhado

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[6] Detecting or inventing ways to resist affective control seems to be one of the many urgent tasks for researchers on digital humanities. This article is restricted to introduce an understanding about sentiment analysis as an emotional control and production mechanism, but the authors are currently developing an investigation in which the resistance dimension has a privileged place for reflection. This research, carried out within the scope of Communication and Society Research Centre (CECS) and the PhD in Communication Sciences at University of Minho, is conducted by Felipe Melhado under the supervision of Jean-Martin Rabot and co-supervision by Moisés de Lemos Martins and Norval Baitello. The project investigates how the concept of "anthropophagy" (as formulated by the poet and philosopher Oswald de Andrade, 1928/2017, and other authors) can be useful as a counter-affection tactic in the context of new communication technologies.

References

Andrade, O. (2017). *Manifesto antropófago e outros textos*. Companhia das Letras. (Trabalho original publicado em 1928)

Andrejevic, M. (2011). The work that affective economics does. *Cultural Studies*, *25*(4–5), 604–620. https://doi.org/10.1080/09502386.2011.600551

Bauman, Z. (2014). *Vigilância líquida: Diálogos com David Lyon* (C. A. Medeiros, Trans.). Zahar. (Original work published 2012)

Bentham, J. (2019). *O panóptico* (T. Tadeu, Trans.). Autêntica. (Original work published 1791)

Bollen, J., Pepe, A., & Mao, H. (2011). Modeling public mood and emotion: Twitter sentiment and socioeconomic phenomena. In L. Adamic, R. Baeza-Yates, & S. Counts (Eds.), *Proceedings of the Fifth International AAAI Conference on Weblogs and Social Media* (pp. 450–453). AAAI Press.

Bosco, C., Patti, V., & Bolioli, A. (2013). Developing corpora for sentiment analysis: The case of irony and senti-tut. *IEEE intelligent systems*, *28*(2), 55–63. https://doi.org/10.1109/MIS.2013.28

Ceron, A., Curini, L., & Iacus, S. M. (2015). Using sentiment analysis to monitor electoral campaigns: Method matters - evidence from the United States and Italy. *Social Science Computer Review, 33*(1), 3–20. https://doi.org/10.1177/0894439314521983

Deleuze, G. (1992). *Conversações* (P. P. Pélbart, Trans.). Editora 34.

Deng, S., Sinha, A. P., & Zhao, H. (2017). Resolving ambiguity in sentiment classification: The role of dependency features. *ACM Transactions on Management Information Systems (TMIS), 8*(2–3), 1–13. https://doi.org/10.1145/3046684

Fathullah, A., & Willis, K. S. (2018). Engaging the senses: The potential of emotional data for participation in urban planning. *Urban Science, 2*(4), 98. https://doi.org/10.3390/urbansci2040098

Feitosa, C. (2018, October 5). Por uma psicopolítica de resistência. *Cult*. https://revistacult.uol.com.br/home/por-uma-psico-politica-de-resistencia/

Ferrara, E., & Yang, Z. (2015). Measuring emotional contagion in social media. *PLOS ONE, 10*(11),1–14. https://doi.org/10.1371/journal.pone.0142390

Foucault, M. (2014). *Vigiar e punir: nascimento da prisão* (P. E. Duarte, Trans.). Leya. (Original work published 1975)

Gomes, H. J. C. (2012). *Text mining: Análise de sentimentos na classificação de notícias* [Master's thesis, Universidade Nova de Lisboa]. Repositório da Universidade Nova de Lisboa. http://hdl.handle.net/10362/9182

Gonçalves, P., Dores, W., & Benevenuto F. (2012). PANAS-t: Uma escala psicométrica para medição de sentimentos no Twitter. In *1st Brazilian Workshop on Social Network Analysis and Mining (Brasnam)*. http://www2.sbc.org.br/csbc2012/anais_csbc/eventos/brasnam/artigos/BRASNAM%20-%20 PANAS-t%20Uma%20Escala%20Psicometrica%20para%20Medicao%20de%20Sentimentos%20 no%20Twitter.pdf

Haggerty, K. D., & Ericson R. V. (2000). The surveillant assemblage. *British Journal of Sociology, 51*(4), 605–622. https://doi.org/10.1080/00071310020015280

Han, B.-C. (2014a). *A sociedade da transparência* (M. S. Pereira, Trans.). Relógio d'Água. (Original work published 2012)

Han, B.-C. (2014b). *Psicopolítica* (M. S. Pereira, Trans.). Relógio d'Água. (Original work published 2014)

Heins, M. (2013). The brave new world of social media censorship. *Harvard Law Review, 127*(8), 325–330. https://harvardlawreview.org/2014/06/the-brave-new-world-of-social-media-censorship/

Hernández-Farías, I., Benedí, J. M., & Rosso, P. (2015). Applying basic features from sentiment analysis for automatic irony detection. In R. Paredes J. S. Cardoso, & X. M. Pardo (Eds.), *7th Iberian Conference on Pattern Recognition and Image Analysis* (pp. 337–344). Springer. https://doi.org/10.1007/978-3-319-19390-8_38

Hintz, A. (2015). Social media censorship, privatized regulation and new restrictions to protest and dissent. In L. Dencik, & O. Leistert (Eds.), *Critical perspectives on social media and protest: Between control and emancipation* (pp. 109–126). Rowman & Littlefield. http://orca.cf.ac.uk/id/eprint/87265

Hur, D. U. (2013). Da biopolítica à noopolítica: Contribuições de Deleuze. *Lugar Comum,* (40), 201–215.

Illouz, E. (2018). *Emotions as commodities: Capitalism, consumption and authenticity*. Routledge.

Islam, M. R., & Zibran, M. F. (2017). *Leveraging automated sentiment analysis in software engineering.* In *2017 IEEE/ACM 14th International Conference on Mining Software Repositories (MSR)* (pp. 203-214). IEEE. https://doi.org/10.1109/MSR.2017.9

Khoo, C. S., & Johnkhan, S. B. (2018). Lexicon-based sentiment analysis: Comparative evaluation of six sentiment lexicons. *Journal of Information Science, 44*(4), 491–511. https://doi.org/10.1177/0165551517703514

Levin, S. (2017, May 1). Facebook told advertisers it can identify teens feeling 'insecure' and 'worthless'. *The Guardian.* https://www.theguardian.com/technology/2017/may/01/facebook-advertising-data-insecure-teens

Liu, B. (2012). *Sentiment analysis and opinion mining.* Morgan & Claypool Publishers. https://www.cs.uic.edu/~liub/FBS/SentimentAnalysis-and-OpinionMining.pdf

Luo, Z., Chen, J., Takiguchi, T., & Ariki, Y. (2017). Emotional voice conversion with adaptive scales F0 based on wavelet transform using limited amount of emotional data. In F. Lacerda, D. House, M. Heldner, J. Gustafson, S. Strömbergsson, & M. Włodarczak (Eds), *Interspeech 20017* (pp. 3399–3403). ISCA. http://www.me.cs.scitec.kobe-u.ac.jp/~takigu/pdf/2017/interspeech-luo.PDF

Malheiros, Y. (2014). Emotte: Uma ferramenta de análise de sentimentos para o Twitter. In *XX Brazilian Symposium on Multimedia and the Web*. Webmedia (pp. 62–65). Sociedade Brasileira de Computação. https://sol.sbc.org.br/index.php/webmedia_estendido/article/view/4932

Marques, R. O. (2019, June 11). Projecto premiado que ajuda a prevenir suicídios passa por Braga. *Meios e Publicidade.* https://www.meiosepublicidade.pt/2019/06/projecto-premiado-ajuda-prevenir-suicidio-passa-braga-videos/

Matsumae, A., Luo, R., Wang, Y., Nishimura, E., & Motomura, Y. (2020). Emotional data visualization for well-being, based on HRV analysis. In *International Conference on Intelligent Human Systems Integration* (pp. 1270–1276). Springer. https://doi.org/10.1007/978-3-030-39512-4_194

McNair, D. M., Lon, M., & Droppelman, L. F. (1971). *Manual for the profile of mood states.* Educational and Industrial Testing Service.

Moise, C. (2017). Natural language processing in political Campaigns. In A. Dinu, P. Osenova, & C. Vertan (Eds.), *Proceedings of the First Workshop on Language Technology for Digital Humanities in Central and (South-)Eastern Europe* (pp. 39–43). Incoma.

Pasquali, L. (2017). *Psicometria: Teoria dos testes na psicologia e na educação*. Vozes.

Pasquinelli, M., & Joler, V. (2020). The Nooscope manifested: AI as instrument of knowledge extractivism. *AI & Society*, 1–18. https://doi.org/10.1007/s00146-020-01097-6

Plutchik, R. (1980). *A general psychoevolutionary theory of emotion*. Academic Press.

Reason Why. (2019, May 22). *Code of Hope - Publicis España para Teléfono de la Esperanza* [Video]. YouTube. https://www.youtube.com/watch?v=AdSEEBfhPYw.

Ringsquandl, M., & Petkovic, D. (2013). Analyzing political sentiment on Twitter. In M. desJardins & M. L. Littman (Eds.), *2013 AAAI Spring Symposium Series* (pp. 40–47). AAAI.

Rolnik, S., & Guattari, F. (1986). *Micropolítica: Cartografias do desejo*. Vozes.

Silveira, S. A. (2015). Interações públicas, censura privada: O caso do Facebook. *História, Ciências, Saúde – Manguinhos, 22*, 1637–1651. http://doi.org/10.1590/S0104-59702015000500006

Spinoza, B. (2014). Carta 58 a Schuller. In R. Romano, N. Cunha, & J. Guinsburg (Eds.), *Obra completa II* (pp. 258–260). Perspectiva.

Stark, L. (2018). Algorithmic psychometrics and the scalable subject. *Social Studies of Science, 48*(2), 204–231. https://doi.org/10.1177/0306312718772094

Tiqqun (2020). *The cybernetic hypothesis*. Semiotext(e).

Watson, D., & Clark, A. (1994). *Positive and negative affect schedule – Expanded form*. The University of Iowa. https://doi.org/10.17077/48vt-m4t2

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