REVISTA DE CIENCIAS SOCIALES Y HUMANAS XXI
NIVERSITAS

https://doi.org/10.17163/uni.n37.2022.10

Gender stereotypes in TikTok and Instagram: a reverse engineering experiment for understanding the mechanisms of social network algorithms

Estereotipos de género en TikTok e Instagram: un experimento de ingeniería inversa para entender los mecanismos de los algoritmos de las redes sociales

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Received on: 10/07/2022 **Revised on:** 2/08/2022 **Accepted on:** 15/08/2022 **Published on:** 01/09/2022

Suggested citation: Bueno-Fernandes, A. C. and Campos-Pellanda, E. (2022). Gender stereotypes in TikTok and Instagram: a reverse engineering experiment for understanding the mechanisms of social network algorithms. *Universitas-XXI, 37,* pp. 233-255. https://doi.org/10.17163/uni.n37.2022.10

Abstract

In the immersion context of digital content during the COVID-19 pandemic, the popularization of algorithmic mechanisms for curating information in everyday life was evident. This article presents the observations of a reverse engineering experiment carried out at PUCRS (Brazil) which aims to look for evidence of the reinforcement (or not) of gender stereotypes in social networks. For this, accounts were created on the TikTok and Instagram apps, one identified with male pronouns, the other with female pronouns. The study was divided into phases in which the levels of interaction with the content were changed so that it was possible to analyze the transformations in the recommended videos to identify clues to the mechanism used by the platform. Finally, it was possible to observe differences between the content suggested for each profile that may be related to gender stereotypes and differences in quality and popular topics in each application. It was also possible to perceive which actions seemed to have more interference in the recommendations and which type of content or interaction was prioritized for each network. This study does not intend to end the discussions on how social networks operate but to bring new questions and reflections on the parameters used by their logic and the possible positive and negative effects of these recommendations in different social contexts.

Keywords

Communication, technology, reverse engineering, gender stereotypes, algorithms, TikTok, Instagram.

Resumen

En el contexto de la inmersión de los contenidos digitales durante la pandemia del COVID-19, se hizo evidente la popularización de los mecanismos algorítmicos de curaduría contenidos en la vida cotidiana. Este artículo presenta las observaciones de un experimento de ingeniería inversa realizado en la PUCRS (Brasil) en el que se buscó evidencia del refuerzo (o no) de los estereotipos de género en las redes sociales. Para ello, se crearon cuentas en las aplicaciones TikTok e Instagram, una identificada con pronombres masculinos y otra con pronombres femeninos. El estudio se dividió en fases en las que se cambiaron los niveles de interacción con el contenido de las aplicaciones, de manera que fue posible analizar las transformaciones en los vídeos recomendados para identificar pistas del mecanismo utilizado por la plataforma. Por último, fue posible observar las diferencias entre los contenidos sugeridos para cada perfil que pueden estar relacionadas con los estereotipos de género y las diferencias de calidad y temas populares en cada aplicación. También fue posible percibir qué acciones parecían tener más injerencia en las recomendaciones y qué tipo de contenido o interacción se priorizaba para cada red. Este estudio no pretende acabar con las discusiones sobre el funcionamiento de las redes sociales, sino aportar nuevas preguntas y reflexiones sobre los parámetros utilizados por su lógica y los posibles efectos positivos y negativos de estas recomendaciones en diferentes contextos sociales.

Palabras clave

Comunicación, tecnología, ingeniería inversa, estereotipos de género, algoritmos, TikTok, Instagram.

Introduction

The evolution of digital content that we are experiencing since the expansion of the *smartphone* market and the popularization of *apps* (applications) is increasing. This upward curve was boosted during the COVID-19 pandemic, where the popularization of algorithmic mechanisms for content curation in everyday life became apparent. Smartphone applications have served not only for services, but also for communication in society in various dimensions. In this context, we observe the emergence of new networks, such as the Chinese TikTok, which forced competitors to increase monetization systems with more intense content recommendations.

In June 2022, *The Verge* news portal released a memo to Facebook employees that was leaked to the public, recommending that the company's engineers transform the app's *feed* into something more like that of its competitor TikTok (Heath, 2022). TikTok, launched in 2016, also known as *Douyin* in China, is a video platform with recreational features such as posting, following, sharing, commenting, likes and others. Its difference from other similar platforms, such as YouTube, is that videos tend to be shorter, with a maximum length of 15 seconds, with a minority of videos longer than one minute. In addition, the platform can customize the content offered based on user navigation and categories used in the content (Su *et al*., 2021).

As Wu (2020) points out, in addition to being a platform in which the dissemination of music fragments, which can be easily included in short sequences, is essential, TikTok is also popular for the narrative in *sitcom* format (situation comedy), sequences based on television series, with the script, characters and dialogues. Its main purpose is more entertainment than social relationship between users. According to Wang (2020), TikTok is positioned internationally to attract a younger audience with funny videos of people singing, dancing, while its Chinese version seeks an older audience with videos about daily routine.

TikTok's strength is seen in its numbers: the app has been downloaded 3.6 billion times. In 2021, the app's downloads were 20 % more than Facebook's and 21 % more than Instagram's. In the first three months of 2022, iPhone users spent on average 78 % more time on TikTok than on Facebook (Heath, 2022). In an interview with journalist Alex Heath, representatives of Meta, the company that owns Facebook and Instagram, stated that the company was slow to realize the growth of its competitor, but was now beginning to understand its social impact. According to the journalist:

> This is how the future of Facebook's app will work in practice: the main tab will be a mix of *Stories* and *Reels* at the top, followed by posts that its discovery engineering recommends from both Facebook and Instagram. It will be more visual, a heavily video-based experience with more precise commands to send a direct message to friends. (Heath, 2022, n/p)

Instagram is closer to this scenario. The app was the first online social network native to smartphones, which appeared in 2010 to share images with the possibility of editing them quickly and putting filters on them, all instantly (Pellanda and Streck, 2017, p. 12). From 2016, the app launched the option of stories, photos and short videos, in which it was possible to insert text and emojis, among other features, which initially had a one-day time limit, but which can be set by the user in their profile so that they do not disappear. Stories can also be posted to a group of close friends or to all followers. Finally, in 2020, Instagram implemented a new format, *Reels*, which features posts in the format of short videos from accounts that the user does not necessarily follow, a model closer to the content and distribution of TikTok.

Although the format of the publications -short videos- is essential, what is striking about Facebook's new direction is the attempt to get closer to the recommendation of the Chinese app in its "For You" tab. If the company was already following a logic of recommended content that used clues from users' preferences by their relationships and likes on the network, TikTok goes a step further, guessing what a user wants by his/her passive habits, so that new videos appearing especially for him/her are unlimited (Heath, 2022). Thus, the first question of this article. After all, what would these cues be and how would they be part of an algorithm that determines what will be shown in a user's *feed*? Going further, how can be proved that the logic used to guess does not reproduce biases, especially those linked to race, sexuality, and gender?

Based on these questions, this article aims to reflect on whether there is any parameter in the algorithms of TikTok and Instagram that may be responsible for reinforcing stereotypes, especially gender stereotypes. Thus, we conducted a reverse engineering experiment in which we looked at the suggested content for two different profiles on the two networks in a way that pointed out the differences and their possible relationships with gender stereotypes.

D'Amorim (1997, p. 122) defines gender stereotypes as "[...] the set of beliefs about the personal attributes appropriate to men and women, whether these beliefs are individual or shared". According to the author, although stereotypes are flexible and change continuously, the cognitive aspects remain more resistant to change than the affective ones, restricting genders to specific roles and characteristics. For example, in Western culture, men are associated with activity, competitiveness, independence, decisiveness and self-confidence, while women are associated with emotionality, kindness, understanding and dedication.

According to Carrera and Carvalho (2020), gender stereotypes are also crossed by those of race and social class. Although this study does not delve into the latter two, the understanding of these aspects is relevant and deserves to be highlighted in future research. Just as an example, one can point out the difference in the media treatment received by white and black women. The authors point out that while white women are portrayed in the press and advertising as submissive and affable, black women are represented by the figures of the "Matriarch" (the black mother), "Jezebel" (the sexualized woman) and "Sapphire" (the independent woman).

Methods and procedures

Based on the assumption that the objects of research are dynamic and have new and typical characteristics, the aim was to create an investigation within the investigation in which the methodology is part of the experiment.

The methodological technique used for the analysis was reverse engineering, in which, starting from an existing product, we seek to understand its operation after interacting with it. As social network applications are systems based on algorithms that seek the user's preferences to define what to display on the screen, certain behaviors were sought within the applications that could shape or interfere with the content displayed.

For the experiment, two formatted cell phones were used (i.e., without data stored in the system), provided by Ubilab, Mobility and Media Convergence Research Laboratory of the School of Communication, Arts and Design of the Pontifical Catholic University of Rio Grande do Sul (Famecos/PUCRS). The objective was that there would be no data previously stored in the cell phones that could interfere with the results of the research. A TikTok

account was created on each of the cell phones. The account was used on only one of the devices so that there would be no interference when browsing one profile on the data of the other.

Hence, fictitious profiles were created for a 29-year-old man named Marcelo and a 29-year-old woman named Marcelly. As the cell phones have geolocation data, it can be identified that both profiles live in the city of Porto Alegre, in the state of Rio Grande do Sul. From this information provided to the application, we observed which videos were shown for each profile in the "For you" area, a feed of popular content on the network that may or may not be posts from profiles followed by the user.

In addition to the TikTok accounts, Instagram accounts were also created with the same fictitious users. As Marcelo's account was on the device due to some technical problems, the Instagram application was not working; his profile was observed accessing the network site in an anonymous window opened on the researcher's notebook (laptop). The anonymous window prevents the site's cookies and browsing history from being saved so that they do not interfere with the analyzed algorithms. Although the use of the notebook may present some differences with the use of mobile devices, such as the identification of the user's location, it is considered that its use did not hinder the analysis of this research, since the objectives are focused on gender stereotypes, and not on regional issues.

Three phases were determined for interacting with the networks. In the first phase, the objective would be to observe the contents recommended by the applications without interactions and try to maintain the same amount of time watched in each video, with the objective of not showing preference in some contents. These contents were analyzed as a control group in order to understand what were the possible transformations in the suggested contents in the following phases.

In the second phase, we initiated some interactions, both within the application and in the device's standard browser, analyzing if there were changes in the recommended content. We watched the suggested videos until the end, and explored the profile of the content creators. Finally, in the last phase, interactions such as likes and favoriting content and following specific content creators were performed. At least three videos from each of the followed creators were viewed and liked, showing user preference for that content.

Table 1
Phases defined for the analysis

1st phase	2nd phase	3rd phase
Observation	**Exploration**	**Interaction**
Neutral action	**Neutral action**	**Positive action**
Videos in the *feed* were half watched. No interactions were made, such as *likes* and favorites. No other profiles were followed.	Browser (Chrome) and app searches were conducted on specific topics that went against gender stereotypes and norms. The videos in the *feed* were half-watched. No interactions were made, such as *likes* and favorites. No other profiles were followed.	Specific creators were sought. At least three of the creators' videos have been liked and/or favored. The videos in the *feed* have been viewed up to halfway through.

The aim of the experiment was mainly to understand whether the apps' algorithms somehow reinforce gender stereotypes. Therefore, after passively observing the content offered at first in each of the apps, the interaction aimed to show the profiles' preferences for topics that are generally not associated with their gender. In this way, the content and creators sought differed in each account.

Since women are often associated with beauty and emotion, contrary to stereotype, the male gender profile Marcelo was used to show the preference for videos related to these aspects. Thus, content and creators of male makeup, fashion, pop music and romance were sought. We also looked for *Drag Queen* creators who identified themselves as cis men, but with a feminine character performance, who published videos of both genders, in addition to talking a lot about makeup and fashion, as they were aspects related to their performance.

On the other hand, the female profile, Marcelly, explores topics more linked to men —activity and competitiveness— such as gamers, electronic games and soccer. As stereotypes are not limited to the differences between genders, we also looked for content different to a standard image of women: white, straight-haired and heterosexual. Therefore, in addition to looking for profiles of women linked to LGBTQIAPN+ issues, we also explored videos and profiles of black and curly-haired women and differentiated behaviors, such as searching for vegan recipes.

Table 2
Actions carried out in each of the profiles of phases 2 and 3

	Marcelo	Marcelly
2nd phase	Search for influencer Lorelay Fox on Google and in the app. Search for makeup on Google and in the app. Search makeup for men on Google and in the app. Men's fashion search on Google and in the app. At least three videos related to the searches were viewed until the end.	Search for curly hair on Google and in the app. Search vegan recipes on Google and in the app. Search vegan recipes on Google and in the app. At least three videos related to the searches were viewed until the end.
3rd phase	Following drag *influencers* Lorelay Fox, Bianca DellaFancy and Drag box. Following Lady Gaga and papelpop. Following Luiza Parente (fashion advice). Following Experiencia Bridgerton (romance).	Following Nathaly Néri's profile. After players FFNala and Swat_Ruiva. Following LouiePonto and Sapaatona (LGBTQIAPN+ issues). Following the Gremio team.

Results

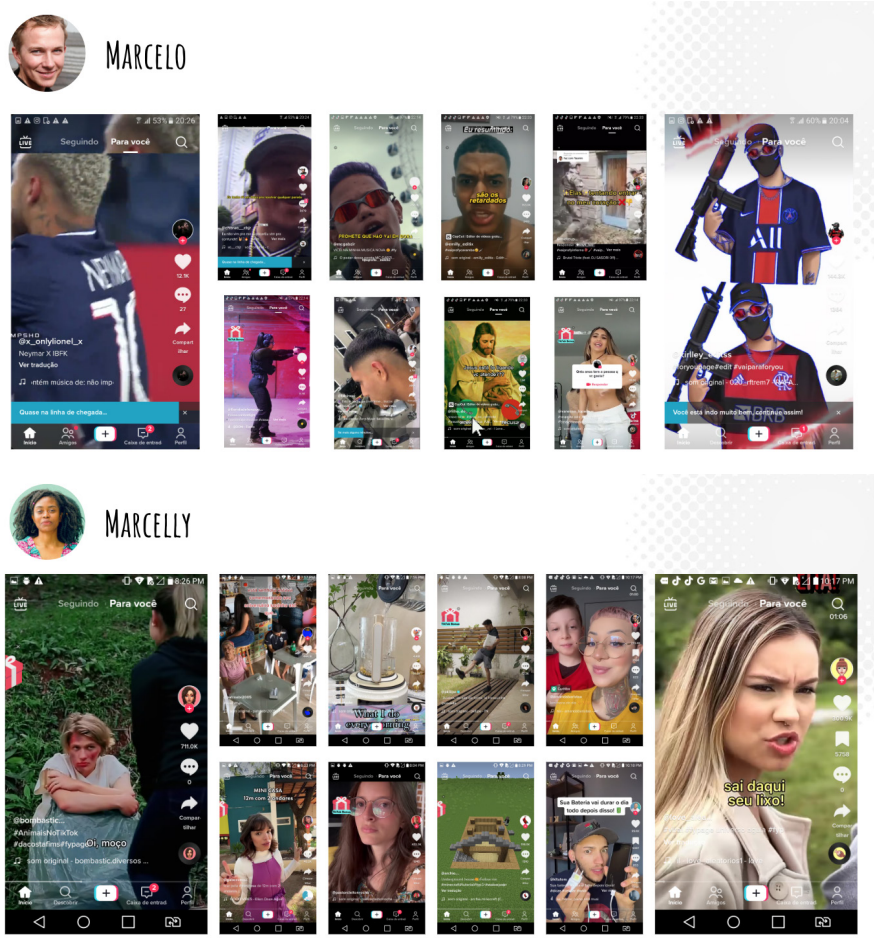
The results presented below are the result of the researcher's observation. Topics related to the videos in each account's *feed* were noted and screenshots were taken to record and review the content.

TikTok

Although there were no interactions with the content of the apps in the first phase, even though the accounts had some content in common, some stories seemed to indicate behaviors related to gender stereotypes. In Marcelo's profile, the contents that appeared were related to soccer, guns, trap music, women with less clothes, serenades sung by women, black humor that showed the relationship between heterosexual couples from a man's perspective. In the content, there were more people associated with the male gender. In Marcelly's profile, the topics were related to moral or religious comedies, country music, relationships between heterosexual couples from a female perspective and light jokes. The content was dominated by people associated with the female gender. It was possible to observe, in addition to

some popular content, especially pop songs and dances of the moment, videos showing white and cis people in heteronormative relationships.

Image 1



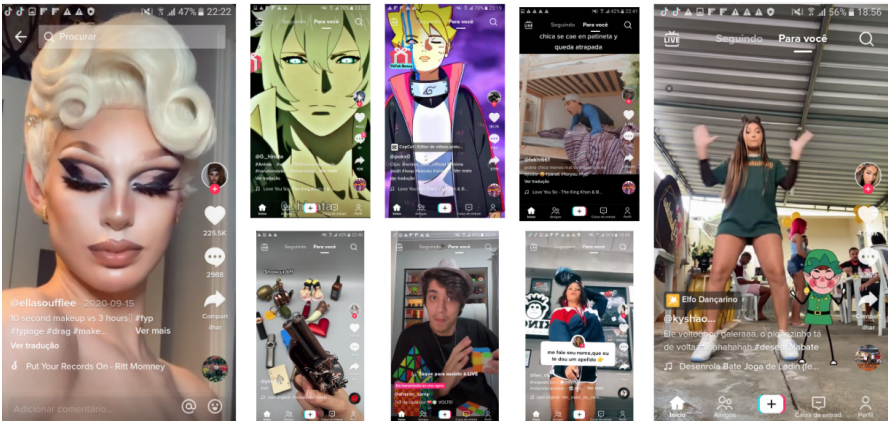
Note. Screenshots of the contents that appeared in the profiles created on TikTok, taken by the author.

During the exploration phase, the *feeds* started to be more similar without any direct interaction in the application. However, Marcelly's profile started to show more content that could be considered engaging. While to-

pics in Marcelo's profile were still related to black humor, soccer, guns, dances, especially of women with sexy clothes and poses, and videos with jokes and some *fat-phobic*. In Marcelly's profile, videos with 18+ content, dances with women wearing sexy clothes sexy poses, ingrown toenails, dermatologists squeezing pimples, sex education classes showing sex organs explicitly and even a childbirth scene at the time of the baby's delivery started to appear. The 18+ videos had a profile picture indicating the type of content or showed explicit sex scenes or nudity. In addition, the *feed* also contained humorous videos, moral or religious (Christian) comedies and, on this occasion, images of Jesus Christ.

Notably, neither profile seemed to show videos related to searches and content viewed. Looking in the browser and in the app did not seem to interfere with what was displayed for each user; even after a few days, the same behavior was maintained.

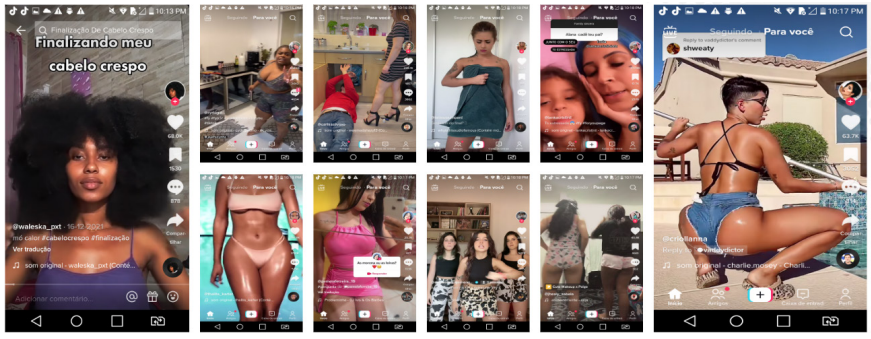
Image 2



Note. Screenshots of the male profile content. The first image on the left is the information searched. The rest of the posts in the "For you" tab.

Changes were observed in the third phase after users followed content and rejected other content. The most significant change was in the profile of the songs shown. Some stereotypes were maintained, such as comedies with a moral or religious bias for Marcelly, and guns and soccer for Marcelo.

Image 3

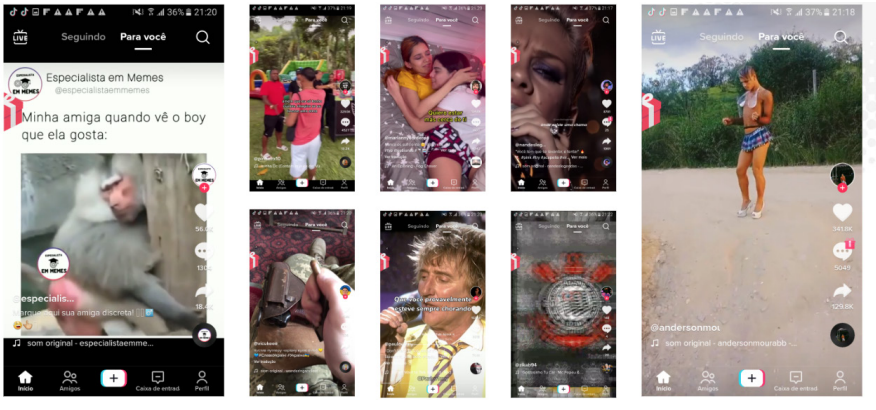


Note. Screenshots of the female profile content. The first image on the left is the information searched. The rest of the posts in the "For you" tab.

In Marcelly's profile, more confusion was observed in the gender treatment intended for the user. Some videos had a woman's perspective. In addition, more images of people who escaped gender stereotypes and heteronormativity, such as transvestites and homosexual couples, started to appear. In videos of transvestites, which differed from *drag* performances, it was impossible to identify whether there was humor or a pejorative bias. However, some posts from trans content creators appeared, commenting on aspects of their lives.

Image 4

Screenshots of the contents of the male profile

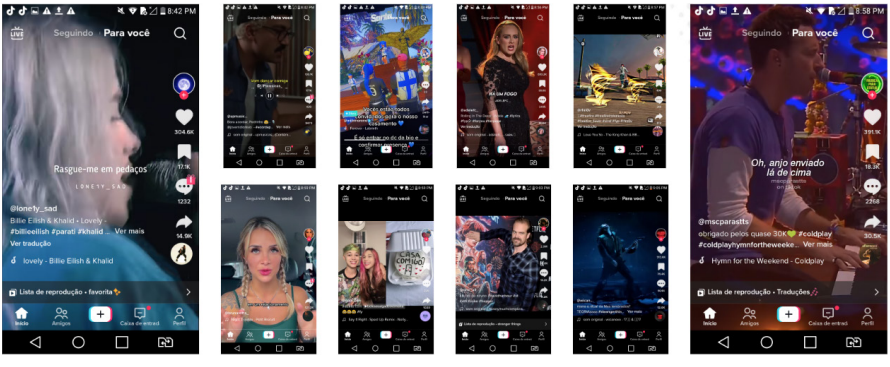


On Marcelly's profile, related videos stopped appearing after content was denied for an 18+ profile and an ingrown toenail video. The music profile shifted from predominantly country concerts to pop singers. The perspective of much of the videos remained as that of a woman (e.g., innuendos of one woman telling another about her boyfriend). A few videos from the *Free Fire* game appeared, related to the profiles followed, but less frequent.

One interaction that escaped somewhat from the methods used was *liking* a video about the *Stranger Things* series, done as a test to observe whether interacting with some content directly in the "For You" tab would have a more noticeable effect. Following this action, the number of stories featuring actors and scenes from the series increased significantly, sometimes appearing in more than five related videos in a row. However, this was not noticeable when *liking* a video with scenes from the game *Free Fire*, when posts on the same topic were much more widely spaced.

Image 5

Screenshots of the contents in the female profile



Instagram

An Instagram account was created to find the differences between the applications and possible explanations. The first impression when creating a profile for Marcelly is that the images have better resolution, show a more diverse international audience, and have less nudity. This will be discussed

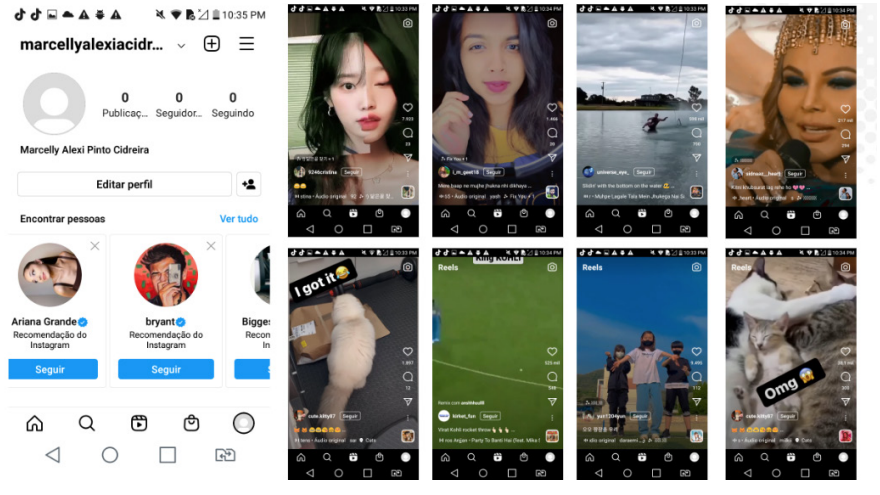
further in the Discussion section, but first, it is worth describing the videos shown in the *Reels* tab.

The first videos of people with Asian features singing popular English pop songs appeared when the female profile was created. There are also videos of animals, mainly cats and dogs, as well as dances, various singers, movements of people on skateboards, scenes from soccer matches and beauty tips. There are videos in several languages.

Early search interactions did not seem to affect the *reels*, or at least took longer to appear. As the beauty tip videos appeared, a post about curly hair care would show up at a particular time related to the search performed. After *liking* this post, *reels* related videos began to pop up: curly hair care and people showing curly or braided hair. The videos also started to be limited to English and Portuguese, decreasing the presence of Asians and Arabs, but posts with pets and sports continued with the same frequency. Videos related to aesthetic treatments, such as painted false nails, also began to appear.

Image 6

Screenshots of the content in the female profile on Instagram



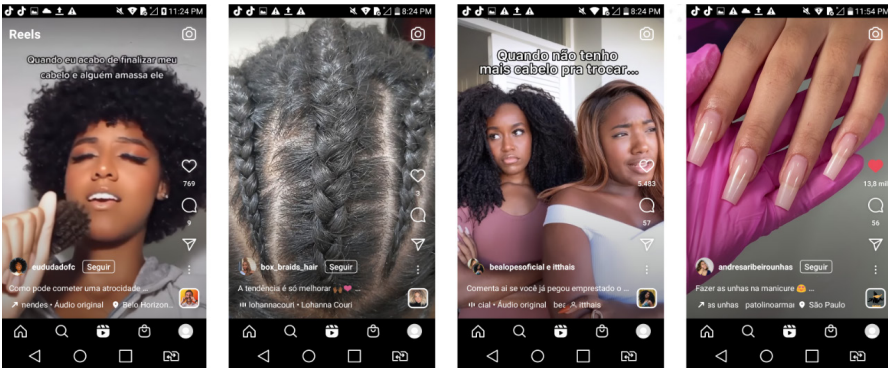
A video of a cake with fun decorations was liked to test the relationship between *liking* content directly on *reels* and increased content on related topics. After a while, it was noticed that images of cakes with the same type

of decoration started to appear again and again, in addition to other sweets that could be related.

When Marcelo's Instagram profile was created, it was impossible to install the application for technical reasons. As a solution, an anonymous Google Chrome window was used on a *notebook* with a Windows operating system. It should be noted that the change from a mobile device with geolocation to a *notebook* may have caused changes in data capture by the algorithm. However, it is considered that since this experiment was an initial exploration, and due to the content of what was observed, even with the change of device, it was possible to obtain relevant evidence for the study.

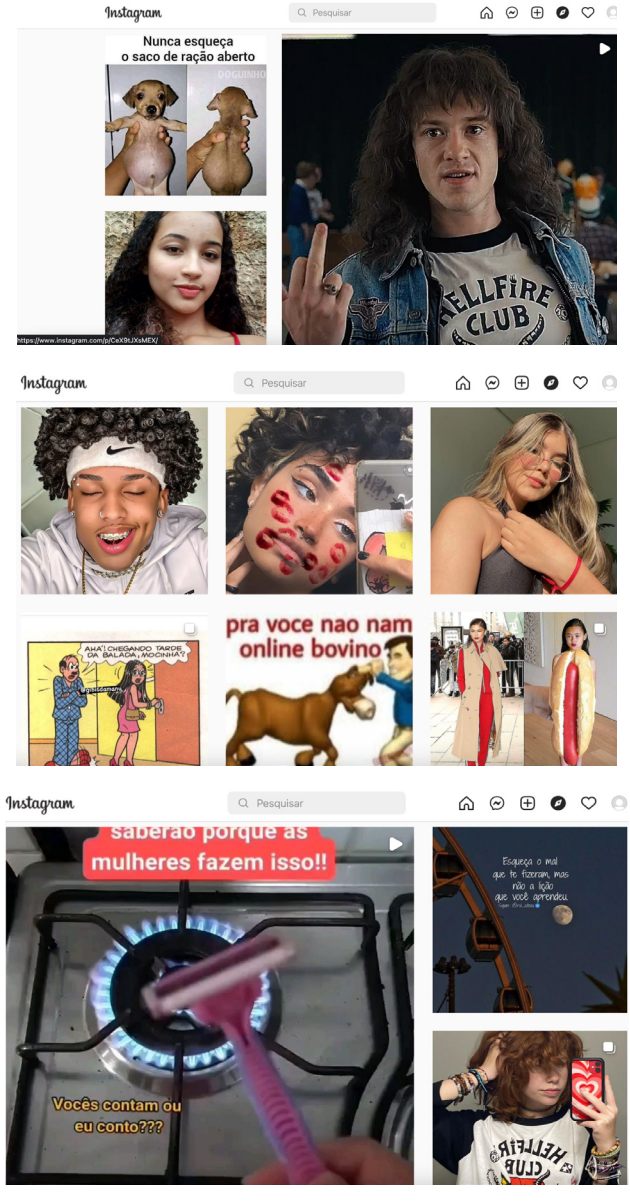
Image 7

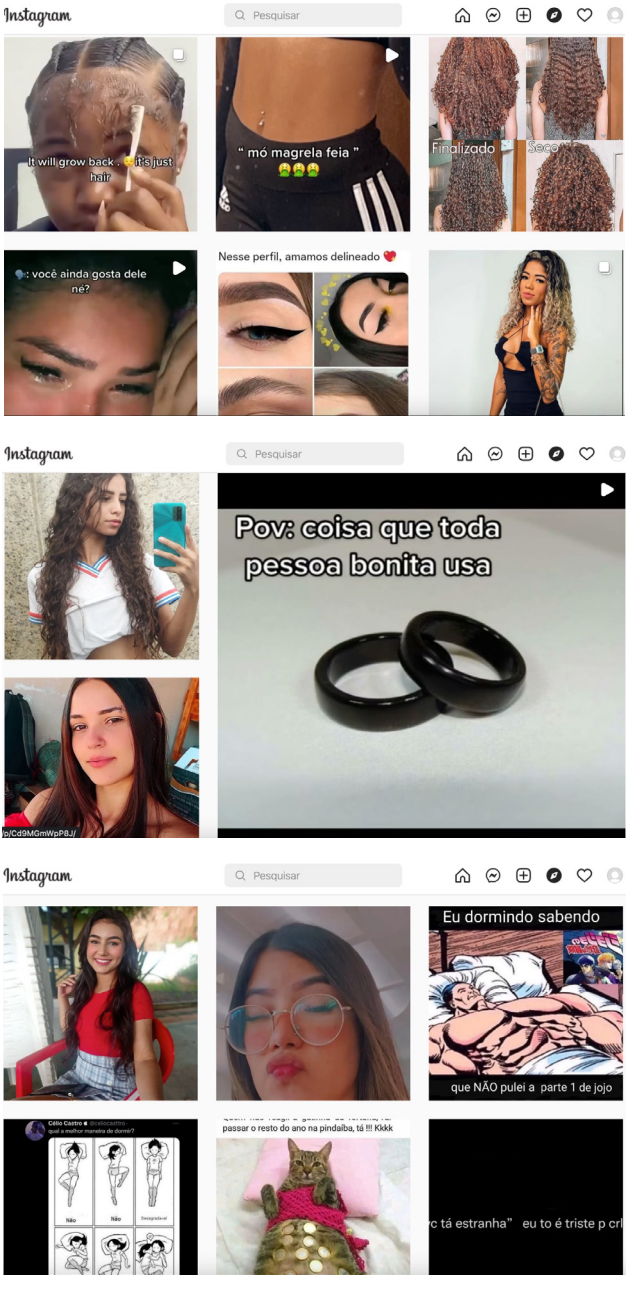
Screenshots of the contents in the female profile



At the beginning, only images of travels around the world appeared. However, when revisiting the page using another computer, with macOS operating system, even using an anonymous window, the *feed* was very different, with contents in Portuguese language. It is possible that this happened due to the possible identification of the connection region, although the use of *cookies* was blocked. The images and videos that appeared to the user can be described as: photos of women, of the face or body, humorous images, videos or images that use a male perspective ("why do women do this", "me when I do a certain thing", showing a figure that can be identified as male), photos or videos of pets, motivational quotes.

Image 8
Screenshots of the contents in the male profile

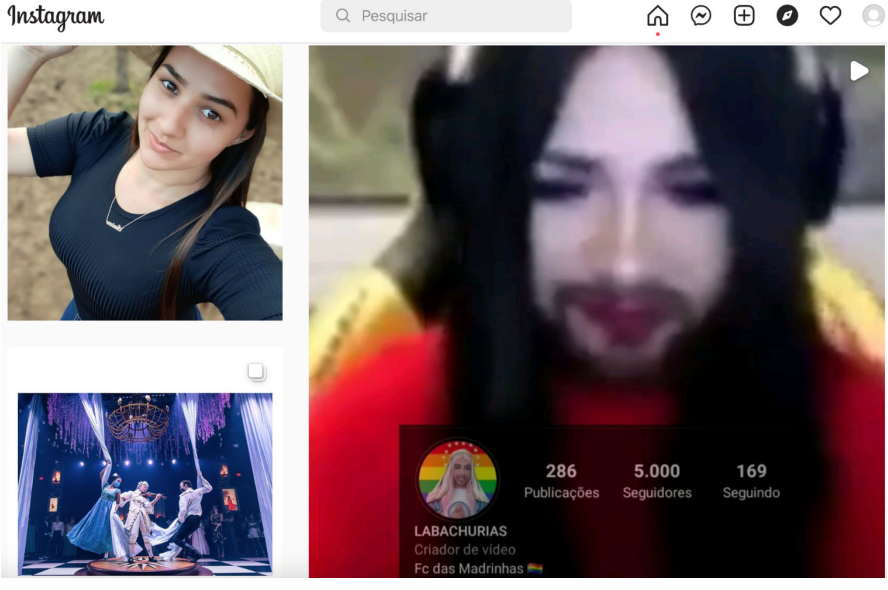


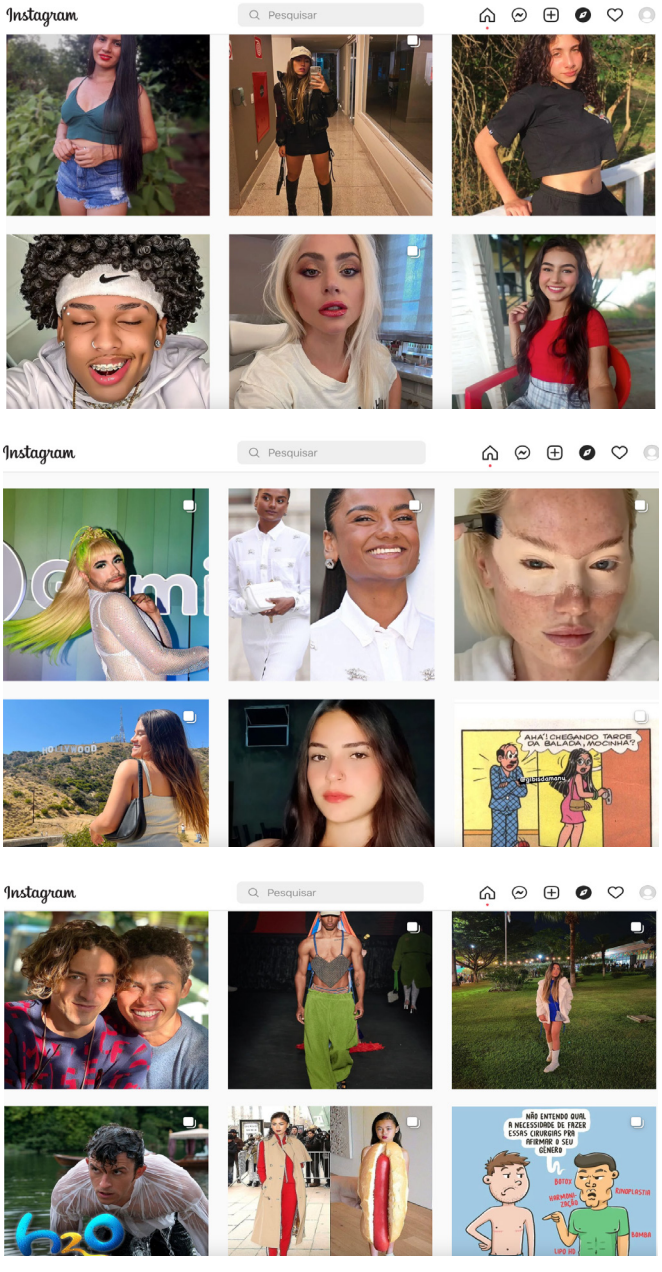

Instagram
Pesquisar
It will grow back 😴it's just hair
" mó magrela feia "
Finalizado
Nesse perfil, amamos delineado
: você ainda gosta dele né?
Instagram
Pesquisar
Pov: coisa que toda pessoa bonita usa
Instagram
Pesquisar
Eu dormindo sabendo
que NÃO pulei a parte 1 de jojo
Célio Castro
qual a melhor maneira de dormir?
Não
Não
Desagradável
passar o resto do ano na pindaíba, tá !!! Kkkk
tá estranha" eu to é triste p cri

In Marcelly's content *feed*, it is worth noting that although no search related to the topic was performed, images of curly hair tips appeared. Thus, it is possible to note beforehand that the images related to curly hair in Marcelly's profile were not necessarily influenced by the searches and reactions made by the user, but may be content considered popular. However, after interaction on the *Reel* tab of the female profile, the increase in similar images was significant.

After the interactions in the third phase, the male profile *reels* were immediately updated with content related to the content creators and the images and videos they liked. More images of *drag*, makeup, fashion, Lady Gaga, actors who participated in the *Bridgerton* series, and even cartoons with gender debates and same-sex couples could be seen. In common with the contents of the *feed* before the interaction, photos of women's faces or bodies remained.

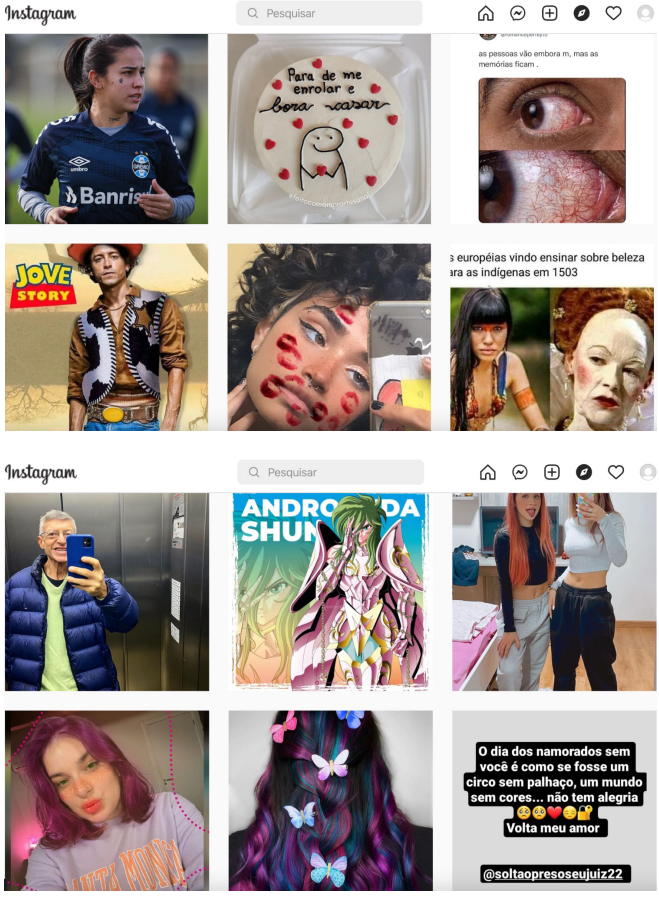
Image 9
Screenshots of the contents in the male profile after interactions

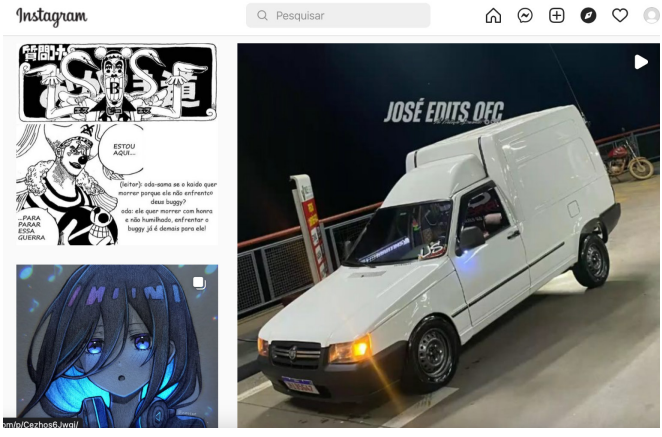



Instagram
Pesquisar
Instagram
Pesquisar
HOLLYWOOD
AHA! CHEGANDO TARDE DA BALADA, MOCINHA?
Instagram
Pesquisar
h2o
NÃO ENTENDO QUAL A NECESSIDADE DE FAZER ESSAS CIRURGIAS PRA REMEMBRAR O SEU GÊNERO
BOTOX
RINOPLASTIA
VAGINOPLASTIA
LIPO SC
BARBA

Due to the differences between the transformations in the profile *feeds*, a test was included in which Marcelly's Instagram profile was also accessed on the *notebook* in an anonymous window. Even without the interactions, it could be observed that the content was more related with the followed accounts, with images of anime and women with dyed hair (which may be related to the followed gaming accounts) and images of soccer.

Image 10
Screenshots of the contents in the female profile, accessing from the computer





Discussion

As Wu (2020, p. 332) states, TikTok is a "pure entertainment" software that recommends a variety of content with the logic of its algorithm. Overall, it was observed that the app seems to invest more in popular web content than in user browsing and interaction, but at first there seems to be a genre cliché. Initially, popular content generates engagement with people of a specific gender, region and age. It may occur based on content that has a gender classification by the author of the post, by the use of specific tags, or because it engages more users with the same demographic characteristics.

As for the second phase of the experiment, it is hypothesized that the app begins to play content that may be more attractive because it generates more engagement or commitment (positive or negative) since there are not many interactions for the algorithm to adapt. Another hypothesis is that the time of use of the app could be influencing more explicit sexual content and black humor, since the app was accessed more at night, after 10 pm.

In the third phase, when looking for profiles of female gamers for Marcelly to follow, it could be observed that some who appeared had more dance videos than game videos, with sensual poses and sexy clothes. Another hypothesis arises: perhaps more 18+ content appears because it is created by profiles that call themselves women, which could have a greater weight on the user who also calls herself a woman.

Finally, the last phase seems to be influenced by the fact that people that users have started to follow also follow or mark as preferences because, although the feed still has no direct relation to the videos searched, the topics of the videos in this new moment seem different. Following other users can also add new trends to the feed, but what is popular and generates engagement continues to dominate. The feed seems to be more influenced when certain content is rejected.

In addition, one can observe that TikTok (from a Brazilian profile, at least) is exceptionally white, heteronormative and Christian. Even when one searches for alternative content starts following creators and likes certain videos, this pattern changes very little. It may have more to do with its audience than with the tool itself.

On the other hand, Instagram is more click-oriented, although search does not affect the content much. If there is a click on one type of video within the Reels tab, at least three other similar ones may appear next. However, searches and likes directly on the creators' profiles do not seem to affect the app's Reels tab either. The videos tend to have better resolution and use image filters and other features. After all, as Wang (2020) states, unlike Instagram, TikTok focuses more on amateurishly produced videos without more elaborate aesthetic production. The videos are reserved, with no +18 content or religious messages (at least in neutral browsing). It may have to do with a more elitist audience, but also with the strong advertising appeal of the tool, which is bound by specific rules.

The use of the tool on the device had problems, making it difficult to compare profiles. On mobile, at first, the content seems more "neutral" in terms of gender stereotypes. At first, Instagram was more diverse, as it includes content in other languages and from various ethnicities, at least on the female profile accessed via smartphone. On the other hand, the male profile, accessed in a notebook, seems to be more influenced by a perspective and gender stereotypes.

A difference could be observed between the content displayed on Instagram Reels when accessing the app from the computer and when accessing it from the mobile. On mobile, many more short videos appeared, while on the computer it was mainly photos or image galleries. In addition, the content was much closer to the accounts with which there was interaction. Further studies on these aspects are needed, but this may indicate that there is a closer approach to the TikTok format and algorithm on the mobile device,

showing more popular content, while on the computer the recommendations are still linked to user interactions.

Final considerations

As stated by Carrera and Carvalho (2020):

> There is scientific relevance in the research on search engines and algorithmic choices that dictate the results of the images that will compose the social imaginary about bodies and subjects. However, it is necessary to continue deepening on the subject in an attempt to expose the issues and contribute to the understanding of the productive dynamics of these artificial agents. (p. 112)

This article was conducted from an observational experiment to try to provide some hypotheses on the operation mechanism of the algorithms of the social networks Instagram and TikTok, mainly in their relationship with the dissemination and reinforcement of gender stereotypes. The study aims to help future research, testing the hypotheses and observations presented so that it can provide further reflections, questioning and, perhaps, some answers about the functioning of social networks and their possible impacts on society.

Some suggestions for future studies are to try to map the content categories (tags) that appear in each profile's *feed* and to include more profiles to obtain more consistent results. In these other profiles, other experiments could be done, such as keeping exact searches and liked or followed content profiles, looking for differences between *feeds*, and if they are related to user profile information, such as gender.

Transformation in forms of interaction is part of the evolution of societies, and technical innovations can bring benefits, as well as disadvantages and difficulties. Understanding and discussing the algorithms that increasingly shape our way of seeing the world and our sense of reality is essential to understanding the negative impacts of new technologies and how to mitigate them.

The importance of understanding the algorithm through its deconstruction becomes latent because the companies that program it do not show its operation. The technique of reverse engineering has the potential to understand these dynamics and enables to monitor the operation of these systems.

References

Carrera, F. and Carvalho, D (2020). Algoritmos racistas: a hiper-ritualização da solidão da mulher negra em bancos de imagens digitais. *Galáxia*, *43*, 99-114. http://dx.doi.org/10.1590/1982-25532020141614. São Paulo.

D'Amorim, M. A. (1997). Estereótipos de gênero e atitudes acerca da sexualidade em estudos sobre jovens brasileiros. *Temas psicol*., 5(3), 121-134. Ribeirão Preto. https://bit.ly/3zAwWXT

Heath, A. (2022) Facebook is changing its algorithm to take on TikTok, leaked memo reveals. *The Verge*. Tech. https://bit.ly/3PZT03t

Pellanda, E. C. and Streck, M. (2017) Instagram como interface da Comunicação móvel e ubíqua. *Sessões do Imaginário*, *22*(37), 10-19. Porto Alegre. https://doi.org/10.15448/1980-3710.2017.1.28017

Su, C., Zhou, H., Gong, L., Teng, B., Geng, F. and Hu, Y. (2021). Viewing personalized video clips recommended by TikTok activates default mode network and ventral tegmental area. *NeuroImage*, 237, 118136. https://doi.org/10.1016/j.neuroimage.2021.118136

Wang, Y. (2020). Influence of camera view on TikTok users' presence, immersion, and adoption intent. *Computers in Human Behavior*, 106373. https://doi.org/10.1016/j.chb.2020.106373

Wu, L. (2020). Comparative analysis of video stories and user behaviors on WeChat and TikTok. *Advances in Social Science, Education and Humanities Research*, *496*, 329-333. 3rd International Conference on Humanities Education and Social Sciences (ICHESS 2020),