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AN ALGORITHM MEASURING THE CHARISMA OF GREEK JOURNALISTS

ABSTRACT

X, formerly, Twitter is considered a valuable tool for journalists for real-time interaction with their followers. Especially, in the case of political journalists, the degree of their influence and persuasion is of great importance. In this paper, we deal with identifying the journalists' political charisma. More specifically we propose an algorithm based on the Analytic Hierarchy Process method to measure the political charisma of the journalists. Numerical results in two different use-case scenarios showed that the proposed algorithm could successfully determine charisma in that it tweaks influence towards a more specific political direction.

Keywords: *X, Twitter, charisma, influence, journalists, Analytic Hierarchy Process*

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ΕΝΑΣ ΑΛΓΟΡΙΘΜΟΣ ΓΙΑ ΤΗ ΜΕΤΡΗΣΗ ΤΟΥ ΧΑΡΙΣΜΑΤΟΣ ΤΩΝ ΕΛΛΗΝΩΝ/-ΙΔΩΝ ΔΗΜΟΣΙΟΓΡΑΦΩΝ

ΠΕΡΙΛΗΨΗ

Το Χ, πρώην Twitter, θεωρείται από τους δημοσιογράφους ως ένα πολύτιμο εργαλείο για την αλληλεπίδραση σε πραγματικό χρόνο με τους ακόλουθούς τους. Ειδικά, στην περίπτωση των δημοσιογράφων του πολιτικού ρεπορτάζ, ο βαθμός επιδραστικότητας και πειθούς τους έχει βαρύνουσα σημασία. Στην παρούσα εργασία ασχολούμαστε με τον προσδιορισμό του πολιτικού χαρίσματος των δημοσιογράφων. Πιο συγκεκριμένα, προτείνουμε έναν αλγόριθμο που βασίζεται στη μέθοδο Analytic Hierarchy Process για τη μέτρηση του πολιτικού χαρίσματος των δημοσιογράφων. Αριθμητικά αποτελέσματα σε δύο διαφορετικά σενάρια χρήσης έδειξαν ότι ο προτεινόμενος αλγόριθμος μπορεί να προσδιορίσει με επιτυχία το χάρισμα υπό την έννοια ότι προσαρμόζει την επιδραστικότητα προς μια περισσότερο πολιτική κατεύθυνση.

Λέξεις κλειδιά: *Χ, Twitter, χάρισμα, επιρροή, δημοσιογράφοι, Analytic Hierarchy Process*

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INTRODUCTION

X, formerly Twitter, has become an increasingly important platform for political communication and activism, with politicians, political organizations, journalists and individuals using the platform to share their views and engage with their followers. Although X is far from being the most popular social medium in general, it is highly appraised among journalists. According to a recent survey by the Pew Research Center (Stocking, Galen et al., 2022) overall, 69% of journalists say X is their first or second most used social media site. Although there are no reliable quantitative studies in Greece, there has been some research on the subject, particularly on X (Δαγουλά, 2019), (Σαπουνά, 2022) that shows its importance in the daily life of newsrooms both as a source and as a medium.

As in 2023 both general and regional/municipal elections will be held in Greece, measuring political influence on X could be a key factor in understanding the upcoming results. But as influence is a factor that is much associated with marketing, another concept is worth exploring, charisma.

The quality of charisma concerning a leader has been discussed for a long time and in different disciplines. Although the Greek word *charis* meaning "charm" has also been associated with divine powers, in political science it has come to describe "the ability of a leader to apply diffuse and intense influence over the values, beliefs, behaviour, and performance of others" (House et al., 1991). Extensive research has been performed for extracting charisma features in different environments and different use cases. However, charisma features on social networks have also started being researched recently (Mohamaddoust et al., 2021). It is noteworthy to mention that the term "rizz'' was honoured as the Oxford Word of the Year for 2023. According to a press release by Oxford University Press (2023), the origin of "rizz'' is fascinatingly traced back to a truncated form of the word "charisma''. Specifically, it is derived from the central segment of "charisma'', showcasing an atypical pattern of word formation. This contemporary adaptation of the term brings the timeless concept of charisma back into the spotlight, reaffirming its relevance in today's linguistic, cultural and in our case political landscape. To this end, we first focus our attention on identifying these charisma features on X and especially on characteristics related to the political influence of journalists. Then, to quantify the degree of their charisma level we propose an algorithm that uses a Multi-Attribute Decision Making (MADM) algorithm, the

Analytic Hierarchy Process (AHP) to weigh according to their significance the charisma characteristics and a cost function for the ranking of the journalists.

The AHP method has been extensively applied in the literature to deal with different problems depending on different various parameters with conflicting goals and objectives (Zayat et al., 2023). Especially, in the field of social media the AHP method has been successfully used for identifying social media influencers (Francalanci & Metra, 2015) (Lamirán-Palomares et al., 2020) or influential segments of short texts. (Garg et al., 2018). In our case, as already stated the AHP method will be applied for the weight determination of the Greek journalists' political charisma. Moreover, a case study was carried out to illustrate the feasibility of the proposed algorithm, with a sample of 20 X accounts operated by Greek journalists.

The rest of the paper is organized as follows: Section 2 discusses the difference between influence and charisma while Section 3 presents the AHP method used in our algorithm. Section 4 describes the proposed algorithm and presents our numerical results. Discussion concerning the obtained results is presented in section 5, while in section 6 conclusion remarks, as well as ideas for future work are presented.

INFLUENCE VS CHARISMA

Charisma and influence are two related but distinct concepts that can be applied to understanding the dynamics of social media.

Charisma is a personality trait that is characterized by charm, persuasiveness, and the ability to inspire and lead others. Charisma is often associated with the ability to attract followers and build a personal brand, which can be important for success in many fields, including politics, entertainment, and business (House et al., 1991). Pappas (2011) defines political charisma as "*a distinct type of legitimate leadership that is personal and aims at the radical transformation of an established institutional order*".

Influence, on the other hand, refers to the ability to affect the thoughts, feelings, and behaviour of others. Influence can be exerted through a variety of means, including persuasion, coercion, and social proof, as shown in the emblematic work "Personal influence: the part played by people in the flow of mass communications" (Katz & Lazarsfeld, 1955). In social media, influence can be exerted through the sharing of information, the creation of content, and the ability to generate engagement and online

discussions. More specifically, political influence in social media can be defined as the power of individuals, groups, or organizations to affect the political opinions, attitudes, and behaviours of others through their online presence and content (Bimber et al., 2015).

While charismatic individuals may have a greater influence on social media, it is important to note that influence and charisma are not always correlated. A person can have a lot of influence on social media without necessarily being charismatic, and vice versa. Additionally, the type of influence can be different, for example, a person can have a lot of followers but still not have much influence on them, or a person could be able to generate a large number of interactions but not have a large number of followers (Bakshy et al., 2015).

At this point and to further clarify the concepts of influence and charisma, integrating the concepts of symbolic capital and charismatic authority into the discussion on X's role in political communication enriches the analysis significantly. This integration allows for a deeper understanding of how journalists on X not only disseminate information but also cultivate charisma, which, in turn, affects political dynamics.

The addition of Pierre Bourdieu's concept of symbolic capital (Bourdieu & Wacquant, 2013) is particularly illuminating. Symbolic capital, as defined by Bourdieu, encompasses the prestige, honour, and reputation an individual or entity possesses within a social space. This form of capital is of paramount importance on social media platforms, where the reputation and perceived authority of journalists can significantly amplify their ability to influence public opinion and political discourse. In this context, the symbolic capital of a journalist is not just a by-product of their social media presence but a key asset that can be leveraged to shape political narratives and outcomes.

Furthermore, Max Weber's concept of charismatic authority (Breuilly, 2011) provides a theoretical framework to dissect the nature of influence that certain journalists wield on X. According to Weber, charismatic authority stems from the personal qualities of the leader, including their charm and their ability to inspire and mobilize followers. When applied to journalists on X, this concept helps to distinguish between those who merely have a large following (influence) and those who can truly engage and persuade their audience through the strength of their charisma. This distinction is crucial for understanding the dynamics at play in political communication on social media.

Therefore, in the proposed ranking algorithm for measuring the

charisma level of journalists on X, it becomes essential to incorporate measures of symbolic capital and charismatic authority. The algorithm will weigh these elements alongside traditional metrics of influence, such as follower counts and engagement rates by considering the interaction between journalists and politicians, recognizing these interactions as a form of symbolic exchange that enhances the journalist's prestige and credibility.

This nuanced approach acknowledges that the impact of a journalist on X is not solely a function of their ability to generate likes, retweets, or followers but also their capacity to command respect, attention, and authority—attributes that are central to both symbolic capital and charismatic authority. By differentiating between influence and charisma in this manner, the study aims to offer a more sophisticated understanding of how journalists can shape political landscapes through their social media engagement. Before proposing our methodology, to distinguish influence from charisma it is worth reviewing the different types of approaches there are to measure each one of them. Measuring political influence on X can be a challenging task, as it is difficult to quantify the impact that a tweet or account has on public opinion and political decisions.

Some of the most common methods used to measure political influence on X are:

Metrics-based approaches: Metrics-based approaches use quantitative metrics such as the number of followers, retweets, likes, and mentions to determine the reach and engagement of a tweet or account. These metrics can provide insight into the popularity of a tweet or account, but they do not take into account the quality of engagement and they can be subject to manipulation through the use of bots and other tactics (Bessi & Ferrara, 2016).

Content-based approaches: Content-based approaches use natural language processing techniques to analyze the content of tweets and identify key themes, sentiments, and influencers. These techniques can be used to determine the popularity and relevance of a tweet or account, as well as the extent to which it can drive conversations and shape public opinion (Tausczik & Pennebaker, 2010).

Network-based approaches: Network-based approaches use network analysis techniques to identify key actors and connections on the X network. This can be used to determine the centrality and influence of a particular account or group of accounts, as well as the extent to which they can spread information and shape public opinion (Conover et al., 2021).

On the other hand, there are also several different approaches to quantifying charisma on X:

Content analysis: One way to measure charisma on X is by analyzing the content of an individual's tweets. This can include assessing the tone and style of their tweets, such as the use of storytelling and authentic language, notions defined by Erving Goffman in his representative work "The presentation of self in everyday life" (Goffman & Erving, 1974). Researchers could also examine the extent to which an individual's tweets can inspire and motivate their followers based on the work of Boorstin (1992).

Engagement analysis: Another way to measure charisma on X is by analyzing the level of engagement an individual's tweets receive. This can include looking at the number of likes, comments, and retweets their tweets receive, as well as the overall level of interaction with their followers (Kwon & Wen, 2010). High levels of engagement may indicate that an individual can effectively communicate and connect with their followers and that their messages resonate with a wider audience (Gentzkow & Shapiro, 2010).

Media attention: The amount of media attention an individual receives can also be used to measure charisma on X. This could include the number of traditional media outlets that cover their tweets, as well as the extent to which their tweets are shared on other social media platforms (Colleoni et al., 2014). High levels of media attention may indicate that an individual is seen as a thought leader or influencer in their field.

Network Analysis: Network analysis can be used to measure charisma on X. This can include looking at the centrality of an individual in the network, the number of followers and the number of retweets and mentions they receive (Borgatti et al., 2009). High levels of centrality and high numbers of followers and retweets can indicate that an individual is well-connected and influential on the network.

As we explore the multiple approaches to quantifying political influence and charisma on X, it becomes evident that traditional metrics, while informative, fall short of capturing the full spectrum of a journalist's impact. The complexity of charisma, in particular, defies simple quantification through conventional metrics such as follower counts or engagement rates. This realization prompts us to seek a more nuanced method of analysis. In response to this challenge, our approach begins by employing classic metrics-based methods to gauge influence. Building on this foundation, we innovate by incorporating an analysis of

"political attention"—the engagement and attention journalists receive from politicians. This methodological pivot allows us to transform a primarily qualitative inquiry into a quantifiable assessment. Our objective is to reveal the distinct nuances between influence and charisma, translated into numerical outcomes that diverge.

Since the measure of influence and then charisma depends on various parameters, having conflicting goals and objectives, we study the problem from the aspect of multicriteria analysis and more specifically by applying the Analytic Hierarchy Process (AHP) to determine the relative weights of the charisma parameters.

Defining the charisma of journalists

Journalists play an indispensable role in informing the public about political issues and actions, wielding a significant level of influence over the political landscape. Their ability to set the agenda for public discourse by highlighting certain issues and framing them in specific ways is a testament to their charismatic authority (McCombs et al., 2021). This influence is not merely about directing attention to particular issues; it extends to shaping the public's perception of them, a capability rooted deeply in the charismatic dimension of their social media interactions.

By selecting certain aspects of an issue or event to emphasize while downplaying or ignoring others, journalists exercise a form of charismatic leadership that shapes audience perceptions and interpretations (Hermida, 2016). This process, known as framing, is a clear manifestation of the charismatic authority Max Weber describes, where the journalist's influence moulds public discourse.

Furthermore, journalists' role in holding politicians accountable through reporting on their actions, statements, and policies, and fact-checking their claims exemplifies the exercise of symbolic capital. The prestige and credibility they command can increase the level of scrutiny politicians face, making them more likely to be held accountable for their actions (Gentzkow & Shapiro, 2010). This aspect of journalistic work underscores the power of symbolic capital as a force for influencing political accountability and public opinion.

Through their reporting, journalists not only inform the public but also influence it, wielding a form of charismatic authority that can sway political opinions and actions which in turn can influence politicians (Boorstin, 1992). Their ability to provide citizens with the information needed to

make informed decisions about political issues and actions (Wettstein et al., 2018) further highlights the significant, charismatic influence they hold within the political sphere.

The advent of social media has amplified the role of journalists as charismatic leaders in the digital age. Platforms like X have become powerful tools for capturing information flow, gauging public opinion, and disseminating news, particularly in crises (Lee, 2015). This digital presence enhances their symbolic capital, allowing them to project their charisma more broadly and effectively.

However, the increasing polarization of journalists, as they take part in public debates not just as mediators but as advocates, raises questions about the impartiality and independence of traditional media (McQuail & Denis, 2010). This trend, particularly evident in Greece and especially in television where journalists often participate in political debates as representatives of political parties, necessitates a reevaluation of how journalistic charisma is perceived and its impact on democracy.

A recent study by Sapouna (2022) prompts reflection on whether the media serves societal interests or those of the political and economic establishment. This concern underscores the complexity of journalistic charisma: it is not merely about personal influence but also about the role journalists play in shaping or challenging the prevailing power structures.

In conclusion, unravelling the intricate ties between journalists and charisma necessitates a discerning appreciation of how journalists leverage their symbolic capital and charismatic authority to mould public discourse, political accountability, and, fundamentally, the processes of democracy. Through their engagement on social media, journalists do far more than merely disseminate information; they actively sculpt the political terrain, highlighting the profound influence of charismatic journalism in today's digital era.

Transitioning from a theoretical understanding of influence and charisma to a practical application, it becomes imperative to measure these concepts in tangible terms. The chosen metric for this analysis focuses on interactions between journalists and politicians. Politicians, who are often charismatic figures themselves, tend to engage with journalists who echo their perspectives, thereby amplifying a unified message. Such interactions are not merely exchanges of information but are emblematic of a deeper acknowledgement. By choosing to engage selectively with certain journalists, politicians inadvertently underscore a problematic dynamic, signalling their endorsement of these journalists' viewpoints and

bestowing upon them a form of respect that borders on favouritism - an action that skews the principle of symbolic capital towards a more insidious interpretation. The selective acknowledgement between journalists and politicians risks undermining the integrity of journalistic impartiality, casting a shadow over the journalists' role in presenting balanced political narratives. Instead of serving as a testament to their charismatic authority in public discourse, it highlights a concerning collusion that threatens to distort the democratic process. This interaction, while seemingly benign in its acknowledgement of influence, in reality, harbours the potential to erode public trust in the media and democracy at large, as it suggests a conflation of media independence with political agendas.

The calculated interaction strategy unveils a troubling symbiosis, wherein the charisma of journalists, as acknowledged by politicians, morphs into a problematic channel for political messaging. It demonstrates how symbolic capital – ostensibly founded on respect, prestige, and honour can deviate from its noble origins, manifesting instead as a tool for manipulating the political narrative. This departure from mere social media metrics to a significant sway over the political discourse underscores a concerning reality. As we explore the intricacies of this relationship, we uncover the unsettling potential for journalistic charisma to detract from the democratic process, revealing a gap between idealistic theories and their potentially detrimental real-world applications. This particular scenario raises alarms about the integrity of democratic dialogue, suggesting that the entanglement of media and political interests may compromise the foundational principles of democracy itself.

THE ANALYTIC HIERARCHY PROCESS (AHP)

The AHP, introduced by Saaty (1988), is a multi-attribute decision-making (MADM) method that can be applied to solve problems where various multi-criteria (quantitative and/or qualitative) should be taken into account. It consists of the following 3 steps:

Step 1. The initial problem is expressed in a hierarchical structure whereas the subsequent lower levels represent the alternative solutions to the problem

Table 1: *Satty's scale of importance*

Intensity of importance	Definition
1	Equal importance
3	Moderate importance
5	Strong importance
7	Very strong importance
9	Extreme importance
2, 4, 6, 8	Intermediate values

Step 2. During this step a positive reciprocal matrix is constructed as follows: each element of the matrix is calculated from the pairwise comparisons of the elements at each level of the hierarchy. Each pairwise comparison is based on a numerical scale from 1 to 9 (Table 1). Thus, assuming that the number of criteria is n, then the matrix can be expressed as

$$D = \begin{bmatrix} d_{11} & \cdots & d_{1n} \\ \vdots & \ddots & \vdots \\ d_{n1} & \cdots & d_{nn} \end{bmatrix} \quad (1)$$

Step 3. The right eigenvector (ϖ) that corresponds to the largest eigenvalue () of is computed, to determine the relative weights, according to Eq. 2

$$D\varpi = \lambda_{max} \quad (2)$$

In addition, to avoid inconsistencies both the consistency index CI and the consistency ratio (CR) are calculated using Eq. (3) and (4) respectively:

$$\mathrm{CI} = \frac{(\lambda_{\max} - \mathrm{n})}{\mathrm{n} - 1} \quad (3)$$

$$CR = \frac{CI}{RI} \quad (4)$$

where the variable RI is a random consistency index and its value depends on the number of the criteria (Table 2).

If the value of CR is ≤ 0.1 then the inconsistency is acceptable; otherwise, the judgement should be reexamined.

Table 2: *The RI values based on the matrix dimension*

Dimension	RI
1	0.00
2	0.00
3	0.58
4	0.90
5	1.12
6	1.24
7	1.32
8	1.41

APPLICATION OF THE METHOD

The Proposed Algorithm

The detailed steps of our algorithm are as follows:

1. Determine the charisma criteria and calculate the value of each journalist.
2. Normalize their values.
3. Apply the AHP method to obtain the criteria weights.
4. Calculate the journalists' charisma by using the following formula:

$$R_j = \frac{\sum_{i=1}^{n} c_i w_i}{\sum_{i=1}^{n} w_i} \qquad (5)$$

where c_i denotes the normalized value of the charisma criterion i and w_i its corresponding weight for journalist j.

5. Rank the journalists in decreasing order.

Data Collection

On the 18th of February 2023, X, Twitter at the time, changed its policy about the use of its API for academic reasons. Nonetheless, we were able to gather the data concerning 20 journalists, from the 1st of January until the 31st of January 2023, as an indicative period. The dataset includes information on various metrics (Tucker et al., 2018). The selection criteria for the twenty accounts included: popularity (high number of followers), as much equality (men-women) possible, representation of different media (press, radio, TV), domain of expertise and political affiliation of the

respective media they work for (or they own because some of them are also media owners, but they are included as they are still active in journalism). The phenomenon of journalist-media owners in Greece has not been extensively studied, but in society, it is not considered incompatible, more so as most of the concerned media are web-based.

However, as it is a rather small sample to use only to construct our model, we anonymized the data. This was done for two reasons. Firstly, it would raise concerns about the choices, as all of them are prominent figures in public -and also in political life- of Greece and we would not like these to interfere with our research. Secondly, it would not be fair to publicize a list of "charismatic" journalists when the list is quite small. This could also be misinterpreted and interfere with the research.

Due to our algorithm's ongoing testing, we've anonymized our dataset to prevent misinterpretations and politically charged debates that could hinder our project. We plan to reevaluate this decision and potentially disclose journalists' names after significantly expanding our dataset, provided our algorithm's robustness and ethical data use are assured. For Parliament members with X accounts, anonymization isn't required. Our dataset includes all members to avoid biased analysis and ensure our findings accurately reflect parliamentary engagement with these accounts, maintaining our commitment to transparency and accountability.

Data anonymization is a method "which transforms the original data by applying some operations on it to effectively protect user's privacy without degrading the anonymous data utility" (Fung et al., 2007). The goal is to ensure the privacy of the subject's information. Data anonymization minimizes the risk of information leaks when data is moving across boundaries. It also maintains the structure of the data, enabling analytics post-anonymization. For this study, pseudonymization was chosen. It is a method of data de-identification that replaces private identifiers with pseudonyms or false identifiers. This ensures data confidentiality and statistical precision. In this case, every male subject is assigned the letter M followed by 3 digits and accordingly, the female subjects are assigned the letter F. This separation was made to be able to make gender observations if needed.

The final list of journalists is presented in Figure 1, shown by the order of their number of followers.

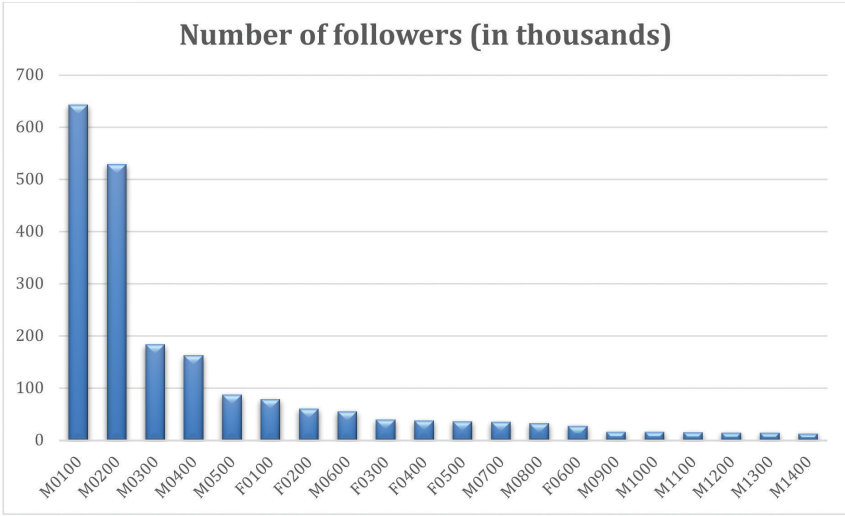

Figure 1: *Chosen X, formerly Twitter, accounts and their rankings by number of followers*

Politicians were selected from all political parties present at the Hellenic Parliament. Most of them are Members of Parliament (MPs) although we have included all active ministers at the time of our study even if they're not MPs. This list, which can be found in Appendix I, doesn't contain inactive accounts of MPs.

Selection criteria

According to Riquelme and González-Cantergiani (2016) a metric is a simple mathematical expression that helps us to provide basic information about the social network in the form of a numerical value. In turn, metrics can be combined to define a (ranking) measure, i.e., either a formula or an algorithm that provides a criterion to rank each user of a Network. The metrics could be useful in some respects and although they are not nearly enough, they cannot be overlooked.

The number of followers -which is the only metric that refers to the account whilst the others refer to a specific tweet- reflects the reach and potential impact of an account's tweets (Cha et al., 2010). "However, the number of followers alone does not reflect the influence a user exerts when the user's tweet is retweeted many times or is simply followed by other influential people: it is not a comprehensive measure", he notes.

Nevertheless in the early days of Twitter and the relevant research the number of followers used to rank accounts by popularity as seen in the work of Kwak et al. (2010) that states that "*the popularity of a Twitter user can be easily estimated by the number of followers*". In a study by Dagoula (Δαγουλά, 2019) that uses some of the same accounts, it is noted that their activity within the platform "*does not seem to determine their popularity on it and raises questions about the criteria for the public to follow a journalist on the platform. It is speculated that an important role popularity outside of Twitter, whether this is determined by the overall popularity of the journalistic work, or by their persona*". In this light, we do not include the number of followers in the next set of metrics to be used in the study but we only use them as a comparison metric to our final results.

The total count of impressions on X refers to the number of times a tweet is seen by users on the platform, and it is often used as a measure of the reach and potential impact of a tweet or X account. It can be a useful metric for measuring the potential impact of an X account, as it reflects the reach and exposure of the account's tweets. For example, De Vries et al. (2012) found that the number of impressions was positively associated with the popularity of brand posts, suggesting that a higher level of exposure can lead to greater engagement and attention from users.

Likes (formerly known as favourites) on X indicate that a user approves or enjoys a tweet. They are a form of engagement that can contribute to the perceived influence of an X account, as they indicate that the user's content is resonating with their audience. Nonetheless, the exact relationship between likes and influence may vary depending on the context and the goals of each analysis. Likes are certainly less important than other engagement factors such as replies, tweets or quotes or as put by Azaouzi and Ben Romdhane "on Twitter, having a "retweet" is not the same as having the mention "favourite"' (2018).

Replies on X can affect the influence of a user's account by indicating the level of engagement and interaction with their audience. Cha et al. (2010) suggest that replies can be particularly important in measuring influence, as they reflect the level of engagement and interaction between users and can help to identify influential users who can drive conversations and shape opinions on the platform. The authors note that users who receive a high number of replies may be particularly influential on Twitter, as their messages are more likely to generate conversation and engage other users. Additionally, the authors put forward that replies can be a more accurate

measure of influence than other metrics, such as retweets, which may be influenced by factors such as timing and the popularity of the original tweet.

Nonetheless, retweets are often used as an indicator of the popularity and relevance of a tweet and can be an important metric for assessing the reach and impact of a particular user or piece of content on the platform. Kwak et al. (2010) who did the first quantitative study on the -then- entire 'Twittersphere' note that ranking by retweets differs from the rankings found by the number of followers and by PageRank (the algorithm used by Google, "indicating a gap in influence inferred from the number of followers and that from the popularity of one's tweets".

Quotes compared with retweets also contain the user's comment on the original tweet. Twitter introduced the ''Quote Tweet'' feature in 2015. Before that, users had to manually copy and paste the original tweet into their tweet to add a comment. The introduction of the Quote Tweet feature made it easier for users to share their thoughts on a tweet while giving credit to the original poster. The Quote Tweet feature was initially available only on Twitter's mobile apps, but it was later rolled out to the web version of Twitter as well. Today, the Quote Tweet feature is a commonly used way for users to share their thoughts on tweets and to engage in conversations on the platform. While retweets and quote tweets are both forms of sharing on X, formerly Twitter, they have different implications for how information spreads and how users engage with content. Therefore, it is important to distinguish between the two when analyzing user behaviour and social influence on X.

Among other metrics, which have not been used in the present study are hashtags and mentions and time series analysis but there are some others used such as the followers/followees ratio for example.

Especially, for the case of political charisma we consider the following 3 additional criteria:

- The number of likes by politicians, to all of the Tweets from a journalist,
- The number of retweets by politicians, to all of the Tweets from a journalist and
- The number of quotes by politicians, to all of the Tweets from a journalist

Normalization

For each journalist Tweet, as already mentioned, we collected the so-called public metrics, namely:

- The number (#) of impressions.
- The number (#) of likes.
- The number (#) of quotes.
- The number (#) of replies.
- The number (#) of retweets.
- The number (#) of likes by politicians, to all the Tweets from a journalist.
- The number (#) of retweets by politicians, to all the Tweets from a journalist.
- The number (#) of quotes by politicians, to all the Tweets from a journalist.

It should be noted that in our data, we exclude retweets that are made by the journalists themselves, so retweets refer to the number of retweets their posts have received.

The data computed is given in the following table.

Table 3: *The obtained per journalist values*

Code	# of Impressions	# of likes	# of quotes	# of replies	# of retweets	# of likes by politicians	# of retweets by politicians	# of quotes by politicians
M1100	2164.46	30.63	1.06	5.69	4.43	16	5	0
F0600	2943.71	49.02	0.54	5.51	4.84	0	0	0
M1400	530.30	4.45	0.08	0.38	0.97	0	0	0
F0500	1243.33	23.00	0.33	1.00	1.67	0	0	0
F0300	2098.82	22.87	0.58	3.58	1.16	1	1	0
F0200	150.00	2.00	0.00	2.00	0.00	0	0	0
M0100	249.90	3.35	0.00	1.20	0.07	0	0	0
M0600	7907.79	205.80	1.00	6.65	34.77	1	0	0
M0200	29359.08	612.97	8.57	46.62	147.10	27	23	0
M1000	1341.33	19.89	0.22	0.56	3.89	0	0	0
M0400	23009.04	444.67	2.74	33.85	45.52	1	0	0
F0100	4977.67	90.64	1.15	4.60	21.80	0	0	0

Table 3, Continued

Code	# of Impressions	# of likes	# of quotes	# of replies	# of retweets	# of likes by politicians	# of retweets by politicians	# of quotes by politicians
M0800	6771.6	261.80	1.00	3.80	73.80	0	1	0
F0400	2636.8	14.00	0.60	0.60	6.60	0	0	0
M1300	27697.16	585.36	14.73	99.93	132.62	10	4	0
M1200	4916.20	123.04	2.03	5.98	40.41	11	9	0
M0900	1587.34	44.36	0.25	1.94	8.86	2	0	0
M0300	10873.55	163.87	1.43	7.92	19.57	0	1	0
M0500	35066.40	645.80	10.20	28.20	74.20	1	1	0
M0700	6912.37	64.21	2.15	6.81	19.30	0	1	0

To focus only on the relative influence of the set of the 20 journalists considered in this study, we divide each metric in the previous table by the maximum values of the respective metric, to get the following table of normalized metrics in the interval [0,1].

Table 4: *The normalized values*

Code	Norm. Mean number of Impressions	Norm. Mean number of likes	Norm. Mean number of quotes	Norm. Mean number of replies	Norm. Mean number of retweets	Norm. Total likes by politicians	Norm. Total retweets by politicians	Norm. Total quotes by politicians
M1100	0.06	0.05	0.07	0.06	0.03	0.59	0.22	0.00
F0600	0.08	0.08	0.04	0.06	0.03	0.00	0.00	0.00
M1400	0.02	0.01	0.01	0.00	0.01	0.00	0.00	0.00
F0500	0.04	0.04	0.02	0.01	0.01	0.00	0.00	0.00
F0300	0.06	0.04	0.04	0.04	0.01	0.04	0.04	0.00
F0200	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00
M0100	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00
M0600	0.23	0.32	0.07	0.07	0.24	0.04	0.00	0.00
M0200	0.84	0.95	0.58	0.47	1.00	1.00	1.00	0.00
M1000	0.04	0.03	0.02	0.01	0.03	0.00	0.00	0.00
M0400	0.66	0.69	0.19	0.34	0.31	0.04	0.00	0.00

Table 4, Continued

Code	Norm. Mean number of Impressions	Norm. Mean number of likes	Norm. Mean number of quotes	Norm. Mean number of replies	Norm. Mean number of retweets	Norm. Total likes by politicians	Norm. Total retweets by politicians	Norm. Total quotes by politicians
F0100	0.14	0.14	0.08	0.05	0.15	0.00	0.00	0.00
M0800	0.19	0.41	0.07	0.04	0.50	0.00	0.04	0.00
F0400	0.08	0.02	0.04	0.01	0.04	0.00	0.00	0.00
M1300	0.79	0.91	1.00	1.00	0.90	0.37	0.17	0.00
M1200	0.14	0.19	0.14	0.06	0.27	0.41	0.39	0.00
M0900	0.05	0.07	0.02	0.02	0.06	0.07	0.00	0.00
M0300	0.31	0.25	0.10	0.08	0.13	0.00	0.04	0.00
M0500	1.00	1.00	0.69	0.28	0.50	0.04	0.04	0.00
M0700	0.20	0.10	0.15	0.07	0.13	0.00	0.04	0.00

ESTIMATION OF REACH/INFLUENCE

To estimate a metric of the reach for each of the 20 Greek journalists considered in this study, we utilize only the first 5 metrics given in the previous table:

- The number (#) of impressions.
- The number (#) of likes.
- The number (#) of quotes.
- The number (#) of replies.
- The number (#) of retweets.

The next step is to construct the pairwise matrix to determine the relative importance of these criteria/metrics concerning the goal. The pairwise matrix is created by considering Satty's scale of importance (Table 1). For example, since the # of retweets has strong importance compared with the # of retweets the value of the element d(5,1) of positive reciprocal matrix D (eq. 1) will be equal to 5.

By comparing pairwise all the criteria, we employ the positive reciprocal matrix of pairwise judgements D (eq. 1) that is given by:

Table 5: *The reciprocal matrix of 5 metrics (influence)*

	# of Impressions	# of likes	# of quotes	#of replies	# of retweets
# of Impressions	1	1/3	1/6	1/8	1/5
# of likes	3	1	1/5	1/6	1/4
# of quotes	6	5	1	¼	2
# of replies	8	6	4	1	2
# of retweets	5	4	1/2	½	1

Since the above positive reciprocal matrix is not consistent (Saaty 2002), we then compute the right eigenvector using eq. 2. Thus, the eigenvectors for each metric are given by:

Table 6: *Weights of 5 metrics (influence) obtained by AHP*

w1	w2	w3	w4	w5
0.037	0.066	0.241	0.469	0.186

To check the consistency, we apply eq. 3 and 4. Since we have 5 metrics the value of RI in eq. 4 is 1.12 (Table 2).

Using these weights, we compute the weighted average of these 5 metrics for the set of 20 journalists (eq. 5). Consequently, we derive the following ranking:

Table 7: *Ranking by influence (5 weights)*

Code	Score
M1300	0.966
M0200	0.638
M0500	0.496
M0400	0.331
M0800	0.161
M1200	0.130
M0600	0.121
M0300	0.113

Table 7, Continued

Code	Score
M0700	0.105
F0100	0.082
M1100	0.055
F0600	0.048
M0900	0.032
F0300	0.030
F0400	0.025
F0500	0.015
M1000	0.014
F0200	0.009
M0100	0.006
M1400	0.005

Estimation of charisma

To extend our results into an estimation of the charisma for the set of 20 Greek journalists considered in this study, we construct the positive reciprocal matrix of pairwise judgements given by:

Table 8: *Reciprocal matrix of 8 metrics (charisma)*

	# of Impressions	# of likes	# of quotes	# of replies	# of retweets	# of likes by politicians	# of retweets by politicians	# of quotes by politicians
# of Impressions	1.00	1/3	1/6	1/8	1/5	1/3	1/6	1/8
# of likes	3.00	1.00	1/5	1/6	1/4	1.00	1/4	1/6
# of quotes	6.00	5.00	1.00	¼	2.00	5.00	2.00	1.00
# of replies	8.00	6.00	4.00	1.00	2.00	2.00	4.00	6.00
# of retweets	5.00	4.00	1/2	½	1.00	4.00	1.00	1/2
# of likes by politicians	3.00	1.00	1/5	½	1/4	1.00	1/4	1/6
# of retweets by politicians	6.00	4.00	1/2	1/4	1.00	4.00	1.00	1/2
# of quotes by politicians	8.00	6.00	1.00	1/6	2.00	6.00	2.00	1.00

Since the above positive reciprocal matrix is not consistent, we once more employ the method proposed in (Saaty 2002) to derive the relative weights, as the eigenvector that corresponds to the largest eigenvalue of this matrix. Thus, we obtain the weights given by:

Table 9: *Weights of 8 metrics (charisma)*

w1	w2	w3	w4	w5	w6	w7	w8
0.021	0.036	0.157	0.351	0.113	0.049	0.105	0.169

In consequence, the ranking of the Greek journalists in terms of charisma is given as the weighted average using the above weights and the normalized metrics given previously as:

Table 10: *Ranking by charisma (8 weights)*

Code	Score
M1300	0.693
M0200	0.573
M0500	0.326
M0400	0.222
M1200	0.144
M0800	0.103
M1100	0.089
M0600	0.079
M0300	0.078
M0700	0.073
F0100	0.052
F0600	0.033
F0300	0.028
M0900	0.023
F0400	0.015
F0500	0.010
M1000	0.009

Table 10, Continued

Code	Score
F0200	0.007
M0100	0.004
M1400	0.003

It should be noted that for this case since we have 8 metrics the value of RI in eq. 4 is 1.41 (Table 2).

DISCUSSION

As expected, there are some limitations to the proposed model. First of all, the size of our sample. We have taken a census of the number of Greek journalists that are using X, and it exceeds 300 (of the most prominent or famous) but there is no accurate official census yet, at least concerning members of the journalistic unions. In a future study, this could be attained with the help of the unions, only to address General Data Protection Regulation (GDPR) concerns.

Secondly, the nature of social media is dynamic and can be affected by many factors such as changes in social media platforms themselves (mainly the way the algorithms promote certain tweets/posts), changes in user behaviour (some journalists block users that use foul or insulting language or even hate speech, thus lowering the "reply" factor which is an important metric), and changes in political events and discourse. In a future study that will focus on pre-electoral periods, we would be able to better define the political stakes to address at least the third factor, as the first two cannot be controlled in the context of such a study.

By comparing the results of the measures: followers (w1), influence (w5) and charisma (w8) we see that certainly the number of followers alone (a metric that is much preferred by the press when evaluating influence in the social networks) is not indicative of the real influence and the ranking has huge differences. For example, M0100 and M1300 change places (from top to bottom and vice versa) after the first set of weights are applied.

Furthermore, the application of three more metrics certainly tweaks our results giving a more politically oriented ranking. The differences are not as huge, but they are noticeable.

There exist however a few noticeable exceptions such as M0200, M0400 or M1400 that keep their ranking (either at the top or the bottom) without this affecting our study.

Table 11: *Comparative ranking*

Code/Weight	Number of followers	Influence criteria	Charisma criteria
M0100	1	19	19
M0200	2	2	2
M0300	3	8	9
M0400	4	4	4
M0500	5	3	3
F0100	6	10	11
F0200	7	18	18
M0600	8	12	8
F0300	9	14	13
F0400	10	15	15
F0500	11	16	16
M0700	12	9	10
M0800	13	5	6
F0600	14	7	12
M0900	15	13	14
M1000	16	17	17
M1100	17	11	7
M1200	18	6	5
M1300	19	1	1
M1400	20	20	20

From our analysis, as Figure 2 demonstrates, the considered set of journalists had interactions with politicians from only three different Greek political parties.

If we further examine the types of interactions, as Figure 3 depicts, these only include likes and retweets. As shown by Figures 4 and 5, politicians prefer to interact more with likes than retweets.

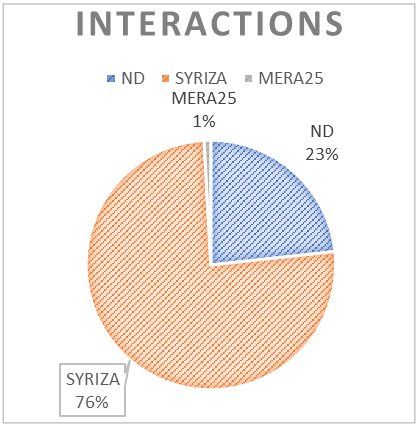

Figure 2: *Interactions from politicians to journalists*

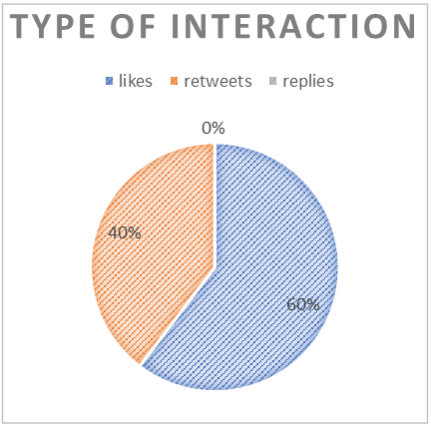

Figure 3: *Kind of interactions from politicians to journalists*

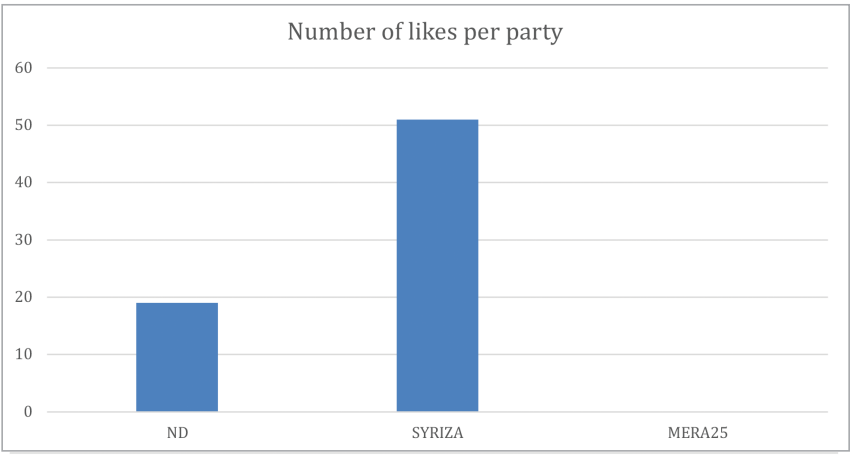

Figure 4: *Likes from politicians to tweets from journalists*

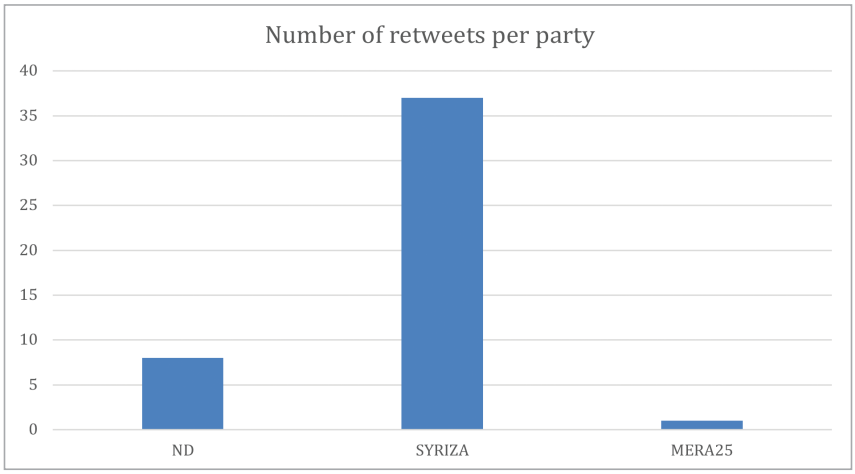

Figure 5: *Retweets from politicians to tweets from journalists*

What becomes apparent when examining the interactions that journalists have with politicians is the two (plus a smaller one) distinctive groups that arise. Politicians from a certain party interact only with specific journalists and the two groups do not interlap (except for one situation), as shown in Figure 6. Not only the groups are distinctive, but it also seems that there are specific people in each group that have an apparent dominant position.

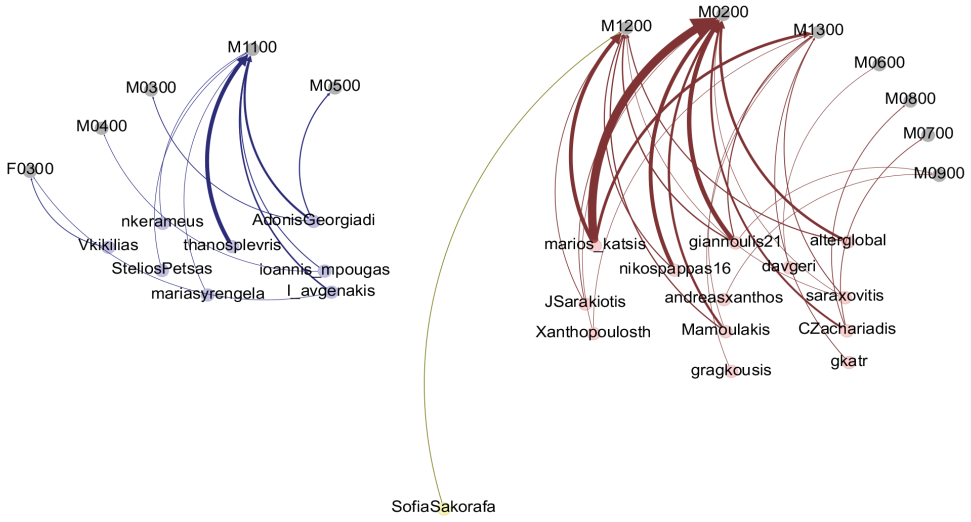

Figure 6: *A graphical representation of the interactions of politicians with journalists*

Schudson (2001) noted that partisan journalism reports the world from a political 'party or faction' perspective and favours one ideology or value system over others. Conover et al. (2021) have shown that the network of political retweets exhibits a highly segregated partisan structure, with extremely limited connectivity between left- and right-leaning users". Earlier Barberá et al (2015) found that political polarization on Twitter is high and that users tend to follow and interact with others who share their political beliefs. The authors noted that "Twitter may exacerbate political polarization by allowing individuals to self-select into like-minded communities". They limited, though, this polarization in the case of political issues but not many other current events. This could also be true when we're not discussing users in general but journalists and politicians.

In an article named "Why Do Partisan Media Polarize Views?", Levendusky (2013) examines the role of partisan media in exacerbating political polarization among viewers. The article argues that partisan media contribute to political polarization by reinforcing existing attitudes and beliefs and discouraging political compromise. This has important implications for the role of the media in shaping public opinion and its potential impact on democratic governance. The same can be argued, by extrapolation, for partisan journalists on X.

What is extraordinary is that most of the journalists included in our sample appear to be partisan which could lead to the hypothesis, to be confirmed in a future study, that the majority of the Greek journalists are partisan and not as they used to be considered "objective".

This opens a whole new area for research concerning objectivity or partisanship and therefore connection not only with certain politicians but also with certain segments of other users. Are journalists and politicians as polarized as the rest of the users? Are the users losing trust in journalists and media for this reason, as noted by Newman et al. (2022): "Greece has the lowest share of citizens thinking that the press is free from undue political (7%) or business (8%) influence across 46 countries."

CONCLUSIONS

In this study, we have measured the charisma in a sample of Greek journalists to create a model for future study. We have enriched the results of the usual influence metrics by applying three more metrics derived from interactions coming from politicians. In consequence, we established a ranking algorithm that is more adapted to politics than any other subject.

The question of political polarization, although expected but not intended, was apparent in our results and could not be ignored. The interaction emulating from politicians is targeted to specific journalists only thus creating distinct groups or political communities. Political segregation is apparent as manifested in our results.

It is hence important to follow up with a study that will include a much bigger sample and enhance our model with qualitative metrics such as those derived from sentiment analysis to go deeper.

Furthermore, as shown in the discussion, a large variety of questions arise such as the relationship between this polarization and trust in media and journalists, the extent of partisanship among Greek journalists, the differentiation of the results in highly politically polarized periods as those preceding general elections, the limit where partisanship becomes dependence from politicians. As Tong (2022) notes "to make partisan journalism beneficial to democracy, it must also be independent to avoid being manipulated by certain political parties or interest groups."

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Appendix I: List of Twitter handles (@_) of politicians examined and the respective political parties in which they belong

NEW DEMOCRACY

kmitsotakis, ioannis_mpougas, ArampatziFotini, VroutsisGiannis, htheoharis, Chboukoros, cstaikouras, Skylakakis, a_vesiropoulos, AdonisGeorgiadi, npapathanasis, yannistsakiris1, ChristosDimas_, NikosDendias, MVarvitsiotis, CFragoyiannis, katsaniotis, Npanagioto, nhardalias, nkerameus, ZettaMakri, AngelosSyrigos, K_Hatzidakis, tsakloglou, domnamich, mariasyrengela, thanosplevris, MinaGagaP, raptizoi, KostasSkrekas, amirasgiorgos, TagarasNikos, theodorikakosp, l_avgenakis, tsiaras_kostas, giorgoskotsiras, MakisVoridis, SteliosPetsas, KalafatisSt, nmitarakis, Sofia_voultepsi, Pierrakakis, th_livanios, karamanlis_k, PapadopoulosMix, G_Plakiotakis, katsafadosk, georgantasgr, gstylios, SimosKedikoglou, Vkikilias, sofiazacharaki, askertsos, i_bratakos, Ctriantopoulos

SYRIZA

atsipras, Tsakalotos, pskourl, gragkousis, olgagerovasili, TTheoharopoulos, tsapanidou, E_Achtsioglou, Tr_Alexiadis, alexischaritsis, Mamoulakis, JSarakiotis, gkatr, alterglobal, tzakri, c_spirtzis, dckalamatianos, giorgostsipras, nikosfilis1, meropitzoufi, marilizaxen, TheanoFotiou, andreasxanthos, GVaremenos, davgeri, SFamellos, PetiPerka, sia_anag, PanosSkourolia1, thanos_moraitis, Xanthopoulosth, iriniagath, CZachariadis, pavpol2222, KiriakiMalama, marios_katsis, NatasaGkara, nikospappas16, giannoulis21, nectarsant, saraxovitis, teligioridou, katenotopoulou, a_avlonitis, g_psychogios

PASOK

androulakisnick, michaelkatrinis, KSkandalidis, ngiannakopoulou, ELiakouli, Arvanitidis_Geo, Glavinas_Than

ELLINIKI LYSI

velopky, ViliardosV, ChitasKostas

MERA25

varoufakis_gr, k_grigoriadis, SofiaSakorafa, ASmyrlis