

Early Career Academic's Associations: A Study of Resistance and Empowerment on Social Media.

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The current Spanish higher education landscape (characterized by evaluations, overcrowding of classrooms, commitment to internationalization) has social, employment, and health repercussions for Early Career Academics (ECAs). However, this group of academics is often described as passive subjects when it comes to challenging the current situation in higher education. In this study, we sought to understand the attitudes of resistance and criticism in ECAs by analyzing the activity (through NodeXL) and content (through Nvivo12) of the Twitter accounts of two Spanish ECA associations. Twitter (now X) was selected since social media has emerged as a new form of social empowerment and democratization. It is concluded that there are attitudes of resistance among the accounts analyzed. However, for ECAs, criticism of the evaluation system and emphasis on scientific production is relegated to the background, with criticism of their working conditions taking priority. Finally, we highlight the significant and impactful role of associations in social and political struggles.

Keywords: Early Career Academic; Higher Education; Twitter; Social Networks Analysis; Resistance; Academic Identity.

Introduction

The current landscape in higher education (characterized by a predominance of evaluations, classroom overcrowding, commitment to internationalization, increasing demand for transparency, and increased precariousness) has significant social, employment, and health repercussions for Early Career Academics (ECAs) (McCune, 2020; Hollywood et al., 2020; Acker and Webber, 2017). This situation has attracted increasing research interest, with examples covering regions as varied as Australia (Bonsanquet et al., 2020; Hemmings, 2012; Apreile et al., 2020), New Zealand

(Sutherland et al., 2013), Malaysia (Abrizah et al., 2019), United Kingdom (Hollywood et al., 2020), Canada (Acker and Webber, 2017), Finland (Ylijoki and Henriksson, 2015), Sweden (Angervall et al., 2017) and even Spain (Castelló et al., 2017), where this study takes place.

In this context, although research often consider ECAs as passive subjects in this situation (Saura and Bolívar, 2019), this is not the case uniformly across the literature (Spina et al., 2020). Taking this second approach, in this study we sought to understand the attitudes of resistance and criticism in this group of academics. To this end, we analyzed the activity and content of the Twitter accounts of two Spanish ECA associations. We selected Twitter (now X) since social media has emerged as a new form of social empowerment and democratization that can influence political and social decisions (Howard and Parks, 2012; Valenzuela et al., 2012). These new forms of networked communication have transformed how social movements organize activities such as demonstrations and protests (Castells, 2012). In the last ten years, Twitter has served as a tool for protest and social activism, helping to develop new forms of social mobilization by the combination of online communication and/or face-to-face protests or the use of online communication alone.

Moreover, among social networks, Twitter — due to its characteristics — played an important role in these processes since it was considered the most democratic and participatory social network given its enormous power to make the voice of citizens visible (Park and Kaye, 2019). Therefore, it is unsurprising that early-career academics, a generation born or fully grown up in the network society (Castells, 2012), use social media as a privileged source of social interaction. Moreover, more than 60% of the Spanish population aged 18-49 uses Twitter as a primary social network, so there is a high probability that this social network will be used by early-career academics

(Fernández, 2022). The second reason for using Twitter in this research is that policies are understood to arise from work in several arenas based on an interactive, multiscale, and multi-actor process (Lawn and Grek, 2012). Moreover, other studies have already used Twitter to analyze the voices of society concerning various political and social issues (Comunello et al., 2016; Marcea and Emre, 2018), including those that impact the education sector (Barroso-Hurtado et al., 2021; Schuster et al., 2021; Silva and Adrião, 2023).

However, it is important to note that since the purchase of Twitter by Elson Musk (October 2022), this social network has undergone numerous changes, including its name, which has become "X". These transformations include various aspects, such as changes in its structure, limiting the reading of tweets, prohibiting the retweeting of certain content, or the development of paid accounts with different privileges, among other aspects. These changes have led not only to a change in the activity on the network, but also in users' engagement (Capriotti et al., 2023). Despite this, throughout this article we will keep the name "Twitter" and "tweets" (messages produced on the network), as the data collection and analysis process were prior to the changes mentioned.

Therefore, based on this framework, we aimed to address the following research questions:

- What are the main characteristics (total number of tweets published, temporal evolution of tweets) of the activity observed on the Twitter accounts selected (@FJIprecarios and @FPUinvestiga)?
- What types of actions or modes of participation are evident on Twitter? In other words, what is the main use of the accounts analyzed (dissemination of information, complaints, organization of events, ...)?

- What are the main contents of the analyzed accounts' tweets?
- Do the accounts show attitudes of criticism or resistance, or, on the contrary, are early-career academics unconsciously subordinated to the system, as pointed out by the literature?

To address these questions, we will first briefly review the broader social context of higher education and its effects on ECAs. Next, we will describe the methodology employed in the research process, followed by a detailed description of the results. Finally, the results will be discussed in relation to the existing literature, and several conclusions and future research directions will be outlined.

Background and key concepts to address today's ECA problems

The Bologna Process represents a complex transformation of the European university system. This process aimed to promote the homogenization of European Higher Education to enable educational harmonization, comparability, mobility, and employability (Brøgger, 2019). The steps taken to achieve these objectives included clear structural changes (credit system (ECTS), a three-cycle process of commitment to internationalization) and the development of accountability processes for various elements (e.g., teaching, study plans, and mobility plans) that are linked to performance-based incentives such as increased funding, the possibility of offering more courses, and the enhanced social prestige of the institutions (Dougherty and Natow, 2019).

This increase in accountability processes in higher education stems from calls for transparency and democratic legitimacy from external stakeholders and is regarded as a means of controlling the quality, autonomy, and performance of universities (Macheridis and Paulsson, 2021). However, from a more critical perspective, some authors understand these processes as a tool that undermines the university's objectives,

values, and functions, leading to the proliferation of principles such as competitiveness, individualization, productivity, and market orientation (Tomicic, 2019).

In the case of accountability processes focused on academics, these are characterized by performance evaluation processes, that influence promotion, tenure, or salary increments. These evaluations prioritize the research output, emphasizing scientific production over other responsibilities such as teaching or management tasks. In Spain, for instance, research holds significant weight, typically constituting around 60% of the evaluations criteria for securing permanent positions. Therefore, university academic evaluations in Spain have a remarkable impact on how academics work due to their capacity to shape the identity of faculty (Saura and Bolívar, 2019).

In this context, ECAs have emerged as one of the most vulnerable groups within academia since, aside from needing to tackle the challenging demands of the culture, they must do so in a highly unstable work environment (Castelló et al., 2015; Acker and Webber, 2017; Apreile et al., 2020). Indeed, Spina et al. (2022) have reported the growth of precarious working conditions for this group of academics.

ECAs constitute a diverse group that many authors have attempted to define by focusing on various concepts such as age, position, functions, years of experience or duration of contracts among other aspects (Hemmings and Kay, 2010; Laudel and Glaser, 2008; Hemmings, 2012; Sutherland et al., 2013; Bosanquet et al., 2016; Hollywood et al., 2020). These definitions agree on two concepts: 1) they point out that ECAs are a group that spans several years from the completion of the PhD; and 2) they point out that there is no room to talk about young, as age is no longer an indicator of the start of a professional career. However, for this study, we define ECAs as the group of academics (teaching and/or research) who are either PhD students with or without research/teaching positions, or have completed a PhD and currently hold or are seeking a research/teaching position.

Regardless, in neither case do they hold permanent or stable positions. In other words, we include the term employment stability in the definition. This is due to the particularity of the Spanish context, in which two large groups of professional categories are distinguished: stable (civil servants) and unstable (temporary contracts). Groups between which there are large differences in working conditions. We therefore understand that once stability has been achieved, the condition of ECAs concludes. Given the concern about the influence of these early-career academics on the future of science and universities (Crew, 2020), a growing body of literature has focused on analyzing the ways in which this group constructs and develops their professional identity in the face of the current higher education landscape (Mula-Falcón et al., 2021).

Studies in the specialized literature agree that this work climate nurtures professional identities with strong individualistic, competitive, and mercantilist characteristics, particularly among junior faculty (Mantai, 2019). Along these lines, Ylijoki and Henriksson (2017) speak of the predominance of a managerial identity, i.e., an identity characterized by meeting production demands, resulting in an over-emphasis on research work (McCune, 2020). As we see in those previous examples, scientific outputs have become the foundation of an early-career academic's identity. This is particularly evident in the case of Spanish ECAs, as the ability to obtain a stable position depends mostly on their scientific productivity.

However, the studies tend to diverge on one of the fundamental characteristics of an early-career academic's identity, i.e., the presence or absence of attitudes of resistance. Thus, while some authors speak of a subject subordinated to the system, suggesting the non-existence of attitudes of resistance or rejection in the face of the new system (Saura and Bolívar, 2019), others describe other forms of resistance: critique, frontal struggle/attack –confrontation against both the system and those responsible–, or

abandonment –withdraw or look for other career opportunities outside academia– (Feldman and Sandoval, 2018; Manzano-Arrondo, 2017). Regardless of the type of resistance, Manzano-Arrondo (2017) points to the inability to change the current system due to the "notable degree of implementation of the current system [...], and the shaping of individual trajectories" (p.28). However, Tight (2019) and Spina et al. (2020) mention the importance of collectivism as the most effective means of resistance, change and support. Despite these discrepancies, research suggests that abandonment appears to be the most used practice among this group of academics (Kalfa et al., 2018).

To gain a deeper insight into the current situation of ECAs, this work analyzes how this group of academics is responding to the current higher education landscape. We aim to detect and describe the existence of resistance actions by analyzing two Twitter accounts of early-career Spanish academics' associations. We focused our analysis on the Spanish context for two main reasons. First, aside from having a long tradition of higher education accountability processes, Spain is one of the European countries with the least investment in science and innovation, which contributes to the increased precariousness and vulnerability of university teaching staff (the main researchers in the Spanish system) (World Bank, 2023). Second, the Spanish higher education and Science system is currently undergoing a process of legislative transformation that will be critical in determining the immediate future of science and universities in this country. The COVID-19 pandemic was an important trigger for initiating this process of legislative change. In general terms, the fight against the pandemic highlighted the evident shortcomings of the science and university sectors, which had been severely damaged by years of cuts as a palliative measure for the global financial crisis that began in 2008. As a result, multiple Twitter mobilizations were organized and served to raise awareness among political institutions. In the aftermath of

the pandemic, a profound legislative process began for both the science law (unchanged for 11 years) and the universities law (unchanged for 20).

Methodology

To analyze how ECAs are responding to the current context of higher education — namely resistance attitudes — we established the following specific objectives:

- To determine the total volume of tweets in the accounts analyzed.
- To determine whether the tweets follow annual and monthly patterns in relation to certain events.
- To describe the main modes of participation.
- To analyze the most prominent issues in the accounts.

The research used a qualitative and interpretative approach to describe and understand the activity of ECAs on the social network Twitter (Daniel and Harland, 2018). To this end, the present study examined the contents of the tweets posted by users of the two accounts of interest. The methodological procedure consisted of two phases: 1) selection of social network accounts and collection of the data, and 2) analysis of the data.

Selection of the social network accounts and collection of the data

The social network selected was Twitter. At the time of data collection, Twitter was conceived as a bidirectional, global, and free social media platform that combines elements of blogs, text messages, and information broadcasting (Del-Fresno-García, 2014). This social network was described as the electronic 'word of mouth,' as it was an ideal platform for sharing information, publicizing events or topics of interest, or making various realities visible (Fina and Toscano, 2017). The platform even reached a worldwide audience of millions and was even used by companies, governments, NGOs,

and the media, among many others. Moreover, given the real-time and retrospective nature of its publicly-available content, Twitter offered a unique opportunity to capture information related to human activity online (Del-Fresno-García, 2014). However, the transition to X has led many users, public and even private institutions to abandon or move to other platforms. Beyond the reasons outlined in the introduction, additional factors have emerged. These include a relaxation in content control, resulting in issues such as disinformation, hate speech, the proliferation of drop shipping advertisements and an increase in adult content (Federal Anti-Discrimination Agency, 2023; Vidal, 2023; Vekaria et al., 2023). These aspects jeopardize the aforementioned benefits of Twitter. Yet, these changes did not affect the present study, as it was carried out prior to the cited changes.

The choice of accounts was based primarily on the criteria of relevance and suitability. Thus, accounts with over 10,000 followers and 8,000 published tweets were considered relevant, while those that could inform our research objectives, i.e., national accounts of early-career academics' associations, were considered suitable. Following these criteria, the accounts selected for analysis were @FJIprecarios and @FPUinvestiga.

At the time of writing, @FJIprecarios (12,953 tweets and 10,500 followers) is the official Twitter account of the Federation of Novel Researchers, representing and hosting ten different associations across Spain. This association represents both pre- and postdoctoral researchers (funded and unfunded) and those in the early stages of recruitment (assistant and assistant doctors). On the other hand, @FPUinvestiga (with a total of 8,304 tweets and 12,700 followers) is an association that only focuses on predoctoral staff, that is, those with FPU contracts (contracts from the Ministry of Universities for the training of future university teaching staff). These accounts belong

to non-profit associations (with the same name as the accounts), self-financed by their members through dues and without any type of public funding. The primary aim of these associations is to represent and make visible the problems of the collective, gathering their demands and claims, and joining efforts to improve their professional, labor, and social quality. The management and organization of these associations is the responsibility of their members (all of whom are ECAs). To this end, both associations have a working committee to coordinate their presence in social media platforms. This working group, made up of active members of the association, is responsible for managing and disseminating the tweets analyzed in this article.

Once the accounts were selected, the data (tweets) were downloaded through Twitter API using NodeXL-Pro software, using the "Twitter users Network" function and a query with the account names. We collected all the tweets published from the date on which the accounts were created until May 2022. NodeXL is a social network analysis software for non-programmers that enables simple statistical calculation and metrics to support social network analysis¹.

Information analysis processes

During this phase, the information was analyzed using two processes. First, we created a full description of the volume of tweets published by the various accounts and an analysis of their temporal distribution. The NodeXL software was used for these tasks. Second, qualitative methodology techniques were applied to analyze the content of the tweets. An inductive thematic analysis (Braun and Clarke, 2022) was applied using Nvivo 12. Table 1 shows the resulting *themes*, together with their definition.

¹ For more information about NodeXL please see Hansen et al. (2011)

Themes were generated after several non-linear cycles of careful and precise reading. As a result, codes were generated that evolved and refined (concretizing, expanding, sharpening). Subsequently, commonalities or patterns of meaning were sought that allowed the linking of codes and the configuration of themes and sub-themes. The initial processes of code creation were carried out individually by one of the authors of this study. However, the codes were pooled, and themes were established by all members of the research team after common discussion and reflection so as to maximize the degree of coherence of the process. This mixed creation process worked as a reflexivity tool that contributed to a deeper interpretation and a richer and more clarifying analytical vision (Braun and Clarke, 2022). Finally, once the tweets were coded after a critical reading, Nvivo12 allowed us to perform cluster analyses according to the similarity of the coded words.

Table 1. Themes and subthemes used.

<i>Main Themes</i>	<i>Definition</i>	<i>Subthemes</i>	<i>Definition</i>
<i>Modes of participation</i>	Includes the modes of participation shown by the accounts.	<i>Dissemination</i>	Includes information on the items disseminated from the account.
		<i>Solutions</i>	Collects information on the solutions provided by the accounts.
		<i>Demonstrations</i>	Collects information about demonstrations organized, developed, or promoted by the accounts.
<i>Aspects reported</i>	Collects information on the aspects that are reported in the accounts.	<i>Reaction to policy measures</i>	Collects information about the accounts' reactions to political elements, decisions, or personalities.
		<i>Work Situation</i>	Includes information on the working situation of this group of academics.

<i>System characteristics</i>	This includes information regarding the characteristics of the current university system.
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Source: Author's own.

The entire process of studying and analyzing the tweets was carried out in their original language, i.e., Spanish. Only the tweets chosen to illustrate the discussion were translated by an experienced translator to minimize, as far as possible, the loss of cultural nuances.

Ethical considerations

Keeping the privacy of the sample analyzed was an arduous and impossible task for several reasons 1) the ease of tracing the messages regardless of the concealment strategies employed; 2) the actual selection process of the accounts (number of tweets) and their purpose, both of which easily contribute to their recognition. Moreover, avoiding quotations or omitting the characteristics of the accounts would decontextualize the whole study and could even give the impression of misrepresentation of data. On this point, the fact that the accounts were public associations made the task easier since, as Mason and Singh (2022) mention, and without wishing to fall into the simplistic discourse of "data is public", obtaining consent or guaranteeing confidentiality is not essential when it comes to tweets by public figures or institutions. But it is when dealing with vulnerable groups. In this situation, rather than anonymity, care was taken to ensure respectful treatment of participants to avoid undue harm (physical, social, psychological, economic, etc.) (Woodfield et al., 2017). Furthermore, in order to avoid consequences for other private or individual and possibly vulnerable accounts, any identifying references (hashtags, names, URLs, ...) were removed from the quotes of the selected tweets. This data was only kept when it concerned political and public figures or organizations or the media.

Limitations

This study shows the voice of the selected and analyzed associations of ECAs. Although there are other associations, which would be interesting to analyze in other studies, this research focused only on the two most representative of the sector in terms of their size and relevance in the public sphere. Furthermore, although the accounts are defined and labelled as associations that represent the collective of ECAs, it is important to recognize that there is no way to control whether people who have already lost this status are still involved in the associations. However, what is relevant, i.e., their messages, show that their only concern is with ECAs. On the other hand, this study only analyses the social network Twitter for the reasons given in the previous sections, however, it is important to recognize that these associations may use other platforms to raise their issues. Finally, it is also important to note that the results shown in this study do not give a direct voice to the ECAs, as the associations analyzed may omit in their discourse some of the group's concerns for various reasons.

Results

This section will present the results organized around the research questions posed at the beginning of the study.

A) What are the main characteristics of account activity?

The total number of tweets published and subjected to the analysis process was 6109, of which 52.09% (3182) belonged to the @FJIpccarios account and 47.91% (2927) the @FPUinvestiga account. These percentages indicate a certain balance in the number of publications even though @FPUinvestiga is only two years old. Table 2 displays the number of tweets published per year by each account.

Table 2. Distribution of tweets according to year.

<i>Year</i>	<i>@FJIprecarios</i>	<i>@FPUinvestiga</i>
2018	406	--
2019	1009	--
2020	789	--
2021	669	488
2022(may)	309	2439
Total	3182	2927

Source: Author's own.

The table shows a stable publication rate throughout 2018, 2020, and 2021.

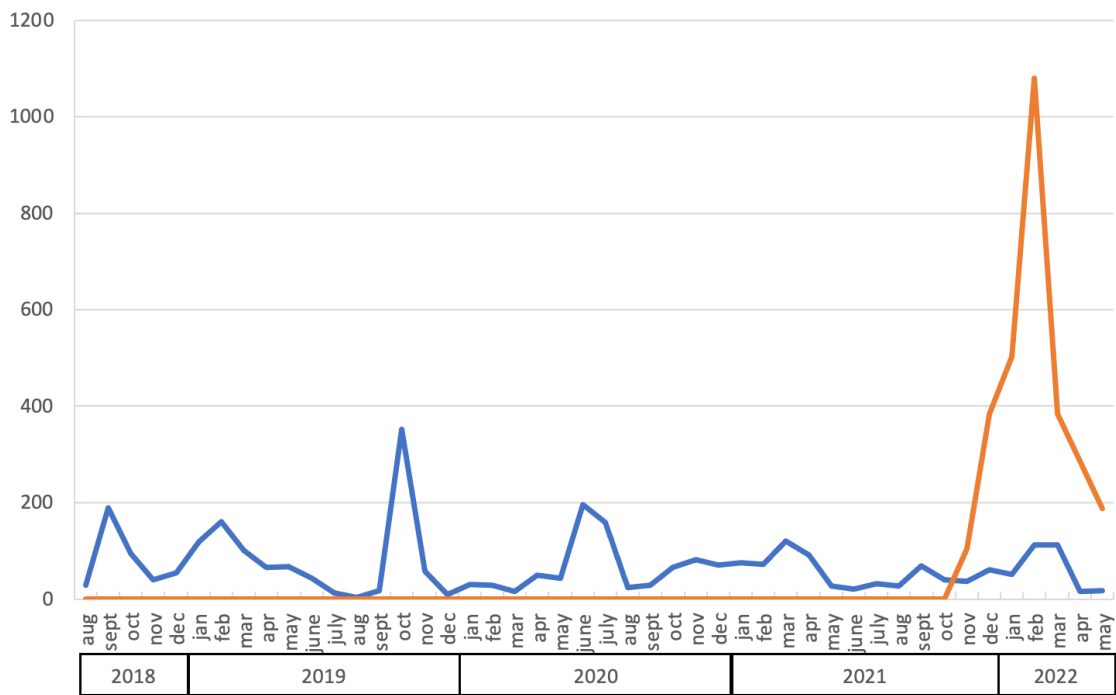
However, 2019 for the @FJIprecarios account and 2022 for the @fpuinvestiga account appear to be exceptions, with a much higher number of publications.

Figure 1 further details the temporal evolution data by focusing on the volume of tweets published each month. In this case, there are several striking observations. First, the volume of tweets published by @FPUinvestiga is greater than that of @FJIprecarios. Second, certain peaks in publication volume coincide with various demonstrations. In this regard, we can highlight four major time points in the two accounts:

- 1) February 2019 (160 tweets): Demonstration in defense of women and science.
- 2) October 2019 (354 tweets): The in-person demonstration called March for Science. In this, demands were made for a pact involving a 2% increase in public investment in science.
- 3) June and July 2020 (199 and 160 tweets, respectively): Month of virtual demonstrations due to the COVID-19 pandemic. The affected dates were 17 and 24 June and 1, 8, 15, 22, and 29 July. Each day was dedicated to different issues, including precariousness, exiles, the government's "shock plan," and women and science.

- 4) February 2022 (1116 tweets): At the beginning of this month, a demonstration was held against the scientific law for the recognition of more decent labor rights, which ended in an uproar due to achieving one of the aims of the previous strike, i.e., the right of workers to severance pays.

Figure 1. Distribution of tweets according to month.



Source: Author's own.

B) Thematic analysis

The main topic of the accounts analyzed is the criticism of this group's employment and professional situation. Within this topic, two themes can be distinguished: modes of participation and main aspects reported.

1. What types of actions or modes of participation are evident on Twitter?

Among the posts published in the various accounts, three main modes of participation can be observed. The first and most frequently observed (see the cross-

reference table – Table 3) is the organization and staging of demonstrations. This theme predominates throughout the threads of the accounts, with the staging of more than 15 strikes.

Table 3. Cross-referencing cases and codes for modes of participation.

<i>Subtheme</i>	<i>@FJIprecarios</i>	<i>@FPUinvestiga</i>	<i>Total</i>
Dissemination	539	462	1001
Solutions	201	169	370
Demonstrations	643	532	1175

Source: Author's own.

Two main types of demonstration can be observed, those held entirely on the Twitter platform and those of a hybrid nature, i.e., face-to-face strikes with virtual support from the social network. An example of the former can be seen in the demonstrations held during June and July 2020, in which the hashtag #SinCienciaNoHayFuturo became a national trending topic. The remaining demonstrations were hybrid, i.e., Twitter was used both as a platform for dissemination and organization and as a loudspeaker for those who could not attend in person:

“On 15 April we took to the streets for our rights. We call on all our comrades #predoctorales to support these actions and, if you can attend, go ahead. #TogetherWeAreStronger” (FPUinvestiga, 2021).

There are also minor differences in the posts published in relation to the same demonstration, depending on the timing. First, messages were posted before the strike to inform the group about the demands of the demonstration, the hashtag to be used, the date and place (if any), and to call for participation:

“On 7 February, we will not forget to call on @CienciaGob en el @Congreso_Es that the #ScienceLaw include, as a minimum, the right to #end-of-contract severance pay also for researchers with CURRENT CONTRACTS at the entry into force of the law. @RaquelYotti” (FPUinvestiga, 2022).

Second, messages were posted during the protest itself. These tweets detail the institutions or persons to which the protest is directed, giving mention to the objectives trying to be achieved and condemning the current situation:

“For strong research investment policies!!! Science does affect you!
#MarchforScience#PactOfState #March19O” (FJIprecarios, 2019)

And finally, messages appeared after the demonstration, which usually summarize the day and thank the participants for their involvement:

“Good morning, compas!! One week ago today, #7F. That day taught us many things and sent a message of #MutualSupport to the research sector that we will never forget. PS: the next will be even better.” (FPUinvestiga, 2022)

In short, these messages are characterized by demands seeking to secure various employee rights such as researcher status, the right to unemployment benefits, or compensation at the end of a contract.

The second major mode of participation is dissemination. Both accounts implemented this action with two clear objectives: to disseminate the situation of the sector and to disseminate ways of improving the situation or providing a solution. Concerning the first objective, the account users share personal experiences to convey a realistic picture of the sector while criticizing the current situation. Thus, for example, one post describes the victory of a doctoral student in his fight against the abuse of power shown by his supervisor:

“Another small victory, one more. Let's report every abuse, comrades, we've put up with too much. #ResearcherDignity#FightPredoc” (FPUinvestiga, 2022)

Among other tweets, we can also see the case in which an early-career academic describes the precariousness of their position:

“We are not middle class. We don't have access to housing, a family, or the security that is essential to be part of this group.” (FJIprecarios, 2019).

Regarding the second objective (disseminating solutions or alternatives), a large body of messages focused on disseminating information on offers or calls for proposals regarding various types of contracts, scholarships, or grants (among other aspects):

“Remember that tomorrow is the application deadline for FPU grants. First of all, we would like to give you some basic advice: BE VERY PATIENT.”
(FJIprecarios, 2020)

“FPU does oblige you to teach: Remember that you must teach a maximum of 180 hours (90 hours minimum) during the whole doctoral period, and you cannot be responsible for any subject, nor can you sign any minutes #StopAbuseFPU”
(FJIprecarios, 2020).

As part of this objective, political or informative events were also disseminated to provide access to information and training for early-career academics:

“Tomorrow, Thursday, we will have the opportunity to attend a great Career Guidance Webinar for Female Researchers.” (FJIprecarios, 2019)

“Minister @DianaMorantR speaks on @La_SER about the #ScienceLaw reform.”
(FPUinvestiga, 2021)

The last major mode of participation is the dissemination of solutions. Particularly noteworthy are solutions related to the employment situation and reaction to policy measures, that is, aspects related to improving job insecurity and securing better employment rights that allow them to develop a decent career and profession:

"Measures that young researchers need in this country: Researcher's own status; Salaries updated. Measures that young researchers have received so far: Salaries updated #WithoutScientistsThereIsNoFuture#WithoutScienceThereIsNoFuture"
(FJIprecarios, 2020)

"Some key ideas we need to improve in science: Attracting and retaining talent; Stabilising science careers; A more equal and inclusive science system; Simplifying bureaucracy; Mental health care" (FPUinvestiga, 2022)

Analysis of the tweets indicates that the accounts are not only used as a means of vindication or criticism but also as platforms for providing support and assistance to the sector through dissemination and the exchange of ideas.

2. What are the main aspects reported?

Regardless of the mode used, there are three main subthemes concerning criticism of the situation of early-academics: employment situation, the characteristics of the system, and reaction to policy measures. The cross-references in Table 4 indicate the most frequently observed subthemes in the discourse of both accounts (in order of frequency).

Table 4. Cross-referencing cases and subthemes.

<i>Subthemes</i>	<i>@FJIprecarios</i>	<i>@FPUinvestiga</i>	<i>Total</i>
Reaction to policy measures	1037	878	1975
Employment situation	834	752	1586
System characteristics	135	126	261

Source: Author's own.

- *Reaction to policy measures*

This theme is the one with the highest frequency in the accounts analyzed. This theme includes all posts related to political issues or decisions that have consequences for the working conditions of early-career academics. Thus, several recurrent issues are seen: (1) the increase in science funding; (2) the new laws on science and universities; and (3) the status of predoctoral research staff in training.

Concerning the increase in funding, the bills focus on requesting an uplift in science funding in line with the European average to resolve major problems in the

sector (e.g., precariousness, instability, new rights). This issue was a shared concern across tweets for the duration of the studied timeframe, particularly during times of public debate. In this regard, it is worth noting the electoral periods during which the account users call upon the various political parties to pledge to increase science funding:

“We are surprised that in the agreement between @PSOE and @PODEMOS the commitment to allocate 2% of GDP to research has disappeared, as both parties included this measure in their electoral programs... What happened @PSOE and @PODEMOS?” (FJIprecarios, 2020).

Likewise, this theme also predominates in the various demonstrations, either as the main theme — as in the case of the demonstration on 19 October 2019 — or as an underlying and secondary theme.

In addition, the new laws on science and universities are predominant within this theme. In general terms, these posts and messages address the main changes and political initiatives created in relation to the new science and university laws promoted by the government in recent years. The messages cover the entire process of debate, drafting, and approval of the laws (this latter aspect only appeared in the case of the Science Law in September 2022). The main concerns regarding the new laws included the creation of a more stable and secure career path within academia, the introduction of new employment rights regarding termination of the contracts of early-career academics, reduction of the bureaucratic burden, improvement of working and contractual conditions for early-career academics (predoctoral and postdoctoral), measures for talent retention, measures to eliminate nepotism, promoting gender equality, and, once again, increasing funding for the sciences.

The second most recurrent theme — closely related to the previous theme — concerns the fight to create a Statute for Predoctoral Research Staff in Training to

improve the working conditions of this sector. This struggle is very evident in the discourses of both accounts, where users call for the right to compensation at the end of a contract, salaries aligned with the cost of living, and pay-scale increments based on seniority.

Within this political theme, the messages are either critical:

"Maybe it's a good time to listen to the researchers who depend on @UniversidadGob, don't you think @subirats9? If you don't fix it, you're going to end up killing the #FPU programme, among others" (FPUInvestiga, 2022)

Or propose possible solutions for improvement:

"-Reserving 15% of secure positions for staff is the current figure, which is clearly insufficient. At least 30% would be necessary to attract more talent and offer stability.

-The recognition of foreign qualifications must be speeded up if we want to attract talent from abroad. Current delays of up to 2 years are hampering our competitiveness." (FJlprecaios, 2021)

Moreover, the consistent activity of the accounts has led to the users' voices being heard on this issue, with the associations holding several meetings with the ministers of science and universities, as well as the Congress of Deputies:

"Today, from the FEDERATION OF YOUNG RESEARCHERS, where we fight for the interests of pre and postdoctoral researchers, we have met with @UniversidadGob to talk about the LOSU on which they have been working for months." (FJlprecarios, 2022)

"Next Monday 14, we will be at the Congress of Deputies to give our views on the #ScienceLaw and the long-awaited State Pact for Science.
#WithoutScienceThereIsNoFuture#ResearchDignity" (FPUinvestiga, 2022)

- *Employment situation*

This theme contains all messages concerning the employment situation of young researchers. This is the second most frequently-occurring theme in the accounts analyzed and is characterized by messages describing a highly precarious situation resulting from low salaries, lack of workers' rights, exploitation, and gender inequalities.

Low wages and lack of workers' rights are the most recurrent topics. In this regard, the tweets detail the precariousness of the situation:

“Paying for your own overseas stays, writing your thesis while unemployed, working 8-hour days while receiving 4 hours pay, alternating temporary contracts with periods of unemployment...”. (FJIprecarios, 2021).

Some posts also suggest solutions such as wage increases, adjustment of wages to the cost of living, the introduction of employee rights such as the right to unemployment benefits, pay-scale increments according to seniority, or compensation for the termination of contracts:

“FPUinvestiga's #Predoc salary modification proposal. The new wording of art. 21 (i.e., predoctoral contract): d) The remuneration of this contract may not be less than the salary set for equivalent categories in the collective agreements of its scope of application. (FPUinvestiga, 2022)

“We call on all political forces to pass the amendment that would recognize the #end-of-contract compensation for predoctoral staff. Do not fail.” (FPUinvestiga, 2020)

In addition, another significant group of tweets voiced their concerns about labor exploitation. In particular, the accounts describe how they are burdened with tasks and functions that are not compulsory, required to work more than their contracted hours, or subjected to harassment at work:

“Let's say NO to #bullying, let's stop the wheel. #I'llgo7F” (FPUinvestiga, 2022)

“Dear predoctoral researchers, now that it is time for teaching assignments, we would like to remind you that by law you can only contribute up to 60 hours per academic year. Don't let them take advantage of you!” (FJIprecarios, 2020)

The accounts describe how this employment situation leads to consequences such as difficulties in reconciling work and family life, mental illness (stress, anxiety, or depression), or the "flight of scientists," either abroad — as a means of seeking better working conditions in the sector — or in search of other employment options outside academia.

Finally, some posts refer to the role of gender inequality in increasing job insecurity. In particular, the accounts warn of the enormous risk attached to being female in today's world of academia. For this reason, a wide variety of initiatives are mentioned, such as making real experiences of inequality visible, giving recognition to women in science, or dissemination of news on this issue:

“You asked for a new #WomenOfScience calendar to thank you for your donations, and here it is!!!!” (FJlprecarios, 2018)

- *System characteristics*

The third theme is concerned with criticizing the characteristics of the university system. However, this theme is neither as recurrent nor as prevalent as the others. Nevertheless, three key issues are addressed: the pressure generated by the performance evaluations implemented throughout their academic career, concerns about the nepotism that exists in the university system, and complaints about the high level of bureaucratization of the system.

Regarding the first of these, the account users express their concerns about the current system used to evaluate the professional performance of university academics, where the emphasis is firmly placed on the number of scientific publications. This prioritization of published output generates an enormous workload, which often leads to mental health problems. Such demands also boost the levels of competitiveness in the sector:

“COMPETITIVENESS is the best strategy instilled by the #Science system so that we don't empathise with our colleagues. So, while we fight (or become obsessed) to get crumbs for the CV, they rejoice to see how productive we are in exchange for #precariousness.” (FPUinvestiga, 2020).

Like the other thematic areas, the posts in this subtheme reveal a tendency toward seeking change, albeit without reference to specific initiatives:

“It is difficult to change the established culture of productivity and competitiveness, but at least we have to try. The virtual demonstrations are a prelude to what is to come, and the hashtags help us to create that unity that will push us to rebel.” (FPUinvestiga, 2020).

However, nepotism within the current university system is the most common concern that is seen among the messages in this subtheme:

“Abuse of power. Nepotism is a problem that plagues our country's universities, and it should concern us. More than 60% of academics work at the university where they completed their thesis.” (FJlprecarias, 2022).

Despite the objectivity of evaluations based on the research activity of central institutions, initial recruitment depends on evaluations organized by the universities themselves:

“The specific standards of universities, departments, etc.... At some point we will have to make visible this problem that affects so many colleagues beyond their research stage. It is such a deep-rooted problem in academia that it is urgent to start NOW” (FPUinvestiga, 2020).

This added complication makes it difficult to progress and stay in the system:

“Only disappointment and anger. The # predoctoral collective has worked hard to increase the competitiveness of research in this country, and this is how they pay us back.” (FPUinvestiga, 2020).

In this regard, the accounts describe numerous experiences highlighting poor recruitment practices that prioritize merits other than those of an academic or professional nature:

“Today, we update the open letter we published on our website after the new case of nepotism in Murcia University: Nepotism and corruption in Spanish universities: are we still looking the other way” (FIIprecarios, 2022).

Finally, the accounts express their concerns about other issues, such as the high bureaucratization of the system, which generates an increase in their workload:

“Most of the day-to-day problems are administrative hurdles. We lose competitiveness” (retweeted by FIIprecarios, 2022).

In this vein, solutions are proposed, such as the development of a fixed calendar of calls for applications, the simplification of bureaucratic procedures, or the unification of the type of curriculum requested by public bodies:

“Investment is important, BUT it is not all about money. The work of scientists in this country would be lighter if, among other things, the following two things were done: meeting deadlines for calls for personnel and projects and reducing bureaucracy.” (FIIprecarios, 2021).

Discussion and conclusions

This study used thematic analysis to examine the contents of Twitter posts in relation to the reactions of ECA associations to the current higher education landscape. In general terms, our analyses have revealed attitudes of resistance among the Twitter accounts of two ECA associations. This resistance is shown by the sharing of information, the proposal of solutions, and the organization and staging of demonstrations. These results partially agree with previous studies showing the three forms of resistance among academics: criticism, frontal struggle/attack, or abandonment

(Feldman and Sandoval, 2018; Manzano-Arrondo, 2017). Contrary to findings in previous studies which identified abandonment as the most common form of resistance among individual ECAs (Kalfa et al., 2018), our study did not detect this phenomenon. Although one of the aims of the associations was to make visible the realities and problems of the collective. Our findings show how ECAs associations not only use Twitter as a means of vindication and criticism but also as a platform for supporting and helping the sector through processes of dissemination and exchange of ideas and as a means of proposing solutions and new initiatives.

Concerning the latter, we have observed how the activity of these accounts and the proposals shared within them have an impact on political decisions, contrary to the suggestion of Manzano-Arrondo (2017). According to this author, the options and alternatives suggested by academics often fail to materialize. This is due to the remarkably high degree of implantation and rootedness of the current system, which makes it difficult to bring about any change. However, this study shows how some of the issues raised by the ECA associations have materialized in the form of meetings with ministers and parliament and the introduction of end-of-contract compensation. Therefore, our findings suggest that Twitter can serve as a useful means of empowering this sector, even influencing political decisions.

Moreover, content analysis has revealed three main themes (with varying frequency) in the discourses. In particular, we observed how reactions to political measures was the most frequently observed theme in the tweets. These posts coincided with the numerous events and legislative changes in Spain in recent years (the debate on the increase in science funding, the new laws on science and universities, and changes to the status of predoctoral research staff in training). Surges in tweet posting tend to coincide with demonstrations organized in response to political acts or measures.

The second most frequently occurring theme was employment conditions. This is unsurprising, given that ECAs represent one of the groups with the poorest working conditions in academia (Spina et al., 2022). Their concerns range from low salaries to the lack of fundamental rights such as unemployment benefits, seniority bonuses, and severance pay.

Finally, the third (and the least frequent) theme concerns evaluation systems and scientific production. This theme is noteworthy since the international literature highlights these issues as having the greatest consequences for academics (work, health, and family) and the future of universities (Mantai, 2019; McCune, 2020). However, although scarce, criticism of these issues indicates that, contrary to what previous studies about ECA as individuals have shown (Saura and Bolívar, 2019), ECA associations are not unconsciously subordinated to the system.

While ECA associations are critical and knowledgeable about the demands of the university system, they are also aware of the importance of scientific production for their current and future academic career, which leads them to voluntarily prioritize and emphasize this work over other duties (Acker and Webber, 2017; Abrizah et al., 2019). Thus, the precarious situation surrounding ECAs makes this group the most vulnerable to the production demands of the new university system.

As a result, ECA associations accept these productivity demands as a means of survival, relegating criticism of the system to second place and directing their attention toward criticizing their working conditions. As an ancient proverb says: "If you keep them busy with basic needs, they will forget about the freedom they lost". However, we must ask ourselves, will the race for stability and the strategies that come with it make them so introspective that they forget to voice their criticisms and eventually fall into the trap of becoming unconsciously subordinated to the system? In this sense, research shows that

senior academics, due to factors such as their stable position, are not forced to meet the production demands of the academic system in order to survive in academia (Mula-Falcón et al., 2021). However, a question arises: do they fight from their "nothing to lose" position against these demands to improve the future of the university, science, and their younger colleagues? Given these concerns, it would be interesting to analyze in futures studies whether criticism/resistance toward the conditions of the system declines or grows further with advancing age. Especially when real and deep changes need the support of tenure colleagues (Spina et al., 2020).

This study also underlines the value of associations in the fight against social and political problems. In this respect, Twitter serves as a platform for uniting different people with a common cause, creating a "fish shoal" whose members would be powerless individually but, when brought together, have strength and a voice. Aspects in line with Tight (2019) and Spina et al. (2020), who highlighted the effectiveness of collectivism in resistance, change and support. Finally, we should note the importance of encouraging further research on social media platforms, given that modern-day social interactions are now predominantly generated in these environments. Moreover, these spaces, for various reasons (e.g., anonymity, sense of freedom, comfort), have become the "loudspeaker" for many groups, especially those that have often been silenced (e.g., through power or fear). Therefore, platforms such as the old Twitter provide a source of rich qualitative data that helps to explore alternative viewpoints of a given social reality.

However, the changes that have emerged in "X", and discussed throughout the text, seem to be altering the characteristics that originally turned Twitter into a space for social empowerment and democratization (Federal Anti-Discrimination Agency, 2023; Vidal, 2023; Vekaria et al., 2023). Furthermore, other policies, such as the end of the free use of APIs, also threaten the suitability of this platform to study and explore social

aspects due to the impossibility of accessing information (Déchéne et al., 2024). In light of these developments, there is a need for studies to evaluate the impact of such changes on the content and activity of users. This would enable to identify the actual effects generated by the modifications implemented since the "X" rebranding.

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