

Migrants and refugees on Twitter in Spain: a study employing automated analysis into the presence of hate and sentiment

Migrantes y refugiados en Twitter en España: estudio de la presencia de odio y del sentimiento a partir de un análisis automatizado



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Abstract:

Hate speech directed towards migrants and refugees poses one of the greatest challenges in communication on social networks. By means of an automated analysis of 124,337 messages about migration collected on Twitter in Spain between 2015 and 2020, the presence of hate and the underlying sentiment in the discourse are analysed, as is their development and the possible differences between Spanish regions. It has been observed that, although greater attention was paid to migration in 2015 and 2016, the core years of the Mediterranean refugee crisis, the greatest volume of hate was detected in 2019 and 2020, following the rise of Vox and its anti-immigration rhetoric. In general, the sentiment in these messages was negative, although the difference is slight between those expressing hate and those which do not. Finally, differences have been observed between Spanish regions, with Asturias having the greatest presence of hate and Cantabria showing the most negative sentiment; such differences, however, are not great and no clear patterns have been detected to explain them.

Keywords:

Immigration; racism & xenophobia; hate speech; social networks; sentiment analysis; Twitter.

1. Introduction

Since the late XXth century Spain has been considered to be a country that receives foreigners (Lacomba et al., 2020), a phenomenon that has generated press interest and presence since the 1990s and 2000s (Seoane-Pérez, 2017). Migratory pressure on the European Union has increased more recently, becoming a central aspect of political and media discourse (Greussing & Boomgarden, 2017).

Although the causes had come earlier, it was in 2015 that migratory flows towards the European Union reached a volume and attention rarely seen (Splinder, 2015), especially after the discovery of the lifeless body of the young boy Aylan Kurdi in September on a Turkish beach, an event with considerable media impact (Mielczarek, 2018), which represented a turning point in coverage of the crisis (Zhang & Hellmueller, 2017). Throughout 2016, migratory flows towards the European Union

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Resumen:

El discurso de odio dirigido hacia personas migrantes y refugiadas plantea uno de los mayores desafíos en la comunicación en redes sociales. A través del análisis automatizado de 124.337 mensajes sobre migración recogidos en Twitter en España entre 2015 y 2020, se analiza la presencia de odio y el sentimiento subyacente en el discurso, así como su evolución y las posibles diferencias entre comunidades autónomas. Se ha observado que, aunque la atención prestada a la cuestión migratoria fue superior en 2015 y 2016, años centrales de la crisis de refugiados del Mediterráneo, el mayor volumen de odio se detectó en 2019 y 2020, tras el ascenso de Vox y su retórica anti-inmigración. En general, el sentimiento de estos mensajes fue negativo, si bien la diferencia entre aquellos que tienen odio y los que no es reducida. Por último, se han observado diferencias entre regiones autónomas, siendo Asturias la de mayor presencia de odio y Cantabria la que muestra un sentimiento más negativo; estas diferencias, no obstante, no son elevadas y no se han detectado patrones claros que las expliquen.

Palabras clave:

Inmigración; racismo y xenofobia; discurso de odio; redes sociales; análisis de sentimientos; Twitter.

began to shift to the central Mediterranean following an agreement between the EU and Turkey, which reduced the number of arrivals through Greece, until that point the country with the highest number of immigrants and asylum seekers. Both the election of Donald Trump in the United States and the victory of Brexit in the United Kingdom, two events with strong nationalist and anti-immigration components (Joppke, 2020), caused immigration as an issue to remain in the media's eye.

The Strait of Gibraltar began to reappear as a route in 2017, and 2018 saw Spain become the European country with the most refugees and migrants arriving by sea, mainly along the coasts of Andalusia, via the eastern Mediterranean route, in part after the tighter measures imposed by the Italian government and, in particular, by the Minister of the Interior, Matteo Salvini. In June, the Spanish government decided to accept 630 migrants on board the *Aquarius* in the port of Valencia after the refusal of their Italian counterparts (CEAR, 2019). There was a decrease in the number of arrivals to Spain in 2020 as a result of the health crisis and, in general, in the international movement of people, though this increased again intensely in the latter months of the year, especially to the Canary Islands (CEAR, 2021).

These events, apart from influencing the social and political situation, had certain protagonism in the media. In fact, there is widespread agreement in academia about the media's treatment of migration, which tends to be negative, simplistic, stereotyped and with a lack of focus on individual stories (Igartua et al., 2007; Muñoz, Igartua & Otero, 2006; Fajardo Fernández & Soriano Miras, 2016; Eberl et al., 2018), something which is also applicable to coverage of the refugee crisis from 2015 on (Greussing & Boomgaarden, 2017; Brändle, Eisele & Trenz 2019; Fengler et al., 2020). This type of representations reinforces the association of immigration and foreigners with out-groups, according to Tajfel and social identity theory (1978), in turn generating less acceptance of immigrants (Esses et al., 2005).

It is true that attitudes towards immigration in Spain tend to be among the most favourable in the European Union, as confirmed by several Eurobarometers (European Commission, 2019; 2022) and international surveys (Pew Research Center, 2021). However, the presence of hate speech and rejection of migrants and refugees on social networks is a matter of growing concern (Arcila Calderón, Blanco-Herrero & Valdez Apolo, 2020), partly as a result of the increase in numbers of hate crimes against the group (OSCE, sf).

That is why this study seeks to analyse public discussion in Spain on the social network Twitter between 2015 and 2020, paying particular attention to the presence of hate and the underlying sentiments in said discourse. The study aims to continue contributing to the still small amount of research that use computational techniques to address the issue, offering an analysis of a large corpus of data. Furthermore, the study aims to fill the existing gap regarding longitudinal approaches that allow observation of the phenomenon's development over time. Such studies, in addition to the scientific knowledge they provide, are key to proposing possible strategic actions a posteriori to combat hate and rejection, both online and in other settings.

2. Hate speech towards migrants and refugees

As noted in the previous section, the presence of expressions of hate, discrimination and rejection has become a phenomenon of some concern, fuelled by anti-immigration discourse (Arcila-Calderón, de la Vega & Blanco-Herrero, 2020), due to generally negative coverage in the media (Schemer, 2012) and by the communication model itself on social networks, an environment in which these types of expressions have increased exponentially in comparison with physical space (Rollnert Liern, 2020).

Focusing on hate speech, this can be defined as apology, promotion or incitement in any form, denigration, hatred or vilification on the part of a person or group of people, as well as harassment, insult, negative stereotyping, stigmatisation or threat regarding one or more people (European Commission against Racism & Intolerance, 2005). Thus, hate speech attacks the dignity of the defamed communities, which are deprived of their right to be considered fit for society (Díaz Soto, 2015). Added to this is the fact that hate speech may act as a precursor to violent hate crimes (Müller & Schwarz, 2020), exacerbating the problem.

That is why numerous public and private institutions are striving to stop or combat hate speech, especially on social networks (Andres & Slivko, 2021). In the particular case of *Twitter*, its rules establish that “you may not encourage violence against other people or attack or threaten them directly (Twitter, 2022).”

Hate speech with racist or xenophobic motivation is of particular concern, in addition to its significant presence on digital platforms, it is the commonest type of hate crime registered both in Spain and in the majority of neighbouring countries (OSCE, n.d.). It is precisely discourse of this type, which is largely directed at migrants and refugees¹, that will be examined in this study.

Content published on Twitter will be used for this analysis, given that, although it is not the most widely used network in Spain, it is, due to its characteristics, one of the most influential in public discourse, as it is the most relevant and widely used by journalists and media, as well as by politicians and institutions (Rodríguez & Ureña, 2011; Campos-Domínguez, 2017). Furthermore, Twitter, like other social networks, offers a valuable source of information for the analysis of public opinion and citizens’ attitudes, even overcoming some of the limitations posed by survey-based studies (Arcila Calderón, Blanco-Herrero & Valdez Apolo, 2020). Moreover, this network, with its easy virilisation of content, its popularity, simplicity of discourse and speed of communication displays elements that summarise the attributes of Web 2.0 (Ausserhofer & Maireder, 2013), along with the capacity for dissemination offered by retweets, which together make this the ideal platform for disseminating information and opinion (Moragas-Fernández, Grau-Masot & Capdevila-Gómez, 2019).

This also contributes to the tendency on Twitter to create homogeneous communities that become echo chambers (Gruzd & Roy, 2014), where individuals are only exposed to information that confirms their ideas, contributing to radicalisation (Yardi & Boyd, 2010). And partly derived from that, the network is considered one of the most problematic for the dissemination of rejection discourse, both by

“the public repercussion of what is disseminated on this social network, and which increases the social alarm of the discourse expressed in it, as well as the greater methodological simplicity that observation on this social network entails compared to others

1 Although no distinctions will be made in this text, it should be pointed out that there are differences between the terms ‘migrants’ and ‘refugees’. Since the 1951 Geneva Convention relating to the Status of Refugees, a refugee is considered to be a “person who, due to well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinions, is outside the country of their nationality and is unable or, because of such fears, unwilling to avail themselves of the protection of that country; or who, lacking nationality and finding themselves, as a result of such events, outside the country of their former habitual residence, cannot or, due to such fears, is unwilling to return to it” (International Organization for Migration, 2019). The IOM includes in the same glossary the word ‘migrant’ as “an umbrella term not defined under international law reflecting the common lay understanding of a person who moves away from his or her place of usual residence, whether within a country or across an international border, temporarily or permanently, and for a variety of reasons” (International Organization for Migration, 2019).

(Facebook, social forums) in which “censorship” of violent discourse is swifter and in which it is more difficult to access a large and homogeneous sample of discourse [...]. Short messages are published on Twitter that, although they may contain complex information, are unlikely to contain the nuances of communication found in other places where this limitation does not exist. Since the objective of this study is to define a basic taxonomy of violent discourse, I consider it appropriate to focus analysis on this type of more basic messages” (Miró Llinares, 2016, p. 86).

For these reasons, the study of discourse on this platform focused on migrants and refugees is of special relevance, as shown by previous studies (Kreis, 2017). Before addressing hate speech, it is worth evaluating the attention generated by migratory phenomena. It has been considered that interest in the Mediterranean refugee crisis in Spain came somewhat late (Seoane-Pérez, 2017), and that the rise of Vox, with its anti-immigration discourse, led to an increase in interest in this matter in political discourse (Castromil, Rodríguez-Díaz & Garrigós, 2020). At the same time, the prominence of immigration in the media has been considered a factor which may increase the appeal of anti-immigration parties (Damstra et al., 2019; Dennison & Geddes, 2019; Krzyżanowski, Triandafyllidou & Wodak, 2018). Therefore, and by way of contextualisation, we pose the following research question:

RQ1: How did the presence of content about migrants and refugees on Twitter in Spain change between 2015 and 2020?

In line with the above, it is known that rejection and hatred are not immutable categories but are marked by social and media events. In fact, news events have been observed to affect both the quantity and characteristics of hate speech directed at migrants and refugees (Arcila-Calderón et al., 2021). At the same time, one must take into account the fact that citizens’ attitudes are not unchanging, but fluctuate over time, as reflected in periodic surveys such as Eurobarometer. And the same is true of media coverage of an issue, in this case migration (Amores, Arcila-Calderón & Blanco-Herrero, 2020; Zhang & Hellmueller, 2017).

For this reason, it is necessary to consider what effects offline events may have had on the volume of hate speech expressed on Twitter towards migrants and refugees, which is why the following research question is posed:

RQ2: How did the presence of hate speech towards migrants and refugees on Twitter in Spain change between 2015 and 2020?

The existence of differences between countries is evident, but also within a country itself, as reflected in the study by Arcila-Calderón et al. (2022) on which this study is based. In order to examine more closely any possible differences between the different regions of Spain, both regarding the presence of this issue and the proportion of hate speech, the following research questions are posed:

RQ3.1: In which Spanish regions was there a greater presence of content about migrants and refugees on Twitter between 2015 and 2020?

RQ3.2: In which Spanish regions was there a greater presence of hate speech towards migrants and refugees on Twitter between 2015 and 2020?

Finally, numerous studies have used sentiment analysis to address the representation of migrants and refugees, both in the mass media (Backfried & Shalunts, 2016) and on social networks (Heidenreich et al., 2020). The study of feelings associated with the discourse around migrants and refugees –the connection of which to hate speech has already been identified by Arcila-Calderón et al. (2021)– allows a greater understanding of the attitudes and forms of expression that surround this

matter. Such analysis of feelings in language is important due to the role that negativity or the presence of incivility has in radicalising and polarising discourses (Robles et al., 2022). Hameleers, van der Meer and Vliegenthart (2022) have analysed the convergence between negativity, incivility, hate speech and misinformation, adding layers to the problem. De León and Trilling (2021) have found that political content with negative tones is more frequently shared and achieves greater reach. And Yordakul (2021) even points out that negative emotions have a greater effect on political decision-making. That is why the following research question is posed:

RQ4.1: Was there a correlation between the presence of hate and sentiment expressed in content about migrants and refugees on Twitter in Spain between 2015 and 2020?

RQ4.2: How did the sentiment expressed in content about migrants and refugees on Twitter in Spain change between 2015 and 2020?

RQ4.3: Were there differences between the Spanish regions in relation to the sentiment expressed in content about migrants and refugees on Twitter between 2015 and 2020?

3. Methodology

In order to achieve these objectives, the database of tweets used in the work of Arcila-Calderón et al. has been utilised. (2022). Tweets focused on the phenomena of migration and asylum were compiled between 2015 and 2020 using the Academic Research product track that Twitter's Application Programming Interface (API) makes available to academic researchers. In order to locate the contents, the keywords 'migrant', 'migrants', 'immigrant', 'immigrants', 'refugee', 'refugees', 'asylum seeker' and 'asylum seekers' were employed. The next step was to exclude retweets and responses and only select geolocated content, this was so that local analyses could be carried out with greater reliability; in fact, the use of this type of messages is one of the main strengths of the study, since, although it significantly reduces the amount of content available, it allows us to guarantee the quality of the analysis, knowing its location with certainty and being able to make regional comparisons. Finally, the downloaded contents were analysed utilising a previously validated automatic hate detection tool (Vrysis et al., 2021) and again reset for the work of Arcila-Calderón et al. (2022).

Only Spanish data has been utilised for this study, a total of 124,337 tweets, which were passed through the detector to determine the presence of hate. The presence or absence of hate was measured using a scale between 0 and 1, with 0 representing absence and 1 the presence of hate.

Similarly, in order to respond to RQ4, sentiment in the messages analysed was evaluated between -1, negative, and 1, positive. An automatic classification tool based on the SentiStrength algorithm, developed by Thelwall et al. (2010), was also used for the same purpose. Although a study of sentiment was also carried out utilising a tool developed from a lexicon composed ad hoc, the tool based on SentiStrength was chosen due to its generalised validity and for allowing easier replicability and comparison. The option of employing other scales of sentiment that could lead to greater variety and detail in the analysis was also evaluated –for example, through the basic emotions developed by Fernández-Abascal, Palmero and Bрева (2002) and Chóliz and Gómez (2002)–, however, a binary classification between positivity and negativity was finally chosen, since it is

precisely negativity, and not a specific type of feeling, that has been associated with phenomena such as polarisation (Buder et al., 2021) or with a greater affective reaction (Soroka & McAdams, 2015). It is precisely these connections that our work seeks to evaluate, since they are what may lead to an accentuation or radicalisation of hate speech. This type of study also promotes the use of the SentiStrength tool, which is widely used internationally and has a greater capacity for replication.

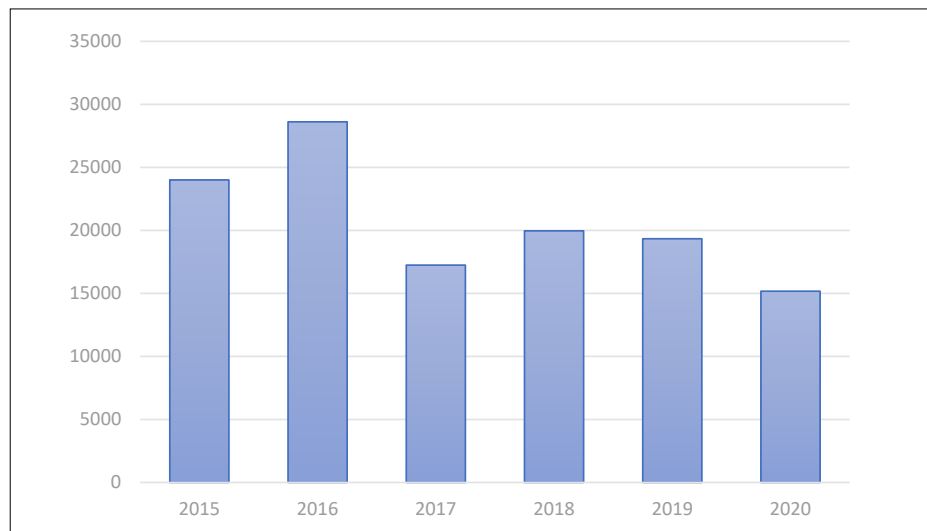
Once the presence of hate and the underlying sentiment in the 124,337 items in the study had been considered, metadata such as the date of publication or the place of publication (NUTS2, which corresponds to the regions of Spain) was also identified, which allowed us to examine the temporal and spatial distribution of both hate and sentiment in greater depth. With this, various statistical tests were carried out to answer the research questions posed, mainly descriptive and frequency analyses and median comparison tests.

4. Results

4.1. Presence of content relative to migrants and refugees

As indicated above, the 124,337 geolocated messages were obtained over a period of six years, between 2015 and 2020. The total number of messages collected each year was: in 2015, 24,001; in 2016, 28,614; in 2017, 17,246; in 2018, 19,963; in 2019, 19,337; and in 2020, 15,176. Figure 1 shows graphically that there are differences, and that the number of messages in 2016 is close to double that of 2020, which may indicate greater interest in the issue.

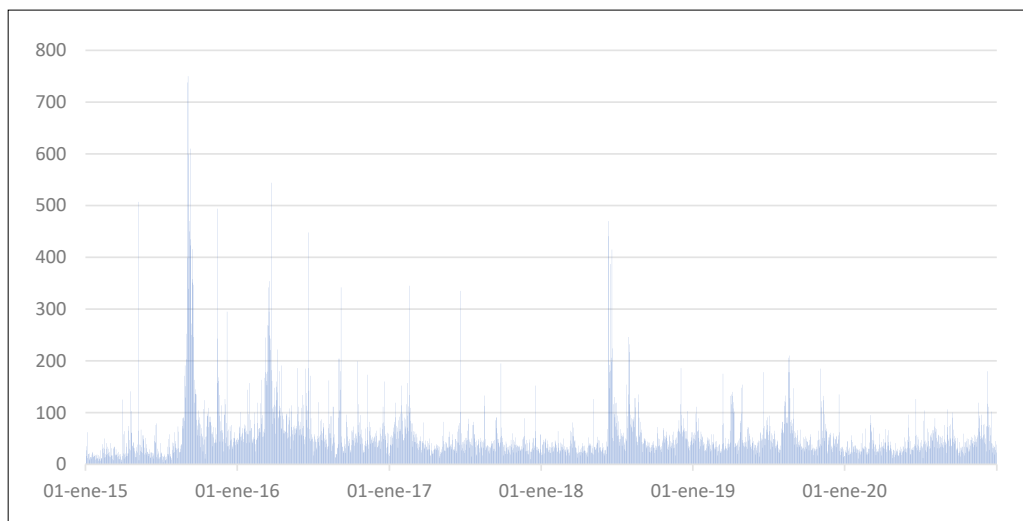
Figure 1. Annual number of messages about migrants and refugees on Twitter in Spain between 2015 and 2020



Source: created by the authors

Figure 2 allows us to observe the number of messages about migrants and refugees collected each day, between January 1, 2015, and December 31, 2020. A series of peaks can be seen, the largest of them in September 2015, at which point in time the arrivals of asylum seekers to the European Union became a focus of media interest, largely after the publication of the photo of Aylan Kurdi, dead by drowning on a Turkish beach. The number of messages remained high in 2016, with a significant peak in March of that year, coinciding with the signing of an agreement between the European Union and Turkey to prevent massive arrivals in Greece. Another major peak was reached in June 2018 as a result of what happened with the Aquarius, a ship which ended up disembarking in Spain. Generally low values are observed in 2020, principally due to the pandemic, which in addition to stopping almost all international movement for many months, notably focused attention on health issues, to the detriment of all other matters.

Figure 2. Daily number of messages about migrants and refugees on Twitter in Spain between 2015 and 2020



Source: created by the authors

4.2. Presence of hate speech against migrants and refugees

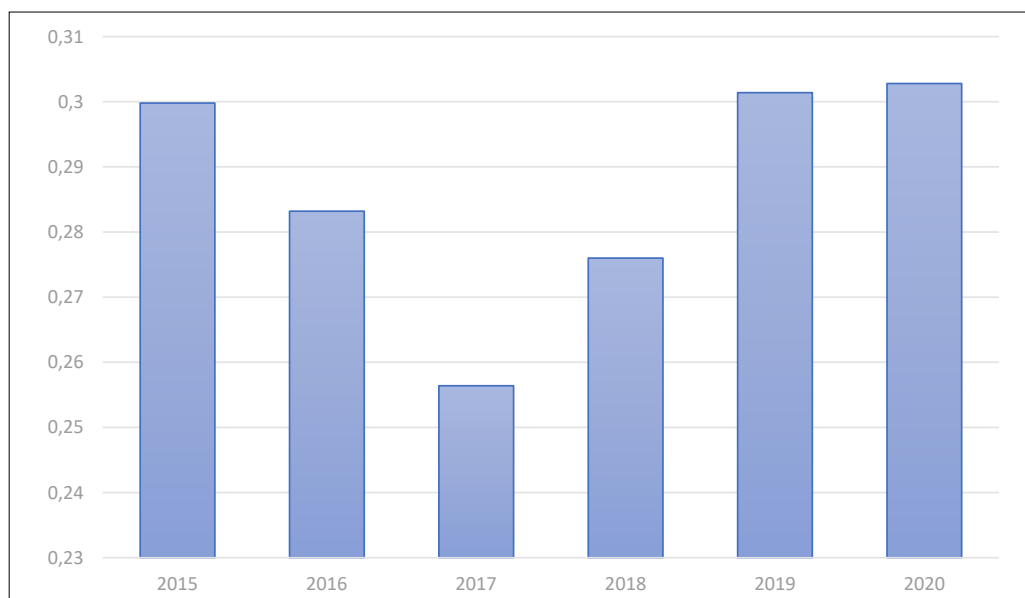
Turning now to the presence of hate, it is important to begin by pointing out that of the 124,337 tweets collected on the issue, a total of 27,468 tweets included samples of hate and rejection greater than 0.5, which could already be considered a form of consistent hate speech. This represents 22.1%, that is, over a fifth of the conversation around migration issues on Twitter in Spain. At the same time, the average value for hate speech present in the whole sample is 0.287 (SD=0.264).

It can be seen that this proportion is not stable, and varies over time, as shown in Figure 3. In fact, carrying out the one-way Anova test for independent samples verifies that the differences are statistically significant; Thus, Welch's F statistic is

significant [$F(5, 54378.503)=90.863, p<0.001$], while the post-hoc tests carried out (Dunnett's T3) indicate that the average hate rate in 2017 ($M = 0.256; SD=0.251$) was significantly lower than the other years considered, while 2020 ($M=0.303; SD=0.76$), 2019 ($M=0.301; SD=0.277$) and 2015 ($M=0.300; SD=0.262$) had a significantly higher average hate rate than the other years, with 2018 ($M=0.276; SD=0.262$) and 2016 ($M=0.283; SD=0.255$) offering intermediate values.

It can be seen that the presence of hate is greater in the early and, above all, later years, with less weight in the central years of the sample. The initial values can be explained by the prominence that migration had as an issue in 2015 and 2016, when the media reported large volumes of people, often portrayed as masses (Amores, Arcila-Calderón & Blanco-Herrero, 2020), arriving in the European Union. Recent years, although general interest has declined, and contrary to what might be expected, the values have seen an increase, which in 2019 and 2020 coincided with the rise of Vox, a party with a nationalist and anti-immigration discourse, causing this type of discourse, which until then had been of little importance, to gain weight in Spain (Ferreira, 2019; Turnbull-Dugarte, 2019).

Figure 3. Annual changes in the presence of hate speech towards migrants and refugees on Twitter in Spain between 2015 and 2020

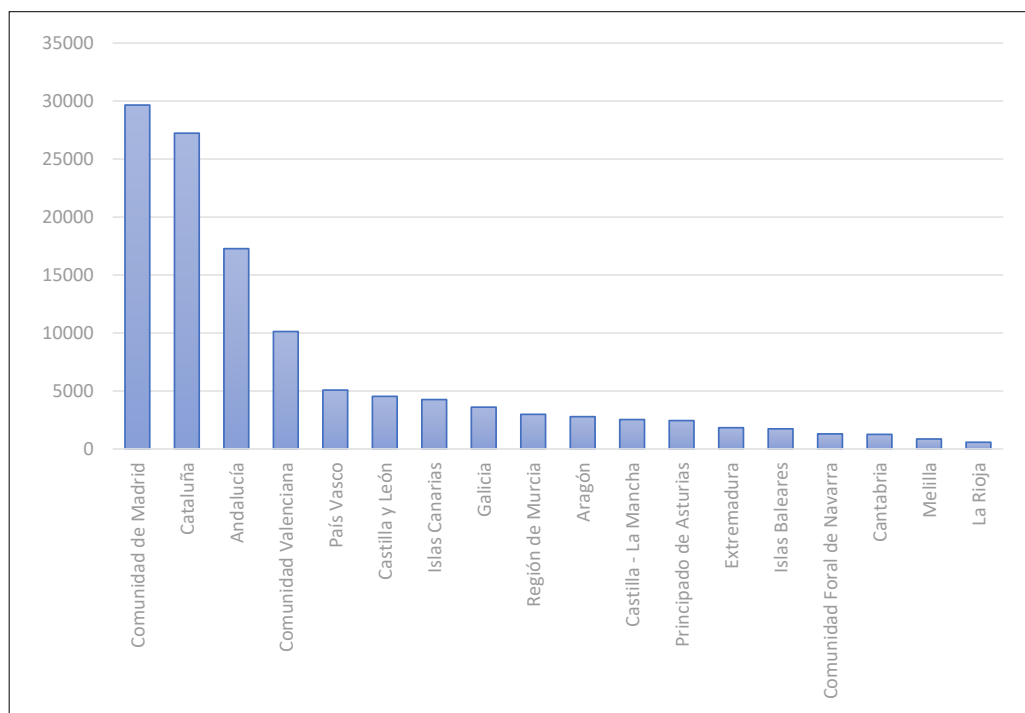


Source: created by the authors

4.3. Regional differences

Firstly, it should be noted that the greatest attention to the issue comes in the most populous regions, thus Madrid, Catalonia and Andalusia accumulate a greater volume of messages about migrants and refugees. Figure 4 summarises the amount of content on the question compiled in each region. However, the distribution does not correspond to the proportion of hatred detected, where the regions with the most hatred detected are Asturias and Castilla-La Mancha. Contrasting of averages shows that there are significant differences between the Spanish regions [$F(17, 13157.451)=27.802, p<0.001$], and post hoc tests confirm these differences. Thus, the average value for hate detected in Asturias ($M=0.323, SD=0.285$) and in Castilla-La Mancha ($M=0.318, SD=0.280$) is significantly higher than that detected in the Valencian Community ($M=0.295, SD=0.268$), Canary Islands ($M=0.292, SD=0.264$), Madrid ($M=0.282, SD=0.263$), Melilla ($M=0.276, SD=0.235$), Extremadura ($M=0.272, SD=0.258$), Catalonia ($M=0.267, SD=0.255$), the Basque Country ($M=0.261, SD=0.248$), and Navarra ($M=0.257, SD=0.250$). In the case of the Balearic Islands ($M=0.311, SD=0.278$) the differences were significant with respect to the Community of Madrid, Extremadura, Catalonia, the Basque Country and Navarra.

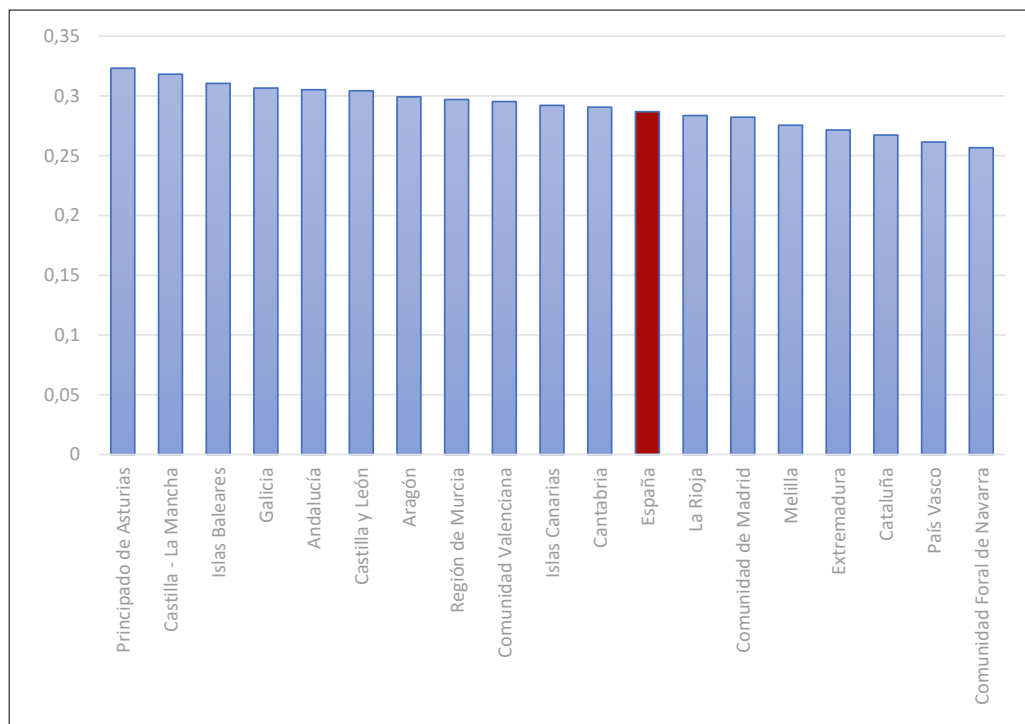
Figure 4. Number of messages about migrants and refugees by Spanish region on Twitter between 2015 and 2020



Source: created by the authors

Figure 5 summarises the above data. In general, clear differences between the regions cannot be observed, be they pronounced jumps between one region and another, regional patterns (north-south, centre-periphery), ideological (the ideological tendency of regional governments does not follow a clear trend), nor even the proportion of the immigrant population in each region, as Arcila-Calderón et al. observed (2022). The only element that seems to be intuited is the presence of the regions with a higher GDP per capita (Madrid, the Basque Country, Navarra and Catalonia) among those with a lower presence of hate. In any case, more detailed studies will be necessary that can shed light on these differences.

Figure 5. Presence of hate speech towards migrants and refugees by region on Twitter in Spain between 2015 and 2020



Source: created by the authors

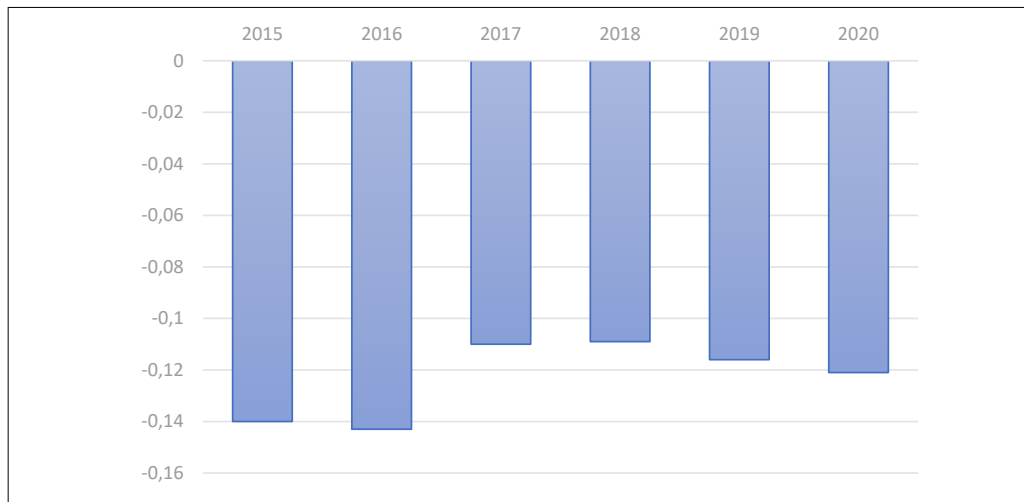
4.4. Study of sentiments

Finally, sentiment analysis shows an average value of -0.125 (SD=0.229). This means that the general sentiment in tweets concerning migrants and refugees in Spain is slightly negative. There is a significant negative correlation between sentiment and the presence of hate [$R(124,031)=-0.068$, $p<0.001$], that is to say, a more negative feeling is correlated with a greater presence of hate, although the effect is very slight. In fact, if we only evaluate messages with a consistent presence of hate (those in which the value of the presence of hate is greater than 0.5) the average value of sentiment is -0.151 (SD=0.226), in other words, very slightly more negative.

The above is relevant because it implies a negative approach to discourse focused on migrants and refugees, something particularly common in hate messages, but not exclusive to them. This is understandable, since even messages that do not include rejection tend to focus on the negative aspects of migration or the drama it poses, something that is consistent with media coverage of migration (Fengler et al., 2020; Igartua et al., 2007). In fact, Spanish news stories about issues related to migration commonly focus on the Mediterranean, Ceuta and Melilla or the Canary Islands (Fajardo Fernández & Soriano Miras, 2016), that is, points of conflict, where tragic events sometimes take place; in such cases, feelings of sadness or indignation over the death of a migrant would not be hatred but do represent negative sentiment.

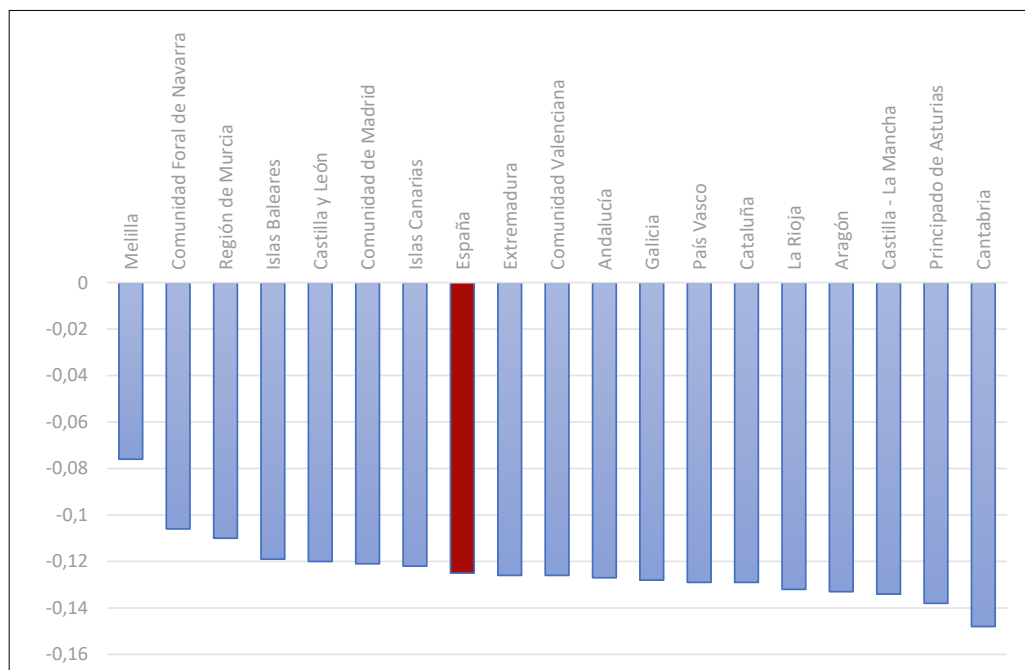
Looking more deeply at developments over time, there are significant differences between the different years [$F(5, 100,459)=100.459$, $p<0.001$]. The post hoc tests confirm that sentiment shows greater negativity in the years 2016 ($M=-0.143$, $SD=0.216$) and 2015 ($M=-0.140$, $SD=0.215$) than in the years 2020 ($M=-0.121$, $SD=0.242$), 2019 ($M=-0.116$, $SD=0.248$), 2017 ($M=-0.110$, $SD=0.223$) and, particularly, 2018 ($M=-0.109$, $SD=0.239$). Figure 6 shows these differences more visually. One can see that it follows a pattern similar to the distribution of hatred (although inverted because it deals with negative values), with lower values in the middle years, although in the case of hatred the later years show the greatest presence, while the earlier years had the most negative feeling. This could be interpreted by the type of feelings associated with the information on migration generated in those years (López del Ramo & Humanes, 2016; Brändle, Eisele & Trenz, 2019; Amores, Arcila Calderón & Stanek, 2019), with cases of shipwrecks, detentions, overcrowding and stories with considerable impact in the media, such as the death of Aylan Kurdi or the discovery of a truck with dozens of suffocated immigrants on the border between Austria and Hungary (Fleming, 2015).

Figure 6. Annual changes in the underlying sentiment in messages about migrants and refugees on Twitter in Spain between 2015 and 2020



Source: created by the authors

Finally, the comparison between the regions once again shows significant differences [$F(5, 100.459)=100.459, p<0.001$]. Cantabria has significantly greater negative sentiment ($M=-0.148, SD=0.252$) than Madrid ($M=-0.121, SD=0.233$), Castilla and León ($M=-0.120, SD=0.221$), Murcia ($M=-0.110, SD=0.235$), Navarra ($M=-0.106, SD=0.238$) and Melilla ($M=-0.076, SD=0.191$). In the case of Asturias ($M=-0.138, SD=0.224$) the differences are significant when compared to Madrid, Murcia, Navarra, and Melilla. The case of Melilla is particularly striking, with significantly less negative sentiment than all the other regions, except Navarra. Figure 7 summarises this data more graphically.

Figure 7. Underlying sentiment in messages about migrants and refugees by region on Twitter in Spain between 2015 and 2020

Source: created by the authors

More pronounced jumps can be observed in these cases than in the presence of hate, especially in the case of Melilla. However, the range is quite limited, not reaching 0.10 points in a range between -1 and +1. Neither does the order seem to obey clear criteria, so it will be necessary to look more deeply into potential causes that could explain these differences.

5. Conclusions

Starting with RQ1, concerning changes in the content about migrants and refugees on Twitter in Spain, it can be affirmed that interest has been marked by events of great impact in the media, with 2015 and 2016 being the most noteworthy years of the refugee crisis, the years when most attention was paid to this matter, as also confirmed by the academic interest in the importance that these years had in the media representation of migration (Zhang & Hellmueller, 2017; Amores, Arcila-Calderón & Blanco-Herrero, 2020). After those years, interest seems to have declined, reaching minimum levels in 2020, coinciding with the pandemic, when attention shifted to health-related matters.

Regarding RQ2, focused on the changes in hate speech, the trend is different and concerning, as the volume of messages of this type has increased, 2020 being the year with the greatest rejection on Twitter in Spain towards migrants and refugees. The

emergence in the Spanish political arena of a party with an anti-immigration and nationalist discourse seems to have played a key role in this sense, as previous research has already indicated (Ferreira, 2019; Turnbull-Dugarte, 2019).

To respond to RQ3, regarding regional differences, we can affirm that, although the greatest volume of messages about migrants and refugees was concentrated in the most populous regions (Madrid, Catalonia, and Andalusia), the highest proportions of hatred were observed in Asturias, Castilla-La Mancha, the Balearic Islands, and Galicia, without clear patterns being detected. It may be advisable for future studies to look into these issues in greater detail, since there do not seem to be ideological patterns –the colour of the regional government, for example–, wealth or population of immigrant origin that explain these differences.

Finally, the sentiment analysis carried out to respond to RQ4 indicates that there is a very weak correlation, whereby sentiment is more negative in messages with a greater presence of hate. In general, the sentiment in discourse about migrants and refugees on Twitter in Spain between 2015 and 2020 was negative, especially in the first two years of the sample, something that coincides with the fact that media coverage and discourse concerning migration tends to focus on negative elements (Amores, Arcila-Calderón & Blanco-Herrero, 2020). Even the discourse in support of migrants can incorporate negativity, by focusing on their status as victims, something that could also explain the weakness of the correlation. Sentiment was negative in all the regions of Spain, Melilla being the place with the least negative sentiment, and Cantabria, the most.

It is worth noting that this work has focused on sentiment analysis from a binary perspective, between positive and negative. This derives from the relevance of examining the association between negativity and hate speech more closely, a connection that other studies have already observed (Arcila-Calderón et al., 2021) and which has been confirmed herein. This, however, sets a limitation, since it does not allow us to evaluate what specific feelings or emotions are associated with this type of rejection discourse, a line of work that future research in the area may explore, research which could go beyond the exploratory vocation of this study.

The above allows us to gain greater knowledge about online hate speech based on racist and xenophobic criteria, confirming the clear relationship between such hatred and news and media events (Arcila-Calderón et al., 2021). The application of computational techniques and automated analyses has allowed us to carry out one of the most extensive longitudinal studies yet, with the particularity of including geolocated content which has allowed consistent comparisons to be made between regions of Spain. This is a considerable advance as a large part of the policies pertaining to coexistence and integration in Spain are the responsibility of the regional governments. However, and despite the interesting observations made, it must be pointed out that the main differences regarding attitudes towards migration occur at the national rather than regional level, as illustrated by the various Eurobarometers (European Commission, 2019; 2022), hence the interpretation of those differences at the regional level still requires future study to give clearer understanding.

Beyond this, a limitation that must be taken into account is the fact that with large volumes of data it is easier for statistical tests to be statistically significant. Thus, it is worth qualifying the observations made, especially those related to regional differences, whose effects were smaller than those observed between the different years.

It should also be noted regarding regional variables that the corresponding region could not be identified automatically in 4,271 cases, since the metadata did not include enough information. Among these messages it is expected that there will be,

among others, all those corresponding to the autonomous city of Ceuta, which is not included among the regions or cities in the study. Given Ceuta's population, and in view of the number of messages identified in Melilla (858), a similar city, it is estimated that the effects of this limitation will be slight, but it would be advisable for future studies to continue perfecting the analyses to look into this question in greater depth.

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Methodology	David Blanco-Herrero, Carlos Arcila-Calderón
Data collection and analysis	David Blanco-Herrero, Carlos Arcila-Calderón, Patricia Sánchez-Holgado
Discussion and conclusions	Andrés Barradas Gurruchaga, David Blanco-Herrero
Drafting, formatting, version review and approval	Andrés Barradas Gurruchaga, David Blanco-Herrero, Carlos Arcila-Calderón, Patricia Sánchez-Holgado

8. Conflicts of interest

The authors declares that there is no conflict of interest contained in this article.

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