WHAT’S IN A TWEET? Twitter’s impact on public opinion and EU foreign affairs

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1. Introduction

Since the end of the Cold War, the European Union (EU) has consolidated itself as a sui generis global actor (Bretherton and Vogler, 1999; Smith, 2014) that is today widely considered one of the most influential international powers (Bindi, 2012; Bradford, 2012; Moravcsik, 2017). Subsequent reforms have transferred more and more foreign policy competences from the member states to the EU. The creation of the European External Action Service (EEAS) in 2010 gave the EU its own diplomatic service. Led by the High Representative for Foreign Affairs and Security Policy, the EEAS serves as the EU’s quasi-foreign ministry. Although the bloc’s foreign policymaking may be obscure and complex, its collective voice gives it significant power in international trade and regulatory matters.

To better understand the EU’s external relations with China, India and Russia, three key counterparts from the BRICS pool of major emerging countries, this analysis employs large-scale text mining of Twitter data. While Twitter is not fully representative of the general public in demographic or ideological terms, its study nevertheless allows important conclusions to be drawn about patterns or shifts in public perceptions.

It can also be useful for extracting insights about relative levels of attention, salient topics and associated attitudes. Furthermore, since many opinion leaders, journalists and multipliers engage in policy discussions via Twitter, it serves both as amplifier and indicator of trends in the foreign policy community as well as in the wider population. Lastly, by specifically studying external communications from a political actor’s official Twitter accounts, one can draw conclusions on the underlying policy priorities, diplomatic practices and strategic outlooks. These accounts may be organisation-
al, such as the European Commission’s @EU_Commission handle, or personal – including the accounts of leading politicians, designated spokespersons and ambassadors.

Feeding into the emerging literature using Twitter-based opinion mining, this study builds on an original dataset of 927,120 English-language tweets talking about the EU’s relationship with China, India and Russia. In addition, the dataset includes all tweets discussing relations to these three countries from a comprehensive list of over 400 official EU Twitter accounts. The resulting dataset is examined through national language processing (NLP) and linear regression analysis. This multi-layered method provides answers to pertinent questions such as: are there differences in tonality when users and official accounts speak about each of these three relationships, and how do they evolve over time? What were the defining topics and how did key events affect public opinion on a relationship? How do the EU’s official Twitter accounts talk about diplomatic affairs and which issues do they prioritise?

2. The EU’s external relations with China, India and Russia

The three countries selected for this study are all from the pool of major emerging countries, often called BRICS. They are amongst the world’s largest and most powerful nations and thus play a key role in shaping international relations and geopolitics. By many accounts, China has reached or is about to reach the status of a superpower. It is also the EU’s second-largest trade partner. India is a major regional power and the world’s largest democracy. Russia, as the heir of the former Soviet Union, fashions itself a global power and, due to its military muscle, is still essential for global security questions. As the EU’s biggest eastern neighbour – and given the historical ties between Russia and many EU member states – EU–Russia relations have always received a lot of attention.

Generally, all three are high on the EU’s foreign policy agenda and recognised as strategic partnerships. India has historically commandedit less attention, as it is considered the least challenging of the three partners from a Brussels perspective. In the absence of substantive disagreements, hostilities or major conflicting interests the relationship is described in fluffy terms. As per the European External Action Service (EEAS), India and the EU are “long-standing partners”, “committed to dynamic dialogue in all areas of mutual interest as major actors in their own regions and as global players on the world stage” (EEAS, 2021b).

The picture is less enthusiastic when looking at the complex relationships the EU has with China and Russia. While the fast-growing Chinese market was long seen as an opportunity for the EU’s exporting economies, the past years have given way to a sobering realisation of the many challenges associated with China’s rise. Concerns over unequal market access and unfair trade practices, cyber espionage, and the expansion of Chinese influence in the EU’s immediate neighbourhood have led to a marked reassessment of the EU–China relationship. The EU’s 2019 Strategic Outlook acknowledged this shift by taking a more assertive stance, defining China simultaneously as “a competitor, a negotiating partner, and a systemic rival” (EEAS, 2021a). The latter term highlights the tense state of bilateral relations.

The EU’s relationship with Russia has also deteriorated considerably over the past years. While it has never been an easy one, the 2014 illegal annexation of Crimea and the violent conflict in eastern Ukraine have caused lasting damage to bilateral relations. Yet, as the EU’s largest neighbour and due to historic, cultural and trade links, “Russia remains a natural partner for the EU and a strategic player combating the regional and global challenges” (EEAS, 2021c). The legal basis is the 1997 Partnership and Cooperation Agreement (PCA), complemented by many sectorial agreements. However, following recent conflicts and political events some of the policy dialogues and cooperation mechanisms have been halted and sanctions have been adopted by both sides.

Based on this overview of the state of bilateral relations, one would expect the sentiment of tweets to be more positive when it comes to the EU–India relationship compared to EU–China and EU–Russia. As the empirical section shows, this is indeed the case for both the EU’s official accounts and the wider Twitter userbase. Beyond that, there are many nuances and differences that help draw a detailed portrait of the state of the EU’s bilateral relations and the way it communicates about them through its Twitter presence.

3. Literature review

But first, this section situates the study within the various strands of literature it engages with and presents related research. On the one hand, this paper explores questions pertaining to the study of public diplomacy. Here, it builds on and feeds into work on the role of social media and the impact of Twitter diplomacy in international relations. On the other hand, its methods are related to the recent but fast-growing scholarship that uses social media data to study real-world phenomena. Here, it connects with efforts to extract information about networks and interactions as well as to measure public opinions based on Twitter data.

3.1. Twiplomacy: the role of social media in international relations and public diplomacy

Much has been written on the important role of public diplomacy in statecraft and international relations (Fitzpatrick et al., 2013; Dodd and Collins, 2017). Public diplomacy (sometimes referred to as nation branding or strategic communications) means the “power to influence the global discourse” (Collins et al., 2019) and communicating to “foreign publics in order to create a receptive environment for foreign policy goals and the promotion of national interest” (Manor and Collins, 2013; Dodd and Collins, 2017). Public diplomacy (some...
Segev, 2015: 93). With the advent of social media platforms, a new form of public diplomacy has emerged. Digital diplomacy is multi-faceted, encompassing everything from negotiations about digital policy files to the introduction of digital tools in traditional diplomatic practices and the use of social media for diplomatic purposes (Hocking and Melissen, 2015; Adesina and Summers, 2017; Krzyzanowski, 2020), most notably as a strategic communication tool. This work explores the latter, often referred to as Twitter diplomacy, hashtag diplomacy or Twiplomacy.

Twiplomacy essentially functions in two modes, high-stakes and strategic communications. In high-stakes situations, world leaders, diplomats and governmental agencies communicate to domestic or foreign audiences over Twitter with an immediate, significant diplomatic impact (Wang, 2019). The ominous use of Twitter by former President Trump made international relationships more fragile, as its directness circumvented many long-held diplomatic norms (Simunjak and Calandro, 2019). The fast and unfiltered pace of Twitter interactions can also result in less sway for experts within the governmental bureaucracy, enabling a more top-down (and often erratic) approach to foreign policymaking.

On the strategic communications side, Twiplomacy enables states and international organisations to conduct nation branding and improve public relations, quickly and effortlessly reaching large foreign audiences. An early and innovative example was the Swedish government’s use of the @Sweden Twitter handle. It was handed to a different average citizen each week who could then curate it to their liking (Mickoliet, 2014). The EU has also built up a strong presence on various social media platforms – especially on Twitter. As of early 2021, its registry of official Twitter accounts listed almost 400 handles of high-level political leaders, spokespersons and institutional entities with a combined following of over 6 million (European Union, 2021). In countries where Twitter is not accessible the EU has gained visibility through other platforms, such as Weibo in China (Bjola and Jiang, 2015).

The role of Twitter communication in international relations and foreign affairs has been the subject of previous studies. Since 2012, BCW’s annual “Twiplomacy Study” looks at how heads of state and government, foreign ministers and international organisations use social media channels (Burson Cohn & Wolfe, 2020). They found that in 2020 the governments and leaders of 189 countries had an official presence on Twitter. In addition, the heads of state and government of 163 countries and 132 foreign ministers maintain personal accounts on Twitter. As the use of social media, and in particular Twitter, has become so widespread, the scholarly interest in studying international relations and the conduct of diplomacy through these platforms has grown accordingly (Simunjak and Calandro, 2020).

Looking specifically at the EU and its member states, Kenna (2011) studied the way social media was used in the EU’s public diplomacy toolbox and recommended a clear social media strategy. Since then, the usage of Twitter by EU institutions and political leaders has increased significantly. Kuźniar and Filimoniuk (2017) later analysed the Twitter communication strategies and efficiency of the Twitter channels of European foreign affairs ministers and their ministries.

Overall, EU leaders have exhibited a somewhat more restrained handling of their Twitter diplomacy than some of their global counterparts. Hence, this analysis is less concerned with high-stakes Twitter communications, which would require a qualitative analysis of key tweets and conversations. The EU’s strategic communications are more concerned with continuous messaging and are thus ideally suited to a quantitative, large-N text mining analysis. Through such an analysis, this paper makes a two-fold contribution. First, it measures public perceptions regarding the different bilateral relationships as expressed on Twitter. Second, it investigates the EU’s usage of Twitter as a diplomatic tool. For the former, it examines views and attitudes expressed on Twitter as a proxy to measure public opinion towards the EU’s relationships with China, India and Russia. For the latter, it zooms in on the EU’s external communications, specifically analysing how its official Twitter handles speak about these bilateral relations and what they say, thereby shedding light on the EU’s strategic communications and public diplomacy practices.

### 3.2. Using Twitter data to investigate diplomatic practices

This work also engages with two strands of scholarly study which both use Twitter data as an empirical base. One is concerned with how Twitter can be used to measure public opinion, and mostly relies on analysing the content of tweets. Another is interested in studying public diplomacy through Twitter data. Here, in addition to content analysis, researchers have used network theory to map connections, interactions and clusters of Twitter users.

Using Twitter data to investigate international relations and public diplomacy is a relatively young, but rapidly evolving field. Sobel et al. (2016) conducted a content analysis of eight American embassies’ Twitter feeds to explore inconsistencies between the embassies’ use of Twitter and the State Department mission. Dodd and Collins (2017) examined 41 embassies’ Twitter accounts and conducted content analysis to understand their public diplomacy practices. Palit (2018) identified key characteristics of India’s digital communica-

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2. As many users follow more than one EU account, the number of unique followers is supposedly somewhat lower. Nevertheless, the European Commission’s main account alone has over 1.4 million (unique) followers. And the three most influential foreign policy figures in the previous Commission, then-Commission President Juncker, then-HRVP Mogherini and then-Council President Tusk boast another 2.5 million followers.
tion and explored the contribution of digital communication to India’s international stature. Sevin and Ingenhoff (2018) explored the ways in which the government-run or -funded Twitter accounts of Australia, Belgium, New Zealand and Switzerland engage in nation branding, and propose a model to assess the impacts of public diplomacy through social media analysis. Collins et al. (2019) developed methods and techniques to understand the process, reach and impact of digital diplomacy via Twitter.

Many of the above-mentioned studies are theoretical, conceptual works, and those that are empirical employ mainly qualitative methods. However, the nature of the study object lends itself to quantitative, computational analysis. Social media generates vast amounts of data and thanks to advanced techniques in natural language processing (NLP), researchers can use that data to generate many interesting insights (see section 4 for a more detailed explanation of the methods used). This has given way to a strand of international relations research sometimes called “computational international relations” (Unver, 2018). Generally, research of this type uses one or a combination of tools such as data mining, NLP, automated text analysis, web scraping, geospatial analysis and machine learning to study international relations.

A number of studies have used network analysis and topic modelling to study various aspects of Twitter-based digital diplomacy (Park et al., 2019; Ingenhoff et al., 2021). In perhaps the broadest such study to date, Sevin and Manor (2019) use social network analysis to discover similarities between traditional embassy networks and Twitter links for the foreign affairs ministries and ministers of 130 countries. Focussing on the US, O’Boyle (2019) explores topics, tones, similarities and differences in tweets during state diplomatic visits in India and the United States. Dubey et al. (2017) deploy text mining and sentiment analysis to study tweets by two leading Indian political diplomats, exploring how foreign service members are perceived by and interact with online audiences. Meanwhile, Šimunjak and Caliandro (2020: 457) examine the ways and reasons EU member states communicated about Brexit by tracking their UK-based embassies’ Twitter activities. They find that “the framing of Brexit on Twitter by individual Member States was deliberate and strategic” and conclude that Twitter is seen “as a tool conducive to meeting the public diplomacy’s aim of relationship-building, but not one to be used for advocacy and influencing interpretation of controversial Brexit issues.”

Another application of computational international relations used in this paper is Twitter-based sentiment analysis. It is described more thoroughly in section 4 on methods, but the basic idea is to assign sentiment scores to tweets based on their content, usually on a negativity-to-positivity scale or according to certain emotional categories. Analysis of such sentiment scores can be a useful proxy for real-world phenomena, inter alia for public opinion towards a given topic, as discussed in the next section.

3.3. Using Twitter data to measure public opinion

Such harvesting of Twitter data to measure public opinion is a relatively novel research methodology with many advantages (Klašnja et al., 2017). Notably, it has applications in the area of public health, most recently to track public mood shifts during the COVID-19 pandemic (Sansone et al., 2019; Boon-Itt and Skunkan, 2020; De Caro, 2020; Dyer and Kolic, 2020; Tavoschi et al., 2020). Bian et al. (2016) mined Twitter to investigate the public’s perception of the Internet of Things. Validating the reliability of such an approach, several studies have compared trends in Twitter data with traditional public opinion surveys (O’Connor, 2010; van Klingen et al., 2020). Meanwhile, Bollen et al. (2011) found that measurements of collective mood states derived from Twitter feeds are correlated with stock market indexes. Twitter data has also been used to predict electoral outcomes (Gayo-Avello, 2013; Beaugrand, 2017) and to explore gender-based differences in citizens’ communications with politicians (Beltran et al., 2021). Yet, the methodology faces inherent challenges that need to be acknowledged and, accordingly, the external validity of some of these studies remains contested in the literature.

Overall, while still in its infancy, Twitter-based study of public opinion can provide novel and reliable insights, but restrictions and limitations of the method need to be considered carefully. First, the Twitter userbase is not representative of the general public and suffers from self-selection bias, resulting in an over-representation of younger, more educated male voices. These biases are even stronger amongst users that engage in political discussions, who were found to have additional demographic and ideological biases (Barberá and Rivero, 2015; Bode and Dalrymple, 2016). Second, structural factors, such as unequal access to digital tools and services (for instance, Twitter is not accessible from within China), and certain online-specific communication traits may impact results. Third, linguistic methods such as NLP rarely work across languages, usually restricting analysis to a body of tweets written in the same language. Lastly, and especially relevant to online discussions on contentious global issues, the use by state and non-state actors of automated bots and coordinated communication campaigns may distort topics and sentiments. The implications of these limitations on the present study are discussed in the Methods section, together with certain technical challenges. Despite these caveats, a careful and well-calibrated study can generate valuable and fairly accurate insights about the perceptions of Twitter users. Given their role as amplifiers and leaders of political discourse, these can serve as an approximation of the wider public’s perceptions (Anstead and O’Loughlin, 2015; McGregor, 2019; Gaisbauer et al., 2020).

4. Methods

The following section describes the methodology and techniques employed in this analysis. First, it briefly discusses the selection of cases from a technical point of view. Then, it presents the data retrieval and processing workflow. Lastly, it discusses the text-analysis methods, notably sentiment and emotion analysis, and the statistical methods.

4.1. Case selection

This study focuses on the EU’s bilateral relationships with three key countries: China, India and Russia. The scope of future analysis could certainly be extended to other import-
Figure 1. Data collection and processing workflow

<table>
<thead>
<tr>
<th>STEP 1 (python)</th>
<th>STEP 2 (R + packages)</th>
<th>STEP 3</th>
<th>STEP 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scoping relevant tweets</td>
<td>Structuring data, pre-processing text</td>
<td>Assigning sentiment and emotion scores</td>
<td>Descriptive statistics and regressions</td>
</tr>
<tr>
<td>Python scraping script gathers English-language tweets (no retweets) from 2016-2020 that:</td>
<td>Inter alia, dplyr, stringr, lubridate, and tidytext packages:</td>
<td>sentimentr package</td>
<td>ggplot2 package for visualisations</td>
</tr>
<tr>
<td>• mention keywords of the three bilateral relationships and either have 1 or more likes</td>
<td>• remove stopwords, punctuation and special characters</td>
<td>• assigns polarity score (from -3 negative to +5 positive) to words and computes a tweet's overall sentiment (unweighted mean score)</td>
<td>tidytext and stringr packages to extract topics and keywords (manually filtering entries without meaningful information)</td>
</tr>
<tr>
<td>• or come from the list of official EU accounts and mention any of the three target countries</td>
<td>• convert emojis to words</td>
<td>• incorporates valence shifters and adversative conjunction</td>
<td>QuantPsy package for linear regression analysis</td>
</tr>
<tr>
<td></td>
<td>• tokenize</td>
<td></td>
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<tr>
<td></td>
<td>• unify synonymous words</td>
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</tr>
<tr>
<td></td>
<td>• no stemming or lemmatization</td>
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</tr>
</tbody>
</table>

Source: Author

4.2. Data retrieval and processing workflow

Figure 1 depicts the mining and analysis workflow with which this study was conducted. The four main steps are: 1) collecting and pre-processing English-language tweets from the last five years that mention one of the three relationships; 2) structuring and enriching the data through the use of the R software and additional packages; 3) pre-processing the tweets’ text so that it is usable for NLP methods; 4) data analysis and visualisation using ggplot2. This section describes each step in more detail, before discussing the limitations of the approach. Less technically minded readers might want to skip straight to the presentation of the findings (section 5).

The search queries used to scrape relevant tweets via a Python script were restricted to exclude retweets and to only target tweets that Twitter’s built-in classification engine labelled as “English-language”. The start and end of the query were set to catch all tweets published between 01.01.2016 and 31.12.2020. To limit the scope to a technically manageable volume and to provide a minimum threshold of tweet relevance (especially useful for excluding bots), a tweet had to have generated at least one like. In terms of tweet content, the query was defined to capture tweets that either directly addressed a relationship (through a hashtag such as “#EUIndia”) or that simultaneously matched an EU-keyword list and one from the partner countries. These keyword lists comprised variations of the country name (e.g. “China”, “Chinese” and “PRC”) as well as widespread synonymously used names (e.g. “Kremlin”, “Moscow”) and key political figures and institutions as well as their Twitter handles (e.g. “Modi”, “PMOffice”). For the full list of queries, see Appendix A.

Next, a list of 416 official EU Twitter accounts was created, including the accounts of EU institutions, Commission departments and delegations (e.g. @EU_Commission, @eeas_eu, @Europarl_EN), as well as leading politicians and spokespersons (e.g. @FedericaMog, @extspxoeu). In addition to currently active politicians, it also includes the handles of members of the previous College of Commissioners. All their tweets over the past five years that made mention of any of the three countries (or variations thereof, as per the above-mentioned keyword lists) were scraped. For a more detailed explanation, see Appendix B.

After merging the datasets and dealing with duplicates, this process resulted in a body of 927,120 tweets. In the second step, the data was structured and the text pre-processed to enable NLP-based analysis, following standard text-as-data procedures. In particular, the tweets’ content was cleaned by removing stop words (e.g. “the”, “and”, “for”), punctuation and special characters; transforming all text to lowercase; translating emojis into words; tokenising the tweets (i.e. breaking them up into individual words); and computing various word frequency statistics.

Step 3 consisted of a sentiment analysis based on Rinker’s sentimentr package (Rinker, 2019). Commonly used
lexical approaches assign individual words a value on a scale from -5 to +5 depending on their negative/positive connotation from a lookup in a pre-defined dictionary. The word values are then weighted relative to the overall lengths of the tweets. Sentimentr augments this process by taking into account valence shifts (negators, amplifiers [intensifiers], de-amplifiers [downtoners], and adversative conjunctions). Even with such improvements, these methods should not be used to assess the sentiment of individual tweets. Rather, they work well when aggregated over a large corpus of data. Hence, for the following analysis, monthly means were used (unless stated otherwise). These monthly aggregations give sufficiently large samples to produce reliable and robust results. To cross-validate the results and ensure their robustness against sampling artefacts, sentiment was also computed based on the IF-ANN dictionary embedded in the tidytext package (Silge and Robinson, 2016) and across various sample sizes and combinations. The results showed remarkable robustness throughout. The process was repeated for the emotion analysis, in which words are associated with one or several of eight emotion categories (anger, anticipation, disgust, fear, joy, sadness, surprise, trust).

In the final step, several simple linear regressions were fitted on the data. For that, dummy variables were constructed either for the account type (official EU account vs other) or the relationship (EU–Russia or not, EU–India or not, EU–China or not). The regressions were run on monthly mean sentiment of the targeted samples. To extract topics and keywords, word frequencies for the targeted samples were computed. In a reiterative process, words void of information were filtered out to produce lists of meaningful, substantive terms. Furthermore, certain synonymous terms were unified based on a manual review (e.g. so that “Ukrainian” and “Ukraine” would be counted together, or “IPR” and “intellectual property”).

### 4.3. Limitations of the study

As acknowledged previously, this approach exhibits several constraints and limitations, which need to be considered carefully when interpreting the results and especially when making inferences about public attitudes. The first set of challenges relates to the representativeness of the data. For one, the Twitter userbase cannot be deemed a representative sample of the wider population and can at best serve as a proxy. Yet, some studies indicate that ideological differences are mostly driven by demographic distortions and disappear when controlling for these (Mellon and Prosser, 2017). Furthermore, Twitter’s demographic composition (younger and more male) may not be too far away from the similarly distorted part of the population that is most vocal when it comes to discussing political issues (Barbera and Rivero, 2014). While generalisability is somewhat limited by these biases, the study still serves as a powerful indicator of the attitudes of Twitter users – an interesting study object of its own. For one, they may reflect trends and patterns in the wider population; moreover, many opinion leaders and multiplicators (journalists, politicians, influencers) are using social media to shape conversations, set agendas and to inform their own views – all of which inevitably feeds back into the offline world.

A second factor limiting the representativeness of the present sample is the restriction to English-language tweets for methodological purposes. This excludes many relevant tweets written in other languages. The impact is somewhat mitigated by the fact that many social media users choose English as their primary communication language – a trend that is probably even more pronounced amongst observers and practitioners from the foreign policy community.

Thirdly, one should be cautious of the presence of bots, unauthentic accounts and coordinated communication campaigns on Twitter, which are especially active in social media discussions related to contentious foreign policy topics. However, as they inevitably form a part of the Twitter discourse, it makes sense to also keep them in the study.

Lastly, the script used to scrape the Twitter data is not an official API and may therefore suffer from sporadic omissions. While careful cross-checks have been conducted and a manual sample validation has shown that indeed the full set of queried tweets has been downloaded, the sheer size of the project means that there may always be singular emissions. However, there are no grounds to believe that they would follow a non-random distribution, and they should therefore not cause any systematic measurement errors.

For the second part of the study, which looks only at official EU accounts, all these representativeness concerns should be less relevant. While not all EU politicians are present on Twitter, it seems unlikely that any correlation exists between foreign policy views and the choice of being on Twitter or not. For institutional accounts falling under the EU’s corporate communication umbrella, this consideration does not matter at all.

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4. The curious reader can find a selection of tweets and their assigned sentiment scores in Appendix C.
5. For more on Twitter’s self-selection bias and the resulting demographic and ideological distortions, consider the following findings: US and UK Twitter users have been shown to be younger and wealthier than their respective general publics. In the US, they are also more likely Democrat-leaning, while UK Twitter users are better educated than the average citizen. In both cases, Twitter users are disproportionately members of elites (Blank, 2017; Mellon and Prosser, 2017; Wojcik and Hughes, 2019).
A second set of challenges pertains to the analysis of the collected data: sentiment scoring is likely to misclassify some text, so it cannot be used to reliably assess an individual tweet. Reasons include the use of irony and sarcasm (users expressing negative sentiments using positive words or vice versa), word ambiguity (words can have different meanings depending on the context), and the multipolarity of a given tweet (expressing both positive and negative opinions towards different actors). However, this study leverages the law of large numbers, meaning that the misclassification error both over- and underrated to a similar extent, so that they cancel each other out on average. Conceptually, the main pitfall of lexicon-based sentiment scoring is probably the sometimes unclear link between the tonality of expressions and the writer’s real attitudes on the wider topic of interest. As an illustration, consider tweets relating to the COVID pandemic, which often include negatively ranked words such as “death”. This does not necessarily mean that the writer has a negative attitude towards the EU’s relationship with a given partner, since they might also be expressing grief, condolence or solidarity. However, once again the caveat applies that these measurement errors may to a large extent cancel each other out. Furthermore, the concurrences of predominantly negative terms combined with a specific country will undoubtedly impact public sentiment towards that country, even if the link is not overly direct and straightforward.

While the study may allow for inference about the tonality and salience of Twitter discussions regarding the EU’s external relations, one has to be careful when drawing conclusions about attitudes of the general public. These caveats are less significant in the chapters exploring the EU’s own Twitter diplomacy.

5. Findings

This multi-faceted research method allows various novel insights to be drawn about attitudes towards three of the EU’s bilateral relationships and the way the EU communicates about these countries. This section presents the findings, starting with a look at the levels of overall interest and their evolution in each of the three relationships. Then, the results of sentiment analysis are plotted to visualise shifting patterns and trends in public opinion. The significance of the difference in attitudes towards the three relationships is confirmed by fitting the sentiment scores to regression models. Next, the analysis zooms into the use of Twitter by the EU’s official Twitter accounts. It shows that the EU’s Twitter accounts tend to talk more positively about the relationships, although again interesting variation can be found, with the study revealing significant differences in sentiment towards the three relationships. Lastly, top keywords and topics are extracted using text mining techniques. This brings to light the evolution of the EU’s focus over time. It also zooms in to explore which words are most associated with strongly positive/negative tweets, allowing conclusions to be drawn about politically salient and possibly contentious topics.

5.1. Different patterns of interest

Figure 2 shows the monthly volume of tweets for each of the three relationships. Since the overall output on Twitter has been relatively constant since 2015 (The GDELT Project, 2019), the growth in tweets talking about the three bilateral relationships is notable. Beyond a general upwards trend at different absolute levels, some spikes in the EU–Russia relationship stand out. In March and July 2018, Twitter users generated a lot of content talking about the EU–Russia relationship, which can be traced to two

Figure 2. Tweet volume over time, by relationship

Source: Author
5.2. Public perceptions of the state of the EU’s bilateral relations

Next, I use tweet sentiment as a proxy for public opinion towards the EU’s bilateral relationships. The distribution of sentiment across all tweets follows a slightly positively shifted normal distribution, with a standard deviation of 0.266 and a mean of 0.022. This means that virtually all tweets are scored between -1 and +1. To see a sample of tweets and their corresponding sentiment scores, see Appendix C.

To see whether there are significant differences in how Twitter users talk about any of the three relationships, a simple linear regression (SLR) model was fitted on the data. For this, a dummy indicating the relationship served as the independent variable (IV), while the sentiment score was the dependent variable (DV). The results from the different combinations of the regression model are reported in Table 1. In all cases, the differences in sentiment are statistically significant at a p=0.001 level with R²=0.6433. The regressions show that users talk most positively about the EU–India relationship (with an average of 0.075, as indicated by the intercept level), followed by EU–China (0.050) and then EU–Russia (-0.008), which users seem to refer to in the most negative terms.6

Looking at the evolution of sentiments over time gives a more nuanced view. Figure 3 plots average monthly sentiments for each of the relationships (blue dots) and draws a red line connecting average quarterly (i.e. January–March, April–June, etc.) observations (red dots). By widening the interval to a quarterly basis, the means are computed using a larger sample, which reduces fluctuation and gives a clearer picture of long-term trends. Consistent with the findings from Table 1, Figure 3 shows lower values for the EU–Russia relationship compared to the other two. But it also brings to light another remarkable development: the marked increase in negative sentiment about the EU–China relationship since the beginning of 2020, driven by tweets related to the emergence and spread of the coronavirus. This is consistent with trends from traditional surveys, which found that unfavourable views of China reached historic highs throughout 2020, including in Europe (Silver et al., 2020). A curious bump appears in the EU–India relationship, which – while relatively high overall – peaked in 2018. Manually reviewing some of that year’s most positive tweets gives us an idea of what has driven this positive development: in the top ten are political statements,7 but also many associated with the popular Ko-

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6. To cross-validate the sentiment classification, I repeated the procedure with other dictionary-based sentiment and emotion analysis methods. All gave the same picture.

7. For example: “thank you hon’able anurag thakur, president of indo-eu parliamentary friendship group, for very interesting & fruitful meeting. parliamentary diplo-
rean boy band BTS, whose large fanbase is very active on social media. In 2018, the band celebrated successes on the Indian market, which was reflected in euphoric tweets by its fanbase, probably nudging up the average sentiment observed for the EU–India relationship that year.

Figure 4 disaggregates these findings even further. By looking at emotion (instead of sentiment), one can trace the evolution of annual average emotion values for each of the relationships. There are large similarities and parallel trends between the relationships, potentially suggesting structural changes in the patterns of how Twitter users speak or which groups of users engage in the discussion. But then there are also marked differences: the strength of emotion in tweets associated with “anger” and “fear” decreased over the years, whereas positive emotions increased.

Consistent with expectations, the EU uses significantly more positive language than the wider Twitter userbase.

5.3. Politeness over politics? The EU’s diplomatic Twitter language

Besides serving as an indicator to gauge overall public perceptions towards the three relationships, disaggregated sentiment analysis also allows us to compare the tone of tweets composed by official EU accounts with that of the wider Twitter userbase. For several reasons, one would expect a “verbal politeness effect”, in other words for the EU’s official Twitter accounts to employ more positive (or less negative) language than the wider Twitter userbase. After all, diplomatic norms command a certain vocabulary that leans towards positive terms and sugar-coated language, even in the face of underlying issues. Furthermore, trolls and users with strong ideological views likely have a negative impact on the sentiment score of the wider Twitter userbase, thus making the EU’s communications even more positive in comparison.

As Rasmussen (2009) has discussed, the EU’s external communication leans on two main approaches: providing information to foreign audiences – which ought to display an objective and neutral tone; and projecting a narrative – by telling success stories and highlighting the positive outcomes of EU action. Negative messaging occurs only rarely, when the EU issues concerns or reservations about certain world events that run counter to its values or human rights.

Table 2. Simple linear regression on the effect of account type on sentiment

<table>
<thead>
<tr>
<th></th>
<th>average_monthly</th>
</tr>
</thead>
<tbody>
<tr>
<td>eu_account</td>
<td>0.160*</td>
</tr>
<tr>
<td>Constant</td>
<td>0.023*</td>
</tr>
<tr>
<td>Observations</td>
<td>120</td>
</tr>
<tr>
<td>R²</td>
<td>0.747</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.745</td>
</tr>
<tr>
<td>Residual Std. Error</td>
<td>0.047 (df = 118)</td>
</tr>
<tr>
<td>F Statistic</td>
<td>349.031* (df = 1; 118)</td>
</tr>
<tr>
<td>p</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

Source: Author.

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8. For instance, the top ten most positive tweets of that year include adoring references to band members: “@bts_europe yes he’s the most warm hearted, most caring, mos lovabel, hard working and supportive, the cutest mochi, jimin i love the way he care for us, love the way he talks haha actually i love his voice, cute voice #meet_bts #meet_jimin @bts_twt” (@startiny738 on 17 March 2018, 18:42). Because the fan groups are internationally connected, they refer to each other (as, in this case, through the tag of “bts_europe”, a European BTS fan page), which led to the tweets being included in this study’s automatic sampling process.

9. On the use of verbal politeness in diplomacy, see Chilton (1990) and Yapparova et al. (2019).
Are the expectations of a verbal politeness effect confirmed by the present data? Indeed, the sub-set of 8,342 tweets by EU accounts is scored more positively than the other tweets: a mean monthly sentiment of 0.187 compared to 0.200, a difference of +0.167. Fitting a simple linear regression (SLR) model with an “EU account” dummy as IV and sentiment score as DV confirms the statistical significance of the difference in sentiment between each group’s tweets \((p=0.001, R^2=0.747\), see Table 2). This shows that, consistent with expectations, the EU uses significantly more positive language than the wider Twitter userbase.

So far, the analysis of the EU’s verbal politeness effect has considered sentiment of tweets across all three relationships. However, one could also expect to observe differences in the attitudes expressed in each of the three relationships individually. Table 3 shows the average sentiment for each of the three over the past five years, disaggregated by whether the tweets came from an official EU account or not. What stands out is that the positive shift in the EU’s communications (delta in Table 3) is much stronger in the cases of the EU–China and EU–India relationships than for EU–Russia, where it is only marginal. In other words: when talking about Russia, the language of EU Twitter accounts is not only more subdued but also much more aligned with the wider Twitter userbase. This is also confirmed by SLRs that test the significance of account type (official EU account or not) for each of the relationships: the politeness effect is statistically significant in all three cases but \(R^2\) is much lower in the EU–Russia case, indicating that less of the variation can be explained with the SLR model.

Overall, the verbal politeness effect is around three times stronger in the case of the EU–China and EU–India relationships than for EU–Russia. This suggests that the EU is less shy about speaking critically or negatively about its relations with Russia.

### 5.4. Salient topics in the EU’s bilateral relations

Having explored how the EU is talking about the different relationships, the next section looks at what it is saying. Text mining methods such as relative word frequency allow us to extract useful information about the shifting focus of the topics the EU’s Twitter accounts prioritise.

Figure 5 shows the ranking of the EU accounts’ most-used keywords over time.\(^\text{10}\) When talking about the EU–China relationship, official accounts emphasise economic aspects, especially “trade”, “intellectual property”, “small- and medium-sized enterprises”, “market” and “business”. Matching the shifting stance of policymakers in Brussels over the past years, mentions of “cooperation” have given way to “protectionism”. This may indicate that the EU is mostly communicating to a domestic audience that has grown sceptical of the EU’s trade relations with China, which many perceive as unfair and disadvantageous. However, the analysis also brings to light the absence of contentious issues in the bilateral relationship. Common areas of EU concern about China, such as human rights, espionage and the treatment of the Uighurs, did not make it to the top of the rankings, and even “climate” only makes an appearance once in 2017. This could mean that the EU is well aware that Chinese officials also follow Twitter and subsequently avoid the diplomatic costs of addressing these concerns publicly.

The EU–India relationship gets a lot of soft, friendly language: “cooperation” and “partnership” rank high throughout the years. Economic terms such as “trade”, “economy” and “business” only make it into the top five sporadically. One specific issue of importance seems to be “energy”, which was often mentioned in connection with attributes such as “green” and “sustainable”. This also fits with the more prominent use of “climate”.

In the case of the EU–Russia relationship, contentious issues are much more prevalent. With top entries covering Belarus, Crimea, disinformation, Iran, the Navalny poisoning, Syria and Ukraine it reads like a diplomat’s shopping list of foreign policy issues the EU has with its eastern neighbour. Clearly, the EU is less concerned with sugar-coating differences than it is in the case of China. Instead, it chooses to actively communicate about contentious issues. This may be a consequence of the strategic communications struggle that has tainted the West’s relationship with Russia at least since the 2016 election of Trump, in which Moscow was accused of meddling through coordinated social media campaigns (Adams, 2019). Following similar interferences across Europe, including influence campaigns specifically attacking the EU institutions, the EEAS bolstered its dedicated strategic communications unit to combat the spread of disinformation (EEAS, 2018).

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\(\text{Table 3. Average monthly sentiment by relationship and account type: differences and SLR results}\\
\) 

<table>
<thead>
<tr>
<th></th>
<th>EU-China</th>
<th>EU-India</th>
<th>EU-Russia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wider public</td>
<td>0.048</td>
<td>0.071</td>
<td>-0.008</td>
</tr>
<tr>
<td>EU official accounts</td>
<td>0.199</td>
<td>0.256</td>
<td>0.030</td>
</tr>
<tr>
<td>Δ EU - non EU</td>
<td>+0.151*</td>
<td>+0.185*</td>
<td>+0.038*</td>
</tr>
<tr>
<td>SLR</td>
<td>R=0.7117</td>
<td>R=0.5922</td>
<td>R=0.1336</td>
</tr>
</tbody>
</table>

* \(p < 0.001\)

\(^{10}\) Note: some terms void of information (e.g. “European”) and emojis are manually excluded.
The last step looks at key terms associated with the most positive and negative tweets from EU accounts regarding each of the three relationships. For Table 4, both the top and bottom 10% of the EU’s tweets were extracted based on their sentiment score. Of these samples, the six most common terms for each relationship are listed.11

In the case of EU–China relations, trade-related aspects figure prominently in both the most positive and most negative tweets, underlining the complex weighting of advantages and disadvantages in the relationship. Not surprisingly, friendly diplomatic terms such as “cooperation”, “partnership” and “agreement” occur frequently in positive tweets. Somewhat unexpectedly, “protection” (concerning trade) is also present. This is possibly a consequence of the EU attempting to frame itself as a protector of European interests for a domestic audience increasingly sceptical of the bilateral trade relationship. Amongst the most negative tweets, “rights” (both intellectual property and human) are mentioned often, suggesting discontent about these issues. The coronavirus has also clearly left its mark. Note that this does not necessarily imply a deterioration of bilateral relations. This could reflect an artefact caused by the sentiment measurement method: tweets talking about COVID-19 may be more likely to include terms such as “death” or “killed”. Even when used in an objective, purely informative way, the method would attribute a lower sentiment, meaning their interpretation requires caution.

As expected, the positive tweets on the EU–India relationship pay lip service to the close and friendly links the EU has with India (“strategic” and “partnership”). In addition, there

Table 4: Most common terms in the EU’s most positive and most negative tweets, by relationship

<table>
<thead>
<tr>
<th>Pays</th>
<th>Negative</th>
<th>Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU-China</td>
<td>trade, covid19, rights, issues, economic, market</td>
<td>trade, IPR, protection, cooperation, partnership, agreement</td>
</tr>
<tr>
<td>EU-India</td>
<td>ocean, cooperation, summit, people, issues, floods</td>
<td>partnership, energy, support, council, security, gas</td>
</tr>
<tr>
<td>EU-Russia</td>
<td>Ukraine, Crimea, disinformation, propaganda, release, sanctions</td>
<td>Ukraine, energy, support, council, security, gas</td>
</tr>
</tbody>
</table>

Source: Author.

11. Again, terms that are not informative are manually removed.
is a lot of emphasis on “clean energy”, “sustainability” and “climate”, suggesting that these green topics are framed as an opportunity for EU–India relations. Regarding the negative tweets, “oceans” ranks first, somewhat unexpectedly. A manual review of these tweets reveals them to be expressions of grief and condolence after natural disasters have struck India, and matches the appearance of “floods”. Other negative keywords (“cooperation”, “summit”, “people”) also fail to show possible strains. This may be because in the case of the EU–India relationship even the most negative tweets are still quite favourable.

Highly contentious issues once again feature in the EU–Russia relationship: “Ukraine” and “sanctions” appear both in the most positive and most negative tweets. This could be because the EU is communicating to different audiences with different purposes. On the one hand, it uses positive language to express its support for and solidarity with the pro-EU protestors in Ukraine, while using negative language to condemn Russian interference and threatening or announcing sanctions. This would also explain the occurrence of “Crimea” in the negative set. It also communicates to a wider audience, both domestic and foreign, to push back against “disinformation” and “propaganda” from the Kremlin. On the positive side, “energy”, “gas” and “security” appear often, highlighting areas in which cooperation is ongoing. “Support” and “council” are in juxtaposition to Russia (for instance, when the EU expresses its support for Ukraine) and should be interpreted carefully.

6. Conclusions

Building on an original dataset of almost one million tweets talking about the EU’s bilateral relationships with China, India and Russia, this study contributes several novel insights into public attitudes towards these relationships as well as the way the EU communicates about these countries.

In the first place, there was a strong rise in public interest for all three relationships. Singular geopolitical events were shown to drive up the volume of tweets. This was especially visible in the case of the Skripal poisoning and the outbreak of the coronavirus. Over time, the attention on EU–Russia affairs has been overtaken by EU–China, with EU–India also catching up quickly.

Sentiment analysis of the tweets showed the attitudes of Twitter users to be most positive when it came to the EU–India relationship, followed by that with China and lastly Russia. The same pattern was found when looking at tweets from official EU accounts. However, there was also a marked and statistically significant verbal politeness effect, meaning that the EU tended to talk positively about its diplomatic relations. While this should not be surprising, it is worth noting that the effect is much more pronounced in the cases of the EU–India and EU–China relationships, and much less so for EU–Russia affairs. This suggests that the EU is more willing to use firm and resolute language and call out concerns when it comes to Russia. This is in line with the way many observers would describe the strained relationship between the EU and Russia.

The analysis further showed the most salient topics for each of the three relationships. Economic and trade-related aspects dominate the EU–China relationship. Substantive issues of disagreement, such as the human rights situation and the treatment of the Uyghurs, do not feature amongst the most used keywords. The EU–India relationship is characterised by the use of more positive and cooperative terms, but disaggregating into words associated with the most positive tweets reveals more: green energy and sustainability are mentioned frequently, hinting at the EU’s attempt to frame a positive narrative around these issues. In the case of EU–Russia relations, many contentious issues appear prominently. The EU does not shy away from addressing major foreign policy conflicts such as Syria, Ukraine, Iran and sanctions. It also frequently calls out Russian disinformation and propaganda. On the positive side are areas of ongoing cooperation, such as gas and security, although these are certainly not without tensions.

Taken together, this provides a rich and nuanced portrait of the EU’s bilateral relations with three key partners. Further research could expand the scope to cover more partners. Certain aspects could also be investigated with even greater detail and explanatory power by fine-tuning the methods. In all of this, the limitations of the research approach need to be carefully considered and accounted for as much as possible. For one thing, the Twitter userbase is not representative of the wider public, so conclusions about public opinion must be drawn with great caution. Second, the current approach is limited to English-language tweets only. It would be of great interest to also study the sentiment and keywords prevailing in tweets written in the partners’ languages.

7. References


Appendix A: Search queries

Note that capitalisation and hashtag variants of the keywords are also captured. As explained in the Methods section, in addition to meeting the following content criteria, tweets also had to meet certain other criteria (English language, not being a retweet, having one or more likes).

- For the **EU–China relationship**, a tweet had to mention either “EUChina”, “ChinaEU” or a combination of China, Chinese, PRC, Beijing, Jinping, Xijinping, Keqiang, CCP, ChinaEUmission, or MFA_China and EU, Europeanunion, European Union, Europeancommission, European Commission, EU_commission, EEAS, Brussels, European, European, JunckerEU, vonderleyen, FedericaMog or JosepBorrellF.

- For the **EU–India relationship**, a tweet had to mention either “EUindia”, “IndiaEU” or a combination of India, Indian, Pmoindia, Narendramodi, Modi, Indembassybru, Indiandiplomacy, MEAIndia, Santjha and EU, Europeanunion, European Union, Europeancommission, European Commission, EU_commission, EEAS, Brussels, Europe, European, JunckerEU, vonderleyen, FedericaMog or JosepBorrellF.

- For the **EU–Russia relationship**, a tweet had to mention either “EURussia” or “RussiaEU”, or a combination of Russia, Russian, Kremlin, Putin, Kremlinrussia_E, GovernmentRF, MedvedevrussiaE and EU, Europeanunion, European Union, Europeancommission, European Commission, EU_commission, EEAS, Brussels, Europe, European, JunckerEU, vonderleyen, FedericaMog or JosepBorrellF.

- For the **tweets from official EU accounts**, a tweet had to come from an official EU account (see Appendix B) and mention one of the following keywords: EUChina, ChinaEU, China, Chinese, PRC, Beijing, Jinping, Xijinping, CCP, ChinaEUmission, MFA_China, Keqiang, EUIndia, IndiaEU, India, Indian, FMOIndia, Narendramodi, Modi, Indembassybru, Indiandiplomacy, MEAIndia, Santjha, EURussia, RussiaEU, Russia, Russian, Kremlin, Putin, KremlinRussia_E, GovernmentRF, MedvedevRussiaE.

Appendix B: List of official EU accounts

The official accounts were scraped from the EU’s website, accessed on February 19th 2021: [https://europa.eu/european-union/contact/social-networks_en](https://europa.eu/european-union/contact/social-networks_en). This gave me 382 Twitter handles. In addition, I manually added 22 missing accounts of those Commissioners from the Juncker Commission (2014–2019) who were in office during the period of inquiry. I also included 12 accounts from key EU officials and foreign policy spokespersons in office during the period of inquiry. This resulted in a final list of 416 EU accounts.
Appendix C: Sample tweets and sentiment scores

Below are some randomly chosen examples from tweets with the highest and lowest assigned sentiment value (score in brackets):

- “This is a brilliant & VERY, VERY helpful work for all European citizens about the triangle between Europe, the US & China & its future! (Attention 20 p, but very worth reading). Congrats to @CER_IanBond @SophiaBesch @LeoSchuette @cer_ianbond @sophiabesch @leoschuette” by Oliver H. Schmidt (@OlifSchmidt) on 22 September 2020, 20:21 (+1.8874805).

- “This confusion, lack of unity and obvious weakness on the European side stimulates Moscow and Beijing to double down with their efforts: more intimidation, more disinformation, more economic blackmail -- as this seems to work.” by Ulrich Speck (@ulrichspeck) on 28 January 2020, 17:20 (-1.2244999).

- “Russia can strengthen its geopolitical positioning in Europe in some respects by seeking to cooperate more with Germany, its most important European partner. @DmitriTrenin explains the importance of this strategic partnership: https://carnegie.ru/2018/06/06/russia-and-germany-from-estranged-partners-to-good-neighbors-pub-76540” by Carnegie Endowment (@CarnegieEndow) on 9 June 2018, 02:00 (+1.4422306).

- “And Russia is an example what for?! Warmongering, murders, corruption, crimes, endless stupid lies, desinformation, occupation of European countries, killing civilians, breaking relations with the civilised world, more murders, more lies..” by @Neiswestnij on 29 September 2018, 09:06 (-1.8031223).


- “I wish more people would relentlessly remind everyone of Russian interference in British/European/American politics.” by @GosiaEss on 23 November 2020, 14:37 (-1.2950000).