Article

Encrypted Engagement: Mapping Messaging App Use in European News Consumption Patterns

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Abstract: This study examines the emerging role of messaging apps and end-to-end encryption in news consumption patterns across the European Union. Using data from the Flash Eurobarometer 3153 "Media and News Survey 2023", we employed K-Means cluster analysis to identify five distinct news consumer profiles. Our findings reveal that while messaging apps are used by 15% of EU residents for news consumption, their adoption varies significantly across demographic groups and regions. Notably, omnivorous news consumers show the highest usage (61%) and trust in these platforms, indicating a complementary role to traditional news sources. The study highlights a generational divide, with younger users and those still in education showing a stronger preference for messaging apps. Surprisingly, individuals without formal education also demonstrate high usage, challenging assumptions about the digital divide. This research offers updated, large-scale information on the evolving European news ecosystem, where private, encrypted channels are gaining importance alongside public platforms. Our findings have significant implications for media strategies, policymaking, and understanding the future of news dissemination in an increasingly digital and privacy-conscious Europe.

1. Introduction

Messaging apps represent a shift towards more personal and direct news sharing. Unlike broadcast media or public social media platforms, news shared via messaging apps comes through private channels, often from trusted contacts. This personal touch can lend greater perceived credibility to the information shared, potentially influencing how recipients engage with and trust the news. The nature of messaging apps allows for rapid, real-time dissemination of news. This speed can be crucial during breaking news events, potentially outpacing traditional media in initial information spread. However, this rapidity also presents challenges in terms of fact-checking and verification.

Messaging apps differ from other news sources in their interactive nature. They allow for immediate discussion and interpretation of news among small groups, fostering a more

engaged and participatory form of news consumption. This interactivity can lead to deeper processing of information but also risks the creation of echo chambers.

The use of messaging apps for news is very important in regions where traditional media may be restricted or distrusted. In such contexts, these apps can become highly used alternative channels for information flow, bypassing official censorship or control. However, the private nature of messaging apps also presents challenges. The spread of misinformation can be harder to track and counter compared to more public platforms. This makes media literacy particularly important for users of these apps and for societies in which they are widespread.

Messaging apps, while not yet a dominant news medium, are increasingly carving out a role in the broader news ecosystem. Their rising popularity, particularly among younger demographics, reflects a broader trend of personalization and privatization of news consumption, suggesting that they may continue to grow in importance as the media landscape continues to change.

A comprehensive analysis by the Center for International Media Assistance [1] underscores how encrypted messaging apps have transformed from simple communication tools into essential news distribution channels, particularly in developing countries and emerging democracies. While these platforms offer specific advantages for news dissemination, including enhanced privacy and potential circumvention of state censorship, they also present significant technical constraints. For instance, WhatsApp's limit of the number of members per group created scalability challenges for news organizations. Regional variations in messaging app use for news are significant, with adoption rates ranging from over 50% in countries like Brazil and Malaysia to below 10% in much of North America and Northern Europe. The popularity of these apps is partly driven by economic factors, as they are often included in mobile data plans without additional charges in many countries, making them accessible to broader audiences. This move towards private, encrypted messaging platforms creates three key challenges: how to verify news accuracy, how to reach wider audiences, and how news organizations can remain financially viable while using these platforms.

1.1. Messaging Apps and Misinformation

The increasing role of messaging apps in news consumption brings specific challenges for combating misinformation due to their end-to-end encrypted nature. While encryption is crucial for protecting user privacy and enabling secure communication, particularly in contexts with limited press freedom, it also creates significant barriers to monitoring and addressing false information. According to a report by NYU's Center for Business and Human Rights [2], these platforms are used by billions globally, with WhatsApp alone exceeding 2 billion users. Their private and direct nature makes them particularly appealing for news sharing, with users relying on features like group chats and broadcast channels for rapid information dissemination. In many regions, including parts of the Global South, these apps now rival traditional media in influence, reflecting a significant shift in the news consumption landscape. However, their private nature also complicates efforts to address misinformation.

End-to-end encryption (E2EE) is a communication protocol that ensures message privacy by encrypting content on the sender's device and allowing decryption only on the intended recipient's device, with no intermediate parties—including service providers—able to access the unencrypted content. While this technology effectively protects user privacy and enables secure communication, particularly in contexts with limited press freedom, it also creates significant barriers for content moderation and fact-checking since the encrypted messages remain inaccessible to platform operators, researchers, and other third

parties. This technical characteristic distinguishes messaging apps from other digital communication channels such as social media platforms, podcasts, or blogs, which typically encrypt data during transmission but retain the ability to access content on their servers.

Research from the International Fact-Checking Network [3] indicates that approximately 13% of fact-checked COVID-19-related claims originated from messaging apps, though many more likely circulated undetected due to the private nature of these platforms. This challenge is amplified by what researchers call the "trusted source effect," where messages received through these apps carry greater perceived credibility because they come from friends and family members. The impact of this phenomenon became particularly evident during the COVID-19 pandemic, when messaging app usage increased by over 50% in heavily affected countries, creating optimal conditions for both legitimate news sharing and misinformation spread.

Studies also indicate that messaging apps are being systematically exploited for disinformation campaigns and political manipulation, a phenomenon termed "encrypted propaganda". A comprehensive study by the Center for Media Engagement [4]) documented over 97 distinct cases of coordinated influence operations across the U.S., India, and Mexico, revealing how political actors leverage these apps' encrypted nature to avoid content moderation while still influencing public discourse. The challenge is acute because messaging apps serve multiple strategic purposes: they function as broadcast channels for groups banned from mainstream platforms, recruitment tools that funnel users into private encrypted spaces, and testing grounds for disinformation narratives. For instance, in India, political parties maintain "IT cells" that systematically spread disinformation through thousands of WhatsApp groups, while in the U.S., extremist groups use apps like Telegram as "incubators" for disinformation campaigns they later amplify on public platforms.

The exploitation of messaging apps for spreading misinformation has been pronounced in India, where WhatsApp has emerged as a potent propaganda tool. Research has shown how the app's technological features—including end-to-end encryption (E2EE), multimedia support, and group messaging capabilities—combine with social factors like high trust in personal networks and low digital literacy to create an ideal environment for the spread of fake news. An analysis by Farooq [5] reveals how the app's adoption by over 200 million Indian users has made it a powerful vehicle for political propaganda, with political parties creating thousands of WhatsApp groups for message dissemination. The app's end-to-end encryption not only protects legitimate communication but also makes it nearly impossible to trace the origins of false information, while its support for multimedia content and ease of forwarding enables the rapid spread of misinformation across trusted networks.

1.2. Trends in the Use of Social Media and Messaging Apps for News Consumption

The landscape of news consumption has undergone significant changes from onwards, as documented by the Reuters Institute's (2019–2024) Digital News Reports. These reports reveal a consistent shift towards digital platforms, with traditional media experiencing a gradual decline. While television remained a dominant medium, particularly among older demographics, its usage showed a slight but steady decrease [6]. Concurrently, online news platforms and social media gained prominence, especially among younger users.

One of the most notable trends has been the increasing importance of messaging apps for news consumption. WhatsApp, in particular, emerged as a significant player, especially in the Global South. Social media platforms have maintained their significance in news dissemination, albeit with changing dynamics. Facebook's role in news sharing decreased over the years, while platforms like Instagram and TikTok gained traction, especially among

younger users. The 2024 report highlighted TikTok's rising popularity as a news source, particularly in Latin America, Africa, and parts of Asia.

A clear generational divide in news consumption habits has persisted throughout this period. Younger users, particularly those under 35, consistently showed a preference for social media and messaging apps for news consumption. In contrast, older demographics maintained a stronger reliance on traditional media sources like television and newspapers. The 2021 report emphasized that under-35s, especially in regions like Latin America and parts of Asia, were heavy users of messaging apps for news [7].

Educational background has also been a significant factor in shaping news consumption patterns. Those with lower levels of formal education tended to rely more heavily on social media and messaging apps for news, while higher-educated individuals were more likely to seek news from a broader range of sources, including traditional media and online news platforms. The 2020 report noted that users with lower formal education were more prone to using messaging apps where misinformation risks were higher [8].

Regional differences in the adoption of messaging apps for news are notable. Within the European Union, the uptake has been relatively slower compared to other regions. Northern European countries like Finland and Denmark maintained high trust in traditional news sources and lower reliance on messaging apps [8]). In contrast, Southern European countries, such as Spain and Italy, showed higher adoption of social media and messaging apps for news consumption. The Global South, particularly countries like Brazil, Malaysia, and South Africa, consistently showed high usage of WhatsApp for news, often exceeding 50% of the population [6,8,9]. These regions often viewed messaging apps as more accessible and reliable than traditional media, especially in countries with limited press freedom. North America, particularly the United States, showed lower adoption of messaging apps for news compared to both the European Union (EU) and the Global South, with traditional news sources and websites remaining more prominent [6].

The Reuters reports identify several distinct types of news consumers: traditional media consumers (primarily older demographics), digital news enthusiasts, social media news consumers (predominantly younger users), messaging app news sharers, and omnivorous news consumers who access information from diverse sources.

All Reuters reports from 2019 to 2024 highlighted growing concerns about misinformation, especially on social media and messaging platforms. Trust in news media showed a general decline, with less than 40% of respondents trusting news most of the time by 2020 [8]. The end-to-end encryption offered by messaging apps like WhatsApp presented a double-edged sword, enhancing user privacy while complicating efforts to combat misinformation [8,9]. The increasing use of messaging apps and social media for news consumption also raised concerns about fragmentation and polarization. These platforms often create echo chambers, potentially deepening political and social divides [6,7]. A growing trend of news avoidance also emerged, particularly among younger audiences. The 2024 report noted that more people, for example, in countries like Brazil and Germany, were actively avoiding news due to its overwhelming or negative nature [6].

According to the Flash Eurobarometer Report on Media & News Survey 2023 [10], news consumption in the EU shows distinct patterns, where both traditional and digital media are used differently by different age groups. Overall, television remains the dominant medium, with 71% of respondents using it to access news in the past seven days. However, the use of TV has slightly declined compared to 2022, reflecting a gradual shift towards digital platforms. Online news platforms and radio also maintain significant shares of news consumption, used by 42% and 37% of people, respectively, with relatively stable year-on-year changes.

One of the most notable shifts is the increasing role of social media platforms, which are now used by 37% of the population for news. This growth is particularly prominent among younger generations, signaling a preference for more interactive and real-time news sources. Traditional forms of news, such as printed newspapers, continue to lose ground, while video platforms have also gained modest traction.

Within this landscape, messaging apps are becoming an increasingly important source of news, although they still occupy a smaller share of the total media mix. In 2023, 15% of respondents reported using messaging apps to access news, marking a significant 5% increase from the previous year. This rise is driven primarily by younger users, particularly those in the 15–24 age group, where usage of messaging apps for news has surged by 10%. For this demographic, messaging apps are now an important part of their news consumption habits, alongside social media platforms, which are also seeing a steep rise in this age bracket. Even among older age groups, messaging apps are experiencing growth, though the uptake is slower. Among the 25–39 and 40–54 age groups, messaging apps have gained 7% and 5%, respectively, becoming a supplementary source of news alongside more traditional outlets.

Despite their growing role, messaging apps are still a minor player in the overall news consumption landscape in the EU, especially when compared to TV and other established forms of media. Their appeal, however, lies in their ability to offer personalized, direct news access, often shared within private networks, which is particularly attractive to younger audiences. This trend towards more private, closed-network news sharing indicates a shift in how younger generations prefer to engage with news, moving away from broadcast and public platforms toward more intimate, peer-based environments.

1.3. State of the Art on Social Media in News Consumption

Previous research also indicates that the role of social media in news consumption has developed significantly in recent years, becoming a primary source of information for many users, particularly younger generations. Social media platforms have transformed from mere communication tools to influential news dissemination channels, often serving as the first point of contact with current events for many individuals [11,12]. This shift has led to the emergence of what researchers call the "News Finds Me" perception, where users believe they can stay informed without actively seeking news, relying instead on their social networks and algorithmic recommendations [12]. This passive approach to news consumption is particularly prevalent among younger users, who often encounter news incidentally while using social media for other purposes [13].

The types of social media users in relation to news consumption vary widely. Researchers have identified several categories, including passive users who receive news incidentally, active users who deliberately seek out news across multiple platforms, and socially driven users who rely on their networks to filter and share relevant information [14]. Additionally, some users engage in selective exposure, purposefully filtering news sources based on pre-existing beliefs, while others may avoid news altogether due to information overload [15].

Generational and educational divides play a significant role in shaping news consumption patterns on social media. Younger generations, particularly those aged 15–24, show a stronger preference for digital and social media news sources, often relying on platforms like Instagram and TikTok for information [11]. In contrast, older generations tend to maintain a stronger connection to traditional media sources, although they too are increasingly adopting digital platforms [16]. The impact of social media on news consumption also varies across age groups. Klopfenstein Frei et al. [13] identified distinct patterns among Swiss youth, with those aged 15–17 relying heavily on social media for news, often

consuming it through memes or short posts, while the 18–20 age group showed more intentional news consumption using specialized news apps. This highlights the need for age-specific approaches in media literacy education. Additionally, the study by Russman and Hess [16] on young adults in Austria emphasized the importance of peer influence in news selection and consumption on social media platforms, underscoring the social nature of digital news engagement. Educational background also influences news consumption habits, with higher-educated individuals more likely to seek out diverse news sources and engage critically with the information they encounter [17].

Geographic patterns in social media news consumption vary across regions. While most studies focus on specific countries or regions, some broader trends have been observed. For instance, in the European context, countries like Spain and the UK have shown higher adoption of messaging apps for news consumption compared to France [11]. However, the overall trend towards increased reliance on social media for news appears to be consistent across many Western countries [18].

The use of social media for news consumption presents both upsides and downsides. Different platforms can have varying effects on users' news diets. For instance, while Facebook usage has been associated with increased partisan news consumption, platforms like Reddit have shown a tendency to broaden users' exposure to more moderate content sources [19]. On the positive side, social media platforms offer quick and easy access to a wide variety of news sources, enabling users to stay informed with minimal effort [14]. These platforms also facilitate the democratization of news dissemination, allowing users to share and discuss information within their networks [12].

However, the downsides of social media news consumption are significant. The risk of exposure to misinformation is high, particularly given that many users share news without fully reading or verifying its content [11]. The algorithmic nature of content curation on these platforms can lead to filter bubbles and echo chambers, where users are primarily exposed to information that aligns with their existing beliefs, potentially exacerbating political polarization [18,20]. Furthermore, the abundance of information available through social media can lead to news information overload, causing stress and potentially decreasing overall engagement with news content [15].

1.4. State of the Art on Messaging Apps in News Consumption

Messaging apps have gradually developed as significant platforms for news consumption. These apps, particularly WhatsApp, Telegram, and Facebook Messenger, have become integral to how many people access, share, and discuss news [11,21]. Initially designed for personal communication, these platforms now serve as spaces where users encounter news both intentionally and incidentally. Many individuals rely on messaging apps to stay informed about current events, often receiving news updates through personal contacts or subscribed channels [22].

Different types of users engage with news on messaging apps in various ways. Kalogeropoulos [22] identified users who actively seek out news, those who share news for social reasons, and others who value the efficiency of receiving news updates. Lottridge and Bentley [23] noted that some users share news across multiple platforms, while others prefer the privacy of messaging apps for news-related discussions. The motivations for using these apps vary, with some users valuing the quick access to bite-sized news updates [21], while others appreciate the ability to engage in more in-depth discussions within trusted circles [24].

Generational and educational divides are evident in how messaging apps are used for news consumption. Younger users, particularly those aged 15–24, show a stronger preference for receiving news through these platforms [11]. Klopfenstein Frei et al. [13]

found that adolescents and young adults often consume news through messaging apps in bite-sized formats, such as memes or short posts. Herrero-Diz et al. [25] observed that teenagers in Spain frequently share news, including fake news, impulsively on WhatsApp, driven more by emotional than factual considerations.

However, the pattern is not uniform across all regions. In Brazil, for instance, older users are more likely to share news via messaging apps [22]. Educational background also influences news consumption patterns on messaging apps. Users with higher education levels tend to engage more critically with news content and are more likely to use these apps for professional information gathering [21]. Conversely, those with lower formal education may be more susceptible to misinformation spread through these channels [26].

Geographic patterns in messaging app use for news consumption also vary. WhatsApp, for example, is particularly popular for news sharing in countries like Brazil, Spain, and Malaysia [22,27]. In Singapore, Telegram has gained traction as a news source [21]. These regional differences often reflect broader cultural and technological trends in media consumption.

The use of messaging apps for news consumption presents both upsides and downsides. On the positive side, these apps offer privacy, convenience, and personalized news experiences. Users appreciate the ease of receiving news updates directly on their phones and the ability to discuss news within trusted circles [28]. The apps also facilitate quick dissemination of breaking news and allow for more intimate, targeted communication between news outlets and their audiences [29]. During crisis events like the COVID-19 pandemic, messaging apps played a crucial role in keeping people informed and connected [26,28].

However, there are significant downsides. The spread of misinformation is a major concern, as the private nature of these apps makes it challenging to monitor and fact-check shared content [27,30]. The end-to-end encryption used by many of these apps, while protecting user privacy, also hinders efforts to combat fake news [31]. Additionally, news consumption through messaging apps can be superficial, with users often engaging only with headlines or short summaries, potentially missing important context [21].

Furthermore, messaging apps can contribute to the formation of echo chambers, where users are primarily exposed to news that aligns with their existing beliefs [32]. This can lead to increased polarization and a fragmented understanding of current events. The apps' role in news dissemination also raises concerns about the commodification of user data and the potential for manipulation of public opinion, especially in politically sensitive contexts [33]. In the context of political movements and authoritarian regimes, Trauthig et al. [31] observed that while encrypted messaging apps can provide safe spaces for activists to organize and share information, they can also be exploited by state actors to spread propaganda.

1.5. State of the Art on End-to-End Encryption in News Consumption

End-to-end encryption has become an essential feature in messaging apps, significantly influencing how news is consumed and shared in digital spaces. The implementation of E2EE in popular platforms like WhatsApp, Signal, and Telegram has been driven by growing concerns over personal data privacy and security, especially in the wake of data scandals such as the Cambridge Analytica incident [34]. This technology ensures that only the sender and recipient can access the content of messages, theoretically providing a high level of privacy protection against unauthorized access by service providers, governments, or malicious actors. The adoption of E2EE in messaging apps also has important implications for news consumption and circulation. It creates a safer environment for journalists, dissidents, and activists to share sensitive information, particularly in repressive regimes where government surveillance is a concern [34]. This protection can potentially

enhance the circulation of uncensored information and support press freedom. However, the same technology that protects legitimate news sharing can also be exploited by criminals and terrorists to communicate without fear of interception, raising concerns among law enforcement agencies [34].

Despite the technical robustness of E2EE, its effectiveness in practice is often compromised by human factors and usability issues. Shirvanian et al. [35] found that users struggle with key-fingerprint verification, especially in remote communication scenarios, leading to high error rates and vulnerabilities to man-in-the-middle attacks. This weakness in the human element of encryption could potentially impact the integrity and trustworthiness of news shared through these channels. The study revealed that in remote settings, false acceptance rates in numeric code verification could reach up to 40%, significantly increasing the risk of successful attacks [35].

Furthermore, Dechand et al. [36] revealed a surprising lack of trust and understanding among users regarding E2EE, even after its implementation in widely used apps like WhatsApp. Many users were unaware that their messages were encrypted or did not understand the significance of this feature. This study found that nine months after WhatsApp introduced E2EE, many users were still oblivious to the fact that their messages were encrypted. Even those who noticed the encryption notifications often failed to grasp their importance [36]. This lack of awareness and trust could influence how freely people share or consume news through these platforms, potentially limiting the impact of E2EE on news circulation.

The technical aspects of E2EE also present challenges in the context of news consumption. Chase et al. [37] highlighted the vulnerabilities in key management systems, where users must trust service providers to correctly distribute public keys. If compromised, this could allow for undetected surveillance, potentially impacting the security of news-related communications. Their proposed solution, SEEMless, offers a way for users to verify their keys without compromising privacy, which could enhance trust in encrypted news sharing. This system allows users to monitor their keys and verify that the keys distributed on their behalf are correct, ensuring better integrity in the flow of information without overly trusting the service provider [37].

While E2EE provides strong technical protection for private communications, including news-related content, its effectiveness is often undermined by usability issues and user misconceptions. Many users overestimate the ability of attackers to break encryption and underestimate the security provided by E2EE apps compared to less secure alternatives like SMS [37]. These misconceptions could influence how people choose to consume or share news, potentially leading them to use less secure channels out of misplaced trust.

The implementation of E2EE in messaging apps also raises questions about its impact on broader information circuits and public discourse. While E2EE can protect private communications, including news sharing, it also presents challenges for content moderation and fact-checking efforts. This dual nature of E2EE—providing security while potentially enabling the spread of misinformation—highlights the relationship between privacy, security, and public information integrity in digital spaces [34].

The seamless integration of E2EE in popular apps like WhatsApp and iMessage has improved usability compared to older, more complex encryption tools like PGP [37]. However, this ease of use does not necessarily translate to better understanding or trust among users. Many still believe that companies can access their messages, despite assurances to the contrary, and some incorrectly think that SMS is more secure than WhatsApp because it does not involve the internet [37]. These misconceptions underscore the challenges in educating users about the benefits and limitations of E2EE in the context of news consumption and sharing.

Based on the data analysis and literature review, this article aims to address several key research questions. Primarily, it seeks to identify patterns of news consumption sources, focusing on the role of messaging apps and end-to-end encryption in a wider landscape of information sources. It then aims to understand how different news consumption patterns, identified through cluster analysis, relate to trust in various media sources across the European Union. The study explores the extent to which age and educational differences are associated with patterns of news sources and with the adoption and use of messaging apps for news consumption among EU residents. Additionally, it investigates the regional patterns within the EU that affect the use of messaging apps for news consumption.

The remainder of this article is structured as follows: Section 2 details the data sources, key variables, and analytical approaches used, including the K-Means cluster analysis. Section 3 presents our findings, beginning with the outcomes of the cluster analysis that identified five distinct news consumption profiles. It then examines patterns of trust in various media sources across these clusters, followed by an analysis of socio-demographic profiles associated with each cluster, including age, gender, and educational background. The section concludes with an exploration of the geographic distribution of these clusters across EU member states. Section 4 interprets these results in the context of digital divides, fragmentation, and potential echo chamber effects, considering their implications for public discourse and political engagement. Finally, Section 5 summarizes the key findings and their significance for understanding the evolving landscape of news consumption in the EU.

2. Materials and Methods

This study employs secondary data analysis using the dataset from the Flash Eurobarometer 3153 "Media and News Survey 2023" [38]. The survey was conducted across all 27 EU member states, and the sample was designed to be representative of the general population aged 15 years and older in each country. To ensure that our findings are representative of the EU27 population, we applied appropriate weighting to the data.

The survey included various measures related to news consumption habits, trust in different media sources, and socio-demographic characteristics. Key variables used in our analysis include news consumption across different media types (e.g., radio, TV, written press, online platforms, social media, messaging apps), trust in various news sources, socio-demographic variables (age, gender, education level), and country of residence.

To identify distinct patterns of news consumption, we employed K-Means cluster analysis, an unsupervised machine learning algorithm that partitions observations into k clusters based on their similarity. In our implementation, each respondent was represented as a point in a 9-dimensional space, where each dimension corresponded to one of our news source variables (radio, TV, written press, online platforms, video platforms, podcasts, social media, messaging apps, and blogs). The K-Means algorithm iteratively assigned each respondent to the nearest cluster center and updated these centers by computing the mean of all points assigned to each cluster. We initialized the algorithm with randomly selected cluster centers and repeated the process multiple times to ensure the stability of the solution. We opted for a 5-cluster solution, as it provided the optimal balance between nuanced classification and interpretability. This decision was based on the criterion of maximizing the number of clusters while minimizing the generation of clusters with 100% representation, which could potentially be a statistical artifact rather than a meaningful grouping.

The resulting five clusters were: traditional media consumers, digital social media users, online news enthusiasts, omnivorous news consumers, and traditional broadcast consumers. Following the cluster analysis, we conducted descriptive analyses to characterize each cluster based on news consumption habits, trust in media sources, and

socio-demographic profiles. We also examined the distribution of these clusters across EU member states to identify potential geographic patterns in news consumption.

All analyses were conducted using weighted data to ensure that the findings are representative of the EU27 population. Statistical analyses were performed using IBM SPSS software version 29.0.2.0, and visualizations were made with Excel from Microsoft Office 365.

Indicators of media use represent answers to the following question: "Among the following, what media have you used the most to access news in the past 7 days? Firstly? [Single answer]", summed with answers to the next question, "And then? [Multiple answers allowed]".

According to the descriptive statistics presented in Table 1, television remains the dominant news source, used by 71% of the population (firstly or secondarily), underscoring its continued relevance in the digital age. Online press and news platforms follow, with 42% of people using them, reflecting the growing importance of digital news consumption.

Table 1 presents the descriptive statistics for all variables used in our analysis. For media use and trust variables, which are binary (coded as 0 for 'no' and 1 for 'yes'), the minimum (Min.) is always 0 and maximum (Max.) is always 1. For these variables, the mean represents the proportion of respondents who answered 'yes' (e.g., a mean of 0.37 for radio indicates that 37% of respondents used radio for news), while the standard deviation (Std. Dev.) indicates the spread of these binary responses. For continuous variables like age, the statistics represent actual values: minimum and maximum show the range (15–99 years), mean shows the average age (48.24 years), and standard deviation (17.28) indicates the typical deviation from this average. All statistics were computed using weighted data to ensure representativeness of the EU27 population.

Radio and social media platforms are tied at 37% each, demonstrating the enduring appeal of traditional broadcast alongside the rise of new digital platforms. Written press is used by 21% of people, indicating a significant decrease from its historical dominance but still maintaining a notable presence.

Table 1. Descriptive statistics for the variables used in the analysis. Source: Authors' analysis of Flash Eurobarometer 3153 data.

Variable		N	Min.	Max.	Mean	Std. Dev.
	Traditional media:					
	• Radio	25,951	0.00	1.00	0.37	0.48
	• TV	25,951	0.00	1.00	0.71	0.45
	• Written press	25,951	0.00	1.00	0.21	0.41
	New media:					
Media used the most to access news in the past 7 days	• Online press and news platforms	25,951	0.00	1.00	0.42	0.49
	• Video platforms (e.g., YouTube)	25,951	0.00	1.00	0.19	0.39
	• Podcasts	25,951	0.00	1.00	0.07	0.26
	• Social media platforms (e.g., Facebook, Instagram)	25,951	0.00	1.00	0.37	0.48
	• Messaging apps (e.g., WhatsApp, Messenger)	25,951	0.00	1.00	0.15	0.36
	• Blogs	25,951	0.00	1.00	0.04	0.20

Table 1. *Cont.*

Variable		N	Min.	Max.	Mean	Std. Dev.
Most trusted news source	**Traditional media:**	25,951	0.00	1.00	0.48	0.50
	• Public TV and radio stations, including online presence					
	• Private TV and radio stations, including online presence	25,951	0.00	1.00	0.29	0.46
	• Written press, including online presence	25,951	0.00	1.00	0.38	0.49
	New media:					
	• Other online platforms, including blogs and podcasts	25,951	0.00	1.00	0.12	0.33
	• YouTube and other video platforms	25,951	0.00	1.00	0.14	0.35
	• People, groups, or friends I follow on social media or messaging platforms	25,951	0.00	1.00	0.16	0.37
	• Influencers on social media channels (e.g., YouTube, Instagram, TikTok, etc.)	25,951	0.00	1.00	0.09	0.28
	• Other	25,951	0.00	1.00	0.06	0.24
	• Don't know	25,951	0.00	1.00	0.11	0.31
Socio-demographics	Age	25,951	15.00	99.00	48.24	17.28
	Gender	25,868	1.00	2.00	1.52	0.50
	Age at graduation	24,587	0.00	99.00	20.98	6.52
	Respondent is still studying	24,587	0.00	1.00	0.11	0.31
	Valid N (listwise)	24,521				

Emerging platforms show varying levels of adoption: video platforms like YouTube are used by 19% for news, messaging apps by 15%, podcasts by 7%, and blogs by 4%. This distribution suggests potential areas for growth in news dissemination.

The data paints a picture of a hybrid news ecosystem where traditional and new media coexist. Many individuals use multiple sources for their news, combining TV and radio with online platforms and social media (see Figure 1 below).
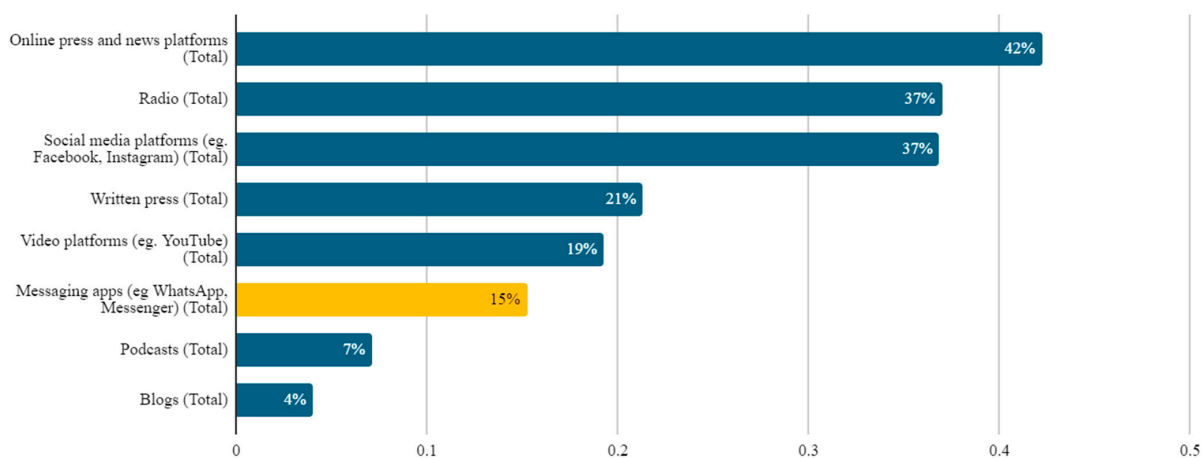

Figure 1. Respondents' reported use of media used the most to access news in the past 7 days. The yellow bar of the figure designates messaging apps, the media of interest in this article. The blue bars of the figure designate other media. Source: Authors' analysis of Flash Eurobarometer 3153 data.

3. Results

Our analysis of news consumption patterns across the European Union shows a diverse landscape where traditional and digital media coexist, with messaging apps emerging as a significant, albeit not yet dominant, player. This section presents the findings of our cluster analysis, which identified five distinct news consumer profiles, and explores how these profiles relate to the use of messaging apps and perceptions of trust in various news sources. We then examine the socio-demographic characteristics associated with each cluster, focusing particularly on age and educational differences. Finally, we present the geographic distribution of these clusters across EU member states, highlighting regional variations in news consumption habits, with special attention to the adoption of messaging apps. Throughout this section, we emphasize the role of messaging apps and the potential influence of end-to-end encryption on news consumption patterns and trust in news sources.

3.1. Cluster Analysis

The K-Means cluster analysis (see Table 2) reveals specific patterns in how people consume news across various channels. Cluster 1 represents traditional media consumers who rely heavily on television for their news, with a score of 0.94. They supplement this with moderate use of social media (0.65) and some engagement with written press (0.48). However, their usage of other news channels is minimal, suggesting a preference for conventional news sources.

Table 2. Cluster analysis of news consumption across various news sources. Source: Authors' analysis of Flash Eurobarometer 3153 data.

News Source	Traditional Media Consumers	Digital Social Media Users	Online News Enthusiasts	Omnivorous News Consumers	Traditional Broadcast Consumers
Radio	0.03	0.15	0.32	0.67	0.63
TV	0.94	0.00	0.82	0.94	0.81
Written press	0.48	0.07	0.18	0.43	0.10
Online press and news platforms	0.03	0.47	1.00	0.72	0.00
Video platforms (e.g., YouTube)	0.07	0.43	0.04	0.72	0.10
Podcasts	0.04	0.11	0.05	0.24	0.04
Social media platforms (e.g., Facebook, Instagram)	0.65	0.78	0.11	0.89	0.06
Messaging apps (e.g., WhatsApp, Messenger)	0.08	0.27	0.03	0.61	0.09
Blogs	0.02	0.06	0.02	0.16	0.02
N (weighted for EU27)	4345	4226	7038	2472	7870
% within EU27	16.74%	16.28%	27.12%	9.53%	30.33%

Cluster 2 can be characterized as digital social media users. This group shows a strong preference for obtaining news through social media platforms (0.78) and makes moderate use of online press and news platforms (0.47). They also engage significantly with video platforms like YouTube (0.43) and use messaging apps to some extent (0.27). Notably, this cluster shows very low or no engagement with traditional media such as TV, radio, or written press, indicating a clear shift towards digital news consumption.

The third cluster represents online news enthusiasts. These consumers rely almost exclusively on online press and news platforms, with a perfect score of 1.00. They complement this with moderate TV viewing (0.82) and some radio usage (0.32). Their engagement with

other news sources is low, suggesting a focused approach to news consumption primarily through digital channels.

Cluster 4 stands out as omnivorous news consumers. This group shows high engagement across multiple platforms, demonstrating the highest usage rates for most channels. They consume news heavily from radio (0.67), TV (0.94), video platforms (0.72), podcasts (0.24), social media (0.89), and messaging apps (0.61). They also make significant use of online press (0.72) and written press (0.43). This cluster represents individuals who actively seek news from a wide variety of sources, embracing both traditional and digital media.

Finally, Cluster 5 can be described as traditional Broadcast Consumers. This group strongly prefers conventional broadcast media for their news, with high reliance on radio (0.63) and TV (0.81). Their engagement with digital platforms and written press is very low, indicating a preference for audio-visual news delivery through traditional channels.

The comparative relevance of messaging apps in acquiring news varies significantly across the different clusters identified in the analysis (see Figure 2). They appear to be most significant for those who actively engage with a wide variety of news sources, rather than being a primary news source for any particular group. This underscores the complementary role that messaging apps currently play in the broader news ecosystem.
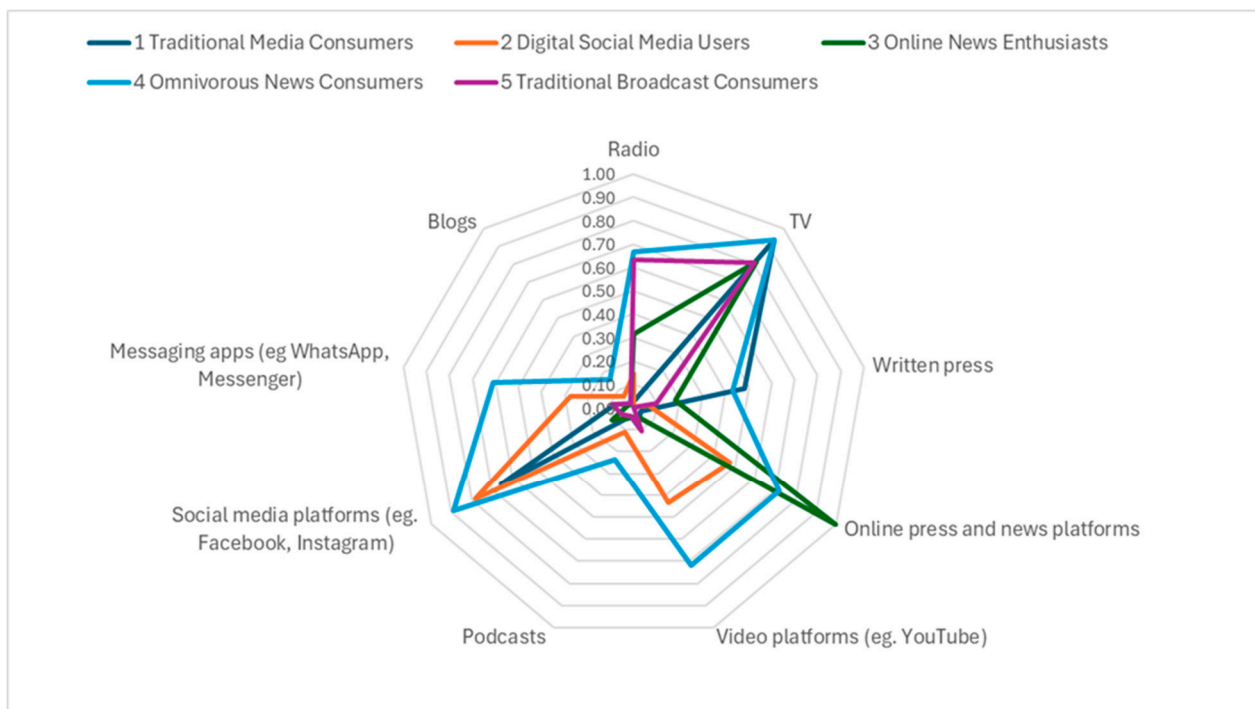
Figure 2. Radar chart of cluster profiles concerning media use. Source: Authors' analysis of Flash Eurobarometer 3153 data.

Among all the clusters, messaging apps appear to be most relevant for the omnivorous news consumers. This group shows the highest usage of messaging apps for news, with a score of 0.61. This substantial usage suggests that for these diverse consumers, messaging apps play a significant role in their news acquisition, likely complementing the wide array of other sources they utilize. In contrast, the digital social media users show a moderate level of engagement with messaging apps, scoring 0.27. While not as high as their usage of social media platforms or online news sites, this score indicates that messaging apps do play a noticeable role in their news consumption. For this digitally oriented group, messaging apps seem to be one component of a broader digital news strategy.

The traditional media consumers, traditional broadcast consumers, and online news enthusiasts all show relatively low usage of messaging apps for news, with scores of 0.08, 0.09, and 0.03, respectively. This suggests that for these groups, messaging apps are not a significant source of news information. They seem to prefer other channels that align more closely with their primary news consumption habits.

It is particularly interesting to note that even among the digital social media users, messaging apps are not as prominent for news acquisition as one might expect. This could indicate that while these apps are widely used for communication, their role in news dissemination is still evolving.

The disparity between the high usage by omnivorous news consumers and the low usage by other groups suggests that messaging apps may serve as a supplementary news source for those who are already engaged with multiple news platforms. It is possible that these users receive news shares or discuss news events through messaging apps as part of their broader news consumption behavior.

3.2. Trust in Media

Table 3 presents the level of trust in different news sources across the identified clusters. For each news source and cluster, we computed the mean value of the binary trust variable (coded as 0 for 'not trusted' and 1 for 'trusted') among all respondents belonging to that cluster. For example, a mean value of 0.50 for 'Public TV and radio stations' in the traditional media consumers cluster indicates that 50% of the respondents in this cluster selected public broadcasting as a trusted news source. These calculations were performed using weighted data to ensure representativeness of the EU27 population. The values in each row thus represent the proportion of cluster members who trust that particular news source, allowing for direct comparisons of trust patterns both within and across clusters.

Table 3. The most trusted news sources of cluster profiles. Source: Authors' analysis of Flash Eurobarometer 3153 data.

Most Trusted News Source	Traditional Media Consumers	Digital Social Media Users	Online News Enthusiasts	Omnivorous News Consumers	Traditional Broadcast Consumers
	Mean	Mean	Mean	Mean	Mean
Public TV and radio stations, including online presence	0.50	0.32	0.55	0.49	0.48
Private TV and radio stations, including online presence	0.28	0.22	0.35	0.39	0.26
Written press, including online presence	0.43	0.29	0.49	0.43	0.29
Other online platforms, including blogs, podcasts	0.11	0.20	0.13	0.19	0.06
YouTube and other video platforms	0.13	0.24	0.09	0.28	0.10
People, groups, or friends I follow on social media or messaging platforms	0.17	0.24	0.11	0.29	0.11
Influencers on social media channels (e.g., YouTube, Instagram, TikTok, etc.)	0.11	0.14	0.04	0.17	0.07
Other	0.05	0.06	0.06	0.04	0.07
Don't know	0.09	0.10	0.08	0.04	0.17

Traditional media consumers show a high level of trust in public TV and radio stations (0.50) and in written press (0.43), while displaying lower trust in digital platforms like YouTube (0.13) and social media influencers (0.11). This pattern aligns with their preference

for conventional news sources and suggests a skepticism towards newer, digital-first media formats.

Digital social media users, interestingly, show lower overall trust across most media types compared to other clusters. Their highest trust is in public TV and radio (0.32), but this is still lower than other clusters' trust in the same medium. They show relatively higher trust in YouTube (0.24) and social media contacts (0.24) compared to other clusters, reflecting their digital-centric news consumption habits.

Online news enthusiasts display the highest trust in public TV and radio (0.55) and written press (0.49) among all clusters. This suggests that despite their preference for online news, they still place high value on traditional journalistic sources, possibly accessing these through their digital platforms.

Omnivorous news consumers show relatively high trust across most media types, with notably higher trust in private TV and radio (0.39), YouTube (0.28), and social media contacts (0.29) compared to other clusters. This reflects their diverse news diet and openness to various information sources.

Traditional broadcast consumers show moderate trust in public TV and radio (0.48) but lower trust in written press (0.29) compared to some other clusters. They also display the lowest trust in online platforms (0.06) and YouTube (0.10), aligning with their preference for broadcast media. The "Don't know" responses are highest among traditional Broadcast Consumers (0.17), which might indicate a level of uncertainty or disengagement with the broader media landscape beyond their preferred broadcast sources.

Across all clusters, public TV and radio stations maintain the highest trust levels, suggesting the enduring credibility of public service media. Conversely, social media influencers and "other" sources consistently receive the lowest trust scores, indicating a general skepticism towards these newer, less regulated information sources. Regarding trust in social media and messaging apps, the data reveals interesting variations. Omnivorous news consumers show the highest trust in social media and messaging platforms (0.29), significantly above the other clusters. This aligns with their diverse news consumption habits and suggests they are more comfortable navigating and trusting information from various sources, including social and messaging apps. Digital social media users, perhaps surprisingly, show the second-highest trust level (0.24) in these platforms. While this is higher than other clusters, it is notable that their trust in social media and messaging apps is not markedly higher than their trust in traditional sources like public TV and radio (0.32). This indicates that even users who frequently consume news via social media maintain a degree of skepticism about the information they encounter on these platforms. As expected, traditional media consumers and traditional broadcast consumers show similar, relatively low levels of trust in social media and messaging platforms (0.17 and 0.11, respectively). This aligns with their preference for conventional news sources and indicates a hesitancy to trust information from social media and messaging apps. Online news enthusiasts display the second-lowest trust in social media and messaging platforms (0.11), despite their comfort with digital media. This could suggest that while they prefer online news sources, they are discerning in their trust, favoring established online news outlets over social media and messaging apps for reliable information.

3.3. Socio-Demographic Profiles

Our findings indicate a clear generational divide in news consumption habits, which can be seen in Table 4. Younger generations show a stronger affinity for digital and social media news sources, while older generations tend to favor online news platforms and traditional broadcast media.

Table 4. Age distribution of clusters. Source: Authors' analysis of Flash Eurobarometer 3153 data.

Age Group	Traditional Media Consumers	Digital Social Media Users	Online News Enthusiasts	Omnivorous News Consumers	Traditional Broadcast Consumers	Total
15–24 years	19%	38%	12%	10%	21%	100%
25–34 years	17%	27%	20%	14%	23%	100%
35–44 years	16%	19%	26%	11%	29%	100%
45–54 years	14%	13%	31%	9%	33%	100%
55–64 years	14%	8%	32%	9%	37%	100%
65 years and older	20%	6%	34%	7%	34%	100%
Total	17%	16%	27%	10%	30%	100%

The youngest age group, 15–24 years, makes up a higher share of digital social media users (38%), significantly higher than any other cluster for this age group. This suggests that younger individuals are more likely to rely on social media platforms for their news consumption. However, they also have a substantial representation in the traditional broadcast consumers cluster (21%), indicating that traditional media still plays a role in their news diet.

As we move to the 25–34 age group, we see a more balanced distribution. While digital social media users remain prominent (27%), there is an increase in online news enthusiasts (20%) and traditional broadcast consumers (23%). This suggests the use of diverse news sources among individuals who are in their early adulthood.

The 35–44 age group marks a shift towards more traditional and online news consumption. Online news enthusiasts (26%) and traditional broadcast consumers (29%) are the dominant clusters, while digital social media users decrease to 19%.

For the 45–54 and 55–64 age groups, we observe a further shift towards online news enthusiasts (31% and 32%, respectively) and traditional broadcast consumers (33% and 37%). The proportion of digital social media users continues to decline with age, dropping to 13% and 8%, respectively.

The oldest age group, 65 years and older, shows the highest proportions in online news enthusiasts (34%) and traditional broadcast consumers (34%). Interestingly, this group also has the highest percentage of traditional media consumers (20%) among all age groups, suggesting a continued reliance on conventional news formats.

Across all age groups, the omnivorous news consumers cluster remains relatively consistent, ranging from 7% to 14%, with the highest proportion in the 25–34 age group. This suggests that diversified news consumption across multiple platforms is a behavior adopted by a small but stable proportion of individuals across all ages.

The traditional media consumers cluster shows an interesting U-shaped distribution, with higher percentages in the youngest and oldest age groups (19% and 20%, respectively) and lower percentages in the middle age ranges.

The data in Table 5 indicate that gender is not a strong influence on news consumption patterns.

Table 5. Gender distribution of clusters. Source: Authors' analysis of Flash Eurobarometer 3153 data.

Gender	Traditional Media Consumers	Digital Social Media Users	Online News Enthusiasts	Omnivorous News Consumers	Traditional Broadcast Consumers	Total
Male	15%	17%	28%	10%	30%	100%
Female	18%	16%	26%	9%	31%	100%
Total	17%	16%	27%	10%	30%	100%

Note: People who identify with another gender, neither male nor female, were not included in the analysis because of the small number of cases (N = 83).

The similarities between male and female news consumption habits across most clusters suggest that other factors, such as age or geographical location, likely play more significant roles in shaping news consumption behaviors.

Our data also show how educational background is associated with news consumption habits (see Table 6 below).

Table 6. Distribution of clusters based on the level of education. Source: Authors' analysis of Flash Eurobarometer 3153 data.

Age When the Respondent Stopped Full-Time Education	Traditional Media Consumers	Digital Social Media Users	Online News Enthusiasts	Omnivorous News Consumers	Traditional Broadcast Consumers	Total
Up to 15 years	20%	11%	20%	5%	44%	100%
16–19 years	18%	12%	27%	9%	34%	100%
20 years and older	15%	15%	32%	11%	27%	100%
Still in full-time education	19%	34%	15%	10%	22%	100%
Never been in full-time education	14%	30%	19%	8%	29%	100%
Total	17%	16%	27%	10%	30%	100%

The most interesting pattern is observed in the group still in full-time education. This group shows the highest percentage of digital social media users (34%), substantially above the overall average of 16%. They also have the lowest percentage of online news enthusiasts (15%) and traditional broadcast consumers (22%), indicating a clear preference for digital and social media platforms for news consumption among students.

Those who completed education at 15 or earlier show a strong inclination towards traditional broadcast consumers (44%), significantly higher than any other group. They also have the lowest percentage of digital social media users (11%) and omnivorous news consumers (5%), suggesting a preference for more traditional news sources.

Individuals who completed education between 16 and 19 years show a distribution closer to the overall average, with a slight skew towards traditional broadcast consumers (34%).

Those with higher education (20 years and older) demonstrate the highest percentage of online news enthusiasts (32%) and the lowest of traditional broadcast consumers (27%). They also show a higher-than-average proportion of omnivorous news consumers (11%), indicating more diverse news consumption habits.

Interestingly, the category that has never been in full-time education shows a high percentage of digital social media users (30%), second only to those still in education. This could suggest that social media serves as a primary news source for this group, possibly due to its accessibility.

The traditional media consumers cluster shows less variation across educational levels than other clusters, ranging from 14% to 20%, suggesting that preference for traditional media is less influenced by the level of education.

3.4. Country Distribution

When examining the five identified clusters, we observe distinct trends among the larger EU nations. In the traditional media consumers cluster (Figure 3a), most countries show a consistent range of 14% to 21%, with Italy, Spain, and Portugal at the higher end. Poland stands out with a notably low 9% in this category. The digital social media users cluster (Figure 3b) exhibits more variation, with higher percentages in countries like Ireland (29%) and Greece (27%), contrasting with lower rates in Portugal (11%) and Italy (12%).
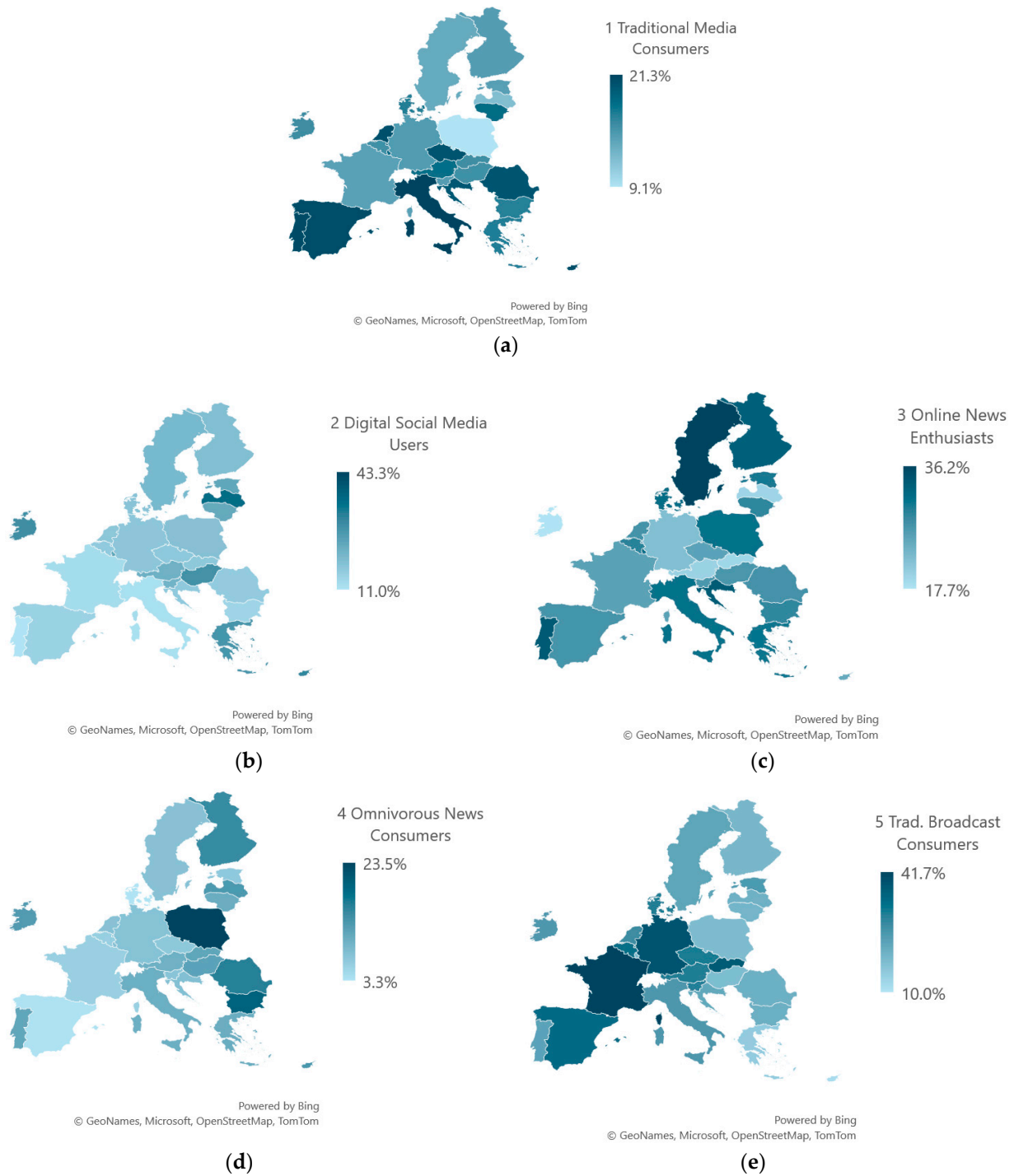
Figure 3. (**a**) Country distribution of traditional media consumers; (**b**) country distribution of digital social media users; (**c**) country distribution of online news enthusiasts; (**d**) country distribution of omnivorous news consumers; (**e**) country distribution of traditional broadcast consumers. Source: Authors' analysis of Flash Eurobarometer 3153 data.

The online news enthusiasts cluster (Figure 3c) is well-represented across many countries, with Sweden leading at 36%, followed closely by Portugal and Croatia at 34%. Ireland and Latvia show the lowest percentages in this category at 18% and 19%, respectively. The omnivorous news consumers cluster (Figure 3d) generally shows lower percentages compared to others, indicating that diversified news consumption across multiple platforms is less common. Poland has the highest proportion at 23%, while Denmark has the lowest at 3%.

The traditional broadcast consumers cluster (Figure 3e) demonstrates the widest variation among countries. France leads with 42%, followed by Germany (39%) and Slovakia (37%). Greece has the lowest percentage in this cluster at 15%.

Western European countries, particularly France and Germany, tend to have higher percentages in the traditional broadcast consumers cluster (see Table 7). Eastern European countries show more diverse patterns, with some, like Poland, having higher percentages of omnivorous news consumers. Nordic countries generally have higher percentages in the online news enthusiasts cluster, although they show varying patterns overall.

Table 7. Country distribution of clusters across EU. Source: Authors' analysis of Flash Eurobarometer 3153 data.

Country	Traditional Media Consumers	Digital Social Media Users	Online News Enthusiasts	Omnivorous News Consumers	Traditional Broadcast Consumers	Total
France	14%	13%	25%	6%	42%	100%
Belgium	16%	16%	29%	6%	33%	100%
Netherlands	20%	17%	27%	8%	28%	100%
Germany	15%	17%	22%	8%	39%	100%
Italy	21%	12%	31%	10%	25%	100%
Luxembourg	18%	24%	32%	8%	18%	100%
Denmark	17%	18%	32%	3%	31%	100%
Republic of Ireland	16%	29%	18%	13%	25%	100%
Greece	17%	27%	31%	10%	15%	100%
Spain	21%	15%	27%	4%	34%	100%
Portugal	21%	11%	34%	11%	23%	100%
Finland	15%	19%	33%	15%	19%	100%
Sweden	14%	20%	36%	8%	23%	100%
Austria	18%	22%	20%	10%	31%	100%
Cyprus	21%	30%	25%	13%	11%	100%
Czech Republic	20%	17%	25%	7%	31%	100%
Estonia	14%	24%	30%	7%	25%	100%
Hungary	16%	28%	27%	12%	18%	100%
Latvia	12%	35%	19%	13%	20%	100%
Lithuania	18%	23%	29%	10%	20%	100%
Malta	20%	43%	20%	7%	10%	100%
Poland	9%	18%	31%	23%	18%	100%
Slovakia	16%	17%	19%	11%	37%	100%
Slovenia	15%	21%	27%	7%	30%	100%
Bulgaria	17%	14%	29%	20%	21%	100%
Romania	20%	16%	27%	16%	21%	100%
Croatia	20%	16%	34%	8%	22%	100%
Total	17%	16%	27%	10%	30%	100%

Southern European countries like Italy, Spain, and Portugal display diverse patterns, with significant representation in both traditional and online news consumption clusters.

4. Discussion

Our cluster analysis of news consumption patterns across the EU reveals several significant sources of potential disconnection in news sharing, which could contribute to fragmentation in the public sphere. These divides, when examined through the lens of

digital divides, fragmentations, bubbles, and echo chambers, paint an interesting picture of how news consumption might be shaping public discourse.

A clear digital divide emerges along age lines, with younger age groups, particularly those still in full-time education, dominating the digital social media users cluster. In contrast, older age groups show a stronger preference for traditional broadcast media. This age-based divide in news consumption methods risks creating generational echo chambers, where different age groups are exposed to different types of news and potentially different political narratives.

Educational fragmentation is also evident, with higher-educated individuals showing a stronger preference for online news platforms, while those with lower levels of education heavily favor traditional broadcast media. This educational divide in news consumption could lead to information inequality, where different educational groups are exposed to varying depths and types of information, potentially affecting the quality of democratic participation. However, our results also show that people without full-time education are intensive digital social media users.

The existence of distinct clusters like digital social media users and traditional media consumers suggests the potential for platform-based bubbles. Users in these clusters may be exposed to news filtered through very different lenses, potentially reinforcing existing beliefs and limiting exposure to diverse viewpoints. This siloing effect could contribute to polarization in political discourse.

Geographic disconnections are apparent in the country distribution data, which reveals significant variations in news consumption patterns across EU countries. These geographic differences in preferred news sources could lead to disconnections in how political issues are perceived and discussed across different EU member states, potentially challenging EU-wide political cohesion.

While messaging apps are used by only a small proportion of the population for news, they represent a potential source of fragmentation. The private nature of these apps can create micro-networks where news is shared within closed groups, potentially reinforcing existing views and limiting exposure to diverse perspectives. This micro-network effect, while currently limited, presents a risk of small group polarization away from broader public discourse.

The omnivorous news consumers cluster, though relatively small, represents a group less likely to be caught in single-source bubbles. However, the existence of clusters heavily reliant on single types of sources suggests a risk of limited exposure to diverse news sources for a significant proportion of the population, further contributing to potential echo chamber effects.

These patterns in news consumption could significantly impact the political sphere. The age-based divide may hinder cross-generational political discourse, as different age groups may operate with different sets of information and priorities. The educational divide could lead to disparities in the quality and depth of political information different groups are exposed to. Platform-based clusters suggest a risk of echo chamber effects, potentially polarizing political discourse. Geographic variations in news consumption patterns could challenge EU-wide political cohesion, as citizens of different countries may have varying levels of exposure to and engagement with EU-level political issues.

While the data does not directly measure fragmentation, it reveals patterns in news consumption that could contribute to public sphere fragmentation. The divides along age, education, preferred platforms, and geographic lines suggest multiple vectors along which political discourse could become disconnected or polarized. Addressing these potential sources of fragmentation would be very important for maintaining a cohesive and well-informed public sphere across the EU.

4.1. Contributions to the State of the Art

Our findings on the use of messaging apps for news consumption in the EU contribute to several key themes in the current literature. The relatively low overall usage of messaging apps for news (15% of respondents) across our identified clusters is consistent with previous research indicating that while messaging apps are increasingly important for news dissemination, they are not yet a dominant news medium in many regions [11,22]. The highest usage of messaging apps for news was observed in our omnivorous news consumers cluster (61%), which aligns with Kalogeropoulos's [22] finding that those who actively seek out news are more likely to use messaging apps for this purpose. This group's diverse news diet, including substantial use of messaging apps, supports Lou et al.'s [21] observation that some users value these platforms for quick access to bite-sized news updates as part of a broader news consumption strategy.

Our data indicated significant age-based differences in messaging app use for news, with younger users, particularly those still in education, showing a stronger preference for digital and social media news sources, including messaging apps. This is consistent with findings by Vázquez-Herrero et al. [11] and Klopfenstein Frei et al. [13], who noted higher reliance on digital platforms, including messaging apps, among younger demographics.

However, our findings also showed that those who have never been in full-time education had high usage of digital social media, including messaging apps, for news consumption. This nuances the educational divide observed by previous researchers [7] and suggests that messaging apps may play a crucial role in news dissemination among groups with limited formal education.

The geographic variations we observed in messaging app use for news across EU countries echo the findings of Kalogeropoulos and Rossini [27], who noted significant country-level differences in WhatsApp use for news sharing.

Interestingly, our analysis revealed that trust in messaging apps as a news source varied across clusters, with omnivorous news consumers showing the highest trust. This supports Ohme et al.'s [28] findings on the role of messaging apps in maintaining information flow and social connections, particularly during crisis events. However, the generally lower trust in messaging apps compared to traditional news sources across most clusters aligns with concerns raised by researchers about the potential for misinformation spread on these platforms [27,30].

The limited but notable use of messaging apps for news, particularly among younger and more diverse news consumers, supports Boczek and Koppers' [29] assertion that these platforms are becoming integral to news dissemination strategies. However, the relatively low overall usage suggests that the "dark social" aspect of news sharing through private messaging, as discussed by Pierson [33], may not yet be as prevalent in the EU as in some other global regions.

Our findings also indirectly support concerns raised by Vermeer et al. [32] about the potential for echo chamber effects in messaging app news consumption. The higher trust and usage among omnivorous news consumers suggest that these platforms might be reinforcing existing news consumption habits rather than broadening exposure to diverse viewpoints.

The role of end-to-end encryption (E2EE) in shaping news consumption preferences appears complicated and potentially contradictory. While E2EE provides enhanced privacy and security for news sharing, particularly valuable in contexts with limited press freedom [34], our findings suggest that this technical feature may not be a primary driver of messaging app adoption for news consumption. The relatively low usage of messaging apps for news (15% of respondents) could reflect the limited awareness and understanding of E2EE noted by Dechand et al. [37], who found that many users remained unaware of

encryption features even months after their implementation. However, the higher trust and usage of messaging apps among omnivorous news consumers might indicate that this technically sophisticated group better understands and values the privacy benefits of E2EE. The technology's impact on news consumption preferences may also be indirect—while users might not actively seek encrypted channels for news, the privacy afforded by E2EE could make them more comfortable sharing and discussing sensitive news topics within messaging apps, as suggested by the Center for International Media Assistance [1]. This dynamic could partially explain why messaging apps, despite their limited overall adoption for news, show higher usage among younger, more digitally engaged users who may place greater value on privacy features.

4.2. Research Limitations

The cross-sectional nature of our data limits our ability to track changes in news consumption patterns over time, particularly in response to evolving digital technologies and changing social contexts. The reliance on self-reported data may introduce biases in how respondents perceive and report their news consumption habits. The study's focus on frequency of use does not fully capture the depth or quality of engagement with news sources, especially through messaging apps. While the research considers end-to-end encryption, it does not directly measure users' awareness or understanding of this technology, which could influence their trust and usage patterns. The broad categorization of messaging apps may obscure important differences between specific platforms. Additionally, the study does not explore the content of news shared through messaging apps, which could provide a better understanding of the types of information circulating in these private networks. Finally, while our study covers all EU member states, it does not account for potential within-country variations.

A key limitation of this study is that while we discuss end-to-end encryption as a defining feature of modern messaging apps, our survey data does not explicitly measure users' awareness, understanding, or attitudes toward encryption. While major messaging apps like WhatsApp and Telegram incorporate E2EE, we cannot directly correlate encryption with user preferences. The connections we draw between E2EE and news consumption patterns are therefore inferential, based on the technical reality that popular messaging apps implement encryption rather than on user-reported data about encryption preferences.

4.3. Directions for Future Studies

Future research could build upon this study's findings in several ways. Longitudinal studies could track changes in news consumption habits over time, providing information on how evolving technologies and social contexts shape media use. In-depth qualitative research, such as interviews or focus groups, could explore users' motivations, experiences, and decision-making processes when consuming news through messaging apps. Studies focusing specifically on users' awareness and understanding of end-to-end encryption could show how this technology influences trust and behavior in news sharing.

Comparative analyses between different messaging platforms could indicate platform-specific patterns and preferences in news consumption. Content analysis of news shared through messaging apps would offer data into the types of information circulating in these private networks and how they differ from public social media discourse. Research examining the role of messaging apps in spreading misinformation and the effectiveness of fact-checking efforts within these closed ecosystems would be timely.

Future research should explicitly examine how awareness and understanding of end-to-end encryption influence users' choices of news consumption channels. While our study provides data on messaging app usage for news, dedicated surveys could explore whether

users consider encryption when choosing news platforms, whether they understand the privacy implications of E2EE, and how this knowledge affects their news-sharing behaviors. Such research could help clarify the relationship between privacy features and news consumption preferences that our current data can only suggest indirectly.

Future studies could also investigate the potential echo chamber effects of news consumption through messaging apps, exploring how these platforms might contribute to or mitigate political polarization. The finding of high digital media use among those without formal education warrants further investigation to understand the factors driving this trend.

4.4. Implications for Media Strategy and Policy

Our findings have several important implications for media strategy and policy development in the European context. First, the identified generational divide in news consumption patterns calls for differentiated media strategies. While traditional broadcasters should maintain their core services for older audiences, they need to develop parallel strategies for reaching younger demographics through digital channels, particularly messaging apps. The high usage of messaging apps (61%) among omnivorous news consumers suggests that news organizations should consider developing dedicated content distribution strategies for these platforms.

For policymakers, our findings point to several key areas requiring attention. Digital literacy programs emerge as a priority, given the high adoption of messaging apps among both highly educated and non-formally educated groups. These programs should focus on critical evaluation of news received through encrypted channels, where fact-checking is more challenging. Special attention should be paid to users without formal education, who show unexpectedly high engagement with digital platforms. Platform regulation represents another critical area, as indicated by the varying trust levels across different news sources and platforms. While maintaining the privacy benefits of end-to-end encryption, policies should address the challenge of misinformation in encrypted channels. This might include requirements for platforms to provide in-app fact-checking tools or clear labeling of forwarded content, without compromising encryption. Furthermore, given the continued high trust in public broadcasting across most clusters, policies should support public service media in expanding their digital presence while maintaining traditional services.

For media organizations, our cluster analysis indicates several strategic directions. News organizations should develop hybrid content distribution strategies that cater to all five identified consumer clusters, maintaining a strong broadcast presence while developing capabilities for encrypted messaging platforms. The lower trust levels in digital platforms indicate that media organizations should focus on building credibility in these spaces, especially in messaging apps where content provenance can be unclear. Our age-related findings show that organizations should develop engagement strategies that recognize younger users' (15–24) strong preference for digital and social channels while maintaining traditional channels for older demographics. The significant variations in news consumption patterns across EU countries indicate that media organizations should adapt their strategies to local preferences rather than applying one-size-fits-all approaches.

5. Conclusions

This study has provided updated information on the patterns of news consumption across the European Union, with a focus on the role of messaging apps. Our analysis indicated five distinct patterns of news consumption: traditional media consumers, digital social media users, online news enthusiasts, omnivorous news consumers, and traditional

broadcast consumers. Within this landscape, messaging apps play a notable but not yet dominant role, used by 15% of respondents for news consumption.

Regarding the relationship between news consumption patterns and trust in media sources, we found that trust varies significantly across clusters. Public TV and radio stations consistently maintained the highest trust levels across all groups. Interestingly, omnivorous news consumers, who showed the highest usage of messaging apps for news (61%), also displayed the highest trust in these platforms.

Our study confirmed significant age-based differences in news consumption patterns. Younger demographics, particularly those still in education, showed a stronger preference for digital and social media news sources, including messaging apps. This trend was most pronounced in the digital social media users cluster, which was dominated by younger age groups.

Educational background was also a significant factor shaping news consumption habits. Higher-educated individuals were more likely to be online news enthusiasts, while those with lower levels of formal education tended to favor traditional broadcast media. Notably, individuals who had never been in full-time education showed high usage of digital social media, including messaging apps, for news consumption.

This article offers several original contributions to our understanding of news consumption patterns in the European Union and the role of messaging apps and end-to-end encryption. By conducting an analysis across all 27 EU member states, it provides a panoramic view of the European news landscape. The study's novel typology of five distinct news consumer profiles offers updated information into how different groups engage with various news sources. It also contextualizes the use of messaging apps within the broader spectrum of news consumption, indicating their complementary role, especially for omnivorous news consumers. By mapping regional variations in messaging app use for news across the EU and providing granular analysis of age-related preferences, the study offers actionable information for media strategists and policymakers.

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