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ANALYSING EU CONSUMER PERCEPTIONS AND BEHAVIOUR ON DIGITAL PLATFORMS FOR COMMUNICATION

Analysis Report

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The study was implemented by

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List of abbreviations

BEREC	Body of the European Regulators of Electronic Communications
CS	Consumer surplus
CZ	Czechia
DCE	Discrete Choice Experiment
DE	Denmark
DTAM	Dhammic Technology Acceptance Model
EE	Estonia
ES	Spain
EU	European Union
FI	Finland
FoMo	Fear of missing out
FR	France
GB	Gigabytes
GDP	Gross Domestic Product
GDPR	General Data Protection Regulation
GIF	Graphics Interchange Format
ICT	Information and Communication Technologies
IE	Ireland
IM	Instant messaging
ISCED	International Standard Classification of Education
LT	Lithuania
MMS	Multimedia Messaging Service
NL	The Netherlands
OECD	Organisation for Economic Co-operation and Development
PPM	Push-Pull-Mooring
PT	Portugal
PU	Perceived usefulness
RO	Romania
SE	Sweden
SIM	Subscriber identity module or subscriber identification module (SIM), widely known as a SIM card
SMS	Short Message Service
SNS	Social networking service
TAM	Technology Acceptance Model
UGC	User-generated content
UGT	Uses and Gratifications Theory
UK	United Kingdom
US	United States
WAD	Web Accessibility Directive
WAI	Web Accessibility Initiative
WCAG	Web Content Accessibility Guidelines
WTA	Willingness to Accept
WTG	Wasting Time Goods
WTP	Willingness to Pay

Glossary

Accessibility	Term referring to the design of products, devices, services and/or environments to be accessible for persons with disabilities on an equal basis with others.
Consumer surplus	A measure of consumer welfare defined as the difference between the highest price that consumers would pay and the actual price they do pay.
Digital means of communication/ means of communication provided by digital platforms	Number-independent interpersonal communication services provided by online platforms (including social media and mobile applications). Digital platform services also depend on and are impossible without mobile plan/internet connection to use online platforms, which is closely related to the access and use of traditional electronic means of communication (e.g., a mobile plan).
Digital platform	Software-based facility offering two- or multi-sided markets where providers and users of content, goods and services can meet. As such, the term can cover a wide range of different types of platform, whose functions and characteristics can differ considerably. Number-independent interpersonal communication services are provided by some of the platforms.
Electronic means of communication	A broad concept referring to traditional electronic and digital means of communication, such as email, instant messaging, websites, blogs, text messaging, voice mail and video messaging, among others. This term may also include services provided by digital platforms.
Endowment effect	A cognitive bias or tendency in which perceived value of goods or services is rooted in pre-existing attitudes towards goods or services previously obtained. It may be seen in contexts in which people are more likely to retain an object they currently own than acquire the same object when they do not own it.
Fear of missing out (FoMo)	Fear of missing out (FoMo) is a form of anxiety that stems from the fear that one might miss out on an opportunity for social interaction or experience. In the context of communication, it relates to a strong need to stay online, receive media messages, passively or actively participate in information exchange.
Messenger application	Messenger applications are applications and platforms that enable instant messaging as a form of number-independent interpersonal communication. Some examples of popular messaging applications include WhatsApp, Facebook Messenger, Telegram, Viber, and Snapchat. Although the functionalities of different apps may vary, many of the have developed into broad platforms enabling status updates, chatbots and conversational commerce.
Multihoming	Multihoming in the context of digital platform communication services describes a situation in which consumers use two or more platforms for similar communication purposes simultaneously.
Network effect	Network effects occur when the value of a digital platform to its users not only depends on features and functionality of the platform itself but increases with the number of other users and the interactions among them. In situations where network effects are large, one dominant platform may create more value for users, relative to smaller competing platforms. Such a dominant platform would have the power to harm users, for example, by raising prices or reducing quality.
Nomophobia	A social anxiety or fear arising from being temporarily unable to use a mobile phone or digital device.
Number-based interpersonal communication service	A number-based interpersonal communications service is an interpersonal communications service that connects with the public switched telephone network, either by means of assigned numbering resources, i.e. a number or numbers in national or international telephone numbering plans, or by enabling communication with a

number or numbers in national or international telephone numbering plans. Examples are 'traditional' telephony, SMS, MMS, Voice over IP (VoIP) services.

Number-independent interpersonal communication service	A number-independent interpersonal communications service is an interpersonal communications service that does not connect with the public switched telephone network. Interpersonal communication services provided by digital platforms fall under this category – for example, instant messaging services such as WhatsApp, Facebook Messenger.
Observed and provided data	Observed data is generated passively when consumers use a platform, creating records such as personal device information, search history, traffic and location data, pages or links accessed, whereas provided data is inputted actively when consumers upload or share photos, posts, other contents of communication.
Privacy paradox	The inconsistency between the concerns of people regarding privacy and their actual behaviour. Users may indicate that the protection of their personal data is important, however this does not mean that they pay attention to the details of requests for personal data before they give consent.
Social networking service	A platform which enables end users to connect, share, discover and communicate with each other across multiple devices and, in particular, via chats, posts, videos and recommendations (i.e. interactive exchange of files and media). Facebook, Twitter, Instagram, etc. are examples of social networking services.
Targeted advertising	A form of advertising directed toward a specific audience and based on certain traits seen as linked with the characteristics of the product or service an advertiser is promoting. Examples of targeted advertising typically include social media ads, search engine ads, behavioural ads for specific demographics.
Technostress	A negative psychological link between people and the introduction and/or use of digital technologies. Often linked with the rapid pace of technological change and the potential mental health problems, anxieties, or exclusions such change may generate.
Traditional electronic means of communication	For the purposes of this study, a traditional electronic means of communication contrasts with the means of communication provided by digital platforms. Examples include text messaging, landline and mobile phone calls, broadband internet connection, voice mail, fax, e-mail and others. In the context of this assignment, the most important category is the number-based services for interpersonal communication.
Willingness to accept	The amount of compensation an individual is willing to accept in exchange for giving up some good or service. This may be elicited from stated or revealed preference approaches.
Willingness to pay	The stated price that an individual would be willing to pay to avoid the loss or diminution of a platform communication service. This may be elicited from stated or revealed preference approaches.
Zero rating	Zero rating is a practice that exempts internet traffic generated through certain applications or access to certain websites from usage charges. By definition, zero rating implies the presence of usage-based pricing with direct charges, or data caps, where the using up of data has an opportunity cost (determined by the value of the content that is displaced when the overall limit is exhausted).

Executive summary

Digital platforms are an increasingly important part of the European digital economy. They drive innovation and play a vital role in economies and societies today. However, digital platforms – especially large international ones – also act as strongly disruptive forces, transforming social, economic and even political relationships.

While digital platforms are gradually penetrating more and more service sectors, this study focuses on a specific type of platforms, namely those providing social networking and number-independent interpersonal communication services as their core services.

While they have been widely embraced by consumers and studied by researchers, still little is known about European consumers' attitudes and behaviours toward the communication services provided by digital platforms. Investigating the motivations and perceptions of European consumers toward digital platforms, as well as how the platforms substitute for traditional communication services, is therefore a key contribution of the study.

More specifically, the study addresses the following research questions:

- What are the main digital platforms and services that European consumers use for interpersonal communication and the interactive exchange of information and media?

- How do consumers use, perceive and behave with regard to the available options for interpersonal communication and interactive exchange of information and media on digital platforms?

- How accessible are the services provided by digital platforms? What are the key challenges to ensuring accessibility online?

- How do consumers perceive the issues surrounding data privacy and security of number-independent services for interpersonal communication? Would they be willing to pay for services in order to avoid data being collected by the service providers?

- How do consumers' use of, behaviours towards, and perceptions of the benefits of, services provided by digital platforms affect their demand for traditional electronic communication services? Do digital platforms provide sufficient substitutes for traditional electronic means of interpersonal communication?

Methodology and scope

From the outset of the study, we developed a list of 17 digital platforms to be investigated. The list encompasses platforms that facilitate communication services, with an emphasis on (1) interpersonal communication services, and (2) the interactive exchange of information and media. We aimed to provide an evidence-based understanding of such digital platforms from the *consumer* perspective, so the selection focuses on those that are the most popular and widely used among European consumers. We have also specifically focused on those platforms that are free to use for consumers, at least with basic accounts that offer access to the applications' key functionalities. Online platforms whose core functions extend beyond interpersonal communication and interactive exchange of information were excluded. This applied to a number of platforms within e-commerce,

transportation, finance, travel and other sectors, as well as communication platforms developed primarily for business use (e.g., Zoom, MS Teams and others), which have become extremely popular during the COVID-19 pandemic.

To answer the research questions, we implemented a mixed-method design for data collection and analysis, combining qualitative and quantitative approaches. At the core of the data collection activities was an online panel survey. The respondents were sampled using quotas by country, age and gender from opt-in online consumer panels. The survey data was afterwards cleaned, validated and weighted to better represent the target populations. In total, after data cleaning and validation, we achieved a sample size of 12,399 responses of messenger application users from 12 BEREC Member States: Czechia, Estonia, Finland, France, Germany, Ireland, Lithuania, Netherlands, Portugal, Romania, Spain and Sweden. The countries were selected to represent the European Union (EU), based on national similarities and differences from other countries not covered in the survey, in terms of the use of digital and traditional means of interpersonal communication.

The survey questionnaire focused on consumer attitudes, behaviours and preferences relating to the use of the selected digital platforms. It also included a small-scale discrete choice experiment, aimed at evaluating the most important features of communication services, as well as their influence on consumer choices. The quantitative component of the study was accompanied by several methods of qualitative research – desk research and literature reviews, interviews and focus groups.

The study built upon a rich body of existing research on consumer use of and perceptions towards social media and means of communication provided by digital platforms. Using new data from an online panel survey, interviews and focus groups of European digital platform users, the mixed-method analysis contributed a number of new insights into consumer attitudes and behaviours toward interpersonal communication services on digital platforms.

Usage of different platforms

As explained in Chapter 3 of the study, among the applications investigated in the study, various products of Facebook, Inc. (such as Facebook, Instagram, WhatsApp or Facebook Messenger) dominate consumers' choices in relation to both social network sites and number-independent means of interpersonal communication. WhatsApp is the most widely and intensively used messenger application among users in the countries surveyed, with 62% of respondents reporting using it daily. Facebook Messenger ranks second, while other applications are used at a notably lower rates and levels of intensity. However, rates of preference observed for the main messenger applications varied markedly between European countries. These can be grouped into WhatsApp vs Messenger-dominated markets. Among the social networking sites, Facebook, YouTube and Instagram are the three most popular platforms for consumers in all of the countries surveyed, and across different demographics.

Furthermore, most consumers regularly use multiple social media and messenger applications (i.e. multihome), and a notable share of them use several applications regularly. Very often, these multiple platforms serve different purposes for individual consumers: they use them individually for access to different types of information, and for communication with friends and family from different social circles, of different generations, and from different countries. This is, however, not always an individual preference: different groups of people with which the consumer

communicates– friends, family members, colleagues, community members – use different platforms (and continuously adopt new ones), leading to an individual consumer being also pushed into adopt multiple applications to maintain communication with all of these groups.

Nevertheless, looking into the patterns of use of different *messenger applications*, we found that EU consumers prefer to use the same application as their main one to communicate in various situations, not only in comparison with other applications, but also with other means of communication. Indeed, for many consumers, WhatsApp is the main means of communication with friends and family, for communication on urgent matters, for private and secure communication, and for cross-border communication.

With regard to the purposes for which *social networking sites* are used, we observe a trend towards more passive use. More people tend to access social media platforms to follow their peers, access information and other purposes, rather than to post and share information or media themselves. The main purpose for using these social networks is as a source of information, news and entertainment, rather than for actively exchanging files and multimedia themselves.

Consumer motivations

The study further provides insights into the motivations of consumers for using messenger applications and social networking sites in Chapter 4. Our analysis drew upon Uses and Gratifications Theory (UGT) to show that consumers attach high importance to the utilitarian and social aspects of digital communication platforms. The key motivations for the use of both messenger and social networking sites among the EU consumers surveyed is that they are free of charge, easy and convenient to use, and that friends and family members also use the service. An additional motivation specific to social networking sites is entertainment, which does not constitute a driver for the usage of messenger applications.

The degree to which consumers value these forms of gratification varies primarily by age. Older cohorts strongly emphasised the importance of the utilitarian and social aspects of application usage compared with younger respondents, who tended to value entertainment more than other groups. Furthermore, we showed that the importance given to using both types of platforms for free increases with age, but that there is little to no variation between different educational groups. In terms of cross-national variation, there are no clear, consistent regional patterns in the gratification findings by country, when controlling for demographic variables.

Dynamic aspects of consumer behaviour

Our analysis of the survey data on consumer behaviour built on the insights of the Push-Pull-Mooring (PPM) framework, which allowed us to analyse consumer behaviour in relation to the factors that push them toward or pull them away from communication services, or influence them to moor in place.

As explained in Chapter 5, we found that, despite the trend towards multihoming on messenger and social networking sites, consumers' behaviour in relation to their main messenger applications is surprisingly stable in important respects. Our findings show that consumers appear to have

developed a strong attachment and loyalty towards their main messaging application services, viewed from various perspectives.

A significant majority of EU consumers (76%) stated that they had not switched their main messenger application over the preceding 12 months. Respondents expressed no great willingness to experiment with new messaging applications, and there is strong evidence among consumers of inertia, brand identification and emotional attachment to applications. In terms of pull factors, to successfully attract consumers to different services, new applications would have to replicate many of the factors that consumers currently seek and receive via other services – free-of-charge use, ease and convenience, and having friends and family who use the same service. However, stronger data privacy and security protections may also influence consumers' migration to other applications, although not as strongly. In addition, we observed that a heightened state of anxiety and stress during emergencies may push consumers towards specific platforms, while 'techno-stress' and negative experiences with a particular application may push them away from using that application altogether.

There was minimal variation in these findings by gender or country. However, younger consumers show a stronger tendency toward experimentation with new applications, switching their main application services, as well as greater frustration than older groups with regard to the hypothetical discontinuation of an application.

Accessibility of platform communication services

In Chapter 6, the study also covered a platform accessibility checklist to evaluate the compliance of the platforms under investigation with levels AA and AAA of the Web Content Accessibility Guidelines (WCAG) 2.1[1]. While the platforms' compliance with these standards is generally insufficient in important respects, our analysis revealed a number of key caveats to consider when evaluating platform accessibility.

First, digital platforms are characterised by the extensive sharing of user-generated content (UGC). The accessibility of UGC varies enormously, and platforms have only a limited degree of control over the accessibility of the content users create and share. Increasing digital platforms' compliance with accessibility standards could conflict directly with the platforms' interactive business model, as it would entail placing significant restrictions on inaccessible UGC. Second, the bifurcation of platforms into both mobile and web applications entails different modes of presentation and different accessibility standards, which in practice impedes full compliance. Third, accessibility suites available on widely used devices do allow for the modification of accessibility settings on platforms, creating a more user-friendly experience for persons with disabilities.

Digital platforms as substitutes for traditional electronic means of interpersonal communication

In terms of the relationship between the interpersonal communication services provided by digital platforms and more traditional number-based electronic services for interpersonal communication,

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[1] Available at: https://www.w3.org/TR/WCAG21/

the study shows patterns among consumers of both complementarity and substitution. The results presented in Chapter 7 show that messenger applications are the dominant means of communication in various situations, but that in some situations they are used in combination with traditional means of communication. For day-to-day communication with friends and family, as well as cross-border communication, the majority of European application users indicated that they preferred to use messenger applications exclusively, although many of them would also use a combination of traditional and digital services. Meanwhile, for secure and private communication, a marginally stronger reliance on traditional electronic means of communication was observed, even though messenger apps were still the choice for a larger share of respondents. Whereas only for urgent communication, more respondents reported using traditional electronic means of communication. Furthermore, the younger the consumer, the more likely they are to prefer applications over number-based services.

Generally, the preference for number-independent communication services provided by platforms is determined by a number of factors: additional functionalities, new modes of communication that allow improved flow and fluidity of communication, and – most notably – the zero cost of platform communication services for consumers.

Overall, more and more areas of interpersonal communication are increasingly dominated by messenger applications across various consumer demographics. The cost-free availability of a wide spectrum of communication services (as substitutes for number-based services for interpersonal communication) means, from the perspective of the telecommunications sector, a shift in power from suppliers to consumers. Although the take-up of mobile plans remains universal, specific number-based communication services such as number-based phone calls and SMS are used less and less. This study demonstrates that this decrease is accelerated by digital platforms, which provide a wide range of alternatives, increasingly preferred by consumers.

The privacy paradox

The business model of the most-used digital communication platforms is one that offers the use of application services free of charge to consumers. By using these services, however, consumers both actively and passively share their personal data and online preferences, and provide their attention to potential advertisers and marketing firms. The platforms then monetise this through targeted advertising. Thus, consumers of all demographics encounter a privacy paradox in relation to online privacy and the use of their data.

As explained in Chapter 8, the reliance of consumers on digital communication platforms comes with inherent trade-offs that are difficult to resolve. Our survey revealed that while consumers emphasise the importance of data privacy and security, this does not emerge as a strong criterion for selecting their main messenger application, relative to other factors such as free-of-charge use and convenient access to application services.

However, a notable share of respondents expressed confidence in their overall understanding of how much data is collected by messenger applications (although such self-reports may not accurately reflect the actual situation). The qualitative data also confirmed the ambiguous nature of consumers' understanding of data collection, revealing that some consumers are unaware or uncertain about the scope of the collection and use by digital platforms of their personal data.

Smaller percentages in the survey stated that they are comfortable with the way companies use this personal data for advertising and marketing purposes. Interviews also showed that while some users have concerns about their privacy and the use of their data for marketing purposes, most have "accepted the reality" that platforms use their data in exchange for communication services, and they were not overly concerned about privacy issues.

It is important to note, however, that a clear generational divide appears to exist in attitudes toward privacy: younger consumers are both more confident about their awareness of data privacy, and more comfortable with the way their data is used by platforms. While the higher perceived awareness of platform practices is probably due to a higher degree of tech and data literacy among younger consumers, this does not necessarily translate into younger consumers adopting more protective strategies towards data use.

Willingness to pay for platform services

The study reveals the strong and unequivocal importance to consumers of the zero-cost of digital platform communication services. Across all demographic segments, the EU consumers surveyed indicated that the fact that messenger applications are free to use is one of their key motivations for using them. This is seen as one of their main advantages over number-based interpersonal communication services. It is also the key factor in deciding to adopt new applications for communication services.

Furthermore, a small-scale discrete-choice experiment in our study, presented in Chapter 9, revealed that zero cost is a more important factor in the choice of interpersonal communication services than specific functionalities, data collection and the display of advertising added together.

In previous studies, some consumers have reported their willingness to pay small sums for monthly subscriptions to messenger applications[2]. The results of our survey, however, show that on average, consumers' willingness to pay for their main messenger application is fairly low. Consumers also note that the messenger application market offers a wide range of alternatives. Their intention to pay will, therefore, remain low unless the quality of the free-to-use interpersonal communication services deteriorates significantly.

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[2] Vock, M., Dolen, W.V. & Ruyter, K.D. (2013). Understanding willingness to pay for social network sites. *Journal of Service Research*, 16(3), pp.311-325.

1. Introduction

Digital platforms are an increasingly important part of the European digital economy. They drive innovation and play a vital role in today's economies and societies. In some instances, the platforms – especially the largest global ones – also act as strongly disruptive forces, transforming social, economic and even political relationships. This raises many policy-relevant questions, including how market power is distributed, if current competition policy remains appropriate for this situation, and how potential bottlenecks in relation to digital platforms can be addressed[3].

Recently, digital platforms have received increasing attention the EU policymakers. For instance, in May 2016, the Commission published 'Communication on Online Platforms', identifying key areas of interest and the guiding policy principles.[4] In March 2018, a Recommendation was issued on measures to effectively tackle illegal content online[5] – area in which digital platforms play an especially crucial role as distributors of such content. In July 2019, a new Regulation on platform-to-business relationships was introduced, with the aim of protecting companies that depend on online platforms to reach consumers, while safeguarding the innovation potential of platforms[6].

The Commission is also considering further action with regard to algorithmic transparency. In addition, it has published the two proposals for a Digital Services Act and Digital Markets Act, which *inter alia* aim to upgrade the liability rules that apply to digital platforms. In general, digital platforms are seen as very important actors in shaping Europe's digital future, as well as the European Digital Strategy[7]. The place and role of digital platforms in the market are also important new topics in the BEREC Work Programmes of 2020[8] and 2021[9].

Currently, no universal legal definition of digital platforms exists. Some authors have argued that that there is a lack even of a "workable" definition[10]. This is at least in part due to the variety of types, sectors and business models of existing platforms. In the most general sense, the European Commission has provisionally defined online platforms as "software-based facilities offering two- or even multisided markets where providers and users of content, goods and services can meet".[11] Similarly, the OECD distinguished several common features of digital platforms. These include being

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[3] BEREC (2020). BEREC Work Programme 2020, Strategic priority 2: Monitor potential bottlenecks in the distribution of digital services. BEREC CN (19) 83 version 12 September 2019. Available at:
https://berec.europa.eu/eng/document_register/subject_matter/berec/download/1/8918-berec-2020-work-programme_1.pdf

[4] Eur-lex.europa.eu (2016). Communication from the commission to the European Parliament, the council, the European economic and social committee and the committee of the regions. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52016DC0288

[5] Available at: https://ec.europa.eu/digital-single-market/en/news/commission-recommendation-measures-effectively-tackle-illegal-content-online

[6] Eur-lex.europa.eu (2019). Regulation (EU) 2019/1150 of the European Parliament and of the Council of 20 June 2019 on promoting fairness and transparency for business users of online intermediation services (Text with EEA relevance). Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32019R1150

[7] Available at: https://ec.europa.eu/digital-single-market/en/content/european-digital-strategy

[8] BEREC (2020). BEREC Work Programme 2020, Strategic priority 2: Monitor potential bottlenecks in the distribution of digital services. BEREC CN (19) 83 version 12 September 2019. Available at:
https://berec.europa.eu/eng/document_register/subject_matter/berec/download/1/8918-berec-2020-work-programme_1.pdf

[9] BEREC (2020). BEREC Work Programme 2021. Available at:
https://berec.europa.eu/eng/document_register/subject_matter/berec/annual_work_programmes/9728-berec-work-programme-2021

[10] Strowel, A. & Vergote, W. (2016), Digital Platforms: To Regulate or Not To Regulate? Message to Regulators: Fix the Economics First, Then Focus on the Right Regulation. Available at: https://ec.europa.eu/information_society/newsroom/image/document/2016-7/uclouvain_et_universit_saint_louis_14044.pdf

[11] European Commission. A Digital Single Market Strategy for Europe – Analysis and Evidence, COM(2015) 192, p. 52

online entities that are based on ICTs; serving at least two different user sets simultaneously, bringing them together and enabling interactions; collecting and using data about those interactions, and gaining network effects.[12] These definitions would include various internet companies in the sectors of e-commerce, travel, transportation, social media, and mobile application stores, among others[13].

In this study, we focus on a somewhat more specific type of digital platform, namely those platforms used by individual consumers for interpersonal communication. In the European Commission's proposal for Digital Markets Act's[14] definition of "Core platform services", these fall under online social networking services, video-sharing platform services, and number-independent interpersonal communication services[15].

These digital platform services are associated with fundamental **effects on the electronic communications sector,** – in addition to profound transformations in the media, politics, and culture more broadly. As a significant part of people's private and public lives has moved online, the use of digital platforms that provide number-independent services for interpersonal communication has proliferated among consumers around the world, demonstrating large and increasing usage statistics. For instance, Facebook is the largest social media platform in the world, with over 2.7 billion users as of 2021, most of whom joined the network over the past decade. Other digital platforms, including YouTube, Instagram and WhatsApp, also have more than one billion users each (see Figure 1 below). This means social media platforms are used by one-in-three people in the world, and more than two-thirds of all internet users.

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[12] OECD (2019). An introduction to online platforms and their role in the digital transformation, OECD Publishing, Paris
[13] Batura et al (2015). Online platforms and the EU Digital Single Market. Available at:
https://ec.europa.eu/information_society/newsroom/image/document/2016-7/nikolai_van_gorp_-_response_e-conomics_to_the_uk_house_of_lords_call_for_evidence_14020.pdf
[14] At the time of the analysis, the Digital Markets Act is at the stage of a legislative proposal.
[15] Eur-lex.europa.eu (2020). Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on contestable and fair markets in the digital sector (Digital Markets Act). Available at: https://eur-lex.europa.eu/legal-content/en/TXT/?qid=1608116887159&uri=COM%3A2020%3A842%3AFIN

Figure 1. Rise in the number of active platform users of platforms worldwide[16]
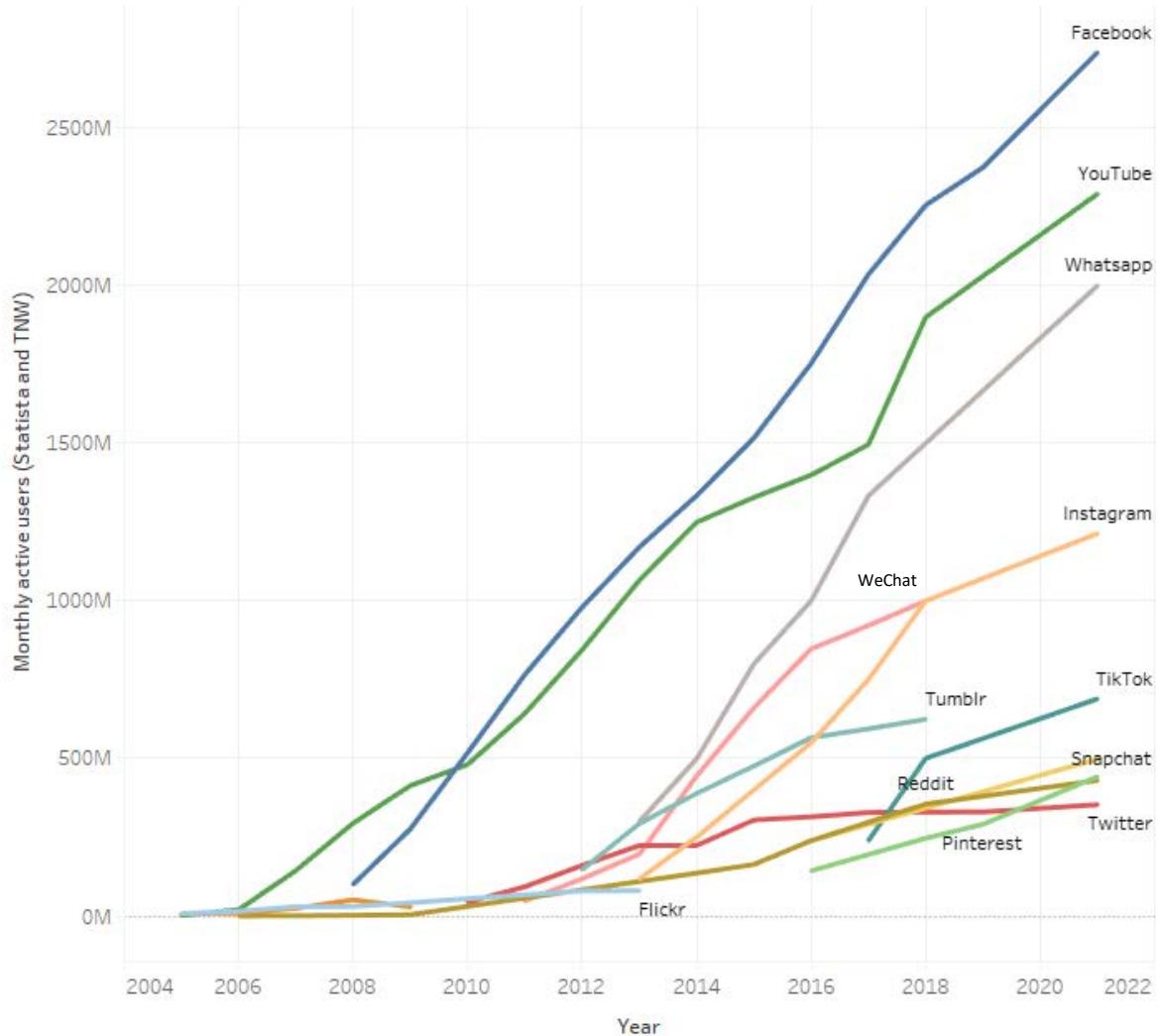
Source: Statista and the Next Web, retrieved from OurWorldInData.org (2019), and Statista (2021). Estimates correspond to monthly active users, as measured by platforms.

Available data on European consumers also shows that they are intensively and increasingly using the communication services of online platforms. In 2016, a survey conducted by Eurobarometer showed that 60% of *European internet users* were already using an online **social networking sites** (for instance to share pictures, videos, movies) at least once a week, with a higher percentage of users among respondents in Portugal, Italy and Malta[17]. According to figures from 2019, around 70% of *EU citizens* had used social networks, and around 52% had also used file-sharing services (to upload or download documents, videos, images or music) at least once[18]. Among OECD member

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[16] Instagram (in April 2012) and WhatsApp (in February 2014) have been acquired by Facebook.

[17] European Commission (2016). Special Eurobarometer 447. Directorate-General for Health and Food Safety & the Directorate-General for Communication. Available at: https://ec.europa.eu/information_society/newsroom/image/document/2016-24/ebs_447_en_16136.pdf

[18] European Commission (2020). How do online platforms shape our lives and businesses? Available at: https://ec.europa.eu/digital-single-market/en/news/how-do-online-platforms-shape-our-lives-and-businesses-brochure

states, European countries have the highest percentages of *young people* engaging in social networking online and spending the most time online in general[19].

Meanwhile, according to a 2018 Eurobarometer[20], 61% of respondents across the EU used mobile phones for **internet messaging services**. Instant messaging was used daily by two-fifths of the respondents, with male respondents being slightly heavier users. Almost one in seven reported making calls via internet applications. Here, the age differences were more pronounced: one in three 15-24-year-olds had used them, compared with around one in 100 in the 75+ age group. Socio-professionally speaking, students were most likely to use instant messaging, followed by managers, together with other white-collar workers and the self-employed. Retired citizens used them the least. Dwellers in large cities were most likely to use instant messenger apps, while those living in small/mid-sized towns used them less, and those living in rural villages, the least.

Overall, many sources of data exist on online platform usage (e.g. Pew Research and Statista, which monitors online traffic to develop detailed statistics). Some sources have even addressed the specific activities for which platforms are used, such as for e-commerce[21] or platform work[22], among others. A rich body of literature also exists on the various aspects of digital platforms that provide communication services. However, while digital platforms have been widely embraced by consumers and widely studied, still little is known about **consumer attitudes towards communication services provided by such platforms and related behaviours in Europe**. Few studies have focused on consumer perceptions regarding **interpersonal communication platforms and services**, and what guides the choices that European consumers make. An extensive literature review implemented for this study, the results of which are presented throughout this report, did not identify sources that present, in a comprehensive and generalisable manner:

- Perceptions, motivations and behaviours among different age groups regarding digital platforms.

- Changes in consumer behaviour on online platforms over time, particularly in the short-term.

- Comparisons between attitudes and behaviours towards digital platforms and towards traditional electronic means of communication.

- Research combining large-scale surveys with qualitative insights.

- Research on a larger number of digital platforms, rather than one or several of the most popular.

- Emphasis on the interpersonal communication services provided by digital platforms, rather than social media more broadly.

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[19] OECD (2019). Society at a Glance 2019: OECD Social Indicators, OECD Publishing, Paris. Available at: https://doi.org/10.1787/soc_glance-2019-en.

[20] European Commission (2018). Special Eurobarometer 462: E-Communications and Digital Single Market. Available at: https://op.europa.eu/en/publication-detail/-/publication/55886f6a-8fb4-11e8-8bc1-01aa75ed71a1/language-en

[21] For example, Guzzo, T., Ferri, F., & Grifoni, P. (2016). A model of e-commerce adoption (MOCA): consumer's perceptions and behaviours. Behaviour & Information Technology, 35(3), 196-209.

[22] Pesole, A., Brancati, M. C., Fernández-Macías, E., Biagi, F. & González Vázquez, I. (2018). Platform workers in Europe. Luxembourg: Publications Office of the European Union.

- Research on the digital platform usage landscape during the COVID-19 pandemic.

In view the of the massive shift toward online interactions and activity across countries and demographics, as well as the gaps of knowledge outlined above, the main objective of the study is to provide an evidence-based understanding of such digital platforms from the perspective of *private consumers*. More specifically, the activities of this study focus on the following research questions:

- What are the **main digital platforms and services that European consumers use** for interpersonal communication and interactive exchange of information and media?

- How do consumers **use, perceive and behave** with regard to the available options for interpersonal communication and interactive exchange of information and media on digital platforms?

  - What are the drivers and motivations behind the use of digital platform services?

  - How do consumers value and benefit from digital platforms?

  - How has consumer behaviour changed in terms of switching between traditional electronic means of communication and digital platforms, different digital platforms, or different services provided by digital platforms?

  - What are the reasons for any changes in consumer behaviour or lack thereof? Do consumers face asymmetries of information, or feel 'locked in' and restricted in terms of access to and switching between digital platforms?

  - How willing are consumers to pay for interpersonal communication services and the interactive exchange of information and media on online platforms? How does this relate to willingness to "pay" through the provision of their personal data?

- How **accessible** are the services provided by digital platforms? What are the key challenges to ensuring accessibility online?

- How do consumers' use, behaviours towards and perceptions of the benefits of services provided by digital platforms affect their demand for **traditional electronic communication services**? Do digital platforms provide sufficient substitutes for traditional electronic means of interpersonal communication?

The scope of this study encompasses platforms that act as enablers of digital services, with an emphasis on (1) interpersonal communication services, and (2) the interactive exchange of information and media. The study does not cover digital platforms that primarily provide types of services other than communication and the interactive exchange of information, such as e-commerce, accommodation, transportation, finance, application stores, and so on.

To answer the key research questions and address these specific knowledge gaps, we implemented a mixed-method design for data collection and analysis, combining qualitative and quantitative approaches. We present this in detail in Chapter 2. At the core of the data collection activities was an online panel survey in 12 selected BEREC member states. This quantitative element was accompanied by several qualitative research methods – desk research and literature reviews,

interviews and a focus group. The following sections of the report provide further detail on the scope and methodology used, before proceeding to a detailed analysis investigating the research questions.

Scope and methodology of the study

- The study focused on a pre-selected list of 17 digital platforms, providing services consumers for interpersonal communication and the interactive exchange of files and media.

- A mix-method approach was applied to investigate the research questions.

- The main method used for data collection was a consumer panel survey in 12 EU countries (n = 12,399), targeting users of interpersonal communication services on digital platforms.

- The quantitative insights from the panel survey were complemented by qualitative insights from interviews and focus groups.

- The new findings were contextualised within the results of an extensive literature review and desk research.

Identification of platforms for inclusion in the study

At the beginning of research activities in mid-2020, the research team developed a list of platforms to be investigated in the study and included in the survey questionnaire. This process followed several selection criteria.

To begin with, we limited our scope to two types of platform that are of most interest to this study:

- Platforms that primarily provide interpersonal communications services (mostly messenger applications, such as Messenger, Viber, WhatsApp, Skype, Gmail, etc.).

- Platforms that primarily facilitate the exchange of information and media (mostly social network sites [SNS], such as Facebook, Twitter, YouTube, Instagram, etc.)

Our main emphasis was on the first category, although in the real world the classification between types is not as clear cut. For example, most social media platforms, such as Instagram and others, are primarily viewed as the second type above, but they also integrate private messenger functionalities germane to the first type. In fact, interviews conducted for this study showed that some users use Instagram as their primary messaging application, and that this practice has become habit. Other examples concern specific functionalities: for instance, when Snapchat – an interpersonal communication application according to our definition – introduced stories that disappeared after 24 hours, Facebook soon implemented the same feature in its products, including both its interpersonal communication tools (Messenger) and its social networks (Facebook and Instagram). The video stories themselves can also serve the purposes of both interpersonal communication (through the built-in messaging functionality) and the exchange of media. Many other examples of such intertwined functionalities and purposes of use exist, while consumers themselves apply various combinations of the digital platform means available to them in their day-to-day communication. To create a clearer distinction for analytical purposes, we grouped platforms into one of the two categories based on their main function, as described in the platform listing on application stores (i.e. Google Play and Apple App Store).

Another category of online platforms – those that primarily provide services whose focus goes beyond interpersonal communication and interactive exchange of information – was **out of scope** for this study. This category includes platforms in e-commerce, transportation, finance, travel and other sectors. Although such platforms may incorporate messaging functionalities, these are not primary services of these platforms and do not constitute substitutes for traditional electronic communications services. Examples of such platforms include Amazon, Booking.com, Airbnb, Uber, PeoplePerHour and others.

Second, the study excluded platforms developed primarily for **business use**, such as Slack, Microsoft Teams, Zoom, Google Meet and others, which have become extremely popular during the COVID-19 pandemic. Instead, the study focused on private consumers and their private interpersonal communication.

Third, we focused on those platforms that are the **most popular** and most widely used among European consumers. Due to the network effects that digital platforms exhibit (i.e. increased numbers of people using a platform improves its value to existing and new users), eventually most consumers end up using several key platforms, on which their peers, colleagues or families are also present[23]. One can therefore expect that a number of platforms will be used by especially large numbers of consumers.

To identify the most popular platforms, we used the platform **user statistics** provided by Statista[24], as well **lists of top applications** on Google Play and Apple App Store in 2019 and early 2020, as well as articles about applications that saw a surge in usage during the coronavirus pandemic[25]. Following this, we included only those platforms that had at least 100 million active[26] users. After exploring the listings of the relevant applications on the application stores (Google Play and Apple App Store), we viewed this number as an appropriate cut-off point, given that the survey aimed to cover a pre-defined list of up to 20 platforms to be investigated in depth.

The focus on European markets also meant that we did not include platforms that are primarily popular in other regions (e.g. WeChat, QQ, Baidu and others in Asia). It is important to note that these selection decisions were made on the basis of the situation and data available in mid-2020, while the general landscape of digital platforms and messenger applications changes continuously. For example, at the time of writing this report in early 2021, two messenger applications that had previously been little used, Signal and Telegram, were seeing rapid growth in user numbers[27].

Fourth, we focused only on platforms that are **free to use** for consumers, at least in terms of basic accounts offering access to the applications' key functionalities (e.g. YouTube). This is in line with the general aim and rationale of the assignment, namely to view online platforms as preferred substitutes for traditional communication services, in part because they are considered to be

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[23] Knee, J.A. (2018). Why Some Platforms Are Better Than Others. MIT Sloan Management Review, 59(2), 18-20.

[24] Tankovska, H. (2021). Most used social MEDIA 2020. Statista. Available at: https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/

[25] For example, https://9to5google.com/2020/04/01/hangouts-meet-usage/; https://www.cnet.com/news/microsofts-skype-sees-massive-increase-in-usage-as-coronavirus-spreads/.

[26] Although definitions of an "active user" differ by platform, it is generally defined as someone who logs in to the site and/or completes some sort of action (liking, sharing, posting, etc.) within the previous 30 days. To estimate numbers, we used information from Statista, and checked this against download numbers on the app stores.

[27] Singh, M. (2021). Signal's Brian ACTON talks about exploding growth, monetization and WhatsApp data-sharing outrage.

cheaper/free alternatives[28]. In addition to this, a wide variety of paid digital services for interpersonal communication and file/media sharing exist. Their inclusion would have significantly expanded the list of potentially relevant platforms, and would have thus been counterproductive in the survey questionnaire.

The list of selected platforms meeting these criteria, finalised after the pilot survey data collection, is presented in the table below. The survey questionnaire included separate questions for the two types of platforms, with more questions and a heavier focus on interpersonal communication/messenger applications.

Table 1. List of platforms selected

Interpersonal communication		Interactive sharing of files and media	
WhatsApp	Discord	Facebook (the social	Pinterest
Facebook Messenger	FaceTime	network)	Tumblr
Snapchat	iMessage	YouTube	Reddit
Telegram	Viber	Instagram	
Skype		TikTok	
		Twitter	

Online panel survey

The online panel consumer survey was the core method used for data collection in this study. The sampling approach focused specifically on European messenger application users, and aimed at a balanced representation of them by age, gender, education and in terms of countries from different regions and with different indicators regarding the use of digital services.

The respondents were sampled using quotas by country, age and gender from opt-in online consumer panels. The survey fieldwork was implemented during September and October 2020. In total, after data cleaning and validation, we achieved a sample size of 12,399 responses from 12 BEREC Member States: Czechia, Estonia, Finland, France, Germany, Ireland, Lithuania, Netherlands, Portugal, Romania, Spain and Sweden. To strengthen the representativeness of the data collected, weights were applied. Detailed information on the entire survey process, from survey design to data cleaning and weighting, is provided in Annex 1.

The survey questionnaire, provided in Annex 2, focused on consumers' attitudes, behaviours and preferences in relation to their use of the specific platforms selected for the study. The interpretation of survey results must take into account the self-reported nature of the consumer insights collected, particularly with regard to hypothetical scenarios. Although aspects relating to self-reporting are a feature rather than a drawback of surveys as a method for data collection in market research, the distinction between reported and revealed preferences should be noted, as reported values can in theory differ notably from data collected on actual consumer behaviour in the markets (e.g. actual data collected on application usage through consumer engagement with platforms). This should be considered in the interpretation of study results.

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[28] European Commission (2018). Special Eurobarometer 462: E-Communications and Digital Single Market. Directorate-General for Communications Networks, Content & Technology. Available at: https://op.europa.eu/en/publication-detail/-/publication/55886f6a-8fb4-11e8-8bc1-01aa75ed71a1/language-en

The details on methods applied for survey data analysis is presented in Annex 1.

Desk research and literature review

As part of the study, we conducted focused desk research and a literature review regarding relevant aspects of the use of digital platforms for interpersonal communication and the exchange of information. The review focused on the specific research questions and covered academic and grey literature[29], policy documents and online publications, as well as existing statistics and other relevant information. These activities followed a standard set of steps:

1. **Defining search keywords**. A list of research keywords was compiled, based on the key research questions presented in the introduction.

2. **Search,** using universal search engines (e.g. Google, Google Scholar, Google Dataset Search), scientific literature databases and publication depositories of relevant organisations, projects and initiatives. In these searches, we used Boolean search strings, employing the keywords identified in the previous step.

3. **Refinement of the search results** based on their relevance and quality. For example, we removed articles from further analysis in cases where they concerned business use of digital platforms, the regulation of digital platforms, or digital platforms in the e-commerce, travel or transportation sectors, or those concerning the use of digital platforms in Asia or Africa, etc.

4. **Synthesis of relevant findings** was made on the basis of the definitions, operationalisation of relevant variables, as well as the conceptual framework for analysis. The findings of the initial literature review in the survey pre-fielding phase fed into the questionnaire development. In the post-fielding/analysis phase, the results of the desk research and literature review were used directly in this Analysis report to contextualise our new findings.

A detailed list of the sources used in the analysis is provided among the references at the end of this report.

Interviews and focus groups

During the questionnaire testing phase, we conducted nine in-depth, one-on-one interviews with people who corresponded to the target group of the survey. The interviewees were identified using the convenience sampling approach. They represented both sexes, three broad age groups (18-25, 26-35 and 36-45), drawn from six different nationalities (French, Dutch, Lithuanian, Romanian/Portuguese (double nationality) and Croatian). Additional insights from these interviews were used in the analysis presented in this report.

To explain and further enrich some of the survey findings with additional qualitative evidence, two international online focus groups were implemented as part of the study[30]. Given that these focus groups served as a complementary data source, the number of questions posed to the participants was fairly small, and a satisfactory level of saturation was reached after the second focus group (please see detailed notes in Annex 2).

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[29] Grey literature is defined as materials and research produced by organisations outside the traditional commercial or academic publishing and distribution channels, which have not undergone the process of academic peer-review.

[30] This is quite a common number of focus groups in social science studies. See, for example, Carlsen, B. & Glenton, C. (2011). What about N? A methodological study of sample-size reporting in focus group studies. *BMC Medical Research Methodology*, 11(1), 1-10.

Participants in the focus groups were recruited though Facebook ad campaigns. This method ensured that all the potential participants were users of digital electronic means of communication, given that Facebook is one such means. After clicking on an ad, potential participants were first directed to a registration form, which included questions on demographic characteristics, English proficiency and their use of different means of communication. The study team used this information to further select specific participants and to ensure that each focus group included diverse (by age, gender and nationality) yet compatible group of participants. The focus groups were conducted online (using the Zoom videoconferencing application), in English. To incentivise participation, each focus group participant was rewarded with an Amazon gift coupon worth EUR 20.

Interaction between participants from different age groups, with different views and experiences, allowed the researchers to gain a more in-depth understanding of the following aspects:

- The relationship between the use of digital platform communication services and the use of traditional electronic means of communication.

- Changes (or lack thereof) in the usage of digital and traditional means of electronic communication over time, taking into account privacy, lock-in effects, and knowledge of alternatives.

- Consumer trade-offs between the monetary costs of interpersonal communication services and the exchange of information, exposure to advertising, privacy and data security, and functionality.

Digital platforms used by European consumers

- Products of Facebook, Inc. dominate the markets for number-independent interpersonal communication services and social networking sites.

- WhatsApp and Facebook Messenger are the most widely and intensively used messenger application among users in the countries surveyed.

- Respondents indicated that, regardless of their main applications, most would fall back on to using WhatsApp if their main application (other than WhatsApp) stopped working for a short or long period of time.

- EU consumers prefer using the same application for communication in various situations, not only compared with other applications, but also with other means of communication.

- Nonetheless, multihoming on digital platforms that provide interpersonal communication services is prevalent among EU consumers, who use different platforms to communicate with different social circles.

- Rates of usage vary quite markedly between European countries, which can be grouped into WhatsApp vs Facebook Messenger-dominated markets. While Romania, Portugal, the Netherlands, Ireland, Finland, Spain and Germany belong to the former group, in Sweden, Lithuania, Estonia and Czech Republic, Facebook Messenger dominates.

- Facebook, YouTube and Instagram are the most popular social networking sites (SNS) among European users.

- The majority of consumers reported using SNS passively (i.e. receiving information and media) rather than actively (i.e. posting, sharing information and media themselves).

Given the distinction made in this study between platforms for interpersonal communication (i.e. messenger applications) and platforms for interactive exchange of files and media (i.e. social networking sites), over the upcoming sections we will provide separate overviews of the use of these two types of platforms by European consumers.

Social networking sites

According to the survey results, YouTube is the most widely used social media platform among consumers in the countries surveyed, with over 91% of respondents reporting that they had used it during the previous three months. Facebook, the second most popular social media platform, with 84% of respondents saying they had "ever" used the platform, surpasses YouTube in terms of intensity of use. Of those surveyed, 59% said they used it daily (compared with 47% for YouTube – see Figure 2 below). Instagram came third, with 66% of respondents saying they had "ever" used it, and 41% saying they used it daily.

Figure 2. Frequency of use of social media platforms by European consumers[31]
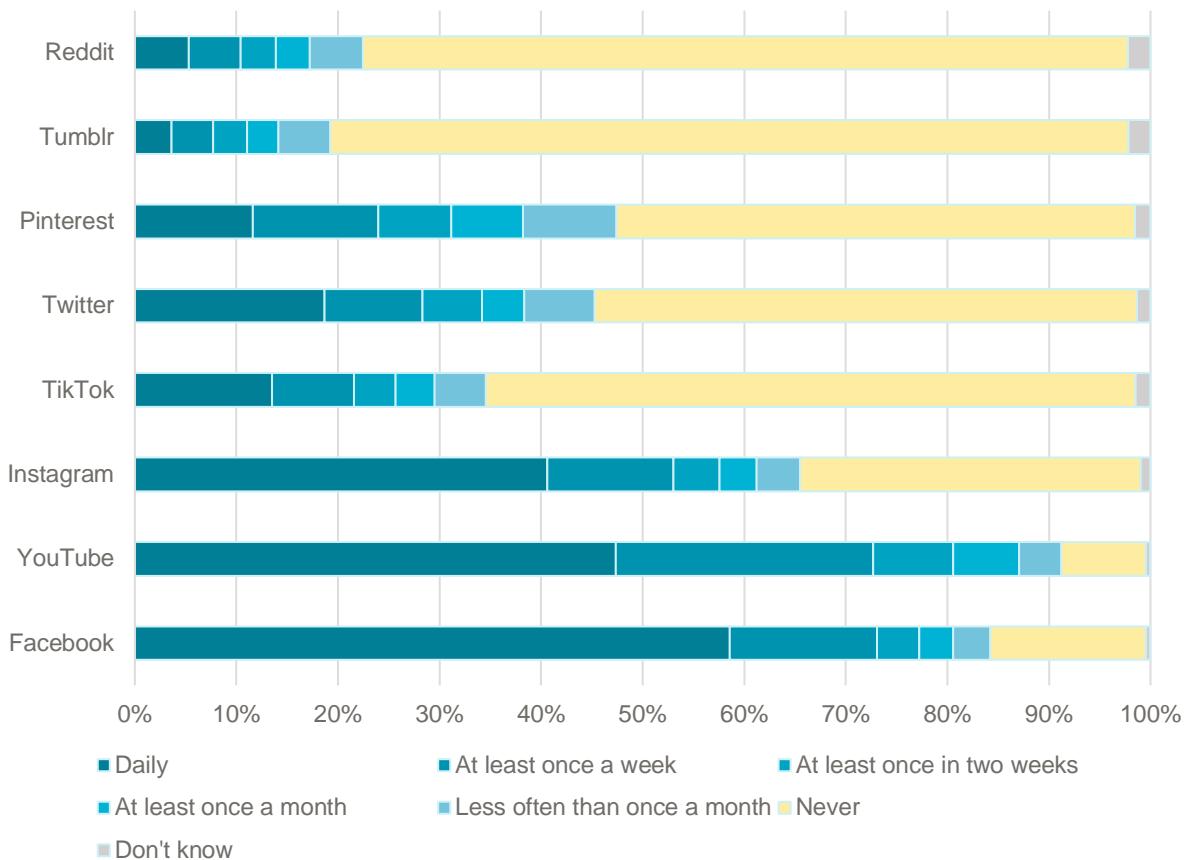
Analysis of Q5: Over the past three months, how often would you say you use each of the following online websites or applications for personal purposes (i.e. not work-related)?

Furthermore, when respondents were asked which of the social media platforms listed they used the most, the largest group – 46% – also said Facebook. YouTube came second (28%), with Instagram in third place with 16%.

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[31] Facebook (Social Network) and Instagram are two products of Facebook, Inc.

Figure 3. The main social media platforms used by European consumers[32]
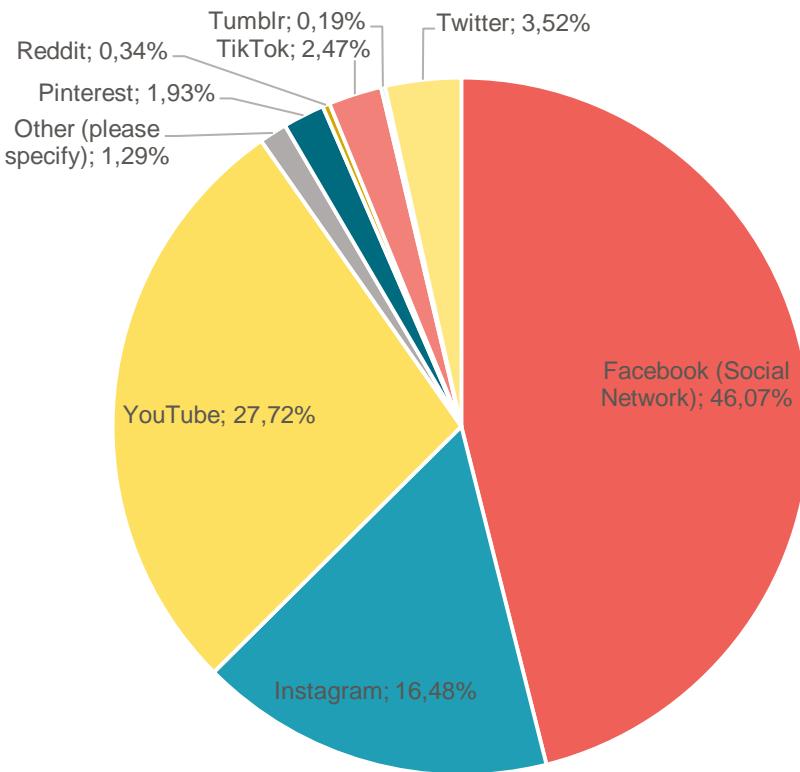
Analysis of Q12: Over the past 3 months, which of these online websites or applications did you use most frequently?

These findings are in line with global trends. For example, according to Statista[33], as of October 2020, Facebook was the leading social network site, with 2.7 billion active users worldwide, followed by YouTube with 2 billion active users, and Instagram with 1.2 billion (see Figure 4 below). Unsurprisingly, given their popularity among consumers, in our overview of research into the use of digital platforms, presented in the following chapters, Facebook appears to be the most analysed social network, while WhatsApp is the application most prevalent in research on instant messenger communications.

Nonetheless, some differences can be observed between the trends found globally and in our EU-wide survey: for example, contrary to the global usage landscape, Twitter was more popular among our respondents than TikTok[34], and Pinterest was significantly more widely used than Reddit.

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[32] Facebook (Social Network) and Instagram are two products of Facebook, Inc.

[33] Tankovska, H. (2021). Most used social MEDIA 2020. Available at: https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/

[34] This likely to be because our sample did not include people under 16.

Figure 4. Global use of social media (in millions of users)[35]
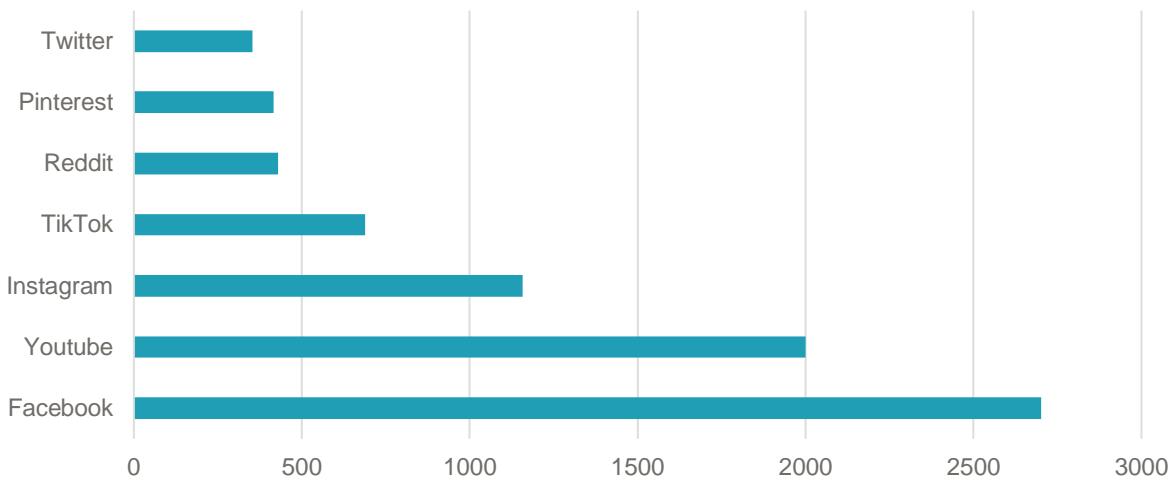
Several notable differences can also be observed in terms of user demographics First, we found a notable variation by gender in the use of Instagram and Pinterest (the platforms more often preferred as the main social media platform by women), as well as YouTube and Twitter (the platforms more often preferred as the main social media platform by men); see Figure 5 for details.

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[35] Facebook (Social Network) and Instagram are two products of Facebook, Inc.

Figure 5. Main social media platforms among European consumers, by sex[36]
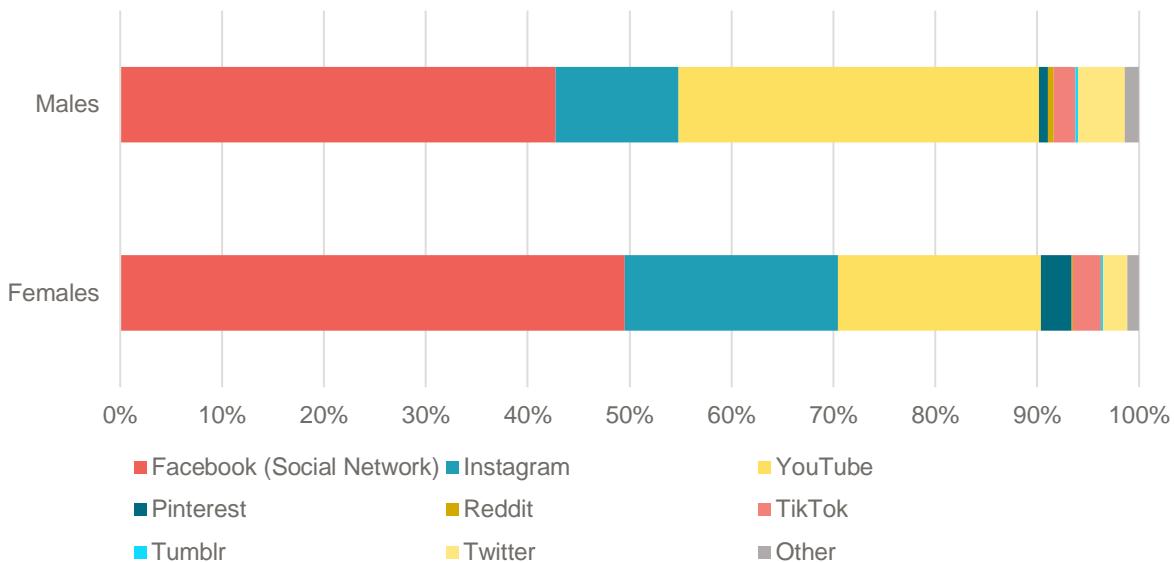
Analysis of Q12: Over the past three months, which of these online websites or applications did you use most frequently?

While earlier research found no notable variations in the overall use of social media by gender[37], the earlier studies and our survey both found such **variation by age**. In general, according to sources developed by digital marketers[38], each generation has its preferred means of communication, and the influence of digital platforms is most pronounced within the younger groups:

-   The silent generation (born pre-1946) and Baby Boomers (born 1946-1964) both prefer face-to-face and telephone calls over anything else, although the latter group generally makes widespread use of email as well.

-   Generation X (born 1965-1980) is comfortable with social media, but tends to regard it as a personal platform. Email is their preferred medium for communication.

-   Millennials (born 1981-2000) prefer the instant connection that comes with social media, instant messaging (overviewed in the following section), and email.

-   Finally, Generation Z (born post-2000) is the first generation of digital natives. Social media – especially newer platforms such as Instagram and Snapchat – and instant messaging are their preferred channels for most communication.

It is therefore commonly recognised that younger people have different patterns of usage compared with older generations, as they are more receptive to new trends and new applications. These characteristics are particularly pronounced among consumers below 20 years of age. For example, according to earlier studies, younger people are considerably more likely than people over 30 to use

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[36] Facebook (Social Network) and Instagram are two products of Facebook, Inc.
[37] Ortiz-Ospina, E. (2019). "The rise of social media". Available at: https://ourworldindata.org/rise-of-social-media
[38] Twilio.com (n.a.). How your customers connect: Communication preferences by generation - contact center. Available at: https://www.twilio.com/learn/contact-center/communication-preferences-by-generation

SNS[39]. This is even more true in relation to newly emerging social media platforms such as Snapchat and TikTok, which primarily target Generation Z audiences[40]. Nonetheless, the use of SNS by older adults continues to increase globally[41].

Our survey also found diverging preferences between age groups with regard to specific SNS (see Figure 6). The youngest age group (16-25) stands out strongly, as Facebook is least popular among this group. Indeed, the use of Facebook as a user's main social networking site appears to correspond with age, being higher the older the age of the group. Meanwhile, Instagram strongly exhibits the opposite trend, with its popularity decreasing very markedly among older groups. YouTube shows the most unstable trend in popularity by age, but remains similarly popular among all age groups except the youngest, among whom it is notably more widely used.

Figure 6. Main social media platforms for European consumers, by age group[42]
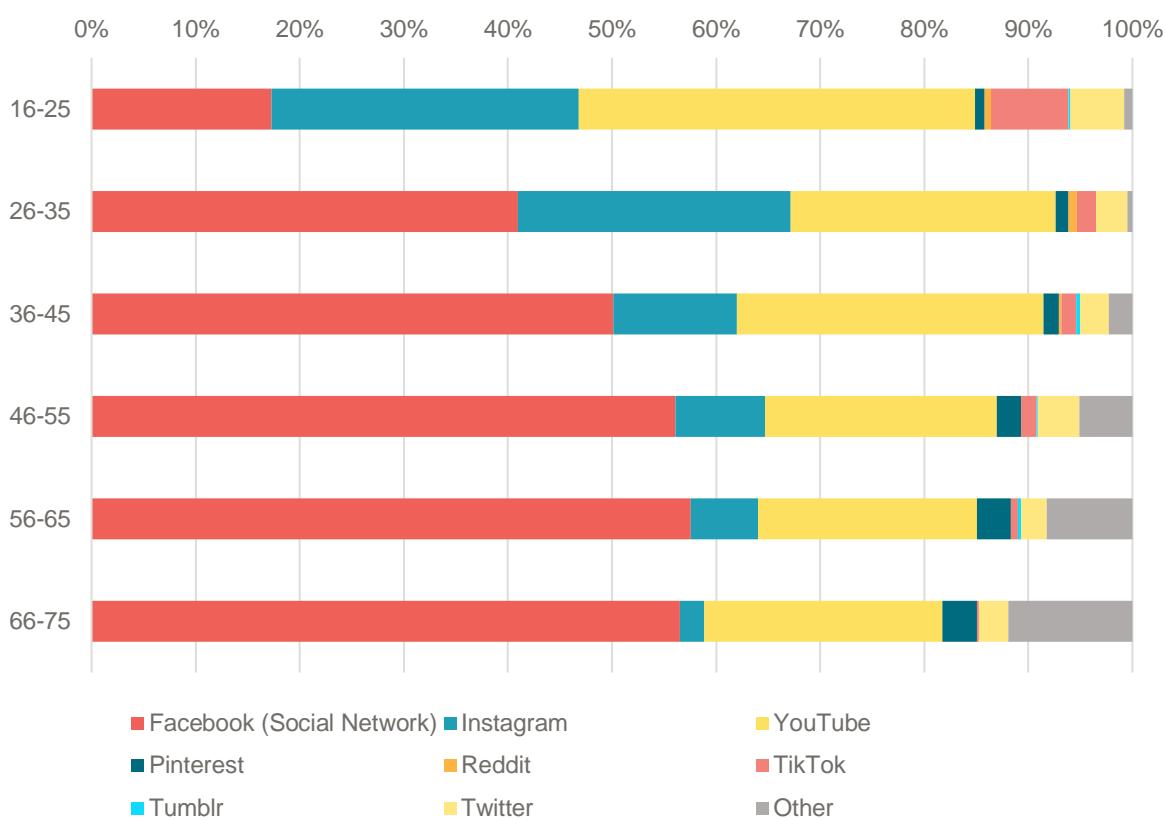
Analysis of Q12: Over the past 3 months, which of these online websites or applications did you use most frequently?

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[39] Pew Research Center (2018). Teens, Social Media & Technology 2018. Online market research company eMarketer, July 2019. Edison Research and Triton Digital March 6, 2019. Available at: https://www.pewresearch.org/internet/2018/05/31/teens-social-media-technology-2018/

[40] Bump, P. (2020). Snapchat vs. TikTok: What Marketers Need to Know. Blog.Hubspot. Available at: https://blog.hubspot.com/marketing/snapchat-vs.-tiktok

[41] Pew Research Center (2020). Demographics of social media users and adoption in the United States. Available at: https://www.pewresearch.org/internet/fact-sheet/social-media/

[42] Facebook (Social Network) and Instagram are two products of Facebook, Inc.

Other interesting findings can be observed in relation to users' level of education: in terms of users indicating their main preferred social networking site, TikTok and Reddit had the largest shares of users with lower levels of education[43]. At the same time, however, Reddit has the largest share of highly educated users, compared with other social media websites (see Figure 7). These differences can, at least to some extent, also be explained by respondent age; with specific platforms such as TikTok being preferred by youth. Meanwhile, Twitter and Instagram both possess more highly educated users who consider one of these platforms to be their main social media platform. Patterns among Facebook and YouTube users broadly reflect the general composition of education levels in our sample.

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[43] Low education category covers ISCED levels 0-2; medium – ISCED 3-4 and high – ISCED. The ISCED categories correspond the following education levels: None or primary pre-primary education (0); Primary education (1); Lower secondary education (2); Upper secondary education (3); Post-secondary non-tertiary education (4); Short-cycle tertiary education (5); Bachelor's or equivalent (6); Master's or equivalent (7); Doctorate or equivalent (8).

Figure 7. Education levels of social media users (main platform)[44]
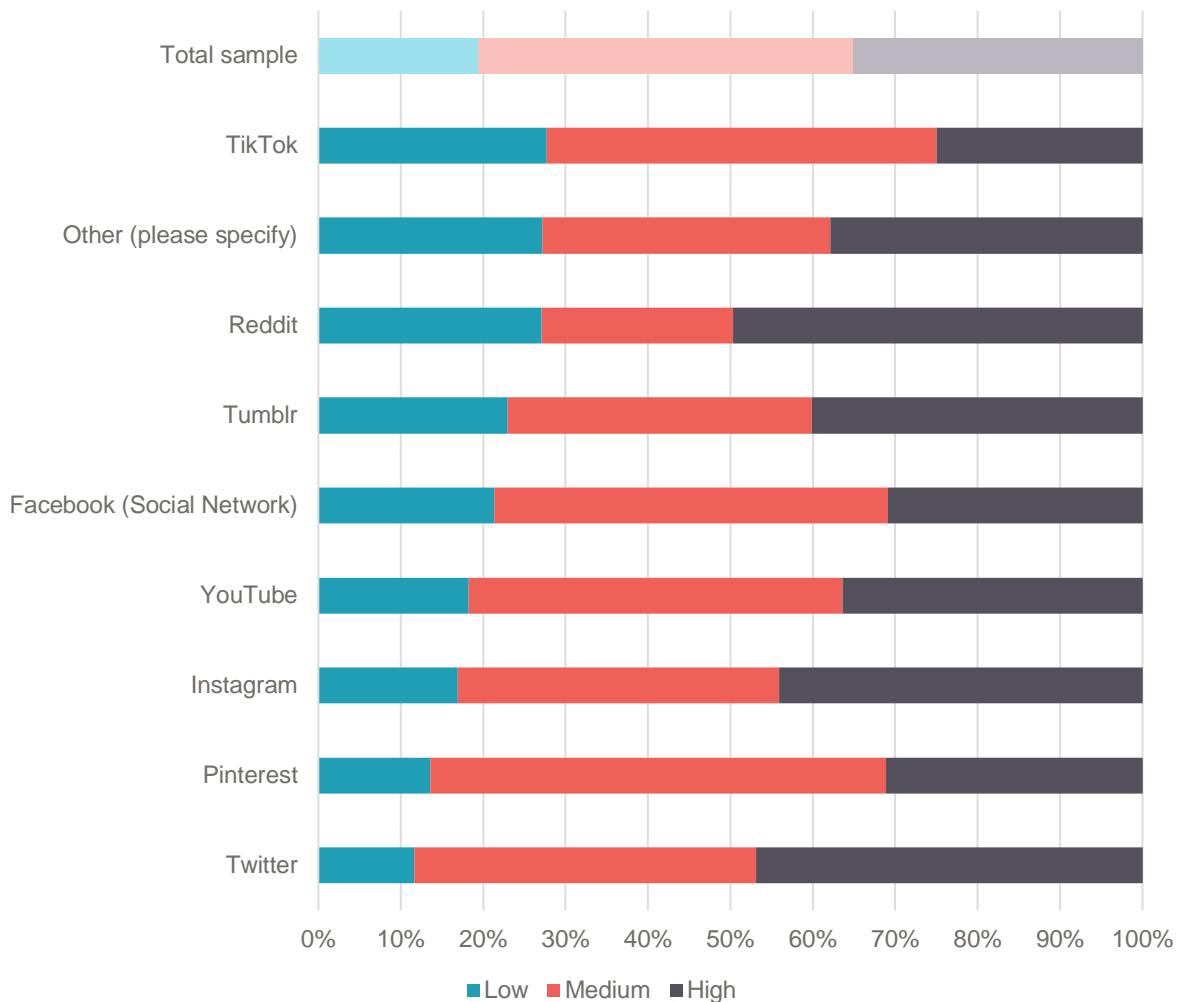
Analysis of Q12: Over the past three months, which of these online websites or applications did you use most frequently?

Finally, the use of social media also varies by country (see Figure 8). As the data show, Facebook is the most popular social media platform in Eastern European countries (59% of Czechs, 57% of Estonians, 66% of Lithuanians and 68% of Romanians) followed by France (53%) and Portugal (51%). Instagram has the strongest position in Portugal (28%), Spain (29%) and Sweden (20%), and the weakest in Lithuania (6%). Meanwhile, the proportion of users reporting YouTube as their main SNS is more consistent across most countries (around 25%), most notably ranging from 15% in Portugal to 33% in Germany.

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[44] Facebook (Social Network) and Instagram are two products of Facebook, Inc.

Figure 8. Main social media platforms, by country[45]
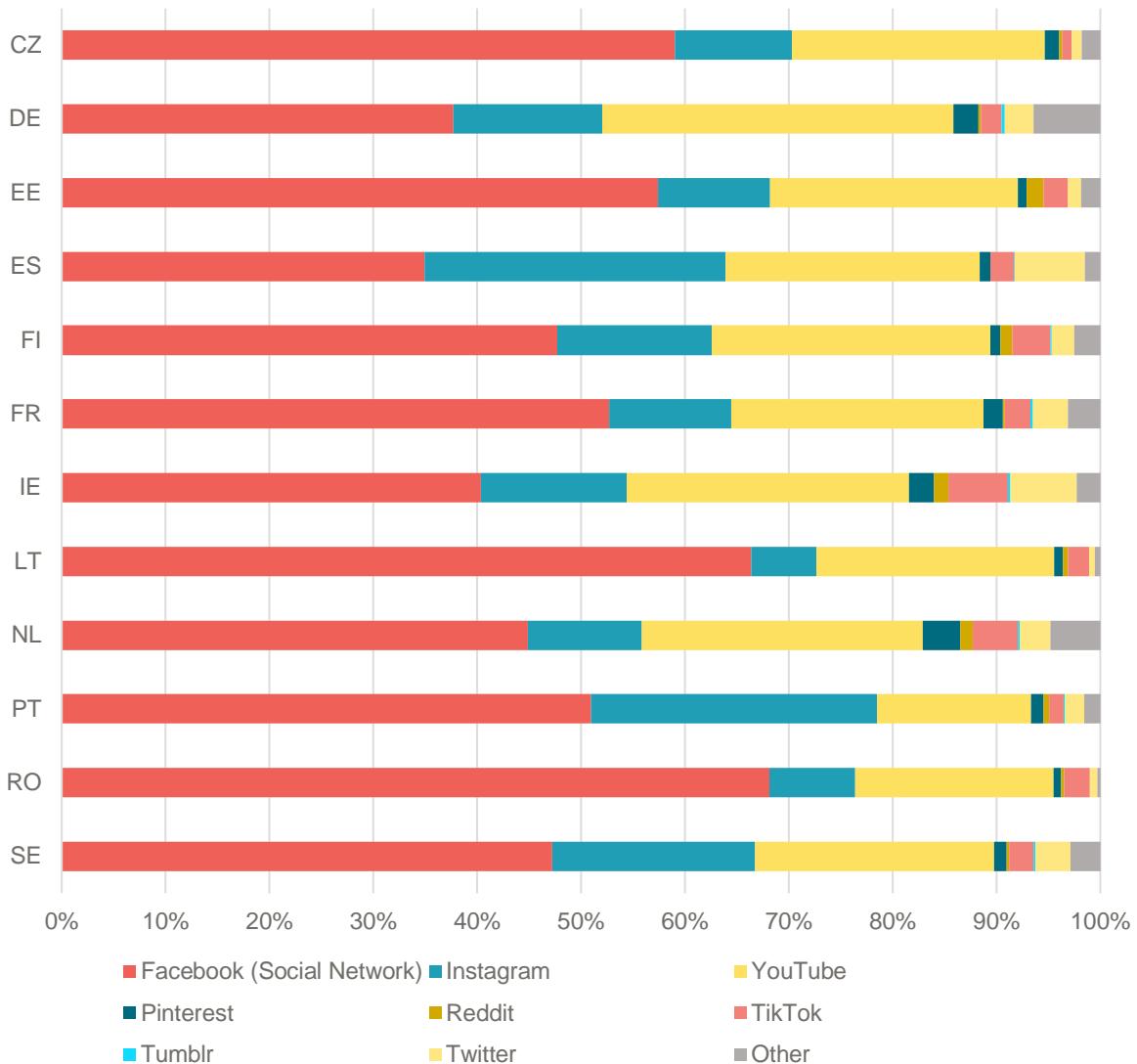
Analysis of Q12: Over the past three months, which of these online websites or applications did you use most frequently?

Most individual users, nonetheless, use several of the social media platforms under investigation at a time, and multihoming is very prevalent. As illustrated in Figure 9 below, only around 11% of consumers from the countries surveyed use only one social media platform from our list; the remaining 89% use two or more. Although no clear trends exist by gender, education or country of residence, the number of social media platforms used correlates negatively with age[46].

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[45] Facebook (Social Network) and Instagram are two products of Facebook, Inc.
[46] Person's correlation coefficient on weighted data -0.406, p=0.00.

Figure 9. Shares of consumers by the number of social media platforms used at least once a month
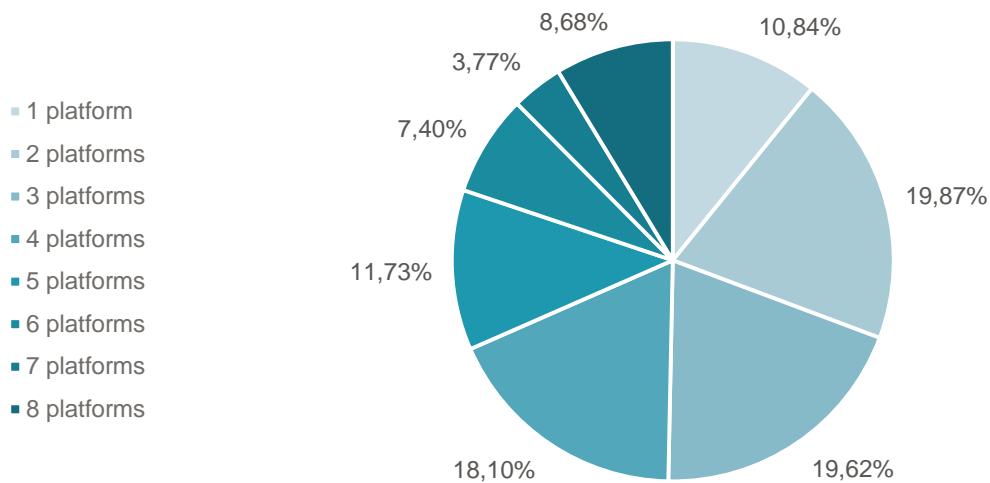
Analysis of Q5: Over the past three months, how often would you say you used each of the following online websites or applications for personal purposes (i.e. not work-related)?

With regard to the purposes for which respondents used their main social media platform, the survey data demonstrates a trend towards more passive use: as illustrated in Figure 10 below, more people tend to access social media platforms to follow their peers, access information and other purposes, rather than to post and share information or media themselves. This is especially true of YouTube, compared with Facebook and Instagram. The same trends towards more frequent, passive use were noticeable also in the segmented analysis by age, gender and education level. This insight was also confirmed by the interviews and focus groups: the majority of consumers tend to use social networks as a source of information, news and entertainment, rather than for actively exchanging files and multimedia themselves.

Figure 10. Main purposes for which respondents used their key social media platforms[47]

■ Sharing messages, files, videos or photos publicly (e.g., posts visible to your friends, contacts, followers)

■ Following the activities, updates, and posts of friends, family and/or other people

■ Accessing information, selling or buying goods/ services and other purposes
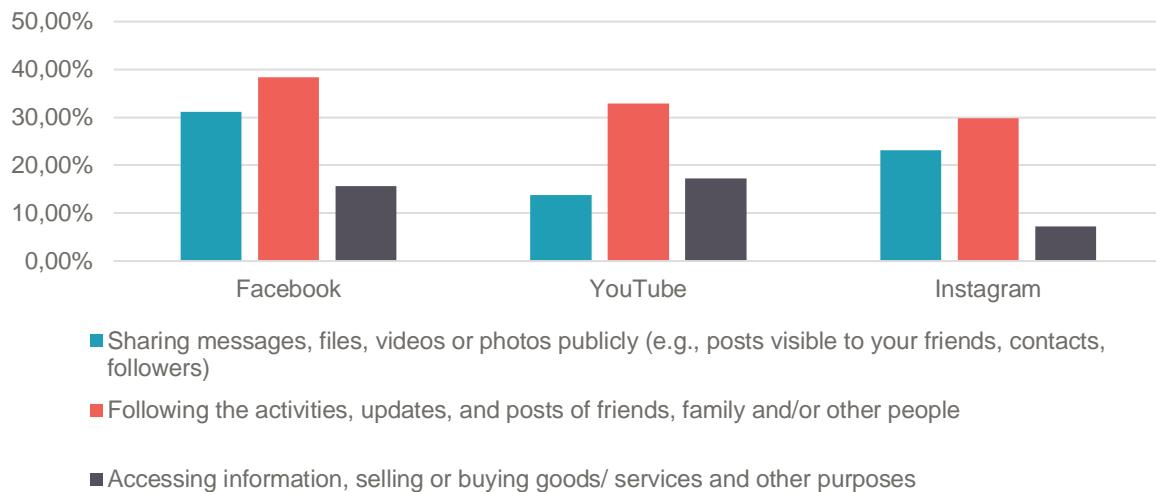
Analysis of Q6: For what purposes do you use the selected online websites or applications?

Messenger applications

WhatsApp is the clear leader as the most widely and most intensively used messenger application among users in the countries surveyed. Over 62% of respondents reported using it daily, and over 80% at least once a month. Facebook Messenger is a fairly close second, while other applications were used at a notably lower rates and levels of intensity (see Figure 11. Frequency of use of messenger applications below).

Box 1. WhatsApp and Facebook Messenger

WhatsApp – the most widely used messenger application, allows users to send text and voice messages, make voice and video calls, and to share images, documents, user location, and other media. WhatsApp's client application runs on mobile devices but is also accessible from desktop computers, as long as the user's mobile device remains connected to the Internet.

Facebook Messenger – the second most widely used application, was originally developed in 2008 as Facebook Chat, with most of its early users being attracted via the social network. The company revamped its messaging service in 2010, and subsequently released the standalone application. Users of Facebook Messenger can send messages and exchange photos, videos, stickers, audio and files, as well as reacting to other users' messages and interacting with bots. The service also supports voice and video calling.

These results from the consumer panel survey are very much in line with the global messenger application usage statistics. According to Statista[48], as of January 2021, WhatsApp and Facebook Messenger had 2.7 billion and 1.3 billion monthly active users, respectively, making them the most popular messenger applications in the world.

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[47] Facebook (Social Network) and Instagram are two products of Facebook, Inc.
[48] Tankovska, H. (2021). Most popular messaging apps. Statista. Available at: https://www.statista.com/statistics/258749/most-popular-global-mobile-messenger-apps/

Figure 11. Frequency of use of messenger applications[49]
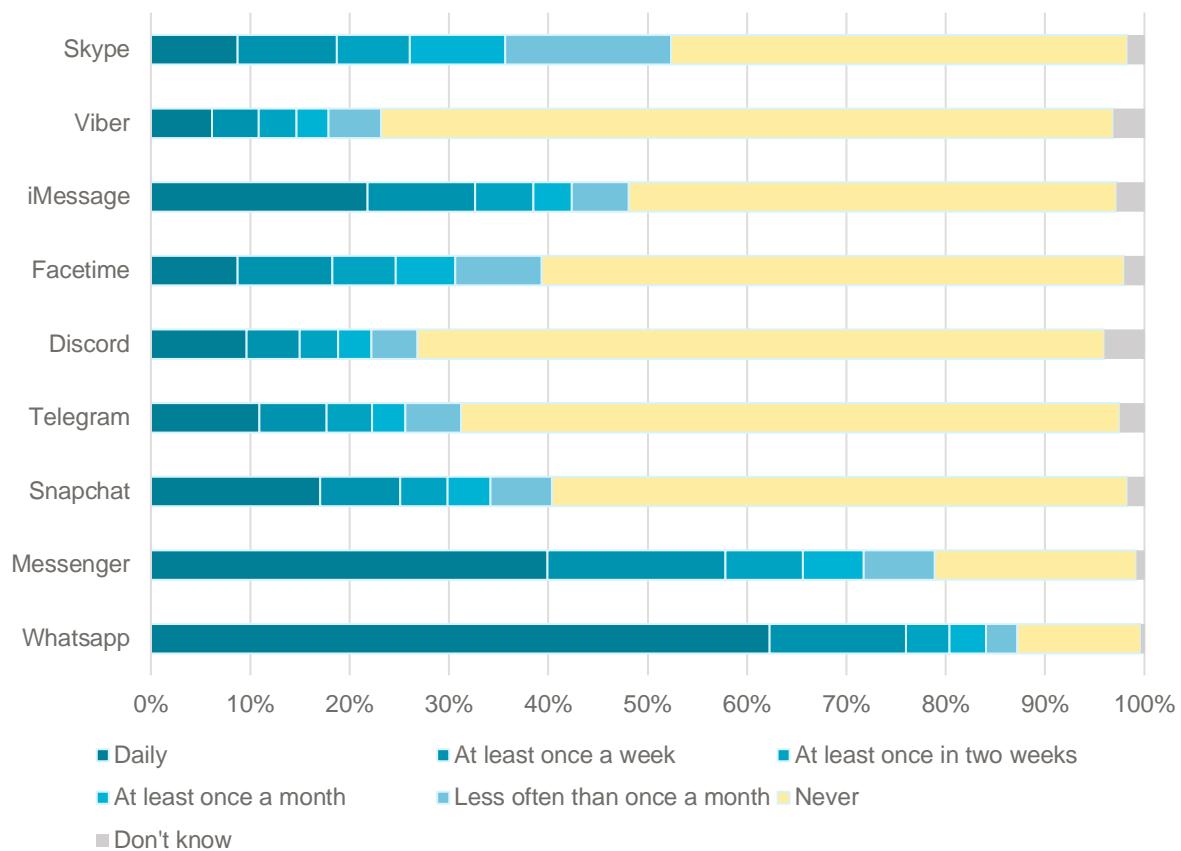
Moreover, the same application is the preferred means of communication in various situations, not just compared with other applications, but with other means of communication too. The survey results show that for 66% of application users from the countries surveyed, WhatsApp is the main means of communication with friends and family; 41% use it for communication on urgent matters; 44% for private and secure communication; and 54% for cross-border communication (see Figure 12). Further discussion of demographic segmentation by preferred means of communication for these purposes is presented in Section 7.1.

[49] Messanger (i.e. Facebook Messenger) and WhatsApp are two products of Facebook, Inc. Facetime and iMessage are two products of Apple Inc.

Figure 12. Consumer preferences for different means of communication in specific situations[50]
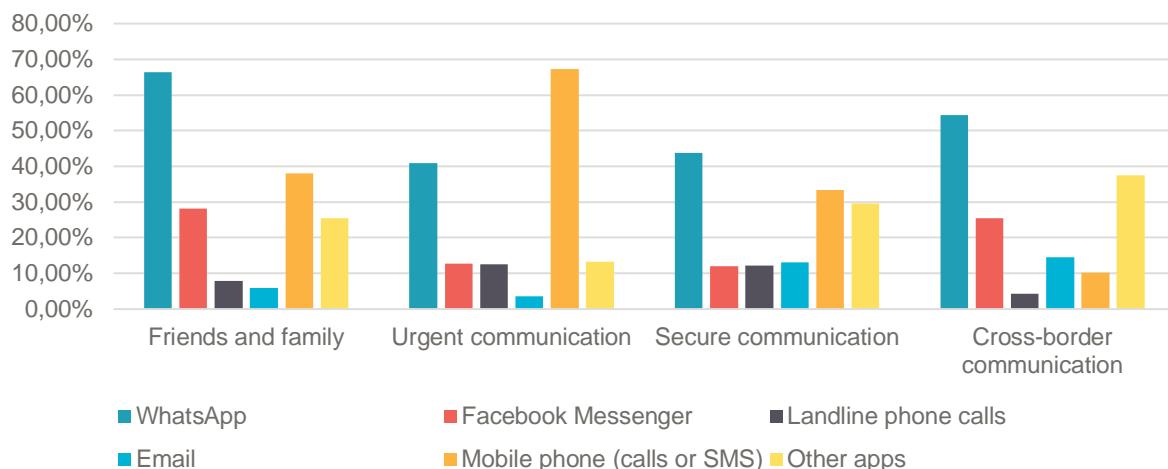
Analysis of Q7: Which means of communication do you prefer to contact your friends or family members?; Q8: Which means of communication do you prefer when you need to contact someone urgently?; Q9: Which means of communication do you prefer when you wish your communication to be secure and encrypted?; and Q10: Which means of communication do you prefer to communicate with someone in another country?. For each question, respondents could indicate up to two choices.

It is also important to note that many businesses which offer various products and services are increasingly using these applications as channels for customer support. In the context of the COVID-19 pandemic, such services have also included healthcare, as discussed in recent literature[51]. The focus group participants noted that communication with various businesses (i.e., B2C/customer service) whose products or services they use was another reason for using messenger applications, most notably WhatsApp and Facebook Messenger.

Nonetheless, according to the survey results, personal messages and audio calls are the key services for which European application users use WhatsApp and Messenger (see Figure 13). These services are similar in essence to those provided via traditional electronic means of communication (as discussed in Chapter 7), as well as the functionalities of some of the other most popular applications. This finding does not vary significantly by age, with very similar shares of age cohort using these functionalities the most, compared with other services offered by the applications. Younger consumers are more likely to make use of functionalities such as video calls, as well as sharing of photos, videos and other media. With regard to gender differences, female respondents are slightly more likely than their male counterparts to use application functionalities such as group chats and to exchange photos and media.

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[50] Facebook Messenger and WhatsApp are two products of Facebook, Inc.

[51] Jakhar, D. et al. (2020). 'WhatsApp messenger as a teledermatology tool during coronavirus disease (COVID-19): from bedside to phone-side.' *Clinical and Experimental Dermatology*.

Figure 13. The purposes for which most popular messenger applications are used[52]

■ Personal messages or audio calls

■ Group messages or audio calls

■ Personal or group video calls

■ Sending messages, files, videos or photos privately (e.g., in personal messages or group chats)
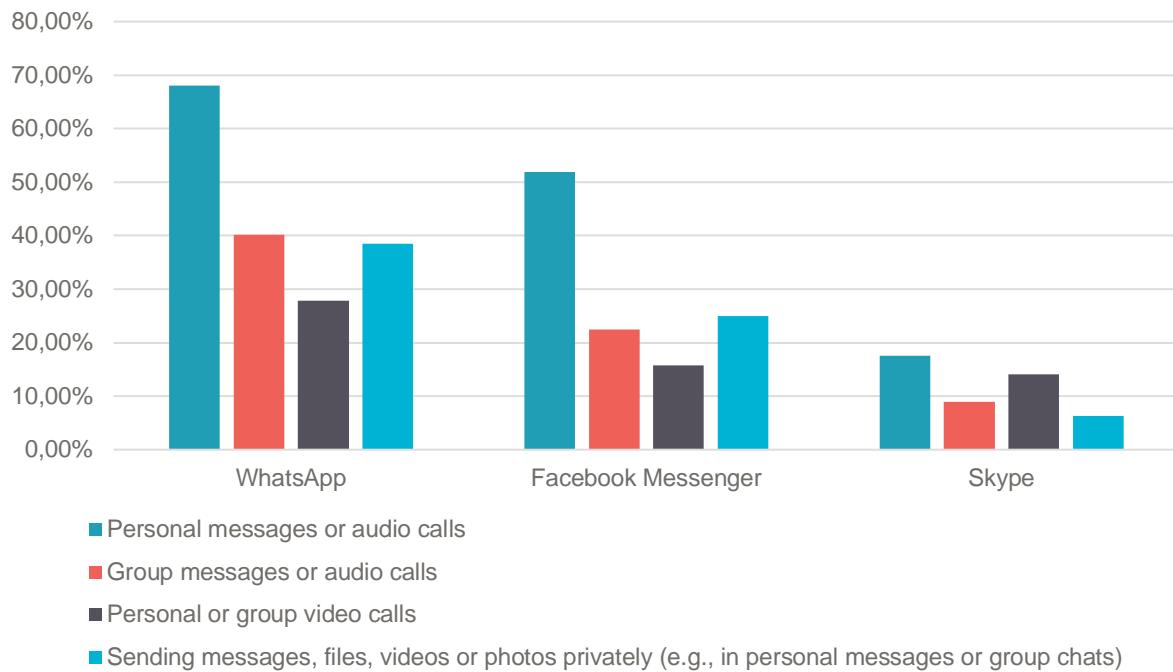
Analysis of Q6: For what purposes do you use the selected online websites or applications?

Personal messages and audio calls are the most widely used functionalities of the three most popular applications – WhatsApp, Facebook Messenger and Skype – among all demographic groups. Meanwhile, application functionalities such as *group* messages and calls, video calls and the exchange of files, are much more popular among younger segments of users, especially among those primarily using WhatsApp and Facebook Messenger. Generally, the data indicate that the number of application functionalities used decreases with user age. Meanwhile, segmentation by gender, education or country of residence did not reveal such clear-cut trends.

1.1.1. Consumer multihoming

As the results above already suggest, multihoming of consumers on several messenger applications at a time is very widespread. Only around 18% of the consumers used one application exclusively at least once a month during the previous three months (for the list of applications presented in the survey, please see Section 2.1 for more details). The remaining respondents – over 82% – use two or more applications at least once a month (see Figure 14 below). Nevertheless, multihoming does not necessarily indicate that the services are very competitive. The most used applications, such as WhatsApp and Facebook Messenger (Facebook, Inc.); or Facetime and iMessage (Apple) belong to the same undertaking.

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[52] Facebook Messenger and WhatsApp are two products of Facebook, Inc.

Figure 14. Shares of consumers using multiple messenger applications at least once a month
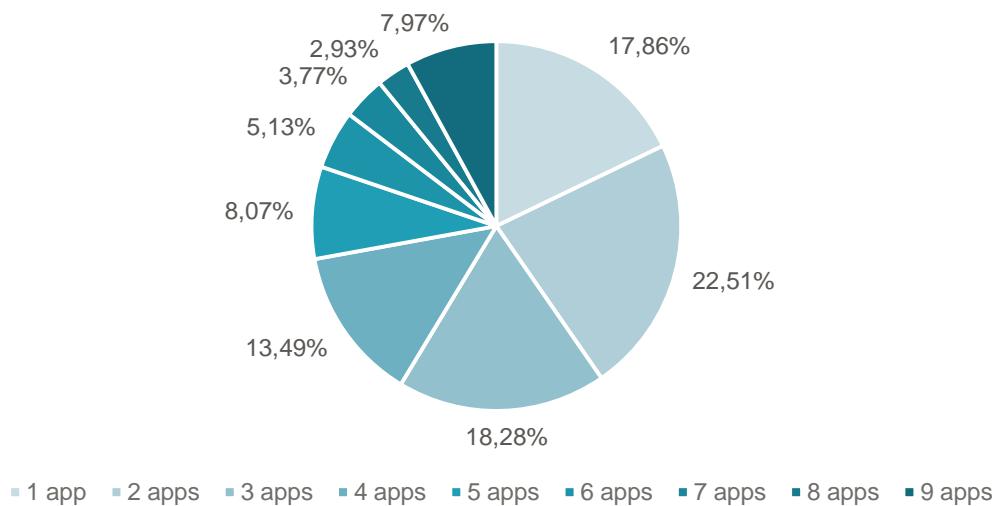
Analysis of Q4: Over the past three months, how often would you say you used each of the following online websites or applications for personal purposes (i.e. not work-related)?

In the panel survey, 43% of respondents also agreed or strongly agreed that they used multiple messenger applications *regularly* (see Figure 15 below).

Figure 15. Regular use of multiple messenger applications
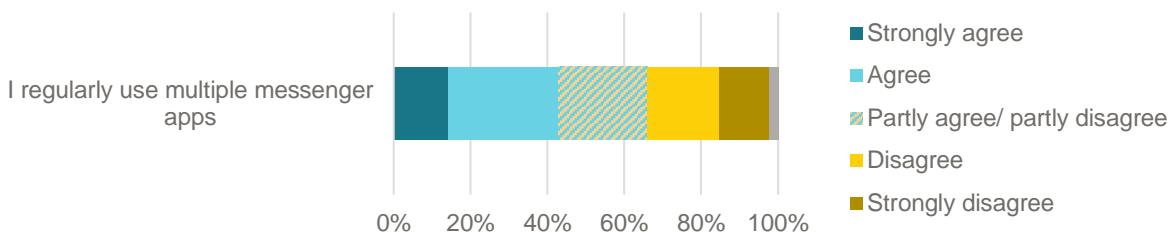
Analysis of Q24: "I regularly use multiple messenger applications."

The survey results show that the number of messenger applications used by a single consumer depends somewhat on their demographic characteristics – in particular, age. A statistically significant, moderately negative correlation exists between age and the number of applications used[53]. Meanwhile, gender is only an influence when also controlling for age, income and education, indicating that men tend to use more applications than women[54]. No notable relationships were found between the level of education and the number of applications used.

The finding that consumers multihome on multiple messenger applications is unsurprising. Existing research literature also finds that most users tend to communicate via multiple

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[53] Pearson's two-tailed correlation: -0.368; p=0.00

[54] Multiple linear regression was applied with the number of apps as a dependent variable, and gender, higher than median income, age and level of education as independent variables.

platforms/applications at the same time (even when they offer almost identical functionalities), and that the preferred platforms often replace one another in different situations. For example, an article, illustratively entitled 'WhatsApp is for family; Messenger is for friends'[55], argues that the contacts that consumers have on a specific platform affect their conversations, their communication patterns with the application, and the quality of their social relationships. The features and technical constraints of different platforms contribute to creating individualised communication domains, each with its own membership rules, perceived purposes, and emotional connotations. Users also shift their communication patterns to accommodate changes in their contacts' behaviour, the dynamics of their relationships, and the restrictions of the technology[56].

The idea of different apps for different purposes was reiterated in our interviews and focus groups, as the participants shared that they use different applications to communicate with different groups of people: relatives from different generations, peers from different countries and different social circles. One interviewee explained that they tended to "compartmentalise" their applications based on the purposes for which they use them. Users also migrate from platform to platform often, so the participants felt the need to constantly try out new communication applications in order not to miss out on any information and to keep in touch with the people using them. This applies to both personal and professional circumstances, and ultimately the line between personal and work-related communication can become very blurred when new digital products are used and domesticated.

However, the focus group participants also viewed application multihoming as a not completely voluntary or desirable behaviour. As different groups of people with whom the consumer communicates – friends, family members, colleagues, community members – use different applications (and continuously adopt new ones), he or she is also pushed to adopt multiple applications to maintain communication with these groups. Consumers then feel that the continual adoption of new applications for communication "has no end", and that they already have "too many platforms to check" every day. On the other hand, individual choice and switching between different applications is not easy: consumers emphasise that applications are worthless if the people they communicate with do not use these services. Meanwhile, encouraging their entire social circles to migrate to new applications is almost impossible. This strengthens the network effects and feedback loops of incumbent main applications and creates 'lock-in' effects for consumers.

Box 2. Platform business models

> The most prominent platforms analysed in this study have a multi-sided business model, meaning that the digital services they provide primarily interact with three different groups:
>
> - consumers who use the services provided by the digital platform;
>
> - advertisers, who purchase the opportunity to display ads to consumers;
>
> - content creators, who contribute to attracting consumers to the platforms.
>
> The business model used by platform companies such as Google, Facebook and others for consumer facing services (including social networks and messenger applications), is to charge a zero monetary price to

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[55] Nouwens, M., Griggio, C.F., & Mackay, W.E. (2017, May). "WhatsApp is for family; Messenger is for friends" Communication Places in App Ecosystems. In Proceedings of the 2017 CHI conference on human factors in computing systems (pp. 727-735).
[56] Ibid.

consumers. However, users effectively "pay" for these services by allowing Google and Facebook to collect and use their data, and by viewing advertisements. In other words, the platform services are provided in exchange for data and attention.

Because Google and Facebook collect a great depth of information about their users (both on and off their own platforms), they are able to offer advertisers very specific targeting opportunities. By attracting large numbers of consumers with services free of charge, platforms also can offer large and diverse audiences for advertisers. Larger numbers of consumers result in more data being collected on them, which allows platforms to offer consumer-facing services that attract more consumers, as well as training the targeting algorithms and thus providing better-targeted ads. This, in turn, reduces the average fixed costs of advertising, making the platform more attractive to advertisers. These effects give rise to positive feedback loops.

In general, therefore, such multi-sided platforms can be also characterised by distinct types of users or parties ('economic agents') who interact on the platform; and an increase in usage by one type of user or party increases the value of the platform to users of another type. A larger audience means more interest from advertisers, and more money from advertisers allows platforms to monetise, innovate and develop services that attract even more consumers.

This process creates incentives for the multi-sided platforms to cross-subsidise by setting a relatively low price to users on one side of the platform or service, with the aim of increasing revenues earned on another side of the platform or service. The most obvious example of a cross-subsidy is illustrated above with the case of consumers and advertisers. However, platforms also cross-subsidise, at least to some extent, the different services that they provide. The recent example in the US of changes to WhatsApp's privacy policies[57] illustrates an attempt to do this: Facebook offers the WhatsApp service free of charge in exchange for consumer data, which can then be used for advertising or other purposes on Facebook's social networking and messenger services[58].

From the consumer's point of view, this connects with at least two different questions analysed in this study. First, the platform business model inevitably raises questions regarding consumer data privacy and data use. Second, the fact that the communication services are provided free of charge to consumers has largely determined the platforms' marketing positions and the value of these service to consumers. These issues are further discussed in Chapters 8 and 9, respectively.

1.1.2. The main messenger application for individual consumers

Given the large number of messenger applications with which a single consumer engages, we further operationalised other research questions in the survey questionnaire (user perceptions, behaviours and experiences, discussed in Chapter 4) to focus on those applications that respondents identified as their main ones. As implied by the results presented above, the most widely used main applications among the European internet users surveyed were WhatsApp (selected as the main

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[57] Owaida, A. (2021). WhatsApp updates privacy policy to enable sharing more data with Facebook. Available at: https://www.welivesecurity.com/2021/01/07/whatsapp-updates-privacy-policy-share-user-data-facebook/

[58] Although in the EU merger investigation of Facebook and Whatsapp in 2011, Facebook provided information that it would be unable to establish reliable automated matching between Facebook users' accounts and WhatsApp users' accounts, in 2016, WhatsApp announced updates to its terms of service and privacy policy, including the possibility of linking WhatsApp users' phone numbers with Facebook users' identities. The company was fined EUR 110 million for providing misleading information.

application by over 61% of respondents), and Facebook Messenger, selected by nearly 23% of respondents (see Figure 16 below).

Figure 16. The main applications identified by European consumers for interpersonal communication[59]
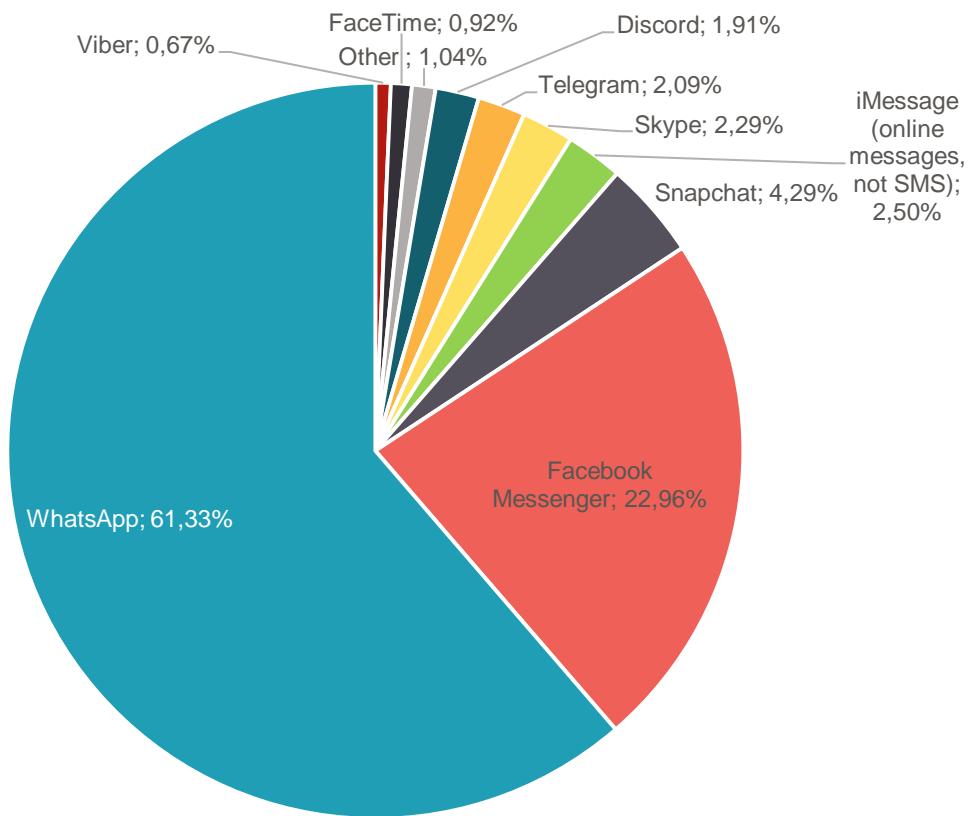
Analysis of Q11: Over the past 3 months, which of these online websites or applications did you use most frequently?

WhatsApp is the most popular messenger application within all the age groups surveyed. However, its use is lowest among the group aged 16-25 - 52% of respondents within this group use it as their main application, compared with 62-64% of consumers in older cohorts. The same trend is notable in the use of Facebook Messenger, which is the main application for 19% of respondents aged 16-25, and for 22-24% of respondents in all older age groups. Indeed, most of the other applications analysed are most popular within this youngest age group (see Figure 17 below), in which application usage is most variable, with a preference for newer applications such as Snapchat or Discord.

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[59] Facebook Messenger and WhatsApp are two products of Facebook, Inc. Facetime and iMessage are two products of Apple Inc.

Figure 17. Most popular messenger applications among different age groups[60]
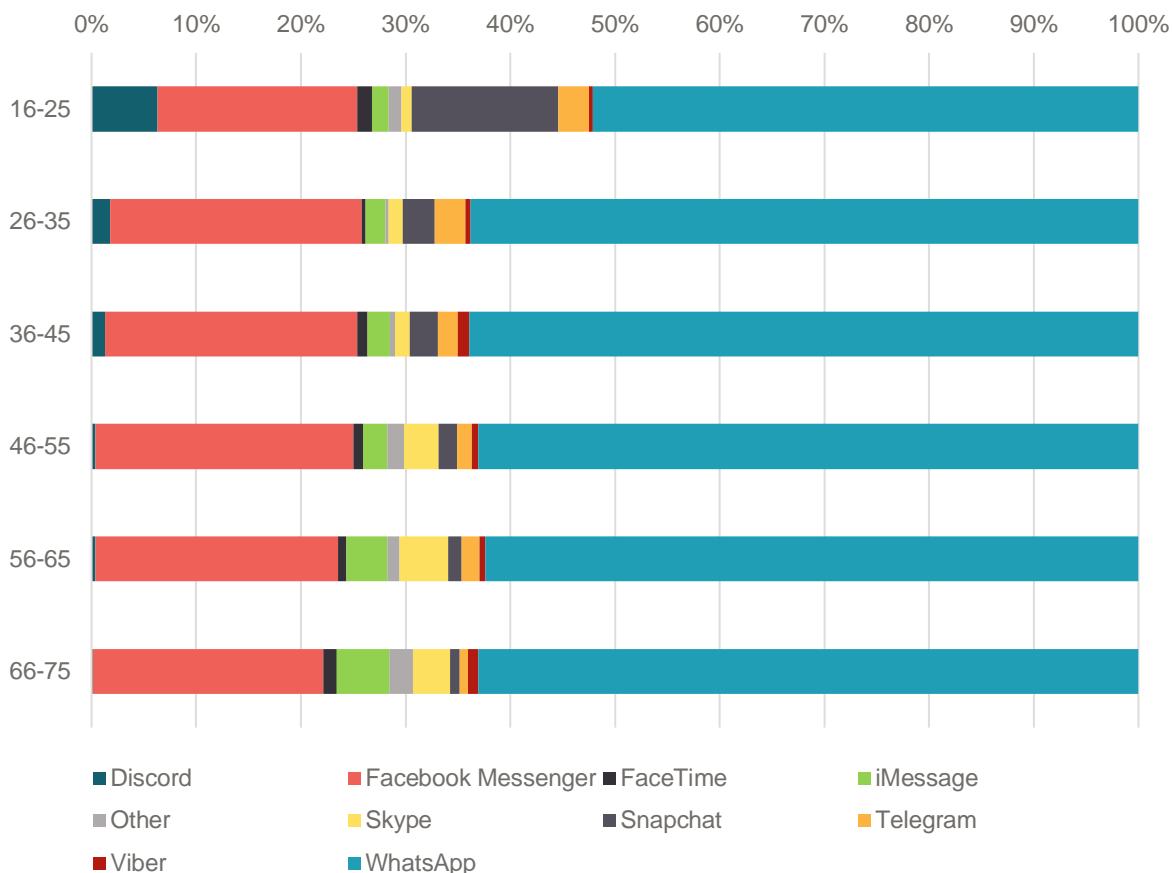
Analysis of Q11: Over the past three months, which of these online websites or applications did you use most frequently?

While there is little variability by gender in the use of WhatsApp as the main application – it was reported by similar shares of men and women – differences in use by gender are more notable for less popular applications. For example, the application Discord – often preferred by online gamers – is almost three times more popular among males than females, and Skype – twice as popular among males. FaceTime, Snapchat and Telegram are also slightly more popular among males. Meanwhile, Facebook Messenger, iMessage and Viber are somewhat more popular among female respondents (see Figure 18 below).

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[60] Facebook Messenger and WhatsApp are two products of Facebook, Inc. Facetime and iMessage are two products of Apple Inc.

Figure 18. Most widely used messenger applications, by sex[61]
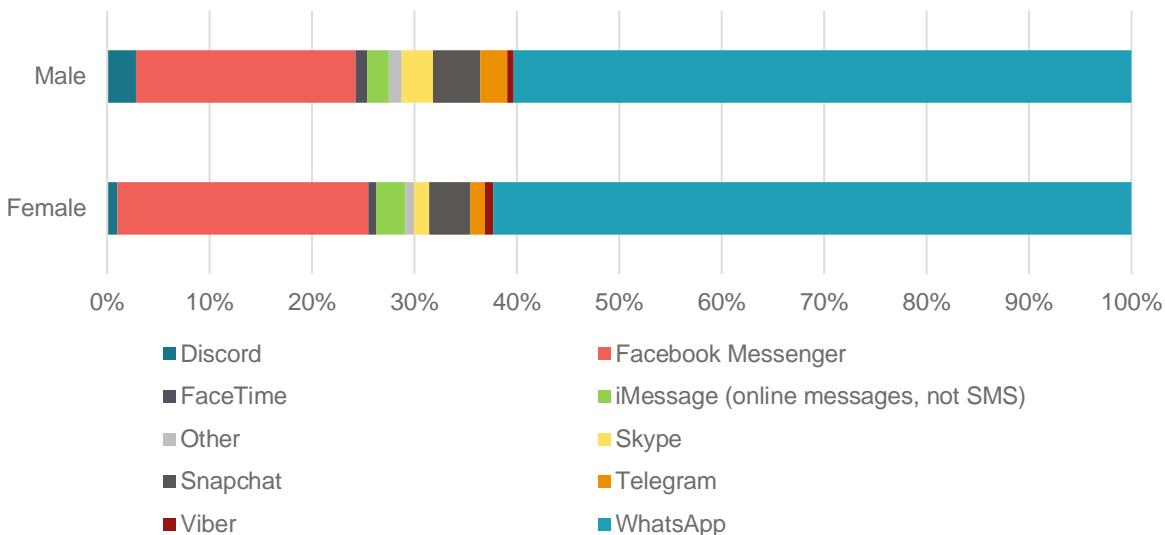
Analysis of Q11: Over the past three months, which of these online websites or applications did you use most frequently?

We identified no strongly pronounced trends linking specific levels of education among consumers to the use of specific applications. In fact, all of the applications reviewed were selected as the main application by users of all education levels. The education levels of consumers who selected WhatsApp and Facebook reflect the general education characteristics of our sample. Nonetheless, as illustrated in Figure 19 below, certain differences by education level do exist. For instance, Skype has a larger share of users with high levels of education (ISCED 5+) compared with other platforms, while iMessage and Discord have a larger share of users with low levels of education (ISCED 0-2). The effects of education are not pronounced when controlling for age, however.

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[61] Facebook Messenger and WhatsApp are two products of Facebook, Inc. Facetime and iMessage are two products of Apple Inc.

Figure 19. Level of education of application users (main application)[62]
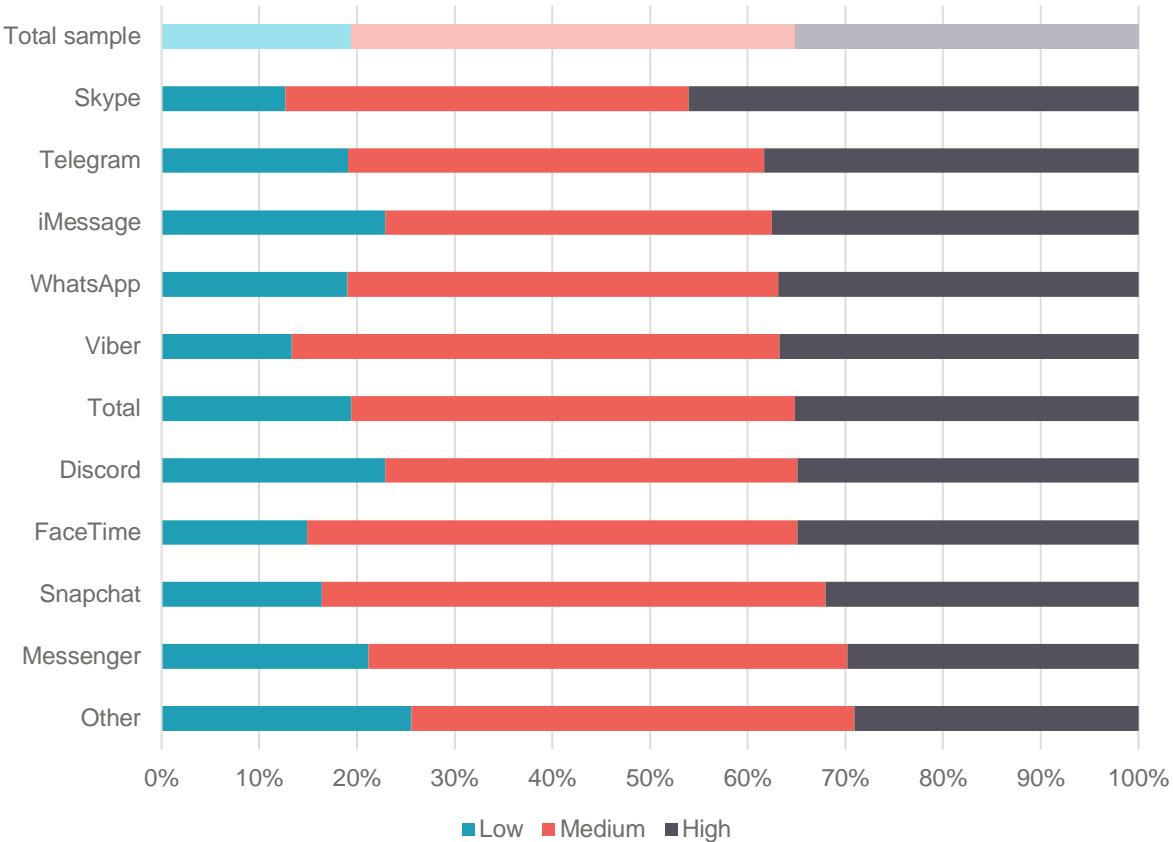
Analysis of Q11: Over the past three months, which of these online websites or applications did you use most frequently?

The most notable differences in app choice were found by consumer country. Rates vary quite markedly between European countries, and can be grouped into WhatsApp vs Messenger-dominated markets. As Figure 20 below illustrates, while WhatsApp is the main application for respondents in Romania (58%), Portugal (58%), the Netherlands (78%), Ireland (58%), Finland (71%), Spain (89%) and Germany (79%), Facebook Messenger dominates in Sweden (50%), Lithuania (76%), Estonia (71%) and Czech Republic (58%). Meanwhile, France is the most diverse country in this regard, with Facebook Messenger selected as the main application by a higher share of users (43%) than WhatsApp (28%), but many other applications having notable shares as well.

[62] Messenger (i.e. Facebook Messenger) and WhatsApp are two products of Facebook, Inc. Facetime and iMessage are two products of Apple Inc.

Figure 20. Main messenger applications, by consumer country[63]
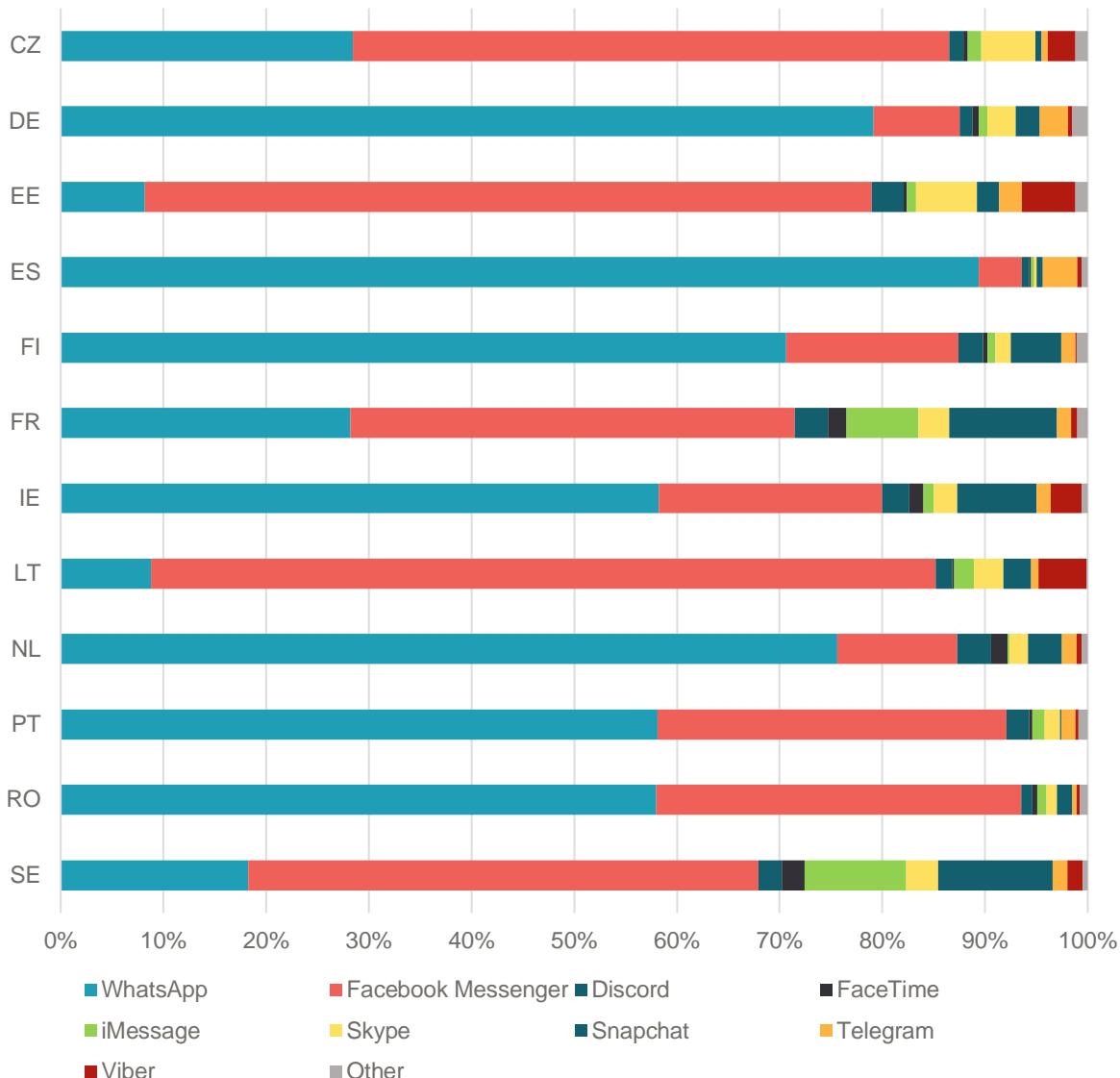
Analysis of Q11: Over the past three months, which of these online websites or applications did you use most frequently?

To further investigate interchangeability between different applications for individual consumers, in the survey we asked what means of communication they would choose in the **short term**, if their main messenger application were to suddenly stop working. Among the respondents, 19% indicated that they would use another digital application in such a situation (rather than traditional electronic means of communication, discussed further in Chapter 7). We then asked these respondents which specific application they would use. Interestingly, no matter which main application from our list users had selected, most reported that they would fall back to using WhatsApp if their main application (other than WhatsApp) stopped working for a short period of time. Among those users

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[63] Facebook Messenger and WhatsApp are two products of Facebook, Inc. Facetime and iMessage are two products of Apple Inc.

who had selected WhatsApp as their main application, the short-term fall-back options selected most often were Facebook Messenger and Telegram.

Another question focused on alternative means of communication if the user's main application were to stop working over the **long term**. This showed that 27% of users would opt for another digital application as a replacement (as opposed to other traditional electronic means of communication; see Chapter 7 for more details). We then asked these respondents which application they would select as an alternative. Exactly the same trend appeared: most users, for whom WhatsApp was not yet their main application, would select that as their long-term fall-back. For those users whose main application was WhatsApp, the long-term fall-back options selected most often were again Facebook Messenger and Telegram. This indicates a marked pattern of stability in consumer preferences with regard to the two applications with the largest market shares across various situations and purposes of use.

Drivers and motivations behind the use of digital platform communication services

- The Technology Acceptance Model (TAM) provides a foundation for assessing the reasons for rising rates of device and application adoption, especially among respondents in our oldest cohort.

- Using insights from Uses and Gratification Theory (UGT), our survey finds that consumers attach high importance to the utilitarian and social functions of messenger and social networking sites.

- The key motivations for the use of social networking sites among the EU consumers surveyed were that they are free of charge, easy and convenient to use, and that friends and family members also use the service.

- Similarly, the most important motivations for using messenger applications are also that they are free of charge, easy and convenient to use, and that the service is also used by friends and family members.

- An additional motivation for using social networking sites is that they provide entertainment. This option was selected by one in three respondents. However, entertainment is not an important motivation for using messenger applications.

- Utilitarian and social motivations are more important to older respondents than younger ones, while entertainment is primarily a key motivation for younger respondents.

The review of earlier studies provides a fairly nuanced picture of the drivers and motivations behind the consumer use of social media platforms and some of the messenger applications. The discussion in this chapter lays out two theoretical frameworks which serve to provide insights into consumer behaviour on platforms. While previous studies have primarily used these to assess motivations for using social media, our data analysis focuses on both social media and messenger applications. In the next section, we discuss the two most prominent conceptual frameworks used in such studies: the Technology Acceptance Model (TAM), and Uses and Gratification Theory (UGT). These frameworks provide insights into our data on device usage rates and user satisfaction with application functions. In the following sections, we apply these frameworks to review the findings on the key motivations for the use of social networking sites and messenger applications.

Conceptual frameworks

To begin with, studies examining drivers and motivations among users of digital communication platforms often apply insights from the **Technology Acceptance Model (TAM)** [64]. Originally proposed in 1986, the TAM has grown in popularity over the past decade as researchers have sought different theoretical frameworks to examine motivations for the adoption and use of new digital technologies (see Figure 21). The most important elements of the TAM framework are "perceived usefulness" and perceived "ease of use", which studies often cite as factors in the adoption and use of messenger and social networking applications. These factors determine a user's general "attitude toward technology".

Figure 21. Technology Acceptance Model (TAM)
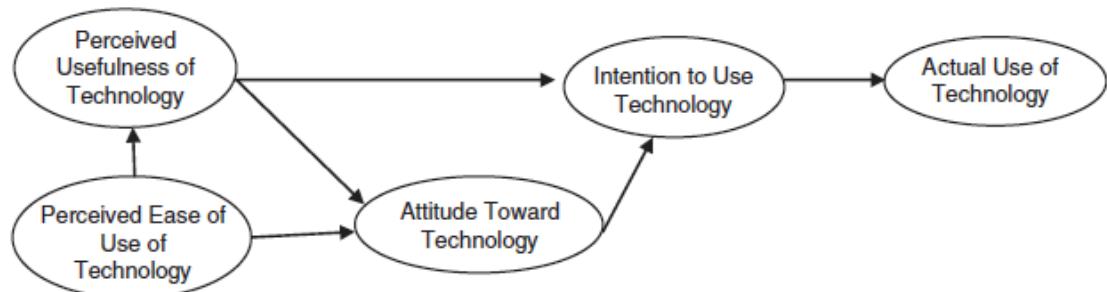
Source: Davis, 1986.

However, given its origins in the pre-Internet age, the TAM has required revision and adaptation in recent years to provide relevant insights on the use of messenger and social media applications. Factors such as perceived usefulness, perceived ease of use, intention to use and actual use have been adapted and incorporated into other studies to increase the TAM's relevance to digital platform engagement (see Figure 22 below).[65]

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[64] Lim, B.H., Lu, D., Chen, T. & Kan, M.Y. (2015, August). # mytweet via instagram: Exploring user behaviour across multiple social networks. In *2015 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM)* (pp. 113-120). IEEE.
[65] Rauniar, R., Rawski, G., Yang, J. & Johnson, B. (2014). Technology acceptance model (TAM) and social media usage: an empirical study on Facebook. *Journal of Enterprise Information Management*.

Figure 22. Revised TAM for social media
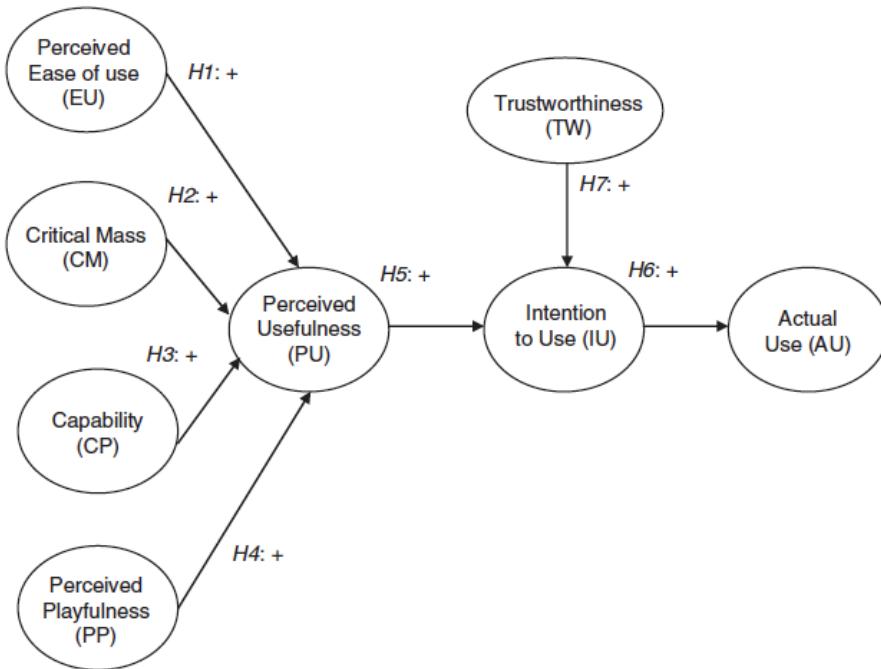
Source: Rauniar et al, 2014.

Rauniar et al. (2014) put forward a revised version of the TAM (see Figure 22) based on an analysis of habits among users of Facebook in the US. The study found that perceived usefulness (PU) was the most important factor influencing a consumer's intention to use a digital platform. However, in this version of TAM, the PU factor consists of additional elements. These include **network effects**, such as a platform having reached a critical mass of users (i.e. users' friends or family also use the platform) to encourage adoption. There is also a role played by new **capabilities or functionalities**, **perceived playfulness** (closely related to entertainment value), and the **trustworthiness** of a platform in influencing intention and use among consumers.

Teo et al. (2018) [66] also aimed to build upon the TAM in the Dhammic Technology Acceptance Model (DTAM), which draws on insights from Buddhist theories of **attachment.** In analysing the factors impacting Facebook use among Canadian students, this study identified the key drivers of Facebook use as perceived usefulness, and ease of use on the platform. However, the model also found that a user's attachment has direct and indirect effects on their use of digital platforms. In other studies, attachment is a significant factor shaping users' motivations and the frequency with which application users engage in single-homing or multihoming.

One example of the TAM's relevance is the variation in device adoption among different consumer groups. Studies drawing on the TAM have shown that within the US and Europe, a digital divide exists between users of traditional means of communication, and users of digital platforms (discussed further in Chapter 7). This divide is especially prominent between those consumers who own and use landline or SIM mobile phones, and those who use more advanced devices such as

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[66] Teo, T., Doleck, T. & Bazelais, P. (2018). The role of attachment in Facebook usage: A study of Canadian college students. *Interactive Learning Environments*, *26*(2), 256-272.

laptops and smartphones. Smartphone ownership, in particular, is often a key precondition for the use of the communication services provided by digital platforms, and thus impacts usage rates and patterns among different consumer groups.

For example, research on tech adoption among the elderly (65+) in the US in 2017 showed that approximately 80% of respondents reported owning a cell phone of some kind, but only 42% reported owning a smartphone –, around 42% lower than rate observed among the youngest cohort[67]. Only one-third of those aged 65+ were reported to use social media of any kind, and around 40% reported never having used the internet. Factors such as age, education and household income appear to have an effect on device ownership, with the highest rates of uptake being among younger, better educated and more well-off participants.

The findings from our survey provide insights into the acceptance of technology across different consumer demographics. Figure 23 below presents data showing variation in the rates of device ownership for personal use by age cohort. In contrast to the findings discussed above, our survey shows that 91% of respondents within our oldest cohort (55-74) report owning a smartphone for personal usage. Differences in the rates of ownership between younger and older users are fairly minimal. Similarly, we see that rates of ownership of laptops and mobile phones are roughly equal across all three age cohorts. However, older consumers are more likely to own landline phones compared with younger users.

Figure 23. Communication device usage among EU consumers, by age
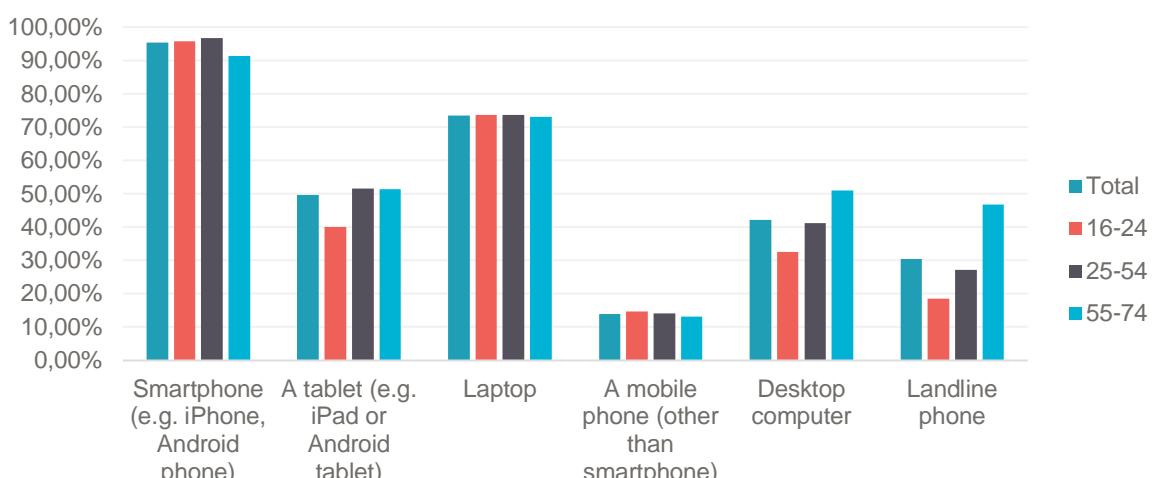
Analysis of Q2: Which of the following devices do you have for your personal use?

However, the TAM alone cannot serve as the foundation for the analysis of consumer motivations. While the acceptance of new technologies is a necessary first step towards digital platform use, other dynamics come into play once consumers adopt and develop usage habits on these networks. A number of studies have applied **Uses and Gratification Theory (UGT)** as a framework for understanding motivations of use. UGT holds that individuals and groups are active and goal-oriented consumers of media. When consuming media, individuals seek to gratify certain desires and needs, and have expectations as to how such media will help them to achieve gratification. However,

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[67] Anderson, M. & Perrin, A. (2017). Tech adoption climbs among older adults. Washington, DC: Pew Research Center.

as media satisfy users' desires and needs, they become sources of competition with other need-satisfying sources. [68] While there are various applications for UGT theory, most studies have focused on the dynamics of usage within the context of social media. They find evidence of three forms of gratification that serve to explain consumer behaviour on digital platforms: utilitarian, social and hedonic.

Utilitarian gratification. Studies examining utilitarian forms of gratification have shown that the **ease and convenience** of digital platforms are important motivations for usage cross-nationally.[69] Another important element in utilitarian gratification is that these platforms are **free to use** (as discussed in Chapter 9, this feature is especially important to consumers). But these platforms also play an instrumental role in allowing users avenues for **information seeking** and **self-presentation**, as well as **self-documentation**. One study of US college students finds that platforms are often used for depicting one's life through photos, and for creating posts to remember and commemorate important life events. Another study of the messaging service WhatsApp showed that it is also used within family contexts for 'lifelogging' – sharing items in family chats in order to archive events so that they can be revisited in the future[70]. Similar behaviours were reported by the participants in our interviews and focus groups.

Our survey also shows that consumers attach great importance to utilitarian functions. In response to one question asking users to rate aspects of their main messenger applications, we find that most users rated the utilitarian features of their applications most highly. As shown in Figure 24, around three out of four rate the convenience (74%) and reliability (73%) of their main messenger applications as good ("good" or "very good"). This is mirrored by similar proportions for functionalities (70%) and the platform interface (70%).

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[68] Alhabash, S. & Ma, M. (2017). A tale of four platforms: Motivations and uses of Facebook, Twitter, Instagram, and Snapchat among college students?. *Social Media+ Society*, *3*(1), 2056305117691544.

[69] Karimi, L., Khodabandelou, R., Ehsani, M. & Ahmad, M., 2014. Applying the Uses and Gratifications Theory to Compare Higher Education Students' Motivation for Using Social Networking Sites: Experiences from Iran, Malaysia, United Kingdom, and South Africa. *Contemporary Educational Technology*, 5(1), pp.53-72.

[70] Karapanos, E., Teixeira, P. & Gouveia, R. (2016). Need fulfillment and experiences on social media: A case on Facebook and WhatsApp. *Computers in Human Behavior*, 55, 888-897.

Figure 24. User ratings of the key utilitarian functions of their main messenger application
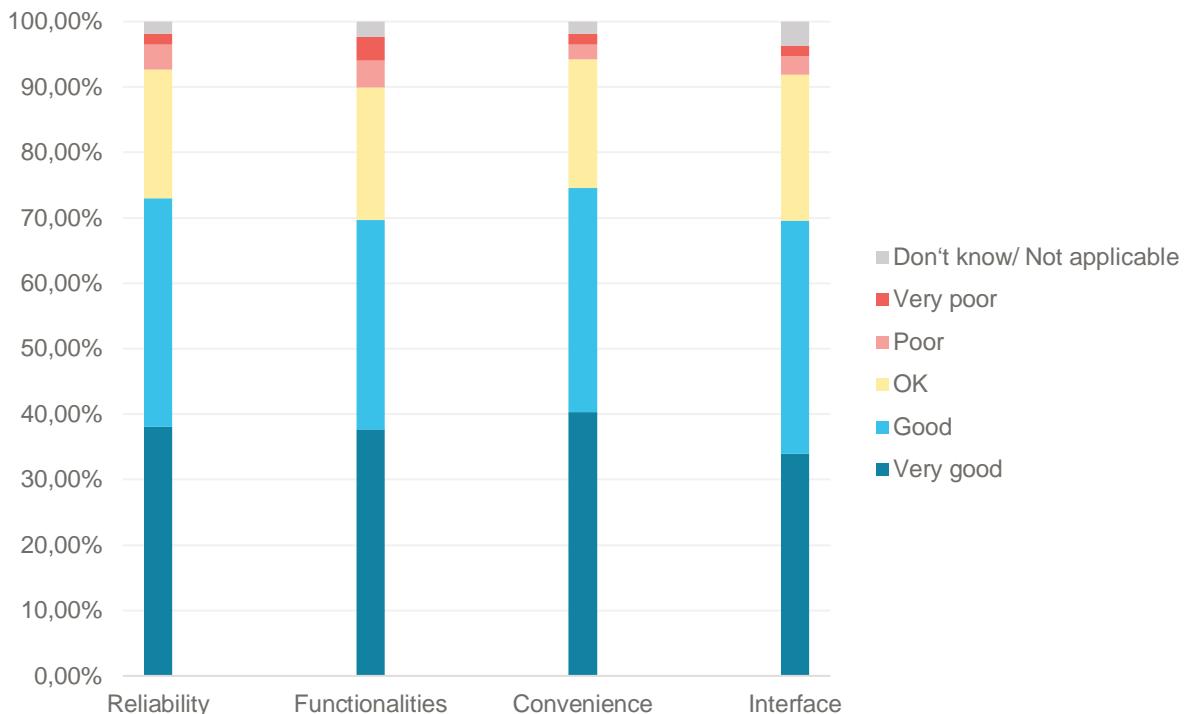
Analysis of Q20: "How would you evaluate the communication services provided by [main messenger application] on the following dimensions?"

However, questions regarding users' motivations for using apps provide better evidence on social and hedonic gratification, as discussed in the sections below.

Social gratification. Another important feature of digital platforms is their role in facilitating social interaction, especially between close contacts.[71] Research has shown that building **social connections** and attaining a **sense of belonging** are important motivating factors behind the use of digital platforms[72]. These platforms build and expand social networks, with consumers tending to join and use platforms on which their friends or family are active, replicating real-world social communities online, as discussed in Chapter 3. Indeed, the presence of family and friends on a particular platform is a key driver of both platform adoption and sustained use. Studies show that social interaction with family and friends is a key driver of engagement on multiple platforms[73]. A sense of social belonging and romantic aims were also found to be among the main motivations for social media use in a cross-sectional survey of American adolescents[74].

Studies have also pointed to clear variations by gender in the social gratification of motivations to use digital platforms. One study of several hundred social media users found that both sexes are

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[71] Hossain, M., Kim, M. & Jahan, N. (2019). Can "Liking" Behavior Lead to Usage Intention on Facebook? Uses and Gratification Theory Perspective. *Sustainability*, 11(4), 1166.

[72] Sheldon, P. & Bryant, K. (2016). Instagram: Motives for its use and relationship to narcissism and contextual age. *Computers in Human Behavior*, 58, 89-97.

[73] Alhabash, S. & Ma, M. (2017). A tale of four platforms: Motivations and uses of Facebook, Twitter, Instagram, and Snapchat among college students?. *Social Media + Society*, 3(1), 2056305117691544.

[74] Young, R., Len-Ríos, M. & Young, H. (2017). Romantic motivations for social media use, social comparison, and online aggression among adolescents. *Computers in Human Behavior*, 75, 385-395

driven to use social media for self-enhancement. However, this study found that women are largely driven by relational motivations ('maintaining ties with close friends' and 'social information on close friends'), while men are driven by a search for general information about others and society[75]. Furthermore, for women, higher numbers of SNS friends led to higher satisfaction with using SNS services, which in turn was associated with greater intention to continue using a platform. For men, intention to continue was impacted by the number of friends they had on the platform.

Hedonic gratification. Multiple studies have emphasised the importance of **entertainment** and **passing time**. Many UGT studies focus on the enjoyment derived from using digital platforms. For example, an exploratory survey of students from Canada, US, Argentina and Mexico shows that the perceived value of entertainment has a positive impact on users' intentions on social network sites (SNS)[76]. This finding applies to consumers of both sexes, all age groups, and different patterns of internet use. Other studies conducted in Europe and elsewhere also find that entertainment-related factors, such as counteracting boredom and enjoyment, are especially important for adolescent users of social media.

The entertainment value derived from the use of digital platforms varies between services. One study employing UGT to investigate motivations for social media use among millennials in the US finds that entertainment was among the strongest motivations for the use of Facebook, Instagram and Pinterest[77]. Other studies have similarly concluded that entertainment is among the strongest motivations behind the use of Twitter, as well as Facebook and Instagram[78], with others pointing to strong entertainment motivations among users of Snapchat, in addition to the platforms mentioned above [79].

However, we can also understand psychological attachments to platform services as resulting from conscious strategies employed by platform owners. As discussed in Box 2 above, the objective of social media and messenger companies is to generate continuing use among consumers, largely for the purposes of collecting data that can be exchanged with advertisers and other interested firms. However, under certain circumstances, the overuse of these technologies may negatively impact the psychological well-being of users. Box 3 below provides an overview of the literature on how social media and messenger use can generate dysfunctional outcomes among consumer populations.

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Box 3. The dysfunctional cognitive dimensions of platform use

A growing body of research has highlighted the **dysfunctional psychological mechanisms** surrounding digital platform usage, including several that stem directly from the drive for self-expression and popularity. One study applying the UGT framework identified both positive and negative drivers of usage among Facebook users in France. The positive ('socially acceptable') gratifications included collaboration and the enhancement of social connections, while negative ('socially dysfunctional') gratifications included voyeurism (within one's own or others' social circles) and exhibitionism (narcissistic and self-aggrandizing tendencies).

Other studies reveal similar findings relating to ego validation, peer comparison and identity projection as motivations. Such behaviours may also produce tendencies toward surveillance and/or stalking. These motivations are enabled by social networking sites, and even messaging services such as Facebook Messenger and WhatsApp, all of which provide real-time information about the interactions and activities of other people. Such drivers have the potential for clearly negative impacts on others' privacy and signalling around the positive/negative reinforcement of behaviour.

Some dysfunctional psychological drivers also appear as motivations in social interaction and digital device usage. Research finds that youth are driven to engage in social media activities by 'pressure for availability', **smartphone addiction**, **nomophobia** (fear of being without one's device), and **fear of missing out** (FoMo). The authors also argue that social media use can be associated with 'digital omnipresence related to control and loss of control'. This finding was also confirmed by individuals in our focus group (see Annex 4).

Some of the key insights from TAM and UGT studies on the motivations for social media use are directly confirmed by our survey. The questions in the survey that focus on consumer motivations, discussed in the analysis presented below in Section 4.2 and 4.3, reveal the overriding importance of both utilitarian and social forms of gratification among respondents. To a lesser extent, the data also confirms the importance of hedonic gratifications.

However, in the following sections we also aim to extend the UGT framework to messenger applications, thereby making a key contribution to the growing literature on consumer motivations. The data presented below show that respondents seek utilitarian and social forms of gratification on both types of platforms. In contrast, hedonic forms of gratification influence user behaviour in the context of social networking sites, but not in the case of messenger services. The forms of gratification are common to respondents across all demographics, but with greater importance given to utilitarian and social gratification among older groups, and entertainment among younger individuals.

Reasons for using social networking sites

As discussed above, the findings of the TAM and UGT frameworks offer insights into individual and social drivers of consumer behaviour on digital platforms. To further investigate underlying motivations among EU consumers for the use of messenger and social networking sites, we asked our survey respondents to select from a list their three most important reasons for using their main applications.

Figure 25 shows that a plurality of respondents cites the importance of key utilitarian factors such as social networking sites **being free** (46%), and around one in three indicates that **ease and**

convenience of the application (35%) and **having friends and family on the service** (33%) are also key motivations. However, the use of social networking sites among EU consumers also involves the pursuit of hedonic forms of gratification. **The entertainment value** of social media is an important driver of use, with 33% of respondents citing it as a reason for engagement, roughly equal to the rates seen for a platform being used by friends and family.

Figure 25. Reasons for the use of respondents' main social networking site
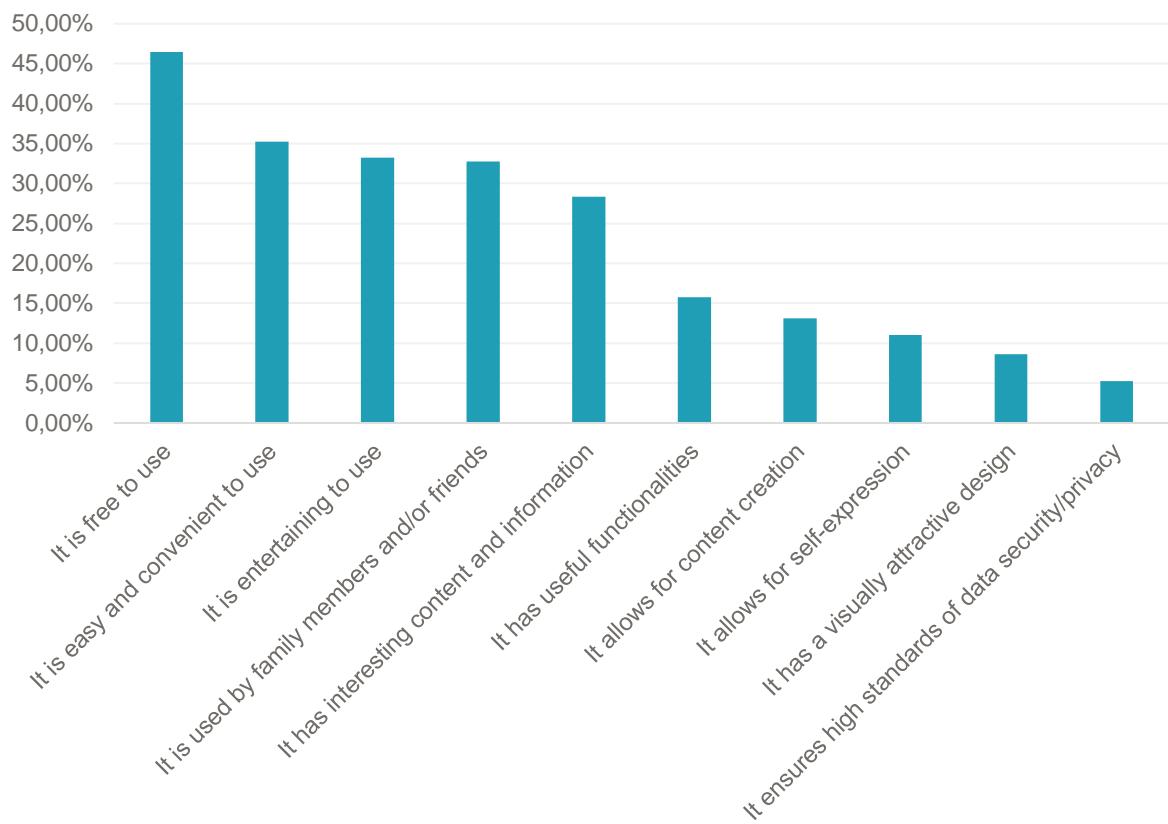
Analysis of Q14: What are the key reasons why you use [main social networking site]?

The most popular reason selected by EU consumers for their use of social networking sites is that they are **free to use**. Figure 26 shows minimal demographic variation by gender and education. The zero cost of social networking sites is cited by slightly more men (48%) than women (45%), with only minor variation by education, responses across all three educational groups hovering between 45 and 47%.

A strong positive correlation can, however, be seen between age and the importance of social media platform use being free. A majority of respondents (55%) in our oldest cohort (55-74) indicate that the use of social networking sites free of charge is a key factor. This falls to a plurality (45%) among users in the middle-aged cohort (25-54), and even lower (37%) among the youngest cohort (16-24), who were the least likely to select zero cost use as an important reason.

Figure 26. Reasons for the use of main social networking site – free to use
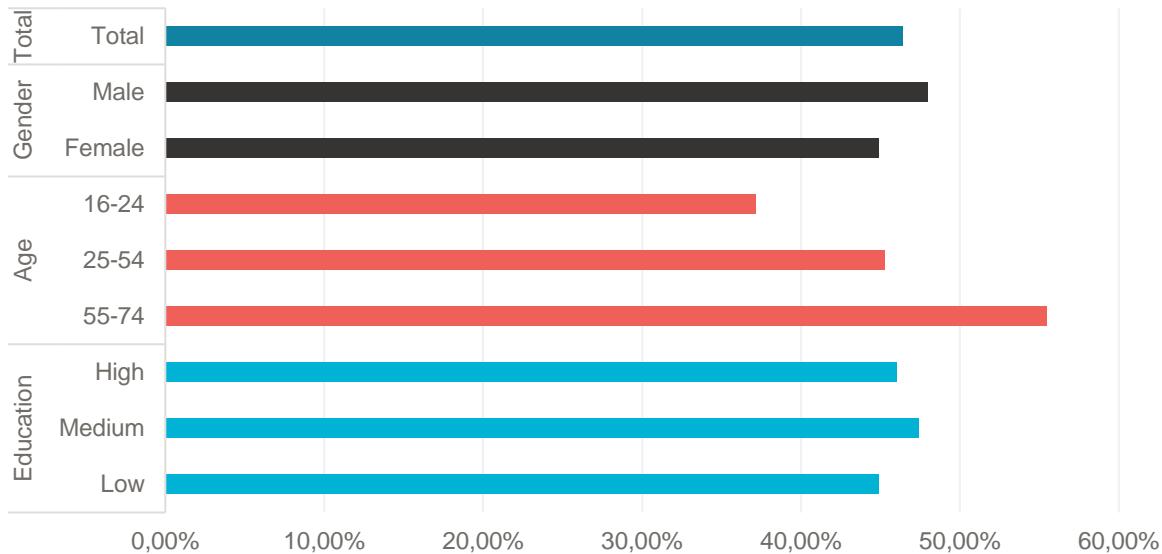
Analysis of Q14: What are the key reasons why you use [main social networking site]? "It is free to use"

Figure 27 shows the variation in these figures by country. The highest rates were observed for respondents in Finland (71%), where women in the two youngest age cohorts drove these rates higher. However, this was the only country in which these rates exceeded a majority of respondents, with minimal variation observed across other countries. Close to a majority of respondents in France (50%), Estonia (50%), and Czechia (50%) indicated that being free of charge is an important reason, while the lowest rates were observed among respondents located in Lithuania (41%) and Spain (36%).

Figure 27. Reasons for the use of social networking site - free to use, by country
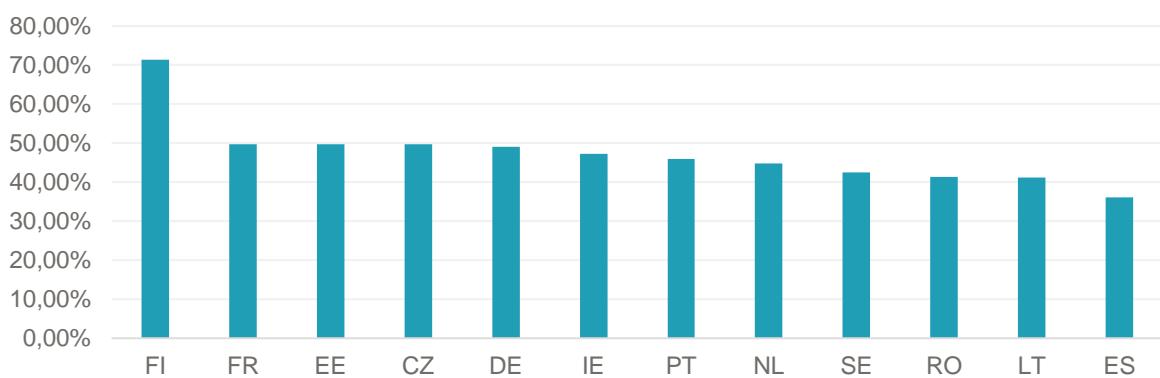
Analysis of Q14: What are the key reasons why you use [main social networking site]? "It is free to use"

The findings for the **ease and convenience** of social networking sites are similar, with some minor variation across demographics. As demonstrated in Figure 28, around 35% selected ease and convenience as a key reason for use. The levels are roughly equal in terms of gender. Women (36%) selected this factor only slightly more than men (34%) as a reason for using social networking sites. We observe no significant variation by educational attainment.

However, again the most notable form of variation is age. Here, we find that a plurality of respondents (40%) in the oldest age cohort (55-74) indicates the importance of ease and convenience of use, the highest among our three age groups. These rates compare with around one in four respondents (27%) among the youngest age cohort (16-24), and 35% among the middle-aged cohort (25-54). This again reinforces the view that certain utilitarian forms of gratification are more important to older users.

Figure 28. Reasons for the use of main social networking sites – ease and convenience of use
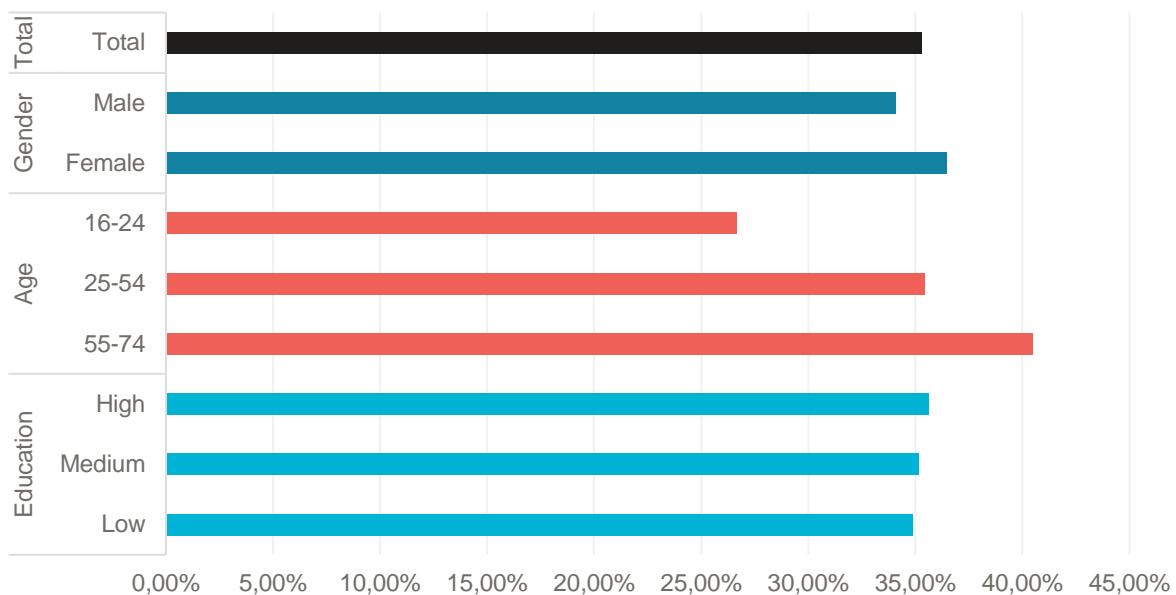
Analysis of Q14: What are the key reasons why you use [main social networking site]? "It is easy and convenient to use"

Some variation can be seen between countries in our findings on the ease and convenience of use of messenger applications. As seen in Figure 29, the highest rates were observed in Finland (68%) and Estonia (48%), demonstrating the continued importance of utilitarian factors for users in these countries. The lowest rates were observed among respondents in Sweden (31%) and the Netherlands (30%).

Figure 29. Reasons for the use of main social networking site – ease and convenience of use, by country
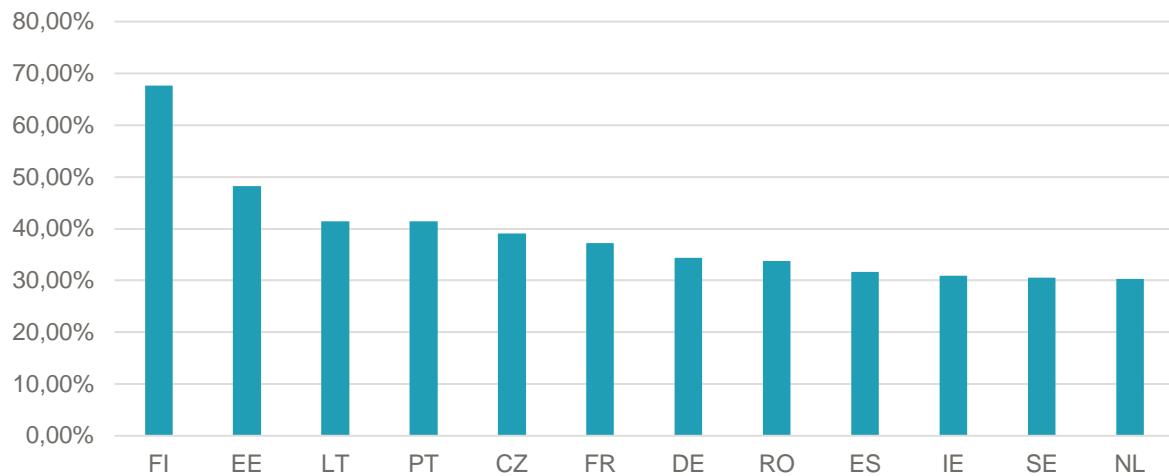
Analysis of Q14: What are the key reasons why you use [main social networking site]? "It is easy and convenient to use"

In addition to utilitarian forms of gratification on social networking sites, our survey data also reveals the importance of **social motivations**. Within the UGT framework, this includes the need for interaction, interconnectedness, and a sense of belonging online. Our survey question on users' reasons for use aims to capture one form of social gratification with the option "It is used by friends and family members".

The presence of friends and family members on a network is similarly important as a motivation for the use of social networking sites as the convenience of use. As shown in Figure 30, one in three (33%) respondents cite this as a key factor, with some notable variation by demographic group. In terms of gender, the presence family and friends, is cited by a higher number of women (36%) than men (30%). We observe no significant variation by education in these figures.

However, notable variation by age can be observed. Again, we find a positive correlation between age and the importance of friends and family on communication applications. Among the oldest cohort in the survey (55-74) around 44% of respondents selected the presence of friends and family as a reason, at rates significantly higher than the average. These rates fell to 31% among respondents in the middle-aged cohort (25-54) and 21% among the youngest cohort (16-24) in the survey.

Figure 30. Reasons for the use of main social networking site – used by friends and family
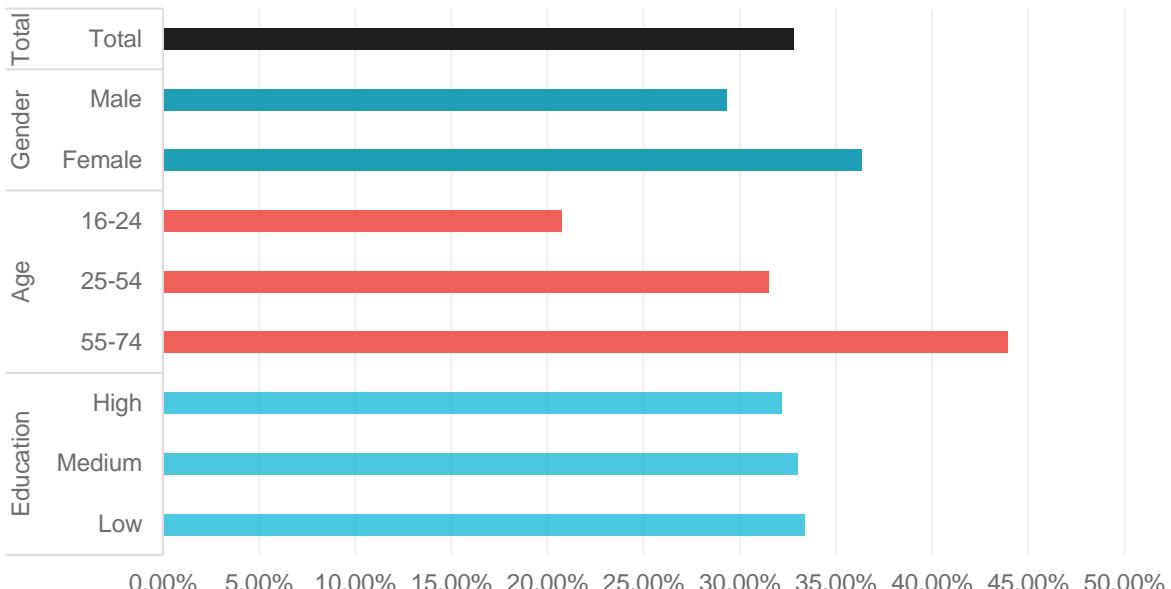
Analysis of Q14: What are the key reasons why you use [main social networking site]? "It is used by friends and family members"

Substantial cross-national variation can be seen behind these figures. As seen in Figure 31, we observe the highest rates for users citing friends and family as a reason are among users in Finland (69%), the only country in which this option achieves a majority. This is followed by pluralities of support for this factor in Estonia (48%) and Portugal (43%), while the lowest rates were observed among respondents in the major EU countries of France (33%), Spain (30%), and Germany (27%).

Figure 31. Reasons for the use of main social networking site – used by friends and family, by country
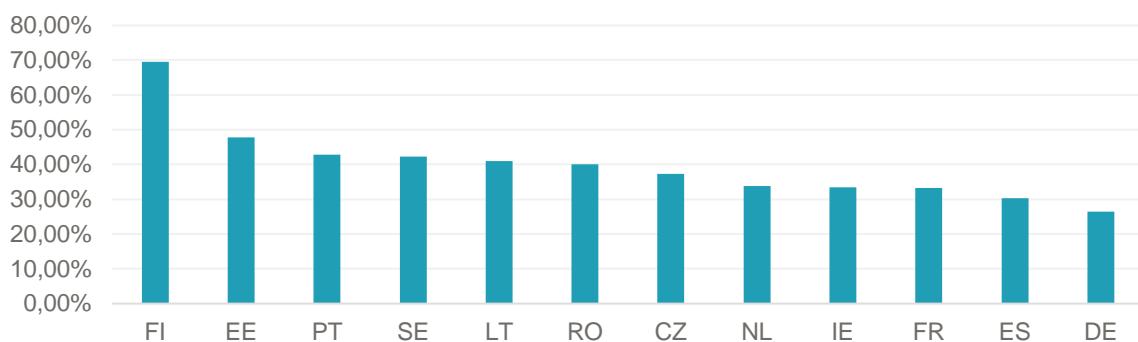
Analysis of Q14: What are the key reasons why you use [main social networking site]? "It is used by friends and family members"

A high proportion of EU consumers also report entertainment value as a reason for using their main social networking sites. As shown in Figure 32, one in three (33%) respondents indicated that entertainment is a key factor in their use of their main social networking site. No significant variation was observed by education, and only minimal variation by gender – slightly more women (35%) than men (32%) selected entertainment as a key reason.

Variation by age, however, was more significant. Deriving entertainment from the use of social networking site is a strong motivating factor among younger users. In the youngest cohort of respondents (16-24), around 37% chose entertainment as a reason. This contrasts with response among users in the oldest (55-74) and middle-aged (25-54) cohorts, who were much less likely than younger respondents to indicate the influence of entertainment motivations.

Figure 32. Reasons for the use of main social networking site – entertainment
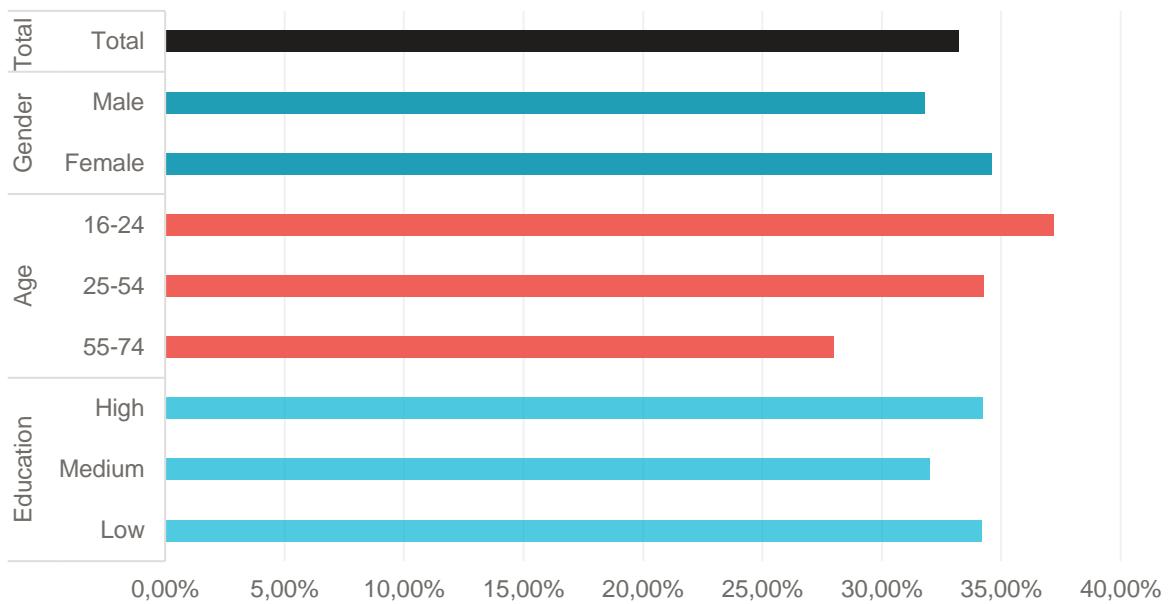
Analysis of Q14: What are the key reasons why you use [main social networking site]? "It is entertaining to use"

Some cross-national variation can be seen in these figures, with two groups of countries emerging. As seen in Figure 33, a plurality of consumers in Spain (42%), Germany (42%), the Netherlands (40%), Sweden (39%) and Ireland (39%) indicated the importance of entertainment in using their main social networking site. Meanwhile, somewhere between 20% and 25% of respondents in Czechia, Romania, Lithuania, Portugal, Estonia and France selected this option. The lowest rates were observed among respondents in Finland (9%), where utilitarian and social factors were stronger reasons for use.

Figure 33. Reasons for the use of main social networking site – entertainment, by country

Analysis of Q14: What are the key reasons why you use [main social networking site]? "It is entertaining to use"

Reasons for the use of messenger applications

As shown in Figure 34, a majority of respondents stated that the ability to use messenger applications for free (60%), the ease and convenience of the application (59%), and having friends and family members who also use the application's services (57%) are key reasons for use. Considered in relation to UGT theories, these reasons demonstrate the importance of utilitarian and social forms of gratification in the use of messenger applications.

Our data also shows that hedonic forms of gratification (entertainment and passing time) are less relevant in explaining the use of messenger applications by the EU consumers surveyed. This finding is perhaps unsurprising. Because messenger applications are primarily used to supplement or replace more traditional means of communication, as discussed throughout the study, their role in providing hedonic gratification is relatively limited. Only around one in 10 respondents provided reasons such as the messaging application being entertaining to use (13%) and or that it allows for self-expression (8%), with only a small number of respondents citing its role in content creation (5%).

Figure 34. Reasons for the use of main messenger application
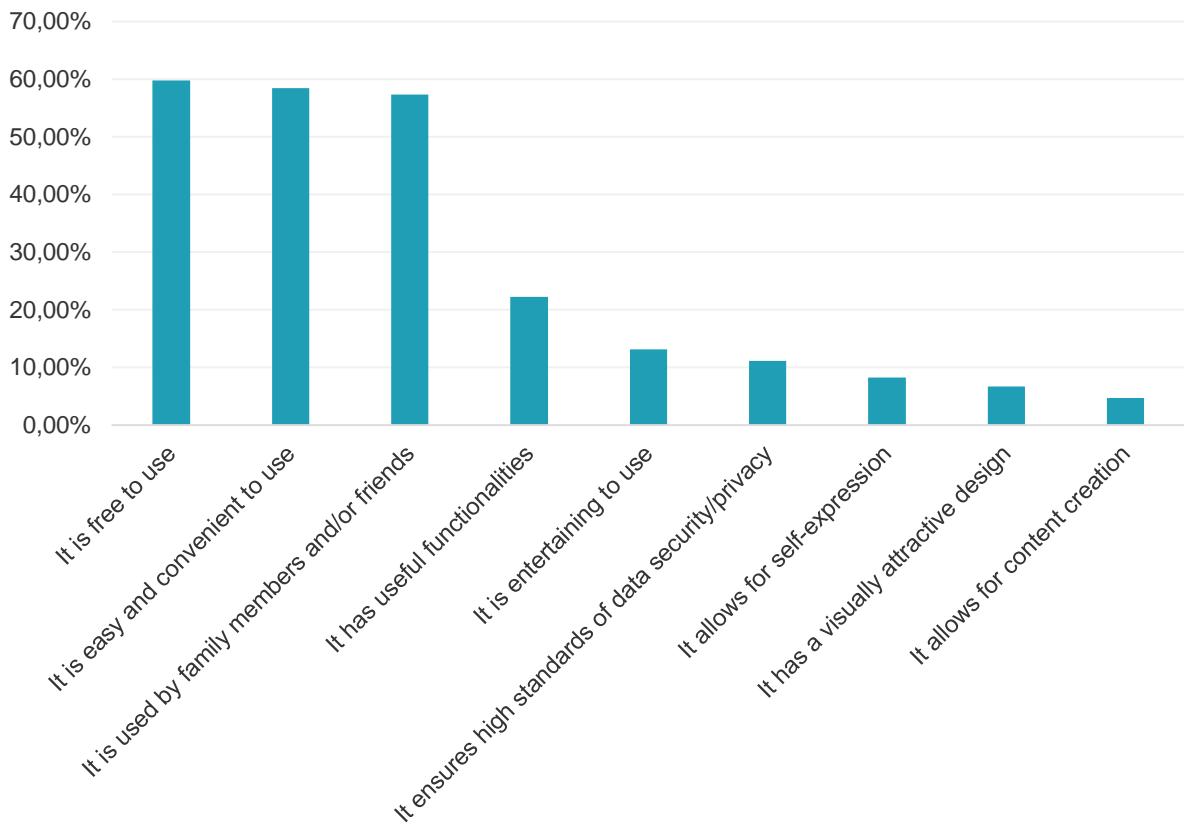
Analysis of Q13: What are the key reasons why you use [main messenger application]?

As discussed above, messenger applications being **free to use** is the most popular reason for their use among a sizeable majority of respondents. This is a key utilitarian form of gratification for the users of digital platforms. Figure 35 below examines this finding more closely, revealing variation by socio-demographic factors such as gender, age and education.

These data show minimal variation by gender, with roughly equal proportions of both women (61%) and men (59%) selecting the option of their main messenger application being free to use. In contrast, variation by education is slightly more significant. Around 62% of respondents with high levels of education (ISCED levels 5+) selected this reason for using messenger applications, compared with 60% of those with medium levels (ISCED 3-4) and 55% of those with low levels (ISCED 0-2).

However, the survey data reveal substantial variation according to age. Among the youngest cohort of users (16-24), the option of a messenger application being free to use draws the support of slightly less than a majority, with around 49% selecting this as an important reason. Rates were significantly higher among the middle-aged cohort (25-54) in our survey, 60% of whom cite this reason for their use of messenger applications. But by far the highest rates are observed among the oldest cohort in our survey (55-74). Just over two-thirds of respondents in the oldest cohort (67%) indicate that being free to use is an important reason.

Figure 35. Reasons for the use of main messenger application – free to use
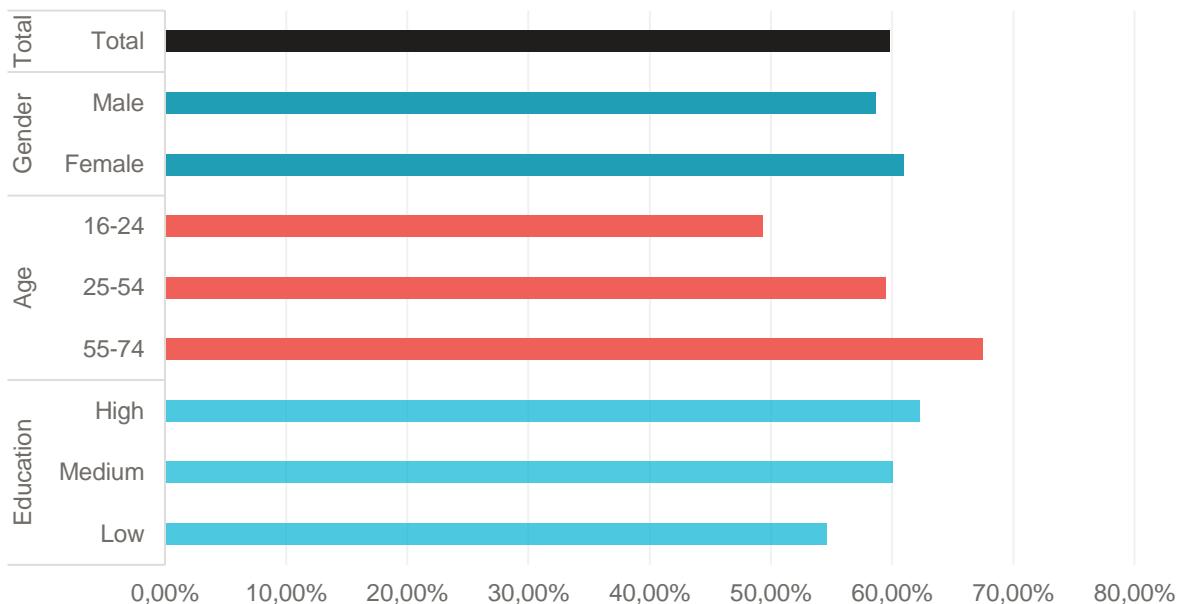
Analysis of Q13: What are the key reasons why you use [main messenger application]? "It is free to use"

Some notable cross-national variation can be seen in the proportion of respondents citing being free of charge as a reason for using messenger applications. As shown in Figure 36, respondents in Finland (73%), Estonia (70%), and Czechia (68%) were most likely to select this reason, while respondents in Spain (56%), Sweden (53%) and Lithuania (52%) were least likely. The higher rates seen in Finland are largely driven by response rates among women, 79% of whom selected this option.

Figure 36. Reasons for the use of main messenger application – free to use – by country
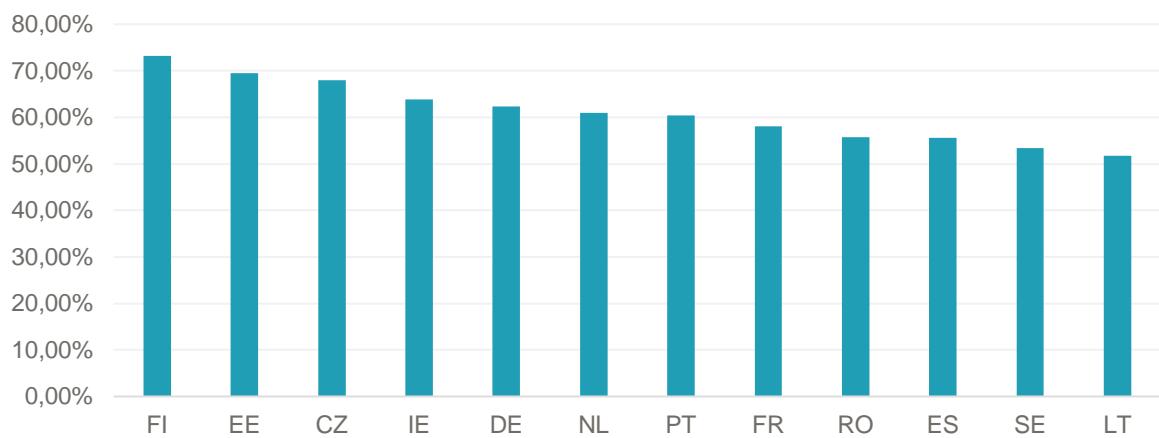
Analysis of Q13: What are the key reasons why you use [main messenger application]? "It is free to use"

Another key utilitarian form of gratification for users of messenger applications is the **ease and convenience of their main services**. As shown in Figure 37 below, we find that ease and convenience of use shows slight variation by gender and age.

The ease and convenience of a messenger application was cited as a key reason by more women (62%) than men (55%). However, generational differences appear to be an even stronger factor, with ease and convenience of use being more important to older respondents. The data show that 66% of users in the oldest cohort (55-74) selected this as a key factor. Only a slim majority (50%) of younger users (16-24) cited ease and convenience as a key motivating factor for use.

In contrast, variation by education is minimal, a rates are slightly above average among respondents with high (ISCED 5+) and medium (ISCED 3-4) levels of education, compared with those found among respondents with lower levels (ISCED 0-2).

Figure 37. Reasons for the use of main messenger application – ease and convenience
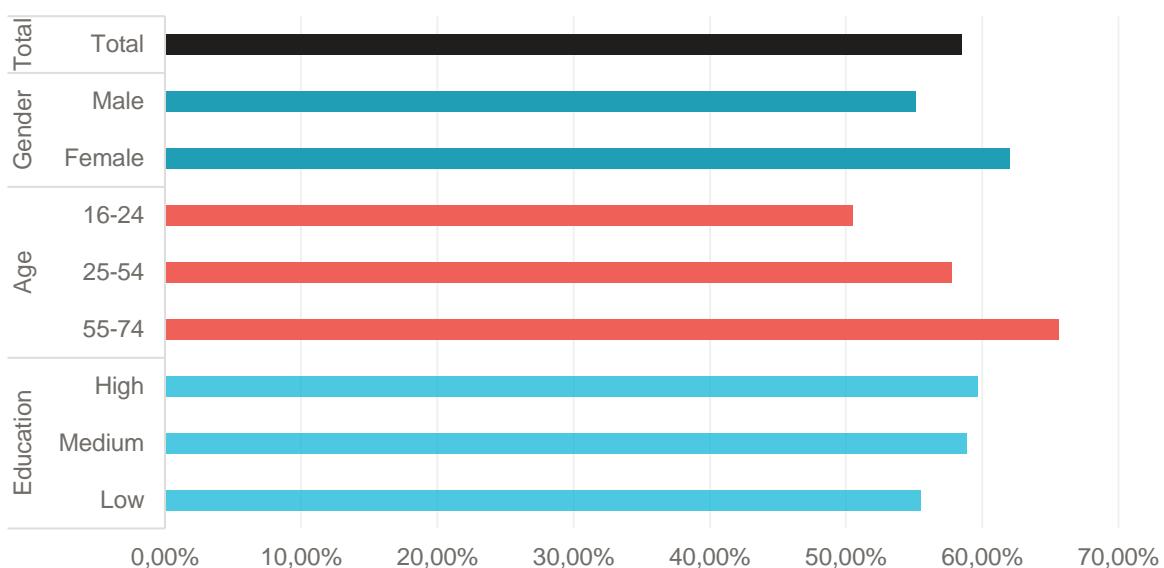
Analysis of Q13: What are the key reasons why you use [main messenger application]? "It is free to use"

Slight cross-national variation can be seen in the findings on the ease and convenience of use on messenger applications, as shown in Figure 38. This factor obtains the support of a majority of respondents in all countries. Again, we find the highest rates are observed in Estonia (70%), Finland (70%), and Czechia (64%), demonstrating the importance of utilitarian factors for users in those countries, as seen above with regard to free-of-charge use.

But whereas the free use of applications was not an important reason among respondents in Lithuania, the rates concerning ease and convenience (66%) are significantly higher. This highlights a differentiation between, and perhaps even a hierarchy of, utilitarian forms of gratification among respondents. The lowest rates were observed among respondents in France (57%), the Netherlands (57%) and Romania (55%).

Figure 38. Reasons for the use of main messenger application – ease and convenience, by country
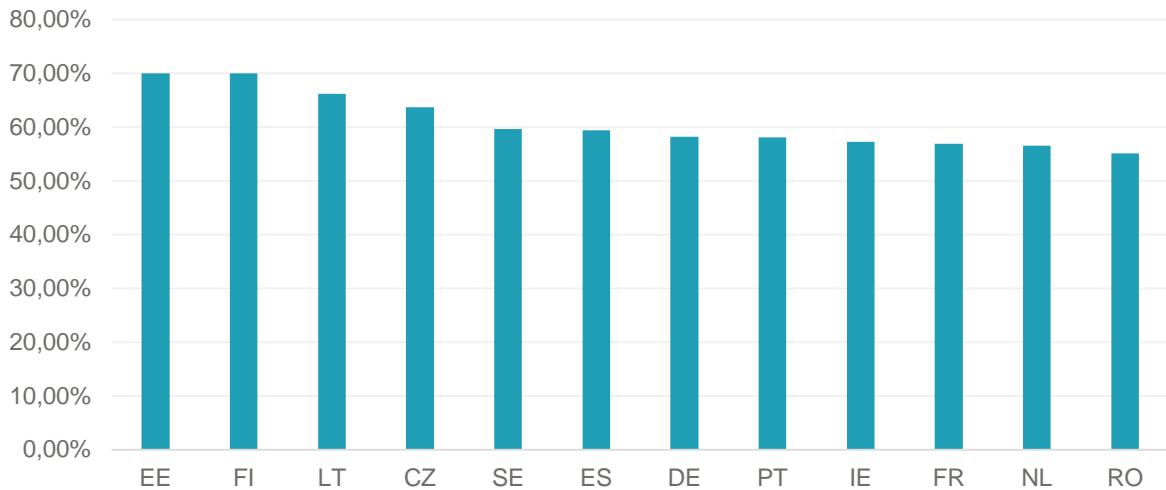
Analysis of Q13: What are the key reasons why you use [main messenger application]? "It is easy and convenient to use"

In addition to utilitarian forms of gratification on messenger applications, our survey data again shows the importance of **social motivations**. We find that the presence of friends and family members on a users' main messenger application is among the strongest motivations for its use. As shown in Figure 39, the majority of users (57%) indicate that they use their main messenger applications because friends and family are also active on the service. There is strong variation by gender behind this finding, with much higher rates observed among women (63%) than men (52%).

Variation by age is also significant. A much higher proportion of the oldest cohort in our study (55-74) selected friends and family as a reason, compared with younger users. Around two out of three (65%) respondents in the oldest group cited this reason in particular, with levels falling to 56% among the middle-aged cohort (25-54) and 51% among the youngest cohort (16-24).

A correlation can also be seen in the data between education and the importance of family and friends with regard to messenger applications, though at weaker levels than for age and gender. Among users with high levels of education (ISCED 5+), around three out of five users (61%) indicated that having family and friends on a messenger service is a key reason for using it. This compares with rates of 55% among users with medium levels of education (ISCED 3-4) and 53% of those with low levels (ISCED 0-2).

Figure 39. Reasons for the use of main messenger application – friends and family
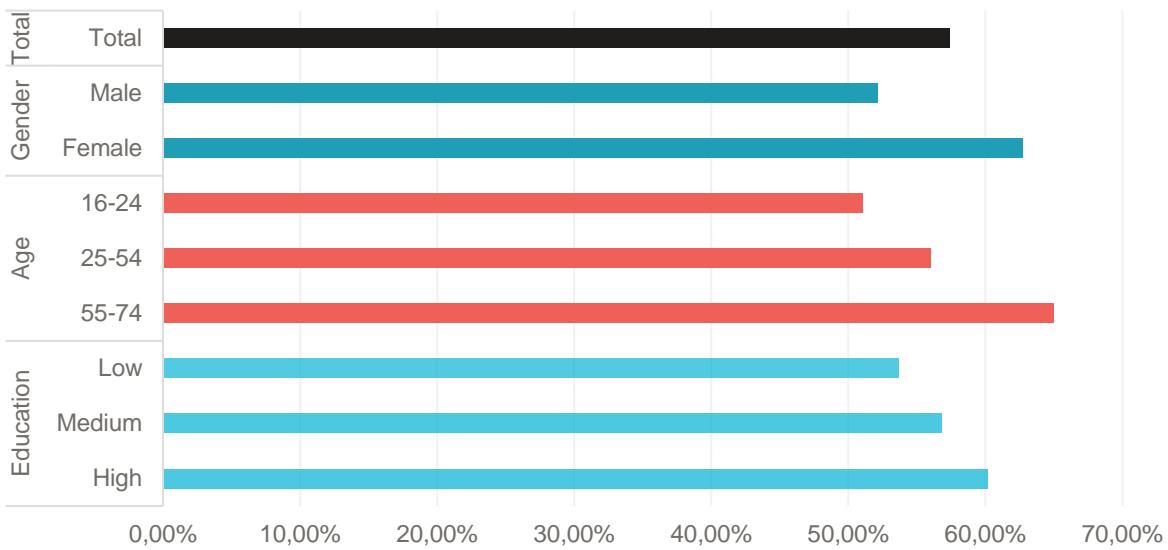
Analysis of Q13: What are the key reasons why you use [main messenger application]? "It is used by friends and family members"

While friends and family was selected as a reason for using a messenger application by a majority of respondents across all countries, we do observe some cross-national variation. As shown in Figure 40, the highest rates were once again observed in Estonia (73%) and Finland (68%), followed by Portugal (65%), with the lowest low levels seen among respondents in the Netherlands (54%) and France (52%).

Figure 40. Reasons for the use of main messenger application – friends and family, by country

Analysis of Q13: What are the key reasons why you use [main messenger application]? "It is used by friends and family members"

Entertainment – a key hedonic form of gratification in the UGT framework – was not among the main factors given by respondents for their use of messenger applications. As shown in Figure 41, only one in 10 respondents (13%) indicated entertainment as a key reason for their use of a main messenger application. Little variation is seen by demographic. Rates were roughly equal among men (14%) and women (13%). A slightly higher proportion was observed among younger users (16%) than in the other age cohorts, probably reflecting the tendency of younger users to utilise newer, more niche messaging application services, which offer functions beyond personal calls and text messages.

Respondents with lower levels of education (ISCED 0-2) selected entertainment at a slightly higher rate (16%) than those with high (12%) and medium (13%) levels of education.

Figure 41. Reasons for the use of main messenger application – entertainment
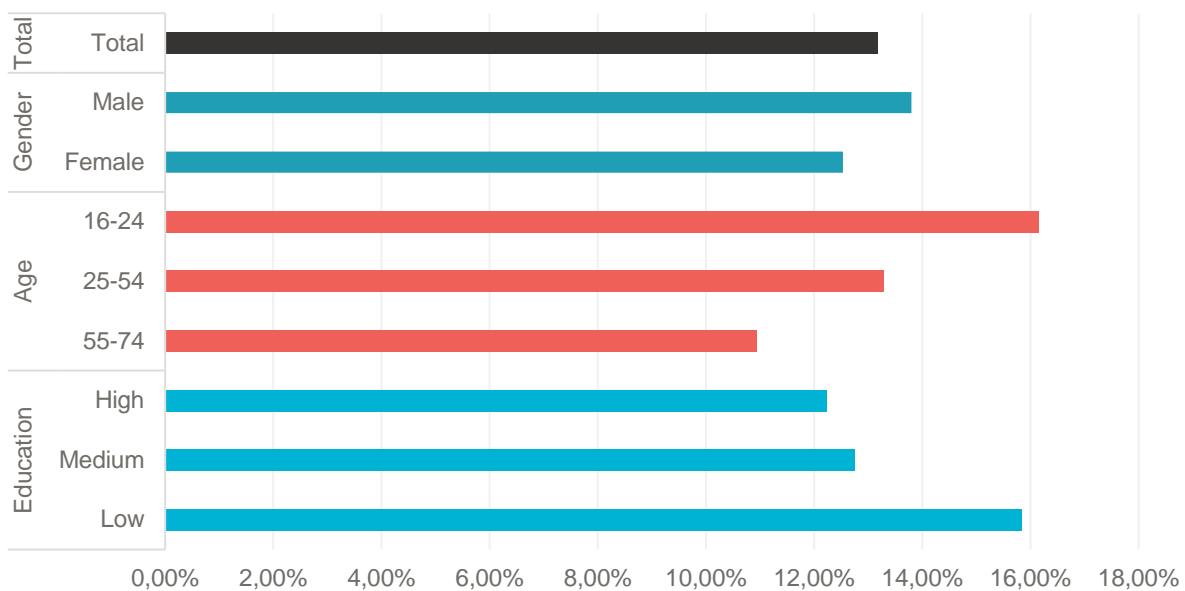
Analysis of Q13: What are the key reasons why you use [main messenger application]? "It is entertaining to use"

There is little cross-national variation in these findings, as seen in Figure 42. Respondents in the Netherlands (24%) were most likely to indicate that entertainment was a key reason for using their main messenger application, followed by those in Germany (15%), Ireland (13%) and France (13%). The lowest rates for entertainment, meanwhile, were observed in Estonia (9%), Finland (8%) and Portugal (6%).

Figure 42. Reasons for the use of main messenger application – entertainment, by country
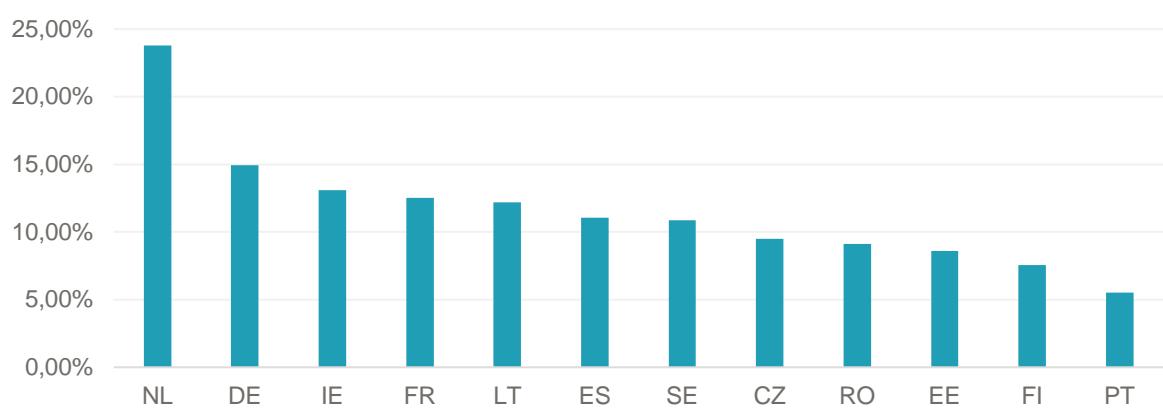
Analysis of Q13: What are the key reasons why you use [main messenger application]? "It is entertaining to use"

Dynamic aspects of use: changes in consumer behaviour

- The Push-Pull Mooring framework offers insights into the dynamics of consumer behaviour on digital platforms. Our survey data shows that mooring factors are particularly strong among respondents.

- The EU consumers surveyed have increased their use of messenger applications, but three out of four respondents stated that they had not changed their main messenger application during the previous year.

- Inertia and attachment are key mooring factors with regard to messenger applications. Strong majorities of respondents indicated that it had simply become habit to use their main messenger application rather than others, and that they had high levels of attachment to and satisfaction with their main application's brand and services.

- The factors that respondents indicated might draw them to new messenger applications are the same as those they currently seek in their main messenger application: free-of-charge use, the presence of friends and family, and ease and convenience. However, stronger data privacy standards are more important for switching to a new application (e.g. Signal or Telegram) than it is with regard to using their current ones.

- Around one in three respondents indicated that they had changed habits or stopped using a messenger application due to stress or anxiety, with rates being slightly higher among men than women, as well as being higher among young people.

An important consideration relevant to users' motivations for using messenger and social media applications is how and why consumers switch or remain with specific services. These dynamic aspects of consumer behaviour and usage of platforms are the key focus of this chapter. To assist with our analysis, the Push-Pull-Mooring framework is used to yield insights into consumer behaviour on messenger applications.

In the next section, we explore the key conceptual framework used to analyse the dynamic aspects of consumer behaviour, the Push-Pull-Mooring model. The subsequent sections then go on to analyse the survey data and highlight the key factors explaining tendencies of consumers to moor (or remain) with a particular service, and the factors that might push consumers towards or pull them away from various services.

Conceptual frameworks

The **dynamic aspects** of consumer-platform relationships are directly related to the concept of the **domestication of technology**. Studies of domestication examine the cognitive, behavioural and material factors that influence the acceptance, rejection and/or use of digital platforms that provide communication services among consumers[80]. These studies conceptualise the domestication of such platforms as a multi-stage process, one that develops with a consumer's movement from initial

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[80] Berker, T. (2005). *Domestication of media and technology*. McGraw-Hill Education (UK).

interest to experimental engagement to habitual and stable patterns of usage over time.[81] The outcome of this process, referred to as the **adoption** of a service or platform, depends upon a highly variable and fluid combination of consumer behaviours and attitudes, on the one hand, and a range of social, psychological and material stimuli on the other.[82]

With the emergence of new SNS services and their competition for users[83], greater attention has been paid to why consumers may **switch** or **migrate** between digital platforms that provide communication services.[84] Within the expansive literature addressing these dynamics, several studies employ the theory of **Push-Pull-Mooring (PPM)** to distinguish between the movements of consumers in different directions. Here, the use of PPM theory may be supplemented with the insights from user gratification theory (UGT) and the technology acceptance model (TAM) discussed above (Section 4.1) to provide a foundation for the analysis of the specific dynamics of consumer behaviour on digital communication platforms.

Within the PPM framework, a **push** factor prompts a consumer to contemplate or undertake a move away from a particular digital communication platform. Push factors may result in movement toward alternative services and platforms - or away from using them altogether. Where stress and anxiety are significant push factors, some consumers may move towards the short- or long-term **termination** of platform services, with a segment of these users later choosing to **re-domesticate** or **re-adopt** the applications following a period of disuse.[85] A **pull** factor, meanwhile, is one that encourages the consumer to evaluate, experiment with, or even adopt alternative services. In practice, these push-pull factors will often overlap considerably, and studies of consumer attitudes demonstrate that switching can occur in either direction, driven by factors such as:

- **Platform cost**: free services (pull) vs. price increases (push) [86]

- **Word of mouth:** positive feedback (pull) vs. negative or critical reviews (push) [87]

- **Brand identification:** perceived brand superiority (pull) vs. perceptions of inferiority (push)[88]

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[81] Matassi, M., Boczkowski, P.J. & Mitchelstein, E. (2019). Domesticating WhatsApp: Family, friends, work, and study in everyday communication. *New Media & Society*, 21(10), 2183-2200.

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[87] Nadarajan, G., Bojei, J. & Khalid, H. (2017). The study on negative eWOM and its relationship to consumer's intention to switch Mobile Service Provider. *Procedia Computer Science*, 124, 388-396.

[88] Zhang, X., Ding, X., Ma, L. & Wang, G. (2018). Identifying factors preventing sustainable brand loyalty among consumers: A mixed methods approach. *Sustainability*, 10(12), 4685.

- **Data privacy or security:** enhanced protections and encryption (pull) vs. security breaches, data theft (push) [89]

- **Data interoperability:** migration of data and contacts vs. platform-bound data and contacts

- **Quality of social interactions:** constructive engagement (pull) vs. experiences of harassment or abuse (push)[90]

- **Network composition:** participation of key social contacts (pull) vs. migration of contacts (push)[91]

- **Psychological effects:** creative engagement, playfulness (pull) vs. fatigue, stress or boredom (push)[92]

The PPM framework also considers the tendency to **moor** or **home** within a specific platform. Earlier analysis of homing tendencies shows that age and gender provide some explanation of variations in the social networking sites that specific consumer groups choose as their preferred platforms, with older adults homing on Facebook or WhatsApp to maintain intergenerational connections, and men and women selecting different sites based on information-sharing needs, social network goals, and privacy risks. [93] Other studies have found that a number of additional homing factors influence behaviour among users of digital communication platforms. These include:

- High user satisfaction[94]
- Inertia or complacency[95]
- Costs associated with switching[96]
- Convenience or ease of use [97]

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[89] Lulandala, E.E. (2020). Facebook Data Breach: A Systematic Review of Its Consequences on Consumers' Behaviour towards Advertising. In Strategic System Assurance and Business Analytics (pp. 45-68). Springer, Singapore; Schreiner, M. & Hess, T. (2015). Examining the role of privacy in virtual migration: the case of WhatsApp and Threema.

[90] Cao, X., Khan, A.N., Ali, A., & Khan, N.A. (2019). Consequences of cyberbullying and social overload while using SNSs: A study of users' discontinuous usage behaviour in SNSs. *Information Systems Frontiers*, 1-14.

[91] Nouwens, M., Griggio, C.F., & Mackay, W.E. (2017, May). "WhatsApp is for family; Messenger is for friends" Communication Places in App Ecosystems. In: Proceedings of the 2017 CHI conference on human factors in computing systems (pp. 727-735).

[92] Sun, Y., Liu, D., Chen, S., Wu, X., Shen, X.L. & Zhang, X. (2017). Understanding users' switching behaviour of mobile instant messaging applications: An empirical study from the perspective of push-pull-mooring framework. Computers in Human Behaviour, 75, 727-738.; Hwang, H.S., Shim, J.W., & Park, S.B. (2019). Why we migrate in the virtual world: factors affecting switching intentions in SNS. *Information, Communication & Society*, 22(14), 2127-2137.; Maier, C., Laumer, S., Weinert, C. & Weitzel, T. (2015). The effects of technostress and switching stress on discontinued use of social networking services: a study of Facebook use. *Information Systems Journal*, 25(3), 275-308.

[93] Jung, E.H., Walden, J., Johnson, A.C. & Sundar, S.S. (2017). Social networking in the aging context: Why older adults use or avoid Facebook. *Telematics and Informatics*, 34(7), 1071-1080.; Lin, X., Featherman, M. & Sarker, S. (2017). Understanding factors affecting users' social networking site continuance: A gender difference perspective. *Information & Management*, *54*(3), 383-395.; Lin, X. & Wang, X. (2020). Examining gender differences in people's information-sharing decisions on social networking sites. International Journal of Information Management, 50, 45-56.; Krasnova, H., Veltri, N.F., Eling, N., & Buxmann, P. (2017). Why men and women continue to use social networking sites: The role of gender differences. *Journal of Strategic Information Systems*, 26(4), 261-284.

[94] Wu, Y. L., Tao, Y. H., Li, C. P., Wang, S. Y., & Chiu, C. Y. (2014). User-switching behaviour in social network sites: A model perspective with drill-down analyses. Computers in Human Behaviour, 33, 92-103.

[95] Wang, J., Zheng, B., Liu, H. & Yu, L. (2020). A two-factor theoretical model of social media discontinuance: role of regret, inertia, and their antecedents. *Information Technology & People*.

[96] Ghasrodashti, E.K. (2018). Explaining brand switching behaviour using pull–push–mooring theory and the theory of reasoned action. *Journal of Brand Management*, *25*(4), 293-304

[97] Dhir, A., Kaur, P. & Rajala, R. (2020). Continued Use of Mobile Instant Messaging Apps: A New Perspective on Theories of Consumption, Flow, and Planned Behaviour. *Social Science Computer Review*, 38(2), 147–169. Available at: https://doi.org/10.1177/0894439318806853

- Strong brand loyalty[98]
- Reliable access to networks used by friends and family[99]

However, most consumers are found to regularly engage in practices of **multihoming** on several communication platforms simultaneously[100] (as discussed in Section 3.2.1.). One study of international SNS users found that the perceived **complementarity** of different platforms for similar functions is associated with multihoming practices, and that this is particularly true for consumers who use platforms for **interpersonal communication** and **access to information**.[101] This multihoming based on complementarity is often rooted in the positive experiences of consumers whose satisfaction with one platform contributes to a willingness to experiment with, switch or even adopt a similar alternative.[102]

One caveat to these findings is that consumer preferences and usage habits on digital platforms for communication services remain highly fluid, and that there are significant gaps in the data on stated versus revealed preferences among consumers, especially among those who multihome on various platforms. This means that while consumers state their preferences openly in certain circumstances, their true preferences are revealed and made available primarily to the digital platforms they use. In this case, our survey provides data on stated preferences among consumers, which may in fact vary in practice.

Our survey provides new evidence on the dynamic aspects of consumer behaviour on digital platforms, revealing factors that play an important role in shaping usage patterns on social media and messenger applications. As discussed above, these factors can be analysed in relation to the insights of the Push-Pull-Mooring model. As seen in Figure 43 below, we find evidence of users having increased their use of messenger applications compared with other means of communication, making the question of dynamic movement across and between applications more relevant. A plurality of consumers in our survey (45%) indicated that their use of messenger applications had increased over the preceding 12 months, with only 6% indicating a decrease. This confirms the general trend observed elsewhere in this study.

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[98] Zhang, X., Ding, X., Ma, L. & Wang, G. (2018). Identifying factors preventing sustainable brand loyalty among consumers: A mixed methods approach. *Sustainability*, 10(12), 4685.

[99] Matassi, M., Boczkowski, P. J. & Mitchelstein, E. (2019). Domesticating WhatsApp: Family, friends, work, and study in everyday communication. *New media & society*, *21*(10), 2183-2200.

[100] Rietveld, J. & Eggers, J.P. (2018). Demand heterogeneity in platform markets: Implications for complementors. *Organization Science*, 29(2), 304-322.

[101] Gu, R., Oh, L.B. & Wang, K. (2016). Multi-homing on SNSs: the role of optimum stimulation level and perceived complementarity in need gratification. *Information & Management*, 53(6), 752-766.

[102] Gu, J., Wang, X. & Lu, T. (2019). I like my app but I wanna try yours: exploring user switching from a learning perspective. *Internet Research*.

Figure 43. Changes in the use of messenger applications over the preceding 12 months
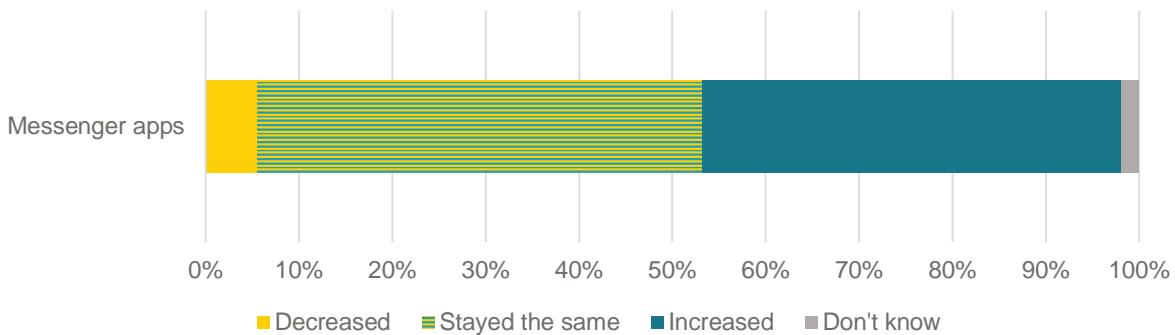
Analysis of Q22: Over the past 12 months, would you say that your use of the following means of communication has increased, decreased or stayed the same? "Messenger applications".

However, the important question with regard to messenger applications is what dynamics influence consumers towards particular messenger applications in practice. Does this increase translate primarily into multihoming or single-homing on messenger applications? Are consumers open to trying new applications? What factors would push/pull them toward other applications? The discussion below provides tentative answers from our survey to these questions.

Mooring factors

As discussed above, within the PPM framework, the tendency of consumers to adopt and continue using a single application or service is known as **mooring** or **single-homing**. While our survey provides evidence that the use of a number of messenger applications among EU consumers is increasing relative to other forms of communication (see Section 3.2.1.), this does not necessarily imply that switching of main applications is occurring. Indeed, while switching between multiple applications is common, consumers' choices of main application services remain more stable over time. This stability is potentially rooted in an aversion toward the perceived costs of switching applications, one which manifests itself in various forms over time.

At a high level, one important variable in user switching is the openness of users to experiment with new applications. We find that respondents do not express great willingness and interest in experimenting with new messenger applications. Our survey asked respondents to indicate whether they agree or disagree with the following statement: 'I like to try new messenger applications for communication and content-sharing when they are launched.' The data in Figure 44 show that only around one in three (31%) respondents agreed with this statement, with a roughly equal percentage (30%) providing an ambiguous response. The most notable demographic variation in these figures is by age and education. Younger and middle-aged respondents expressed greater openness to switching than older respondents, and there was a positive correlation between education and higher willingness to experiment with new applications.

Figure 44. Willingness to try new messenger applications when first released
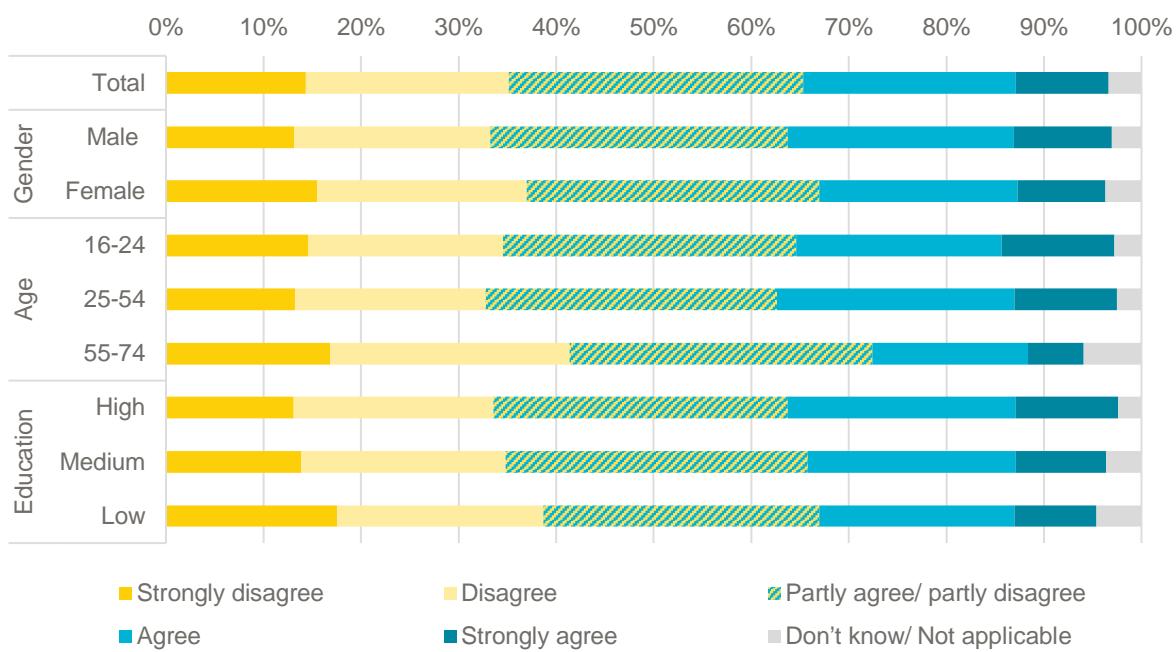
Analysis of Q24: "I like to try new messenger applications for communication and content-sharing when they are launched"

One question to ask here is whether this low level of willingness to experiment with new messenger applications is reflected in stable patterns of usage with regard to a consumer's main messenger application. As shown in Figure 45 below, around three-quarters (76%) of respondents stated that they had not changed their main messenger application during the previous year. Variation in this "no change" response by gender is minimal, though slightly more women (78%) than men (74%) chose this option. We also find only slight variation by education: users with high (79%) and medium levels of education (76%) were somewhat more likely to state no change than those with lower levels of education (72%).

When it comes to switching messenger application, however, the most significant demographic factor here is age. Around 65% of surveyed EU consumers within the 16-24 age cohort indicated they had not changed their main messenger application. The rates are significantly higher among the middle-aged (75%) and older (87%) age cohorts.

Figure 45. User switching of main messenger application over the past year
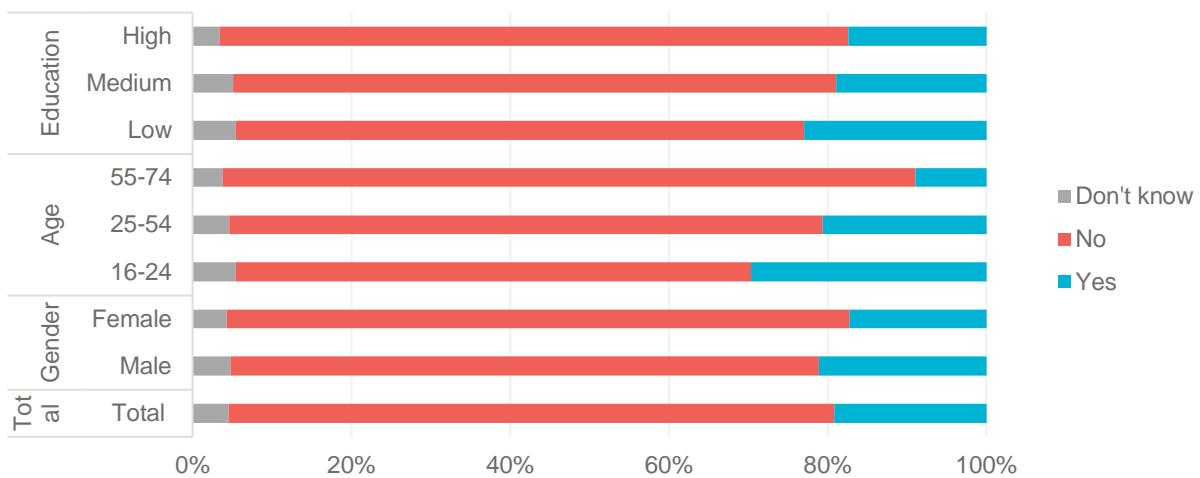
Analysis of Q21: Over the past 12 months, have you changed the online website or messenger application which you use most often to communicate with friends or family? In other words, was your main messenger application different to the one you use currently, [main messenger application]?

But if this shows that most users have moored on a single messenger application, what factors explain this tendency? In behavioural economic terms, the users surveyed in our study show strong tendency to a "status quo bias" towards their existing communication preferences. Within the context of digital platforms, a status quo bias can be understood as a generalised aversion to the short or long-term "disutility" of abandoning a particular service in favour of a different, perhaps suboptimal alternative.[103]

In particular, the status quo bias on digital communication platforms may be connected to the perceived "costs" of switching between different applications. These switching costs can be classified in terms of 1) procedural switching costs - loss of time and effort moving to and establishing a presence on new networks; 2) financial switching costs - quantifiable financial losses potentially resulting from lost data and connections; and 3) relational switching costs – "psychological or emotional discomfort due to the loss of identity and the breaking of bonds".[104] These factors, and especially the first and third, are understood to have a moderating effect on consumer intentions to move between different applications for communication, thereby contributing to mooring tendencies.[105]

The findings from our survey of EU consumers shows the importance of all three of these factors, albeit indirectly. While financial switching costs would appear to be less relevant for the applications we analyse here (since their services are offered for free and the platforms are usually not used to generate income), the high importance attached to zero cost services among consumers strongly

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[103] Kahneman, D., Knetsch, J.L. & Thaler, R.H. (1991). Anomalies: The endowment effect, loss aversion, and status quo bias. *Journal of Economic Perspectives*, 5(1), pp.193-206.

[104] Burnham, T.A., Frels, J.K. and Mahajan, V., 2003. Consumer switching costs: a typology, antecedents, and consequences. Journal of the Academy of marketing Science, 31(2), pp.109-126.

[105] Lee, C.L. and Huang, M.K., 2014. A nonlinear relationship between the consumer satisfaction and the continued intention to use SNS services: The moderating role of switching cost. International Journal of Electronic Business Management, 12(2).

suggests that financial switching costs would be a significant factor where changing applications potentially involves a rise in monetary costs.

Furthermore, the procedural and relational costs of switching also indirectly emerge as important factors. As discussed in Chapter 4, surveyed EU consumers place high emphasis on the ease and convenience of using their main social networking sites and messenger application. This likely indicate that procedural costs, which potentially involve an inefficient and time-consuming migration to other services, would deter switching behaviour among consumers. Equally important, surveyed EU consumers place high value on their main applications' ability to facilitate relationships with friends and family members – connections which might be weakened or even severed through a switch to other services.

In the background of switching between services, the question of data portability is also a fundamental concern for consumers, one which GDPR sought to address[106]. In recent years, prominent communication providers have sought to enhance data portability to increase consumer control over personal data and reduce switching costs. For example, Facebook, Google, Apple, and Microsoft all provide the ability to download personal data and transfer photos and videos across networks through their participation in the Data Transfer Project, established in 2018 [107].

However, the data portability landscape varies considerably across different applications. While user profile data is easily portable across, for example, different Facebook products (Facebook, Instagram, Facebook Messenger), smaller, more niche communication platforms do not have the required interoperability features. Moreover, as discussed in our interviews with messenger application users, because the presence of key social contacts on different services drives multi-homing on applications, the inability to reconstruct social connections and networks, regardless of data portability, may present an insurmountable barrier to switching altogether.

While our survey does not provide direct evidence on which types of switching costs which are perceived as important by most consumers, the mooring habits that we observe among consumers suggest an indirect relationship with the costs discussed above.

We find that mooring among surveyed EU consumers is structured around inertia on their preferred platforms, high brand satisfaction with the services they have already selected, and an emotional attachment to their main messenger application. While other studies have previously found evidence of inertia among consumers on social media platforms, for reasons such as habit and affective attachment[108], our survey extends and modifies these findings for the use of messenger applications.

To examine behavioural inertia directly, we asked users to indicate whether they agreed or disagreed with the following statement: "It has just become a habit to use [main messenger app] rather than other messenger applications." As Figure 46 shows, around 71% of EU consumers surveyed indicated that using their main messenger applications had become a habit. Little variation was apparent in

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[106] De Hert, P., Papakonstantinou, V., Malgieri, G., Beslay, L. and Sanchez, I., 2018. The right to data portability in the GDPR: Towards user-centric interoperability of digital services. *Computer law & security review*, 34(2), pp.193-203.

[107] Morland, W. Data Transfer Project: Enabling portability of photos and videos between services, Facebook https://engineering.fb.com/2019/12/02/security/data-transfer-project/

[108] Wang, J., Zheng, B., Liu, H. & Yu, L. (2020). A two-factor theoretical model of social media discontinuance: role of regret, inertia, and their antecedents. *Information Technology & People*.

this finding, either by age or gender, though users with higher levels of education were more likely to indicate that habit was a factor.

Figure 46. Habit of using main messenger application rather than other applications
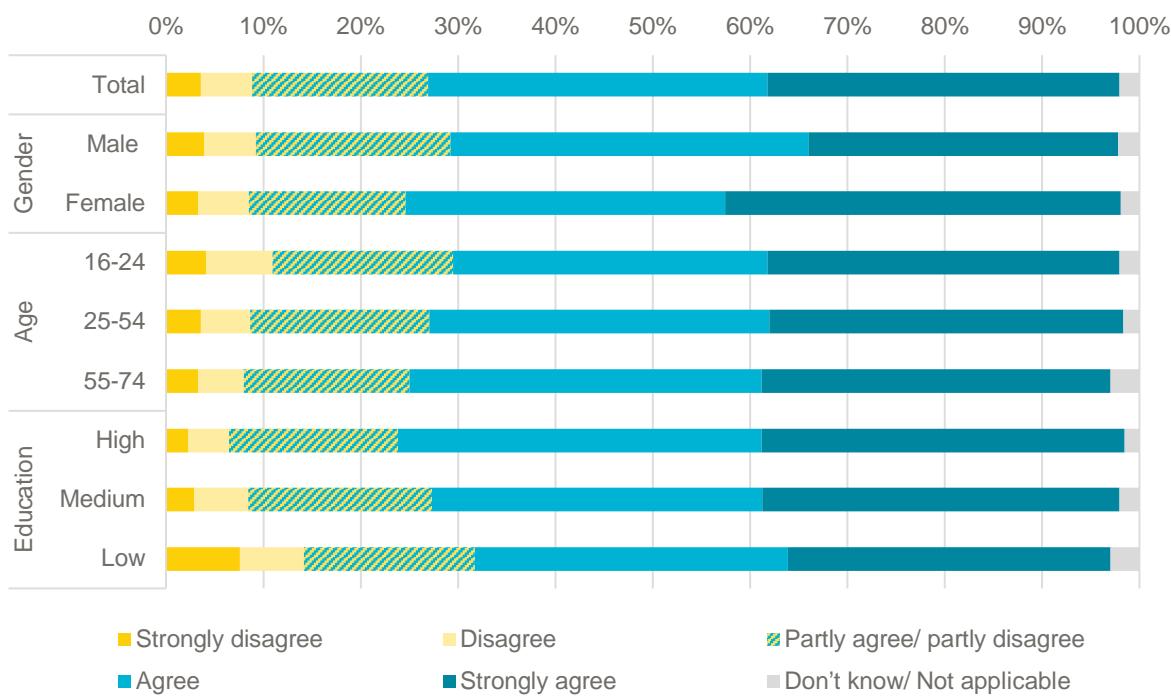
Analysis of Q24: "It has just become a habit to use [main messenger application] rather than other messaging applications."

However, inertia may not fully explain the patterns of mooring among respondents. The role of brand satisfaction and attachment may also be relevant. Some research has suggested that brand satisfaction attachment influences consumers' intention to continue using and purchasing specific products, provided that such services fulfil user expectations.[109]

To measure this factor, we asked respondents to share their assessment of the brand and services of their main application by indicating whether they agreed or disagreed with the following statement: 'I value the brand of [main messenger application] and associate it with high-quality services'. As illustrated in Figure 47, a strong majority of internet users surveyed (68%) agreed with this statement, indicating high levels of overall attachment to and satisfaction with their main applications' services. Slightly higher rates were observed among women (69%) than among men (66%). Younger users were less likely to agree, and more likely to disagree, than older respondents – perhaps reflecting higher levels of tech literacy and product standards among younger, tech-savvy application users.

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[109] Hew, J.J., Badaruddin, M.N.B.A. & Moorthy, M.K. (2017). Crafting a smartphone repurchase decision making process: Do brand attachment and gender matter?. *Telematics and Informatics*, 34(4), pp.34-56.

Figure 47. Value of brand and services of main messenger application
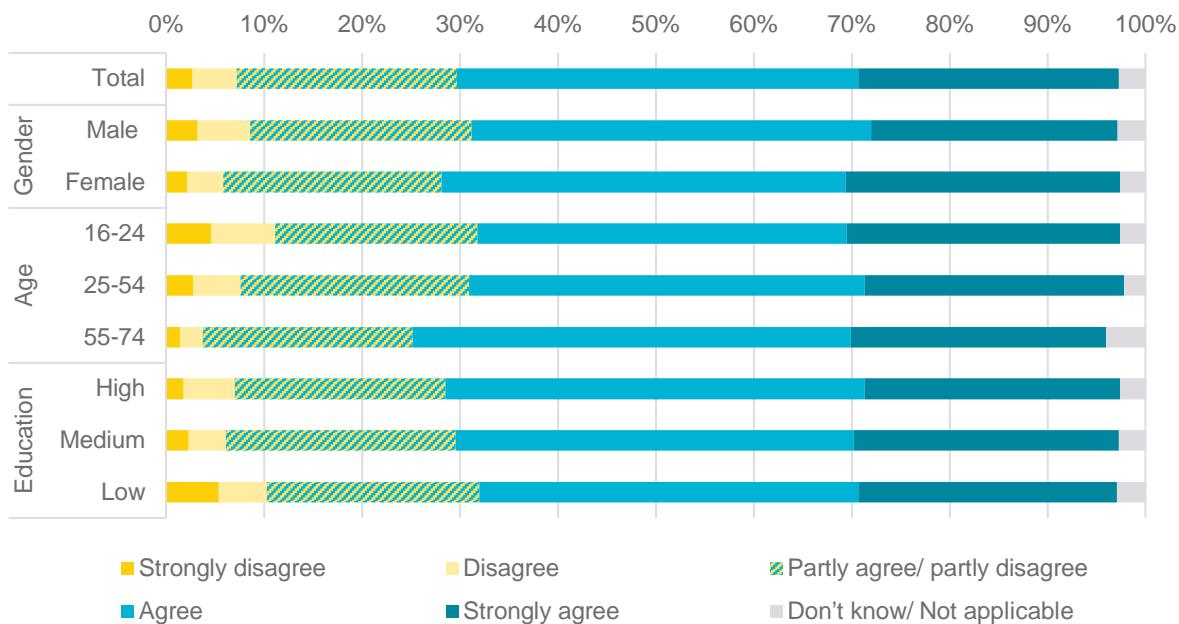
Analysis of Q24: "I value the brand of [main messenger application] and associate it with high-quality services."

To examine from another angle the emotional attachments that users develop concerning platform usage, we asked respondents how frustrating they would find a situation in which their main messenger application stopped working and was discontinued permanently. While indirect, this question also implicates relational switching costs among consumers. As shown in Figure 48, more than three out of five respondents (62%) said they would find this situation "very frustrating" or "somewhat frustrating". Rates were considerably higher among women (67%) compared with men (57%), and among the younger (66%) and middle-aged (63%) cohorts compared with the oldest group (57%)

The significantly higher rates among women probably reflect some of the findings with regard to reasons for use, as discussed above in Section 4.3. Women were more likely to state that are motivated to use messenger applications to communicate with family, friends and social contacts, as shown previously in the literature. The data here suggests that the discontinuation of such contact may have strong emotional implications for women in particular. This trend may be reflected among younger users as well, given the stronger integration of digital platforms among digital native generations. Studies have found that younger users are more likely to develop strong attachments and become addicted to communication applications.[110] Other studies have pointed to this group's dependence on social media in particular, and its general inability to discontinue use without experiencing frustration.[111]

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[110] D'Arienzo, M.C., Boursier, V. & Griffiths, M.D. (2019). Addiction to social media and attachment styles: a systematic literature review. *International Journal of Mental Health and Addiction*, 17(4), pp.1094-1118.

[111] Mahmud, I., Das, S.R., Ahmed, S., J-Ho, S.C. & Andalib, T.W. (2020). Fun or Frustration: Modelling Discontinuance Intention of Social Media Users. *International Journal of Electronic Commerce Studies*, 11(2), pp.107-118.

Figure 48. Frustration at the hypothetical discontinuation of user's main messenger application
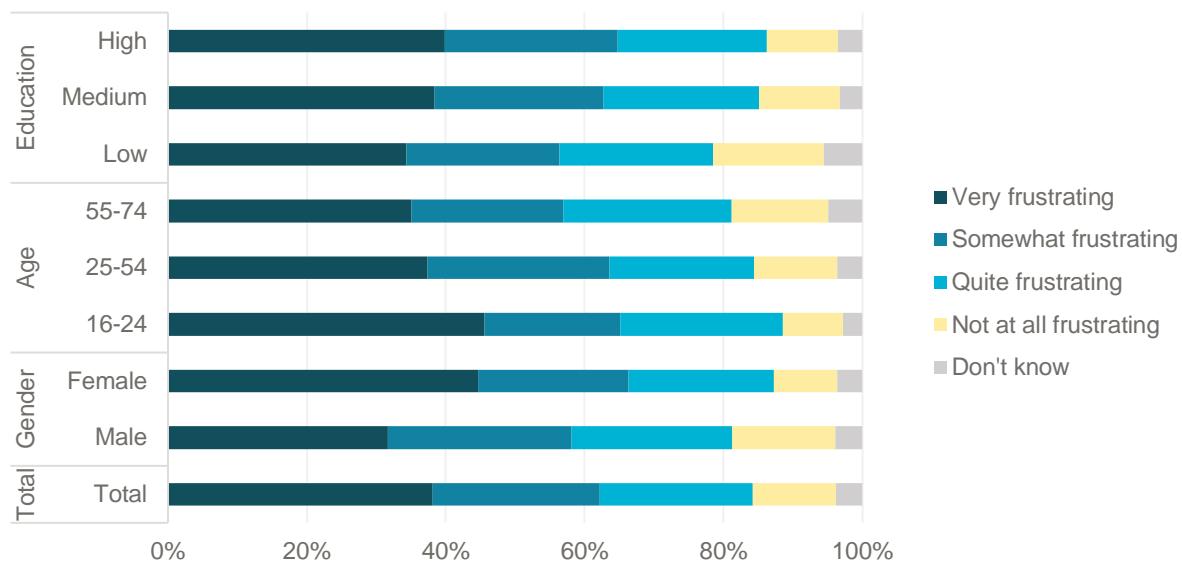
Analysis of Q19: How frustrating, if at all, would you find such a situation, in which [main messenger application] stops working and is discontinued permanently?

Taken together, these findings of strong inertia, brand satisfaction and emotional attachment explain the tendency to moor on messenger applications. Indeed, while many consumers in our survey indicated that their use of messenger applications had increased over the preceding year, this does not appear to have translated into any significant level of switching between main applications.

So, what does this strong evidence of mooring imply for the findings of the PPM framework? As discussed above, much of the literature and our survey data show that movement between multiple applications is common among EU consumers. However, these findings should not overlook the fact that most consumers have a preferred main application and are less likely to change it over time. That is to say, the landscape of digital platforms may be fluid and dynamic, but patterns of use among consumers appear to be strongly anchored around specific main application services. Therefore, although the dynamic competition for consumer attention among digital platforms may be intensifying, there are likely to be limits to the changes that consumers are willing to consider when it comes to their preferred service.

Push-pull factors

A push factor in the PPM framework prompts a consumer to contemplate or undertake a move away from a particular digital communication platform. Push factors may result in movement towards alternative services and platforms – or away from using them altogether. A pull factor, meanwhile, is one that encourages a consumer to evaluate, experiment with, or even adopt alternative services. Push-pull factors usually overlap in practice, often with regard to factors such as platform cost, data privacy or security, and network composition, among others.

In order to test some of the dynamics of user switching, our survey presented respondents with a hypothetical situation concerning a new application. We asked respondents to imagine a situation in which a new messenger application is launched – one that offers many of the main functions

preferred by consumers and to indicate what factors would be most important in deciding whether to start using it.

As shown in Figure 49, the top three factors are a continuation of the most important reasons for respondents' use of their existing main messenger applications (see Section 4.3). Respondents selected free-of-charge use (61%), the presence of friends and family (45%), and ease and convenience (41%), as the key pull factors for a new application. However, other functions could pull respondents over to a new application, such as stronger data privacy standards (29%), which overlaps with the findings in Chapter 8 on privacy. Another key factor for around one in five respondents (21%) would be better the performance of an application, so that it does not stall or crash during use. This reinforces the finding that utilitarian factors are crucial among messenger application users, as seen in Sections 5.2 and 5.3. The entertainment factor was selected by respondents least often (13%), showing the lesser relevance of hedonic gratifications in switching between messenger applications.

Figure 49. Potential factors influencing the use of new messenger applications
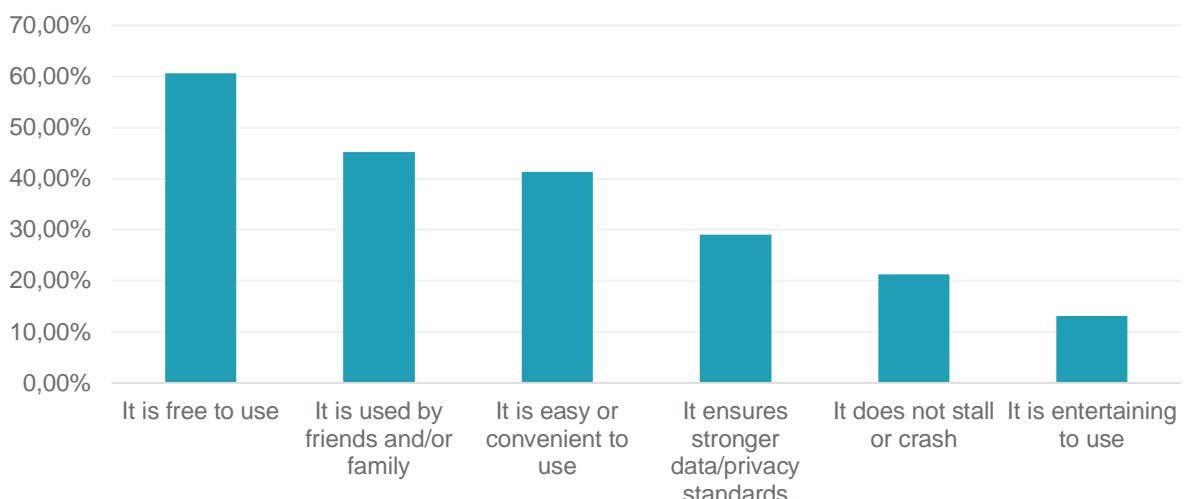
Analysis of Q23: Please imagine a situation in which a new online website or application is launched. The online website or application allows you to make calls and exchange personal messages, photos and videos with your friends, family and the wider public. What factors would be most important for you in deciding whether to start using it?

What these finding suggest is that new messenger applications would largely need to replicate the key factors indicated by users in order to provoke a significant shift in consumer choice. However, new applications could potentially pull a certain segment of younger consumers over by improving existing functionalities and providing stronger data privacy standards. Nonetheless, maintaining this user base over time would be a significant – perhaps insurmountable – challenge for any messenger start-up seeking to challenge the likes of WhatsApp and Facebook Messenger, whose brand recognition, technical resources and international networks far surpass those of even their closest competitors.

But if this demonstrates the pull exercised by key functionalities, are there utilitarian and social factors that might push consumers towards or away from using particular platforms? Studies have shown that emergencies and public health crises may push consumers towards the increased use of

certain social media and messenger applications.[112] A topical and relevant example is a recent study of WhatsApp users, which found that the Covid-19 pandemic generated increased use of the application for sending and receiving pandemic-related information.[113]

However, just as the heightened state of anxiety and stress during emergencies may push consumers towards specific platforms, some studies have indicated that 'techno-stress' and negative experiences with an application may push them away.[114] To further examine push factors around techno-stress and usage discontinuation, our survey also enquired as to whether users had changed habits or stopped using a messenger application due to stress or anxiety.[115] As shown in Figure 50, around one in five respondents (21%) indicated that they had done so, with another 19% partially agreeing or disagreeing with the statement. The levels of agreement and partial agreement or disagreement were slightly higher among men than women, and higher among younger and middle-aged users than older users.

Figure 50. Changing habits or discontinuing use of a messenger application due to stress or anxiety
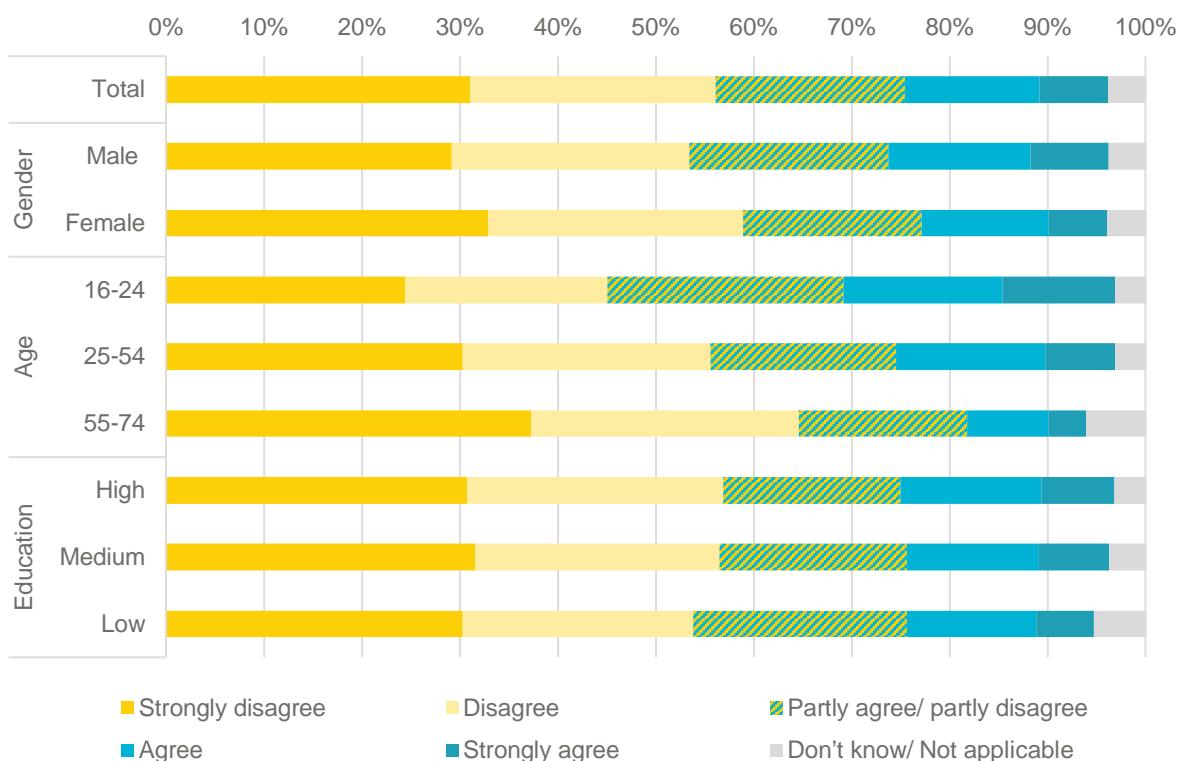
Analysis of Q24: "I have changed my use habits or stopped using a messenger application due to stress or anxiety."

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[112] Reuter, C. & Kaufhold, M.A. (2018). Fifteen years of social media in emergencies: a retrospective review and future directions for crisis informatics. *Journal of Contingencies and Crisis Management*, 26(1), pp.41-57.

[113] Tan, E.Y., Wee, R.R., Saw, Y.E., Heng, K.J., Chin, J.W., Tong, E.M. & Liu, J.C. (2020). Tracking WhatsApp behaviors during a crisis: A longitudinal observation of messaging activities during the COVID-19 pandemic. medRxiv.

[114] Maier, C., Laumer, S., Weinert, C. & Weitzel, T. (2015). The effects of technostress and switching stress on discontinued use of social networking services: a study of Facebook use. *Information Systems Journal*, 25(3), pp.275-308.

[115] BEREC Survey Question 24: "I have changed my use habits or stopped using a messenger app due to stress or anxiety"

In summary, we show that despite the general tendency to multihome, a significant number of respondents have moored (or single-homed) on one main application for messaging services. Openness to experimentation with new messenger applications is fairly low, and inertia and strong attachments to specific brands play a role. Consumers might be willing to try a new application if it offers many of the same benefits they currently enjoy with their main messenger service. However, stronger data and privacy protections might also pull consumers towards new services, as seen in the case of WhatsApp and Telegram. In contrast, the factors that push consumers towards or pull them away from messenger application use may include public emergencies, as seen in the case of WhatsApp users during the pandemic, or techno-stress and anxiety among users of messenger applications more broadly.

Accessibility of digital platform communication services

- Our platform accessibility checklist shows that digital platform compliance with WCAG 2.1 standards at the AA and AAA levels is generally poor, but that there are a number of key caveats to consider when evaluating platform accessibility.

- Digital platforms are characterised by extensive sharing of user-generated content (UGC), which complicates accessibility. The accessibility of UGC varies enormously, and platforms have only a limited degree of control over accessibility standards in relation to this.

- Full compliance with accessibility standards on digital platforms would come into direct conflict digital platforms' interactive business model, as it would entail significant restrictions on inaccessible UGC.

- The bifurcation of platforms into both mobile and web applications entails different modes of presentation and different accessibility standards.

- Accessibility suites and applications on devices allow for modification of accessibility settings on platforms, creating a more user-friendly experience for persons with disabilities.

As online social networks and digital platforms have become increasingly important for personal integration within society, the drive to improve platform **accessibility** for persons with disabilities has strengthened. This is supported by research showing that digital platforms that provide communication services serve a variety of important social functions for persons with disabilities, including the creation of virtual and physical communities,[116] the reduction of mental stress and social isolation,[117] the use of creative avenues for self-expression and identity formation, [118] and the formation and maintenance of new and existing personal relationships.[119]

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[116] Kožuh, I., Hintermair, M. & Debevc, M. (2016). Community building among deaf and hard of hearing people by using written language on social networking sites. *Computers in Human Behaviour*, 65, 295–307; Viluckiene, J. (2015). The relationship between online social networking and offline social participation among people with disability in Lithuania. *Procedia -Social and Behavioral Sciences*, 185, 453–459.

[117] Lee, H.E. & Cho, J. (2019). Social media use and well-being in people with physical disabilities: Influence of SNS and online community uses on social support, depression, and psychological disposition. *Health Communication*, 34(9), 1043-1052.

[118] Chadwick, D.D., & Fullwood, C. (2018). An online life like any other: Identity, self-determination, and social networking among adults with intellectual disabilities. *Cyberpsychology, Behavior, and Social Networking*, 21(1), 56-64.

[119] Borgström, Å. (2017). A literature review about young people with intellectual disabilities and social media. In *Cyberspace 2017. 24-25.11. 17, 15th International Conference, Masaryk University, Brno, Czech Republic*.; Darragh, J., Reynolds, L.C., Ellison, C., & Bellon, M.L.

Recognising the importance of these benefits, the EU's recently published Strategy for the Rights of Persons with Disabilities (2021-2030) makes ensuring the accessibility of the digital transition a key policy priority for the coming decade.[120] The forthcoming Action Plan on digital accessibility will seek to build upon and identify gaps in previous efforts such as the Web Accessibility Directive (WAD) and the Harmonised Standards for ICT Services and Products implemented in recent years.[121] These measures establish a broad framework for online accessibility measures, as well as clear responsibilities and obligations for platforms and institutions, leaving enforcement and oversight of implementation to governments and regulators throughout the EU. Given the immense scale and reach of digital communication platforms, as discussed in this study, further efforts from the EU are needed to ensure compliance and enforcement.[122]

Within this context, the ongoing collaboration between BEREC and the OECD regarding accessibility can serve to ensure the ongoing review of initiatives and to recommend further reforms for communication providers. This collaboration seeks to coordinate efforts with independent national regulators to improve the Quality of Standards (QoS) for accessibility around the world.[123]

Over the past few decades, the EU has made important strides in improving the accessibility of physical spaces for persons with disabilities across the public and private sectors alike.[124] Improvements in the architectural, technological and financial aspects of building construction within both government and businesses have generated greater access and social inclusion for those with disabilities. However, despite clear progress on accessibility within physical spaces, the digital communication landscape presents a range of unique and novel challenges to the creation of comparable forms of accessibility online.[125]

Studies have emphasized that accessibility is a broad concept involving both the elimination of existing **barriers** (aspects limiting or inhibiting the use of social networks) and the prevention of new ones. The possibility of attaining full accessibility, however, depends on the type of engagement undertaken by persons with disabilities, how such disabilities impact user capabilities, and the specific type and technical complexity of communication platforms. Thus, when using social networks, persons with disabilities may encounter barriers that vary in their degree of severity. For instance, one literature review found that the **technical complexity** (e.g. non-assisted voice and text systems, automatic video and graphics features, and complex interfaces) of social media platforms

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(2017). Let's talk about sex: How people with intellectual disability in Australia engage with online social media and intimate relationships; Shpigelman, C.N. & Gill, C.J. (2014). Facebook use by persons with disabilities. *Journal of Computer-Mediated Communication*, 19(3), 610-624.

[120] EU. (2021) Union of Equality: Strategy for the Rights of Persons with Disabilities 2021-2030. https://ec.europa.eu/commission/presscorner/detail/en/ip_21_810

[121] Eur-lex.europa.eu (2019). Accessibility of products and services. Available at: https://eur-lex.europa.eu/legal-content/EN/LSU/?uri=CELEX%3A32019L0882

[122] Ferri, D. & Favalli, S. (2018). Web Accessibility for People with Disabilities in the European Union: Paving the Road to Social Inclusion. Societies, 8(2),.40.

[123] BEREC (2020). BEREC and OECD Webinar on QoS and QoE, Part I, 23 June 2020. YouTube. Available at: https://www.youtube.com/watch?v=kJnmqyBXiG0

[124] Priestley, M. (2005). We're all Europeans now! The social model of disability and European social policy. The social model of disability: Europe and the majority world, pp.17-31.

[125] Gleason, C., Carrington, P., Chilton, L. B., Gorman, B. M., Kacorri, H., Monroy-Hernández, A…. & Wu, S. (2019, November). Addressing the Accessibility of Social Media. In: Conference Companion Publication of the 2019 on Computer Supported Cooperative Work and Social Computing (pp. 474-479).

reportedly resulted in poor accessibility,[126] especially for people with visual impairments,[127] while shortcomings with application design reportedly lead to the decreased use or abandonment of social networks altogether.[128]

In addition, frequent redevelopment of or updates to social media sites may render learning and adapting to change more difficult or slower for disabled persons than for participants in the non-disabled population.[129] In some instances, there may also be **risks** such as cyberbullying and inappropriate sharing, which undermine the potential of new technologies and services to improve social well-being**.** Such factors can, however, be mitigated through the use of enhanced social support and education aimed at overcoming both interface barriers and potentially harmful online exposure.[130]

One component of our desk research for this study consisted of producing a platform accessibility checklist. A list of the WCAG 2.1 standards at AA and AAA level (see Box 4 below) was applied to assess the specific accessibility features of each platform included in the study, with the goal of determining their overall levels of compliance. Because the WCAG standards are a central component of the Harmonised Standards for ICTs mentioned above, our approach thus aligns with and contributes to the discussion of EU accessibility guidelines more broadly.

Our platform accessibility checklist can be segmented according to the WCAG's four key principles: that the features and content on digital platforms and online applications should be **perceivable, operable, understandable, and robust**. We find that that the overall picture concerning platform accessibility is somewhat mixed at AA level and generally poor at AAA level. Our findings align with those of previous studies assessing the accessibility of mobile applications more generally, which highlighted a high number of actual or potential violations of key accessibility standards.[131]

Box 4. WCAG standards

The Web Content Accessibility Guidelines (WCAG) were created during the late 1990s by the Web Accessibility Initiative (WAI) in collaboration with technology and accessibility experts. Since their release, the WCAG standards have provided technical specifications for the development of websites and online applications accessible to persons with disabilities. The guidelines are intended for use by web content developers, web authoring tool developers, web accessibility evaluation tool developers and others who want or need a standard for web accessibility, including on mobile devices.

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[126] Brunner, M., Hemsley, B., Palmer, S., Dann, S. & Togher, L. (2015). Review of the literature on the use of social media by people with traumatic brain injury (TBI). *Disability and Rehabilitation*, 37(17), 1511-1521.

[127] Babu, R. (2015). Blind students' challenges in social media communication: an early investigation of Facebook usability for informal learning. *International Journal of Online Pedagogy and Course Design* (IJOPCD), 5(1), 58-73.

[128] Bayor, A., Bircanin, F., Sitbon, L., Ploderer, B., Koplick, S. & Brereton, M. (2018). Characterizing participation across social media sites amongst young adults with intellectual disability. In: Proceedings of the 30th Australian Conference on Computer-Human Interaction (pp. 113-122).

[129] Brunner, M., Hemsley, B., Palmer, S., Dann, S. & Togher, L. (2015). Review of the literature on the use of social media by people with traumatic brain injury (TBI). *Disability and Rehabilitation*, 37(17), 1511-1521.

[130] Raja, D.S. (2016). Bridging the disability divide through digital technologies. *Background paper for the World Development report*.

[131] Yan, S. & Ramachandran, P.G. (2019). The current status of accessibility in mobile apps. ACM Transactions on Accessible Computing (TACCESS), 12(1), pp.1-31.; Alshayban, A., Ahmed, I. & Malek, S. (2020). Accessibility issues in Android apps: state of affairs, sentiments, and ways forward. In: 2020 IEEE/ACM 42nd International Conference on Software Engineering (ICSE) (pp. 1323-1334). IEEE.

The standards have been updated on several occasions to reflect the increasing complexity and sophistication of digital platforms and web applications. The 2.0 version, published in 2008, aimed to update standards on websites, while version 2.1, published in 2018, focuses on mobile applications; version 2.2 is scheduled for release in 2021. Each version contains 12-13 guidelines organised under four key principles: perceivability, operability, understandability, and robustness. For each guideline there are sets of testable success criteria, with different levels of stringency set at three levels: A, AA and AAA.

WCAG Principle	Criteria
Perceivable	1.1 Provide text alternatives for any non-text content so that it can be changed into other forms people need, such as large print, braille, speech, symbols or simpler language. 1.2 Provide alternatives for time-based media. 1.3 Create content that can be presented in different ways (for example simpler layout) without losing information or structure. 1.4 Make it easier for users to see and hear content including separating foreground from background.
Operable	2.1 Make all functionality available from a keyboard. 2.2 Provide users enough time to read and use content. 2.3 Do not design content in a way that is known to cause seizures. 2.4 Provide ways to help users navigate, find content, and determine where they are.
Understandable	3.1 Make text content readable and understandable. 3.2 Make web pages appear and operate in predictable ways. 3.3 Help users avoid and correct mistakes.
Robust	4.1 Maximise compatibility with current and future user agents, including assistive technologies.

However, it is important to note that reaching firm conclusions regarding platform compliance with WCAG standards is tricky, and that any assessment must be qualified with a number of caveats. First, the interactive and social elements of digital communication platforms introduce factors that complicate a straightforward analysis of accessibility. The most consequential of these is the influence of **user-generated content** (UGC).[132] Digital platforms provide a decentralised, software-based infrastructure for communication between and among multiple parties. However, the accessibility of the actual content that users create and share among themselves varies enormously, and the platforms have only a limited degree of control over whether such content will be accessible to persons with disabilities.

To take a hypothetical example of this dilemma, consider the sharing of videos on several digital communication platforms. There is no guarantee that, say, video content on YouTube or Twitter, or a livestream broadcast on Instagram or Skype uploaded by one user will necessarily be accessible to another user who may have some form of disability. That video content may in turn be reposted and/or re-shared freely among digital platform users around the world – though, crucially, without audio captions enabled for the hearing-impaired, automated reading functions for the visually-impaired, or simplified graphics or features that facilitate access for persons with mental disabilities,

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[132] Kuksenok, K., Brooks, M. & Mankoff, J. (2013, April). Accessible online content creation by end users. In: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (pp. 59-68).

such as epilepsy or colour-blindness. These issues also arise with third-party advertising content that appears on the platforms themselves.

All of the platforms assessed in this study feature the extensive sharing of UGC across networks. This partly accounts for our findings of general non-compliance with standards such as live audio captions for video (WCAG 2.1 AA 1.2.4.), pre-recorded sign language (WCAG 2.1 AA 1.2.6), extended audio descriptions of content (WCAG 2.1 AAA 1.2.7), and pre-recorded media alternatives, such as transcripts for video and audio content (AAA 1.2.8). This is also reflected in the finding that platforms are broadly non-compliant with standards such as presentation of textual information without images (WCAG 2.1 AA 1.4.5) where possible, and those ensuring that there is low or no background audio (WCAG 2.1 AAA 1.4.7) on content presented on the site.

However, according to the WCAG rules, platforms should not be held accountable for the accessibility of the content that users create and share.[133] And while platforms including Instagram, Facebook and YouTube have taken steps to improve the accessibility of user-generated content with labels and explanatory texts attached to specific types of content (e.g. photos and videos with flashing graphics) or through colour or text modification settings (e.g. colour-blind settings, font and text contrast), these measures alone do not ensure that UGC is fully accessible.

Platform compliance with WCAG standards pertaining to similar accessibility modifications across platforms and websites remains uneven. WhatsApp, Telegram and YouTube, among others, have implemented standards regarding contrast and text sizing at both AA and AAA levels, while almost all others only partly satisfy such criteria. Furthermore, results of the analysis suggest that the platforms assessed in this study have only partly complied with the strictest visual presentation standards (WCAG 2.1 AAA 1.4.8), such as ensuring an 80-character width, non-justified text, adequate line spacing, and foreground and background colour specifications, which allow persons with disabilities to navigate easily and interpret page content.

As these examples illustrate, user-generated content therefore renders platform compliance with accessibility standards only partial at best, and this is compounded by the digital platforms' **interactive nature.** The popularity and widespread adoption of digital platforms among users worldwide are predicated upon the platforms' openness: their role as service providers is to permit, facilitate, amplify and accrue profit from the open and relatively unrestricted dissemination of UGC in one form or another.[134] If accessibility standards were to be fully implemented across digital platforms, it would probably entail significant restrictions on UGC, due to concerns over its inaccessibility for persons with disabilities. Such measures would not only undermine free expression and the exchange of ideas on platforms, but also elements of their business model, in the interest of accessibility for a minority of users.

Another caveat is that the **bifurcation of platforms** into both mobile and web applications entails different modes of presentation and different accessibility standards. All of the platforms analysed in this study have at least two versions of their applications, with most offering tablet versions as well. While specific AA standards, such as reflow (WCAG 2.1 AA 1.4.1) and text spacing (WCAG 2.1 AA 1.4.10) settings apply only to the web versions, others such as consistent navigation (WCAG 2.1 AA

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[133] Hall, C., Sajka, J. & Korn, P. (2020). Challenges with accessibility guidelines conformance and testing, and approaches for mitigating them. W3.org. Available at: https://www.w3.org/TR/accessibility-conformance-challenges/#Challenge-3
[134] Luca, M. (2015). User-generated content and social media. In Handbook of media Economics (Vol. 1, pp. 563-592). North-Holland.

3.2.3) and status messages (WCAG 2.1 AA 4.1.3) apply to both. Meanwhile, AAA standards, the most advanced and stringent of the accessibility criteria, apply to both mobile and web applications. But because levels of compliance are staggered over several iterations of the WCAG standards, the structure and content of a given platform or application is never strictly homogenous: content and features added under WCAG 2.0 AA standards may continue to exist on the platform or websites alongside newer features and content that comply with WCAG 2.1 AA standards.

Accessibility issues such as these often arise from both the front end (client-side) and back end (server-side) dimensions of application development processes. Studies have shown that ensuring accessibility in application design is a not high priority in the development process. Indeed, application developers and their organisations are often unaware of accessibility design principles and analysis tools in practice.[135] Developers rarely utilise accessibility standards in developing automated platform interfaces (APIs), and few test their products for accessibility compliance once an application is released.[136] It is often argued that, by default, the development of attractive and convenient user interfaces incorporates many aspects of accessibility. While outside the scope of this study, further research into the development side of digital accessibility should focus on how to facilitate greater use of **standardised and automated accessibility testing tools**. In our literature review, we found evidence of researchers and developers using automated tools including IBM's Mobile Accessibility Checker[137] and Android Accessibility Scanner.[138]

However, to compensate for these shortcomings in the design of applications, a number of **accessibility suites and applications** have been developed that allow for the modification of platform settings and features, often through devices. While these do not modify the underlying structure of the back-end elements of a digital platform or application, they do assist with vital improvements to the front end. Operating systems such as Android and IOS offer accessibility suites and applications that allow users to adjust accessibility settings on the device – and therefore across all platforms used on such devices – creating a more user-friendly experience for persons with disabilities, and removing barriers to use.

These services have been downloaded and used by significant numbers of consumers. The Android Accessibility Suite, for instance, has been downloaded by over 2.4 million users, according to data accessed in February 2021[139]. While similar data is unavailable for the range of IOS applications to assist users with accessibility, the Apple App Store lists numerous applications for text transcription, recognition tools for the blind, accessible keyboards, and other modifications.[140] Such features of mobile operating systems allow users to modify various elements of their functionalities, graphics and display features, and enable audio captions or screen readers for users with disabilities, as well as improving upon the interface design and structure of certain mobile applications. Therefore, even where platform features may not be compliant with WCAG 2.1 standards – for example, the display

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[135] Alshayban, A., Ahmed, I. & Malek, S. (2020). October. Accessibility issues in Android apps: state of affairs, sentiments, and ways forward. In: 2020 IEEE/ACM 42nd International Conference on Software Engineering (ICSE) (pp. 1323-1334). IEEE.

[136] Eler, M.M., Rojas, J.M., Ge, Y. & Fraser, G. (2018, April). Automated accessibility testing of mobile apps. In: 2018 IEEE 11th International Conference on Software Testing, Verification and Validation (ICST) (pp. 116-126). IEEE.

[137] Yan, S. (2016). IBM Strengthens Mobile App Accessibility and Usability. Available at: https://www.ibm.com/blogs/age-and-ability/2016/10/12/ibm-strengthens-mobile-app-accessibility-and-usability/

[138] Android Accessibility Guide. Available at: https://developer.android.com/guide/topics/ui/accessibility/testing

[139] Data accessed at: https://play.google.com/store/apps/details?id=com.google.android.marvin.talkback&hl=en&gl=US

[140] See: https://apps.apple.com/us/story/id1266441335

settings in WhatsApp or Facebook Messenger – there are potential ways to address these shortcomings.

In recent years, the need for innovation aimed at overcoming barriers to accessibility online has become clearer – and more urgent. As platforms have become more widely adopted across societies, they have also increasingly been used as channels for **public information services,** especially during the COVID-19 pandemic. While there is a significant gap in the existing literature on accessibility issues during the pandemic, one study of WCAG compliance on the World Health Organization website found that the messages and information provided were not compliant with the 2.1 standards, in particular the 'understandable' and 'perceivable' principles.[141] The authors contend that this leaves some individuals unable to access public health information, and that steps must be taken to ensure that the structure and content of texts are reviewed in relation to WCAG standards.

While the research focuses on WCAG standards, it also shows that most digital platforms, due to the myriad factors outlined above, are at present do not fully meet the standards set by the EU Directive 2018/1972, which requires that relevant ICT products and services for emergency communications[142] "provide real-time text in addition to voice communication" for the hearing impaired, "provide total conversation where video is provided in addition to voice communication" for the visually impaired, and ensures that all "emergency communications using voice, text (including real-time text) is synchronised".[143]

In summary, our accessibility analysis shows that the compliance of digital platforms with WCAG 2.1 standards is generally poor. But because platforms are characterised by extensive sharing of user-generated content (UGC), the assessment of accessibility is complicated. Platforms have only a limited degree of control over accessibility standards, which come into direct conflict with digital platforms' interactive business model. However, accessibility suites and applications on devices allow for the modification of accessibility settings on platforms, creating a more user-friendly experience for persons with disabilities. Addressing these issues has become increasingly important within the context of the COVID-19 pandemic, a key area for future research and policy intervention.

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[141] Fernández-Díaz, E., Iglesias-Sánchez, P.P. & Jambrino-Maldonado, C. (2020). Exploring WHO Communication during the COVID 19 Pandemic through the WHO Website Based on W3C Guidelines: Accessible for All?. *International Journal of Environmental Research and Public Health*, 17(16), 5663.

[142] The emergency calls obligations under the European Electronic Communications Code (established by the mentioned directive) are only applicable to the number based digital communication providers (e.g. Skype-Out; Microsoft Teams with connectivity to telephone numbers).

[143] Eur-lex.europa.eu (2018). European Electronic Communications Code. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32018L1972

Digital platforms as substitutes for traditional electronic means of communication

- The rise in the use of digital platforms and social networks coincides not only with increased demand for broadband internet, but also with a decrease in the use of SMS, MMS and mobile phone calls, not to mention landline phones.

- In our survey, most respondents agreed that they make fewer mobile calls and send fewer SMS messages using a SIM card because they use messenger applications.

- The results show that for day-to-day communication with friends and family, cross-border communication, urgent communication and private communication, the majority of European application users prefer to use messenger applications exclusively, rather than number-based interpersonal communication services.

- The main trade-offs between digital and traditional electronic means of interpersonal communication involve the cost of services, possibilities for self-expression, the fluidity of the conversational method and the functionalities available.

A crucial feature of online platforms is their capacity to alter **consumer behaviour** in various ways. For example, earlier studies have confirmed that social networks (and, more specifically, exposure to marketing on them) strongly influences purchase behaviour[144]. Others even present social media as a means to present opportunities to change user's behaviour in terms of health habits[145], food waste[146] or even climate change[147]. However, the area of behavioural change that is most relevant and important to this study concerns the ways in which the use of **traditional electronic means of communication** is impacted by the use of online platforms. Later in this chapter, we present the key trends in the use of messenger applications, and in the number-based interpersonal communication services they replace. We then go on to discuss our findings in relation to preferred means of communication in different situations, and conclude with an overview of the key consumer trade-offs in choosing digital or traditional means of interpersonal communication.

Key trends

The rise of digital platforms and social networks has coincided not only with increased demand for broadband internet, but also the decreasing use of SMS, MMS and mobile phone calls, not to mention landline phones[148] (particularly among certain age groups, as already illustrated in the previous chapters). This conclusion is strongly supported by the results of our survey and focus groups. One of our survey questions asked interpersonal communication how their use of different means of communication had changed over the preceding 12 months. The most notable decreases concern landline phones (the use of which was already low) and SMS messages. The use of

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[144] Ioanăs, E. & Stoica, I. (2014). Social media and its impact on consumers' behavior. *International Journal of Economic Practices and Theories*, 4(2), 295-303.

[145] Adewuyi, E.O. & Adefemi, K. (2016). Behavior change communication using social media: a review. *International Journal of Communication and Health*, 9, 109-16.

[146] Young, W., Russell, S.V., Robinson, C.A. & Barkemeyer, R. (2017). Can social media be a tool for reducing consumers' food waste? A behaviour change experiment by a UK retailer. *Resources, Conservation and Recycling*, 117, 195-203.

[147] Fernandez, M., Piccolo, L.S., Maynard, D., Wippoo, M., Meili, C. & Alani, H. (2016, May). Talking climate change via social media: communication, engagement and behaviour. In: Proceedings of the 8th ACM Conference on Web Science (pp. 85-94).

[148] SMS, MMS and mobile call data in various EU countries from Statista.

messenger applications, meanwhile, saw both the smallest decreases and the largest increases (see Figure 51 below).

Figure 51. Self-reported changes in the use of different means of interpersonal communication in the preceding 12 months
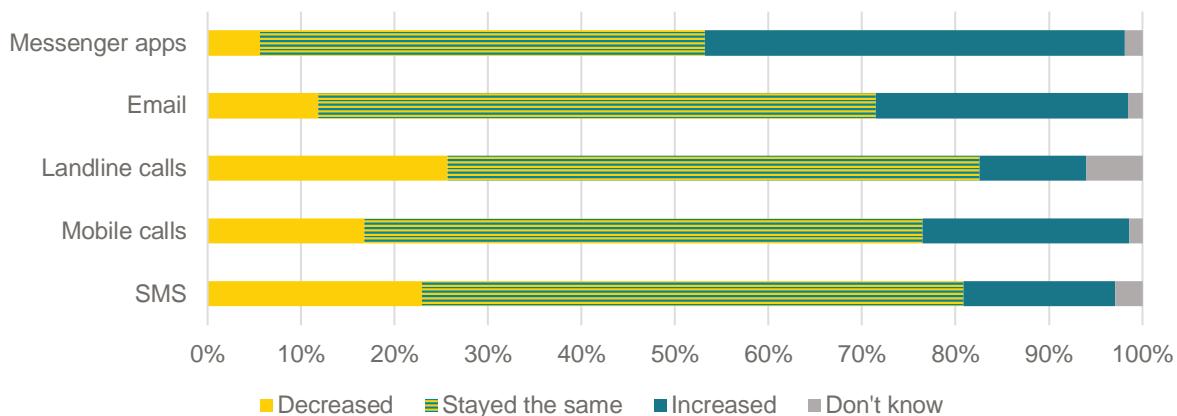
Analysis of Q22: Over the past 12 months, would you say that your use of the following means of communication?

In relation to these, while differences by sex do not exceed 1-2 percentage points across all different means of communication, differences by age group are notable. As illustrated in Figure 52 below, the survey results support the other findings of greater stability among the oldest age group in terms of their use of various means of communication, and the greatest change among the youngest.

Figure 52. Self-reported changes in the use of different means of interpersonal communication in the preceding 12 months, by age group

AGE GROUP	16-24	25-54	55-74
Messenger applications			
Decreased	9.89%	5.56%	2.78%
Stayed the same	31.77%	47.56%	57.91%
Increased	53.73%	45.69%	37.48%
Don't know	4.61%	1.14%	1.82%
Email			
Decreased	18.06%	11.48%	8.76%
Stayed the same	38.14%	60.10%	72.33%
Increased	40.91%	26.93%	18.01%
Don't know	2.89%	1.44%	0.89%
Landline			
Decreased	31.85%	26.11%	20.34%
Stayed the same	45.71%	56.97%	64.07%
Increased	13.98%	11.42%	9.93%
Don't know	8.46%	5.44%	5.66%

	Mobile calls		
Decreased	24.45%	17.55%	9.80%
Stayed the same	44.02%	58.59%	72.57%
Increased	29.57%	22.54%	16.25%
Don't know	1.95%	1.27%	1.38%
	SMS		
Decreased	29.01%	23.90%	16.53%
Stayed the same	45.03%	56.53%	69.69%
Increased	21.54%	16.80%	11.25%
Don't know	4.42%	2.72%	2.53%

Analysis of Q22: Over the past 12 months, would you say that your use of the following means of communication has…?

Furthermore, one of the survey questions specifically sought to link the decrease in the use of traditional electronic means of communication to rises in the use of messenger applications. In our survey, 60 % of respondents agreed or strongly agreed that they made fewer calls and send fewer SMS messages using a SIM card *because* they use messenger applications (see Figure 53 below). This share is smaller among the oldest age cohort (50% agreement in the age group 55-74, compared with 65% among users aged 15-24). In general, responses were fairly similar between sexes.

Figure 53. Decrease in the use of SIM card services due to the use of messenger applications
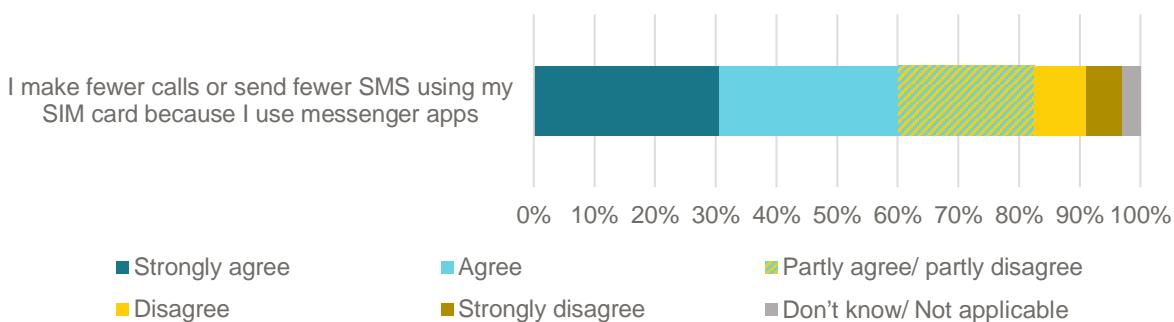
Analysis of Q24: "I make fewer calls or send fewer SMS using my SIM card because I use messenger applications".

These findings are broadly in line with general trends seen throughout the EU. As the longitudinal data from a Special Eurobarometer Survey on E-Communications and Digital Single Market[149] appears to show, since 2009, the penetration of fixed telephone access has decreased continually across Europe, while individual mobile phone access, as well as access to computers and internet (the key preconditions for the use of digital means of communication) has gradually been increasing.

[149] European Commission (2018). Special Eurobarometer 462: E-Communications and Digital Single Market. Directorate-General for Communications Networks, Content & Technology. Available at: https://op.europa.eu/en/publication-detail/-/publication/55886f6a-8fb4-11e8-8bc1-01aa75ed71a1/language-en

However, the use of traditional means of communication remains almost universal in Europe: this is confirmed both by earlier EU-level studies[150] and by our survey. As illustrated in Figure 54 below, mobile phone calls and email remain the most popular options, with over 90% of respondents using them at least once a month. Meanwhile, the use of number-based interpersonal communication services, such as landline phones and SMS/ MMS messages, is notably less prevalent among the application users surveyed.

Figure 54. Use of traditional electronic means of communication by application users
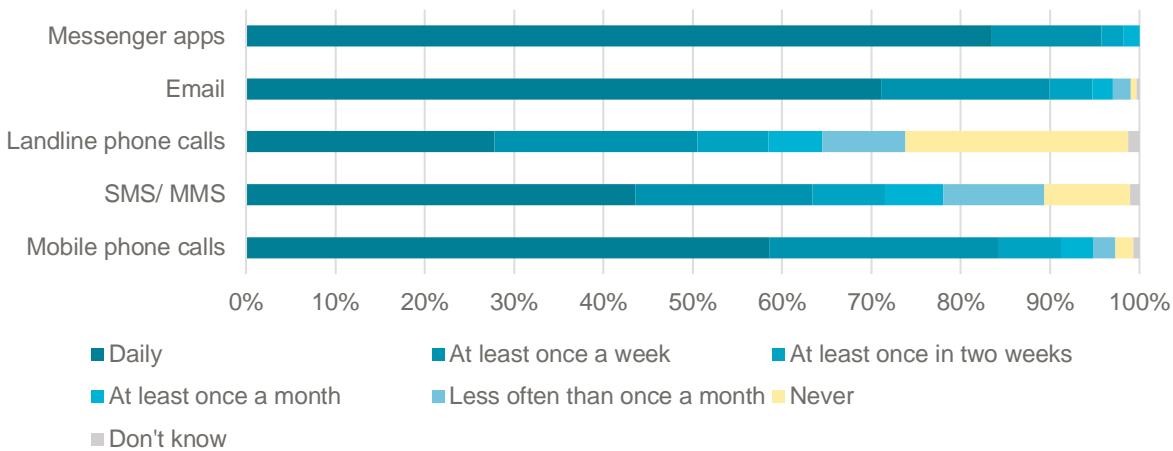
Analysis of Q3: Over the past three months, how often would you say you used the following means of communication for personal purposes (i.e. not work-related)?

As illustrated throughout this report, short messages using a SIM card are one of the functionalities most likely to be replaced by instant messages via messenger applications, as this is the most widely exploited messenger application functionality (see Section 3.2.). This was reiterated repeatedly in the interviews and focus groups, with many participants claiming they now use SMS only for various specific services (e.g. payment confirmation codes) rather than interpersonal communication. Meanwhile, the find that email and phone calls remain an option for communication in specific situations and with specific groups of people (with whom messenger applications are less appropriate) also emerged from the focus groups.

Preferred means of communication in different situations

Among consumers, some traditional and digital communication methods appear complementary. For example, the research reviewed finds that voice calls are generally used for communications with closer friends and relatives, while other relationships are maintained via WhatsApp or other social networks.[151] Another study looking at daily channel use for face-to-face communication, telephone,

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[150] European Commission (2018). Special Eurobarometer 462: E-Communications and Digital Single Market. Directorate-General for Communications Networks, Content & Technology. Available at: https://op.europa.eu/en/publication-detail/-/publication/55886f6a-8fb4-11e8-8bc1-01aa75ed71a1/language-en; European Commission (2018). Special Eurobarometer 462: E-Communications and Digital Single Market. Directorate-General for Communications Networks, Content & Technology. Available at: https://op.europa.eu/en/publication-detail/-/publication/55886f6a-8fb4-11e8-8bc1-01aa75ed71a1/language-en

[151] Fernández-Ardèvol, M. & Rosales, A. (2018). Older people, smartphones and WhatsApp. *Smartphone Cultures*, 55-68.

email, text messaging and Facebook found that complementarity of different channels is dependent on a consumer's social competence (defined as their ability to interact in ways that are appropriate and effective). Channel complementarity was found between telephone and email, telephone and text messaging, email and Facebook, email and text messaging, and Facebook and text messaging.[152]

Indeed, with regard to consumer switching between digital and traditional electronic means of communication, the survey data revealed patterns both of complementarity and substitution in different situations. In the survey, we asked application users to provide up to two preferred means of communication in different situations. The response options included applications as well as traditional electronic means of communication.

The results show that for day-to-day communication with friends and family, the majority of European application users – 54% – indicated that they prefer to use messenger applications exclusively. Another 35% indicated they used both applications and traditional electronic means, while the remaining 11% used traditional electronic means of communication exclusively.

Figure 55. Preferred means of communication in different situations
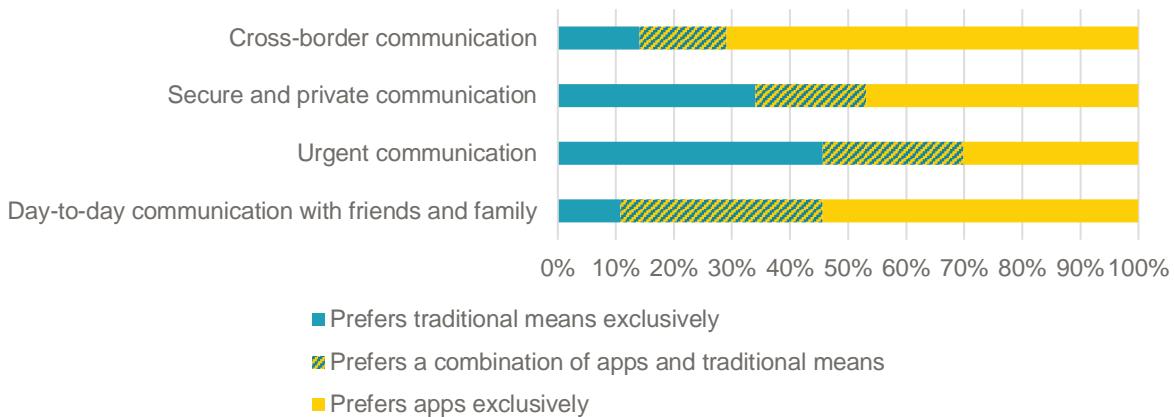
Analysis of Q7: Which means of communication do you prefer to contact your friends or family members?; Q8: Which means of communication do you prefer when you need to contact someone urgently?; Q9: Which means of communication do you prefer when you wish your communication to be secure and encrypted?; and Q10: Which means of communication do you prefer to communicate with someone in another country? The response options for these questions included a list of messenger applications and number-based services. Each respondent could select up to two preferred means of communication for each situation.

Furthermore, for **cross-border** communication, the preference for applications was notably more pronounced, with 71% of respondents indicating they used applications exclusively. A combination of application and non-application means was indicated for interpersonal communication by 15% of the application users surveyed, while the remaining 14% reported a preference for using traditional electronic means of communication exclusively. As we argue in the following section, this is likely to be related with certain consumer trade-offs and the cost of traditional electronic means of communication for cross-border exchanges.

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[152] Ruppel, E.K. & Burke, T.J. (2015). Complementary channel use and the role of social competence. *Journal of Computer-Mediated Communication*, 20(1), 37-51.

Nonetheless, as illustrated in Figure 55Figure 47 above, quite different trends were observed in the answers concerning communication under specific circumstances. When asked about **urgent** communication, the respondents reported quite different preferences: while 30% indicated that they preferred applications exclusively, 24% reported using both applications and traditional electronic means of communication, while 46% used traditional electronic means of communication only (most often phone calls).

Finally, when it comes to concerns over secure and private communication, we also observe a somewhat stronger reliance on traditional electronic means of communication. In our sample of application users, 47% prefer to use applications only for private and secure communication, 19% use both application and traditional means of communication, while 34% use traditional electronic means of communication. This is likely to be connected with lower levels of trust in the data privacy conditions of the applications used, as discussed in Chapter 8.

The results – particular with regard to reliance on traditional electronic means of communication – were quite similar for both sexes and for all education levels (after controlling for age). However, differences by age were very notable, with rising age correlating positively with a preference for traditional electronic means of communication rather than applications in all of the four situations presented (see Figure 56 below).

Figure 56. Preferred means of communication in different situations, by age group
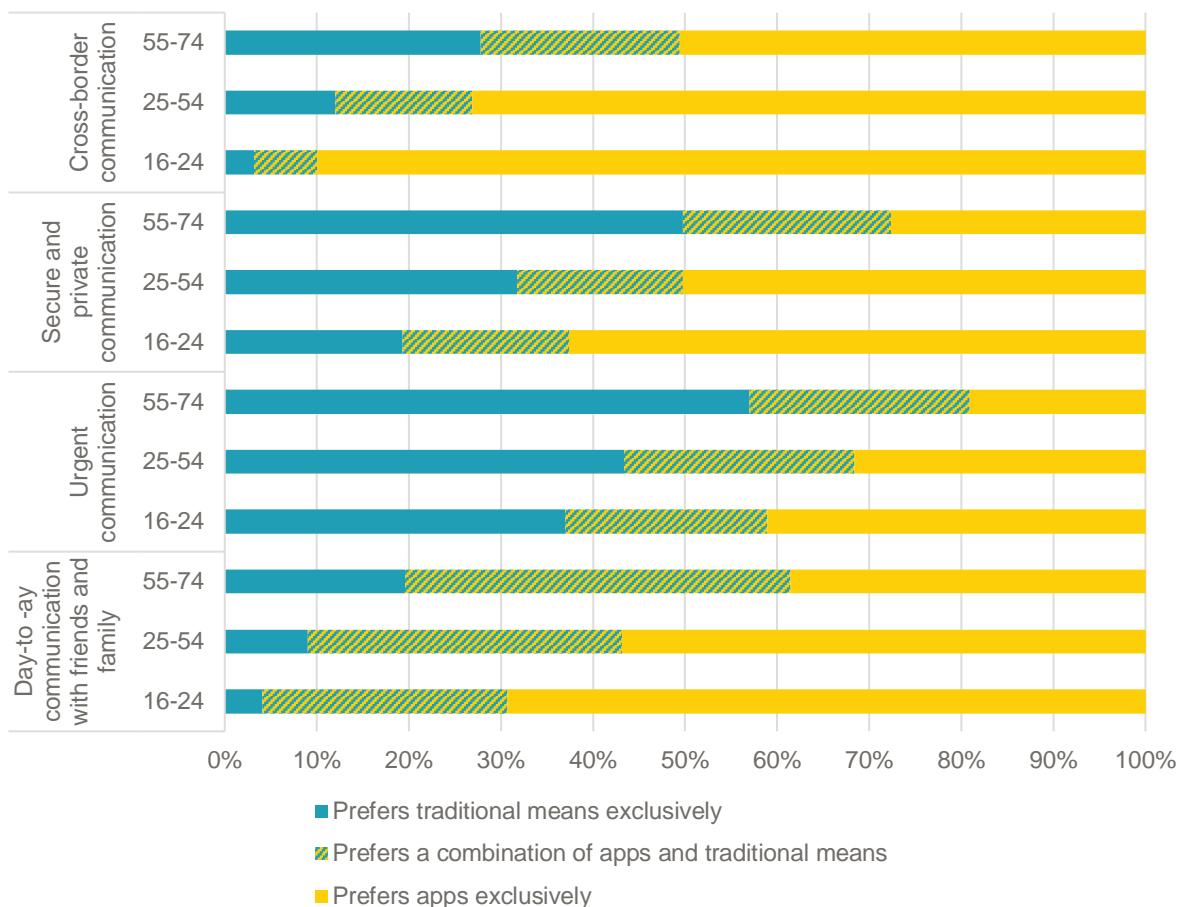
Analysis of Q7: Which means of communication do you prefer to contact your friends or family members?; Q8: Which means of communication do you prefer when you need to contact someone urgently?; Q9: Which means of communication do you prefer when you wish your communication to be secure and encrypted?; and Q10: Which means of communication do you prefer to communicate with someone in another country?. The response options of these questions included a list of messenger applications and number-based services. Each respondent could select up to two preferred means of communication for each situation.

This finding is fairly in line with those of earlier research. For example, a cross-European study of persons aged 60 and over from Belgium, Croatia, Denmark, Germany, Hungary, Italy, Poland, Portugal and Israel found that despite the rapid adoption of ICT by older adults, seniors are less inclined toward tech innovation and tend to adhere to use of traditional media and communication channels[153]. In another study, many elderly respondents in the US reported not missing much by staying off social media networks, with 79% of users and 48% of non-users agreeing with such a sentiment. Preferences for a more **traditional, in-person face-to-face** conversation were emphasised, with phone conversations as the second most preferred, and email the third most convenient[154].

[153] Nimrod, G. (2017). Older audiences in the digital media environment. Information, Communication & Society, 20(2), 233-249.
[154] Yuan, S., Hussain, S.A., Hales, K D. & Cotten, S R. (2016). What do they like? Communication preferences and patterns of older adults in the United States: The role of technology. *Educational Gerontology*, 42(3), 163-174.

Other recent research into patterns of mobile phone use among populations aged 16-65 in Spain shows that the most common uses of mobile phones among 16-25-year-olds were texting (92%), social networking (53%) and email (43%). Applications such as WhatsApp, Facebook and Twitter were considered indispensable among this age group. In contrast, the most common uses of mobile phone among older populations between 46-55 and 56-65 was to make phone calls (74%), with the most important service being SMS.[155]

Nonetheless, as mentioned, some groups within the older age cohorts do use digital platforms, although for slightly different purposes than the younger populations. For example, one study found that middle-aged adults (35-59) use instant messengers for a mix of work, personal, and care responsibilities, with WhatsApp being the most dominant application used among this age cohort. Meanwhile, younger cohorts tend to use WhatsApp to stay in touch with friends, whereas adults aged 60+ use WhatsApp to connect with younger generations (children and grandchildren) and, to a lesser extent, their peers (this message was reiterated in one of the focus groups conducted for this study; see Annex 2). However, older populations used IMs more sparingly and were less likely to be present on the networks, while younger cohorts use platforms constantly and are always available. Older cohorts were also found to be less likely than younger groups to use instant messaging applications, and generally used fewer platforms for the purposes of communication.[156]

Furthermore, to investigate the situations in which consumers may switch from applications back to traditional electronic means of communication, we also asked respondents what other means of communication they would choose in the short and long term if their main application suddenly stopped working. Generally speaking, the results further strengthen the argument for the interchangeable use of messenger applications and traditional electronic means of communication.

In the short term, most users would not switch to another application/online platform (while 19% would), but would instead select one of what we consider in this study to be the traditional electronic means of communication: 57% would use a mobile phone with a SIM card (either for calls or SMS), 7% would use a landline phone, and 12% would use email. More details are provided in Figure 57 below.

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[155] De-Sola, J., Rubio, G., Talledo, H., Pistoni, L., Van Riesen, H. & de Fonseca, F. R. (2019). Cell Phone Use Habits Among the Spanish Population: Contribution of Applications to Problematic Use. *Frontiers in Psychiatry*, 10.

[156] Matassi, M., Boczkowski, P. J., & Mitchelstein, E. (2019). Domesticating WhatsApp: Family, friends, work, and study in everyday communication. *New Media & Society*, 21(10), 2183-2200.

Figure 57. If your main application suddenly stopped working, what types of communication services would you use instead, in the short term?
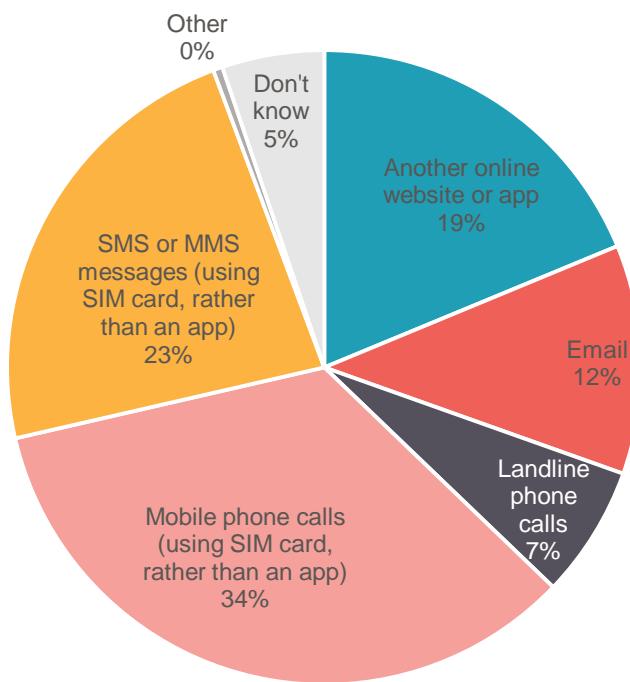
Analysis of Q15: If [main application] suddenly stopped working, what types of communication services would you use instead, in the short term?

In the long term, a greater proportion of users (27%) would select another application or online platform than in the short term, mostly at the expense of mobile phone use. The latter (either for calls or SMS) was selected by 50%, while the shares for other means of communication would remain very similar as for short-term substitution (see Figure 58 below).

However, our findings concerning the long-term substitutes may be less reliable, as respondents may find it difficult to speculate about the distant future. One important consideration to bear in mind is that a key motivation for consumers using specific messenger applications is the presence of their social contacts on the same application (see more details in Chapters 4 and 5). While available alternative applications are numerous, it is hard to predict which applications friends or family would ultimately select. In contrast, the use of mobile phones is almost universal, so SIM card services could be the safe choice to get in touch with anyone. In reality, therefore, with less uncertainty about the application choices of one's social networks and contacts, simply choosing another applications can be a much more common response.

Figure 58.If your main application stops working and is discontinued permanently, which types of communication services would you use instead, in the long term?
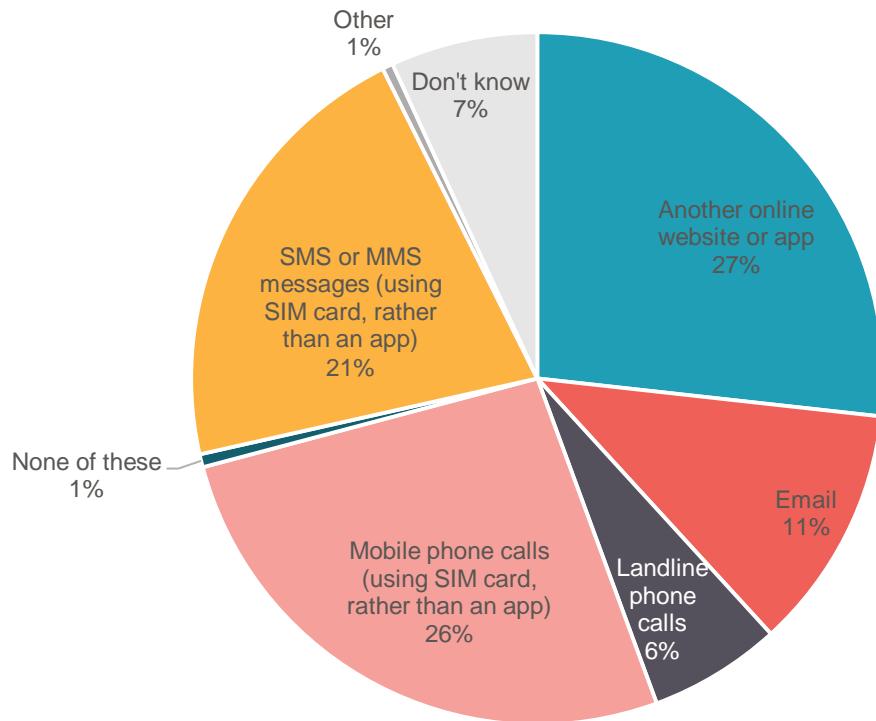
Analysis of Q17: Imagine a situation in which [main application] stops working and is discontinued permanently. Which types of communication services would you use instead, in the long term?

Consumer trade-offs

With regard to the trade-offs made by consumers between digital and traditional electronic means of communication, multiple studies show preferences for instant messenger applications over SMS, driven by several factors. These can also be applied to a broader range of platform communication services.

First, **low cost** is one of the key reasons for use, as illustrated in earlier research[157]. For example, WhatsApp is seen by users as a free texting application, which 'has no limitations and [is] cheaper than phone calls or text messages'[158]. This is especially relevant when it comes to cross-border communication[159] - as also illustrated by our survey results (see Figure 55 above). However, issues of

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[157] Taipale, S. & Farinosi, M. (2018). The big meaning of small messages: The use of WhatsApp in intergenerational family communication. In: International Conference on Human Aspects of IT for the Aged Population (pp. 532-546). Springer, Cham.
[158] Rosales, A. & Fernández-Ardèvol, M. (2016). Beyond WhatsApp: Older people and smartphones. *Romanian Journal of Communication and Public Relations*, 18(1), 27-47.
[159] European Commission (2018). Special Eurobarometer 477. Directorate-General for Communication. Available at: https://op.europa.eu/en/publication-detail/-/publication/ccf2679b-5d01-11ea-8b81-01aa75ed71a1/language-en/format-PDF/source-189797785

cost are sometimes seen as 'multi-dimensional,' as it is not always the price of the message that the sender is concerned about, but also the potential incurring of costs for the receiver[160] - costs which are not incurred when using IM applications. In our survey, throughout various items of the questionnaire, respondents strongly indicated that the fact that messenger applications are free of charge is very important to them (see Figure 59 and Figure 60 below), and is one of the reasons why consumer of all age groups choose applications (see Chapter 4 for a more detailed analysis). This was also reiterated in the focus groups.

Figure 59. Importance of messenger applications being free of charge
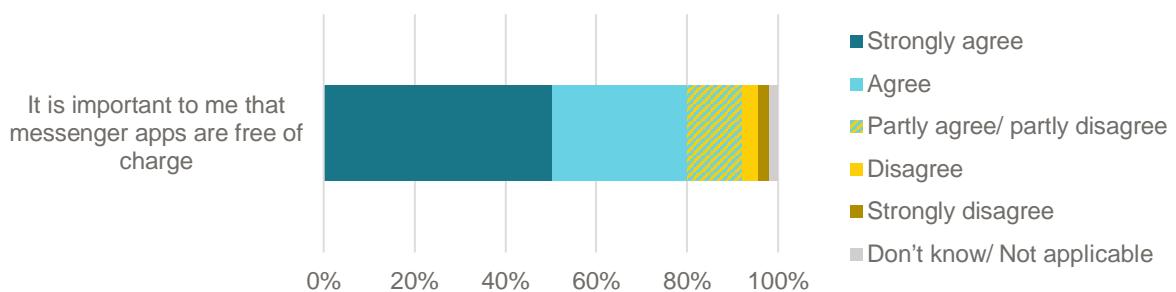
Analysis of Q24: "It is important to me that messenger applications are free of charge".

The same trend was notable across all demographic groups, as illustrated in Figure 60 below. In terms of attitudes by country, respondents in Portugal (87%), Estonia (87%) and Finland (85%) were slightly more likely to attach a high level of importance to the use of messenger applications being free. In each of these countries, the higher rates were driven by strong differences between sexes.

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[160] Church, K. & De Oliveira, R. (2013). What's up with WhatsApp? Comparing mobile instant messaging behaviors with traditional SMS. In: Proceedings of the 15th international conference on Human-computer interaction with mobile devices and services (pp. 352-361).

Figure 60. Importance of messenger applications being free of charge across user groups
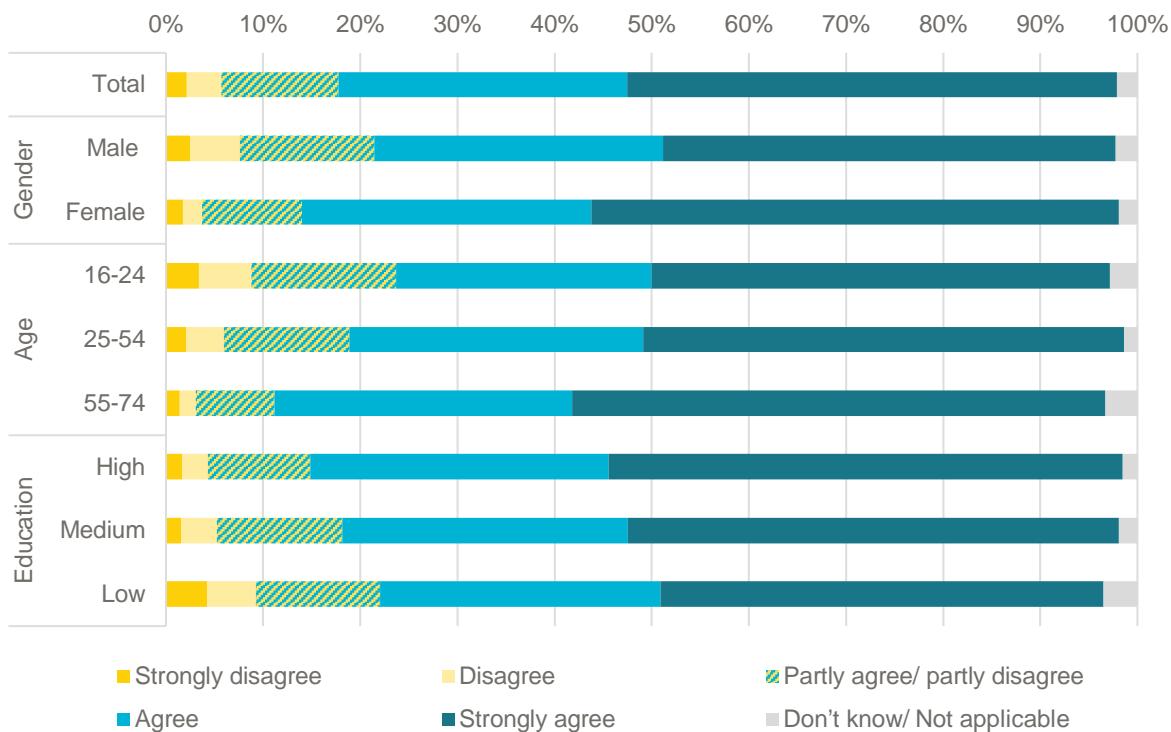
Analysis of Q24: "It is important to me that messenger applications are free of charge".

Second, **fluidity of conversational method and immediacy of delivery** is another advantage of messenger applications as compared to traditional electronic means of communication. Conversations via WhatsApp were reported in earlier research to be more fluid and natural, almost like a face-to-face meeting, and thus more synchronous.[161] SMS messages, on the other hand, are seen as a way to communicate very specific issues via attempts to fit information "into a single packet due to costs," which to some felt "unnatural".[162] Younger generations also tended to prefer WhatsApp for the flexibility it provides, offering a way for short and fast communication, while also offering longer means of communication if needed.[163]

In fact, respondents to our survey also indicated that using applications for instant messaging allowed them to better express themselves, compared with SMS messages: 55% agreed or strongly agreed with this statement, while another 26% partly agreed/partly disagreed (see Figure 61 below). The levels of agreement were even stronger within the youngest age group (57% of respondents aged 16-24 agreed or strongly agreed with the statement, compared with 48% of respondents aged 55-74).

[161] Karapanos, E., Teixeira, P. & Gouveia, R. (2016). Need fulfilment and experiences on social media: A case on Facebook and WhatsApp. *Computers in Human Behavior*, 55, 888-897.
[162] Church, K. & De Oliveira, R. (2013). What's up with WhatsApp? Comparing mobile instant messaging behaviors with traditional SMS. In: Proceedings of the 15th international conference on Human-computer interaction with mobile devices and services (pp. 352-361).
[163] Taipale, S. & Farinosi, M. (2018). The big meaning of small messages: The use of WhatsApp in intergenerational family communication. In: International Conference on Human Aspects of IT for the Aged Population (pp. 532-546). Springer, Cham.

Figure 61. IMs via messenger applications allow for better self-expression than SMS messages
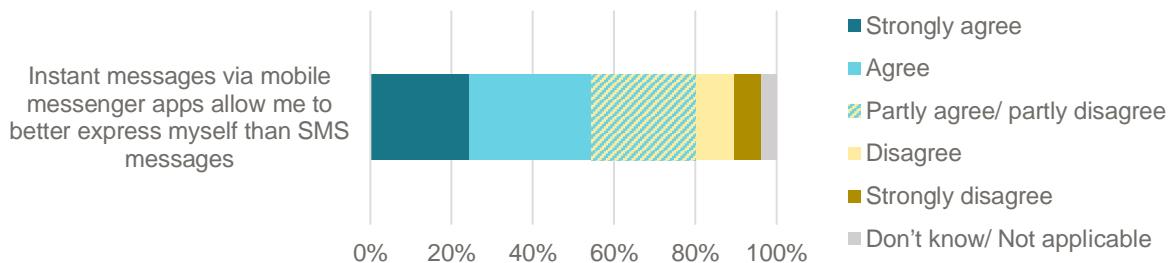
Analysis of Q24: "Instant messages via messenger applications allow me to express myself better than SMS messages".

Third, instant messengers tend to provide users with **additional functionalities,** such as the sharing of audio, video and image files, group chats, video calls, and so on. In addition to these, many of the most widely and intensively used applications allow users to add playful elements to their communication - e.g. GIF images, filters for video calls, etc. – ultimately enabling new modes and forms of interpersonal communication. In addition, visual information about the status of the message (whether it has been delivered and read), not available in SMS, is greatly appreciated by users[164]. As explained in Chapter 4, these additional functionalities are especially relevant for the younger cohorts of users. Younger interview participants tended to appreciate the functionalities of messenger applications that are either unavailable or very expensive when using traditional electronic means of communication, such as sharing GIFs, pictures or videos in private messages. Some of them used IMs as a way to share with their closest friend and family, instead of posting publicly on social networks. However, as the focus group results show, additional functions such as sharing of multimedia files are an important advantage of messenger applications for the older age cohorts as well, when compared with traditional electronic means of communication.

However, the ways in which digital platforms in general, and messenger applications specifically, have transformed interpersonal communication, also comes with some negative effects on consumers. Focus group participants noted the *immediacy* of communication via messenger applications, constant distractions from incoming communications, and a decline in interpersonal communication etiquette. Interpersonal communications via messenger applications continues at all times of the day, and senders often expect an immediate reply. The feeling of an obligation to reply immediately is strengthened by the display of message status and pending applications notifications on mobile devices, which also arouse curiosity. The platform companies are in fact known to apply behavioural nudges (including notifications and other means) to increase user "addiction" to their applications [165].

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[164] Church, K. & De Oliveira, R. (2013). What's up with WhatsApp? Comparing mobile instant messaging behaviors with traditional SMS. In: Proceedings of the 15th international conference on Human-computer interaction with mobile devices and services (pp. 352-361).
[165] Laliberte, M. (2017). This is why Facebook is so addictive, according to science. *Reader's Digest*. Available at: https://www.rd.com/article/why-is-facebook-so-addictive/#:~:text=%E2%80%9CThe%20internal%20trigger%20is%20boredom,Forming%20Products%2C%20tells%20Business%20Insider.

Data sharing and the privacy paradox

- Our survey finds evidence confirming the existence of the privacy paradox in consumer attitudes and behaviours towards digital platforms.

- EU consumers indicate that data privacy and security are highly important to them, with older respondents valuing privacy more than younger ones.

- A plurality of the EU consumers surveyed report that they have a good understanding of the amount of personal data collected by applications (although at least one-fifth of respondents from all demographic groups reported a lack of understanding). A similar proportion state that they are uncomfortable with how the personal data collected by messenger applications is used in practice.

- However, data privacy and security are not cited as important reasons for users' selection of their most-used messenger applications, compared with utilitarian and social motivations for using messenger applications such as free-of-charge use and connecting with friends and family.

While engaging with social networking sites, users not only browse and consume media (all of which is monitored by platforms to generate behavioural data); they also – driven by the motivations discussed above – actively share information about themselves publicly.[166]

Intensive engagement by consumers allows the platforms to collect huge amounts of their personal and behavioural data. This, as discussed above in Box 2, is a core element of the platforms' business and monetisation models, with consumers having access to most of the platforms' services free of charge. Over recent years, monetary costs to users have not been introduced widely, while personal data collection (as well as advertising activities building on this data) has become increasingly intrusive.

Awareness of the privacy risks surrounding the use of free online services such as those provided by platforms has also been increasing, and policy measures have been introduced (in Europe, most notably, the GDPR) to address this. Existing research in the US and Europe does, in fact, show that that users tend to take time to think about privacy online, and have concerns in relation to it, as well as certain levels of awareness as to the safeguarding of it[167]. However, many users also report the

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[166] Choi, T.R. & Sung, Y. (2018). Instagram versus Snapchat: Self-expression and privacy concern on social media. *Telematics and Informatics*, *35*(8), 2289-2298.

[167] European Commission (2016). Special Eurobarometer 447. Directorate-General for Health and Food Safety & the Directorate-General for Communication. Available at: https://ec.europa.eu/information_society/newsroom/image/document/2016-24/ebs_447_en_16136.pdf; ACCC (2019). Digital platforms inquiry. Available at: https://www.accc.gov.au/publications/digital-platforms-inquiry-final-report; Yerby, J., Koohang, A. & Paliszkiewicz, J. (2019). Social media privacy concerns and risk beliefs. *Online Journal of Applied Knowledge Management (OJAKM)*, *7*(1), 1-13; Bhatnagar, N. & Pry, M. (2020). Student Attitudes, Awareness, and Perceptions of Personal Privacy and Cybersecurity in the Use of Social Media: An Initial Study. *Information Systems Education Journal*, *18*(1), 48-58; Harris Interactive (2019), Information Rights Strategic Plan: Trust and Confidence. Available at: https://ico.org.uk/media/about-the-ico/documents/2615515/ico-trust-and-confidence-report-20190626.pdf

Kowalewski, S., Ziefle, M., Ziegeldorf, H. & Wehrle, K. (2015). Like us on Facebook! Analyzing user preferences regarding privacy settings in Germany. *Procedia Manufacturing*, *3*, 815-822; Agosto, D.E. & Abbas, J. (2017). 'Don't be dumb—that's the rule I try to live by': A closer look at older teens' online privacy and safety attitudes. *New Media & Society*, *19*(3), 347-365; Fox, A.K. & Royne, M.B. (2018). Private information in a social world: assessing consumers' fear and understanding of social media privacy. *Journal of Marketing Theory and Practice*, *26*(1-2), 72-89; Vitak, J., Blasiola, S., Patil, S. & Litt, E. (2015). Balancing audience and privacy tensions on social network sites: Strategies of highly engaged users. *International Journal of Communication*, *9*, 20; Big Brother Watch (2017), Topline Figures: UK Citizens' Attitudes Towards the General Data Protection Regulation. Available at: https://bigbrotherwatch.org.uk/wp-

so-called 'privacy paradox': the discrepancy between individuals' intentions to protect their privacy and the way they actually behave online. This phenomenon has been widely analysed in research literature[168], and is often used as a starting point for analysis of the privacy attitudes of social media users[169].

In general, there are significant gaps between the privacy intentions and the actions of digital platform users[170]. Studies in the field of behavioural economics have pointed to the role of "bounded rationality" to explain this phenomenon. Bounded rationality in this context relates to the cognitive biases and informational deficits that impact 'optimised' decision making among consumers with regard to data privacy trade-offs. This is often due to the connection between abstract privacy risks and concrete privacy actions appearing tenuous in practice, and consumers often making immediate decisions about privacy under conditions of imperfect information, and with conflicting or unclear preferences in mind[171]. While this may give rise to a certain degree of cognitive dissonance among users, it may also produce 'privacy cynicism' that rationalises the use of digital platforms without taking additional data precautions or adopting protective behaviour[172].

One example of this discussed in the literature is perceived ideal privacy settings versus actual privacy settings. While users know how to access platform privacy settings, they do not necessarily modify them. A 2019 Eurobarometer survey[173] on social network participation and privacy behaviours and attitudes revealed this point, as well as the lack of a consistent approach to the protection of personal data. Even though the majority of respondents had heard of the GDPR and felt that they had some control over data they disclose online, only 13% of them had fully read the privacy agreements of digital platforms. Also, over 40% of respondents had not tried changing their privacy settings, because they either trust the platforms, or did not know how to access the privacy settings.

Our survey of EU consumers provides additional evidence as to how the paradox surrounding privacy on digital platforms operates in practice. In some instances, respondents indicated that privacy standards were important to them, while in others they indicated that they regard them as relatively insignificant compared with other interests. Through the questionnaire, we aimed to uncover evidence about different aspects of consumer attitudes towards privacy: the general importance of data privacy and security in using and selecting applications, self-reported awareness of data collection, comfort with the specific use of data.

First, we asked consumers directly to indicate whether they agreed or disagreed with the following statement: "The privacy and security of my personal data are important when using messenger

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content/uploads/2017/12/GDPR-Polling-Toplines-final.pdf; Ofcom (2016). Adult's Media Lives 2016: A Qualitative Study. Available at: https://www.ofcom.org.uk/__data/assets/pdf_file/0021/102756/adults-media-lives-2016.pdf

[168] Kokolakis, S. (2017). Privacy attitudes and privacy behaviour: A review of current research on the privacy paradox phenomenon. *Computers & Security*, 64, 122-134.

[169169] Shane-Simpson, C., Manago, A., Gaggi, N., & Gillespie-Lynch, K. (2018). Why do college students prefer Facebook, Twitter, or Instagram? Site affordances, tensions between privacy and self-expression, and implications for social capital. *Computers in Human Behavior*, *86*, 276-288.

[170] Acquisti, A. & Grossklags, J. (2005). Privacy and rationality in individual decision making. *IEEE Security & Privacy*, 3(1), pp.26-33.

[171] Flender, C. & Müller, G. (2012, June). Type indeterminacy in privacy decisions: the privacy paradox revisited. In: International Symposium on Quantum Interaction (pp. 148-159). Springer, Berlin, Heidelberg.

[172] Hoffmann, C.P., Lutz, C. & Ranzini, G., 2016. Privacy cynicism: A new approach to the privacy paradox. Cyberpsychology: *Journal of Psychosocial Research on Cyberspace*, 10(4).

[173] European Commission (2019). Special Eurobarometer 487a: The General Data Protection Regulation. Available at: https://ec.europa.eu/commfrontoffice/publicopinionmobile/index.cfm/Survey/getSurveyDetail/surveyKy/2222

applications." Figure 62 shows that more than three out of four (77%) EU consumers surveyed indicated that data privacy and security are important to them. There is notable variation in these views by sex – more women (80%) than men (73%) cite the importance of this factor, aligning with findings from the literature discussed above. Similarly, there are salient generational differences behind these figures as well, with respondents in the oldest cohort (55-74) appearing to value privacy more (83%) than their younger (70%) and middle-aged (76%) counterparts. Minimal variation can be seen in these findings by country.

Figure 62. Importance of data privacy and security on messenger applications
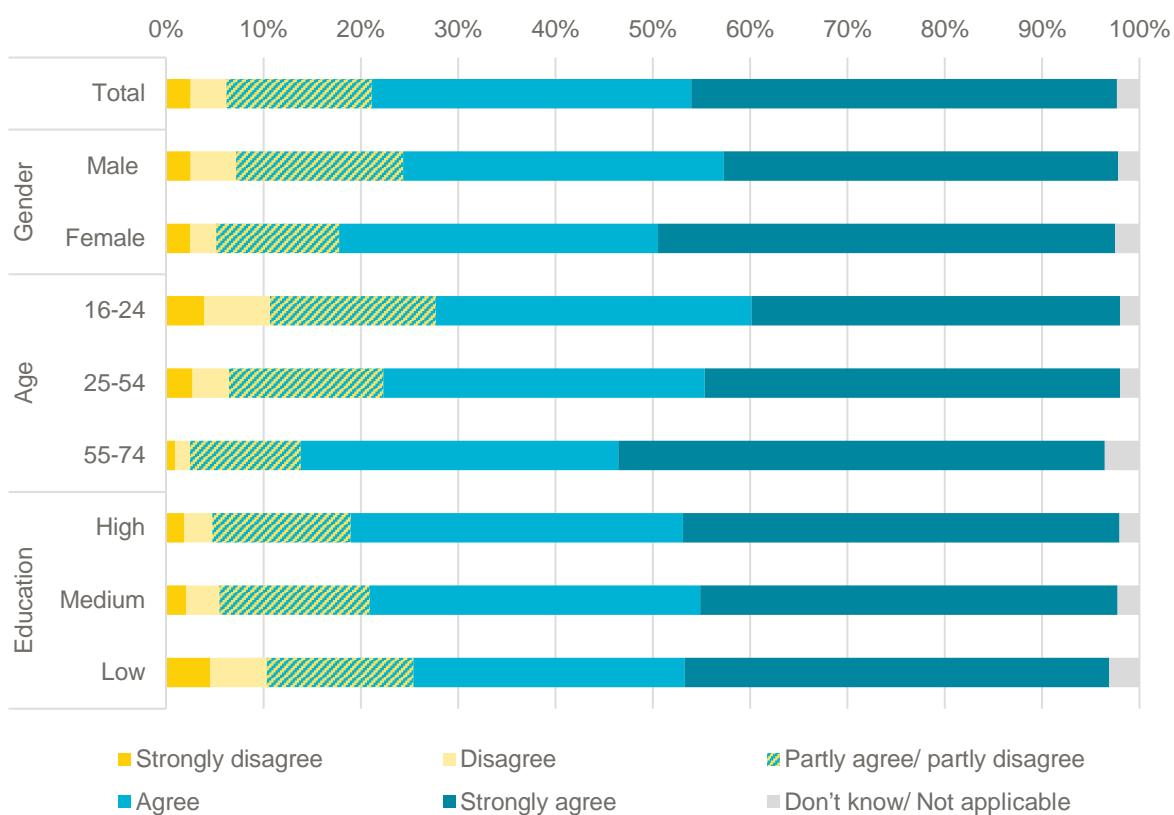
Analysis of Q24: "The privacy and security of my personal data are important when using messenger applications".

But if we observe that the EU consumers surveyed attach a high level of importance to their data privacy and security on messenger applications, does this emerge as a strong factor in their choice of applications to use? The answer, according to our survey, is no. Figure 63 below shows that privacy does not emerge as a notable factor explaining why consumers use their main messenger applications. Around one in ten (11%) respondents answered that privacy is a key reason, with insignificant levels of variation observed by sex, age, education and country. These findings on consumer motivations with regard to privacy remain consistent when the same question is asked in relation to social networking sites, though at even lower levels.

Figure 63. Reasons for the use of main messenger application – privacy standards
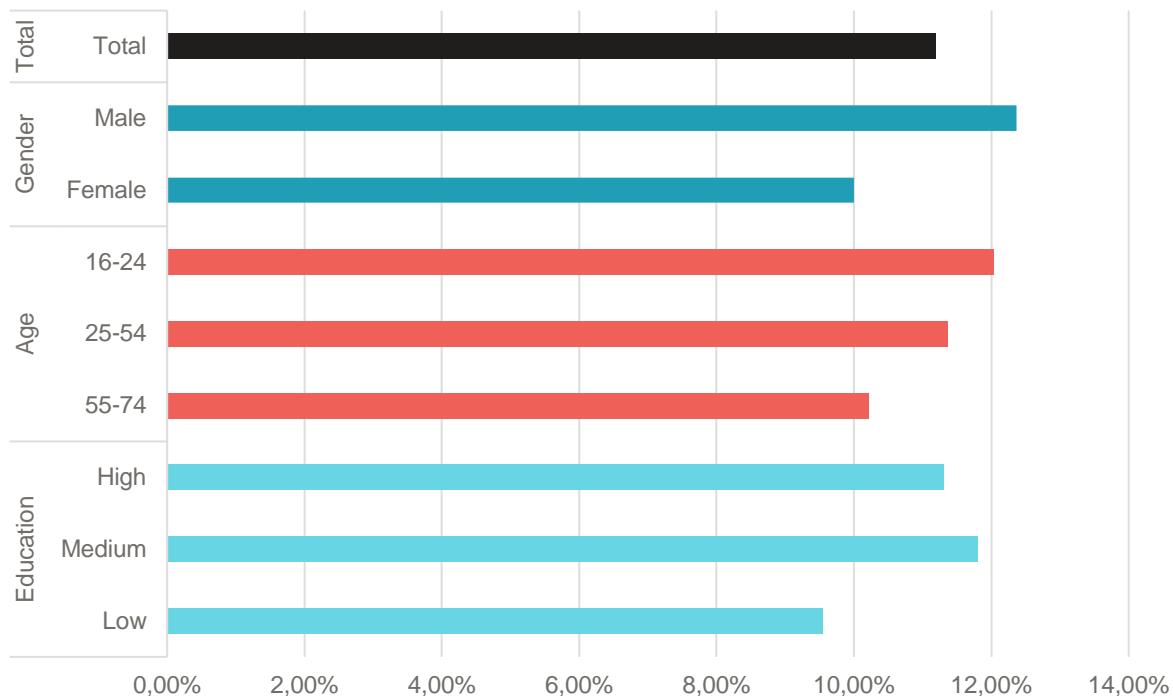
Analysis of Q13: "It ensures high standards of data privacy/security."

This insight into privacy should considered alongside the data from our discrete choice experiment (DCE, see Section 9.1), and our findings on reasons for use discussed above (Sections 5.2 and 5.3). The data in these sections show that consumers place greater emphasis on price compared data privacy, by a significant margin, when using messenger and social networking sites. Indeed, data privacy and security do not appear to be overly important reasons for their use relative to other factors such as accessing and using application services for free, connecting with family and friends, and having easy and convenient access to applications.

The premise of the privacy paradox is that consumers make informed choices in their transactions with digital platforms. Providing digital platforms with their data is, therefore, part of consumers' bargain with digital platforms, under which they receive services at zero monetary cost. Given the bounded rationality factors and the resulting behavioural biases discussed above, however, it is doubtful if consumers are adequately informed about how their user data is collected, used and disclosed (e.g. only a minority fully read the terms and conditions of use), and whether or not they, as consumers, have sufficient control in deciding whether to give up their user data. Consumers' behaviours in using digital platforms may not, therefore, accurately reflect their true individual privacy preferences.

To investigate this issue further, we asked respondents to self-assess their knowledge concerning data collection by messenger applications, by stating whether they agreed or disagreed with the following statement: "I have a good understanding of how much of my personal data is collected by messenger applications."

Figure 64 shows that more than one-fifth of internet users surveyed (21%) disagreed with this statement, indicating that they do not have a good understanding of the amount of personal data collected by applications. Around one in four (41%) respondents expressed agreement, with roughly one in three providing an ambiguous response (32%). No notable variation in disagreement rates was apparent by gender, age, education or country.

While a plurality of respondents agreed with the statement, it should be emphasised that such self-reported assessments of privacy understanding with regard to digital platforms are highly subjective, and may suffer from the cognitive sources of bias in survey measurement, such as acquiescence and social desirability biases. As discussed above, decisions to use platforms rarely take into consideration the full range of technical complexities and privacy issues arising online, and are subject to a range of variable factors in practice[174]. Thus, we can only infer from these findings that those who express disagreement do not know *and are aware that they do not know*. We cannot, however, infer that those who express confidence in their understanding of privacy actually do possess a full knowledge of the matter.

Figure 64. Perception of understanding of data collection by messenger applications
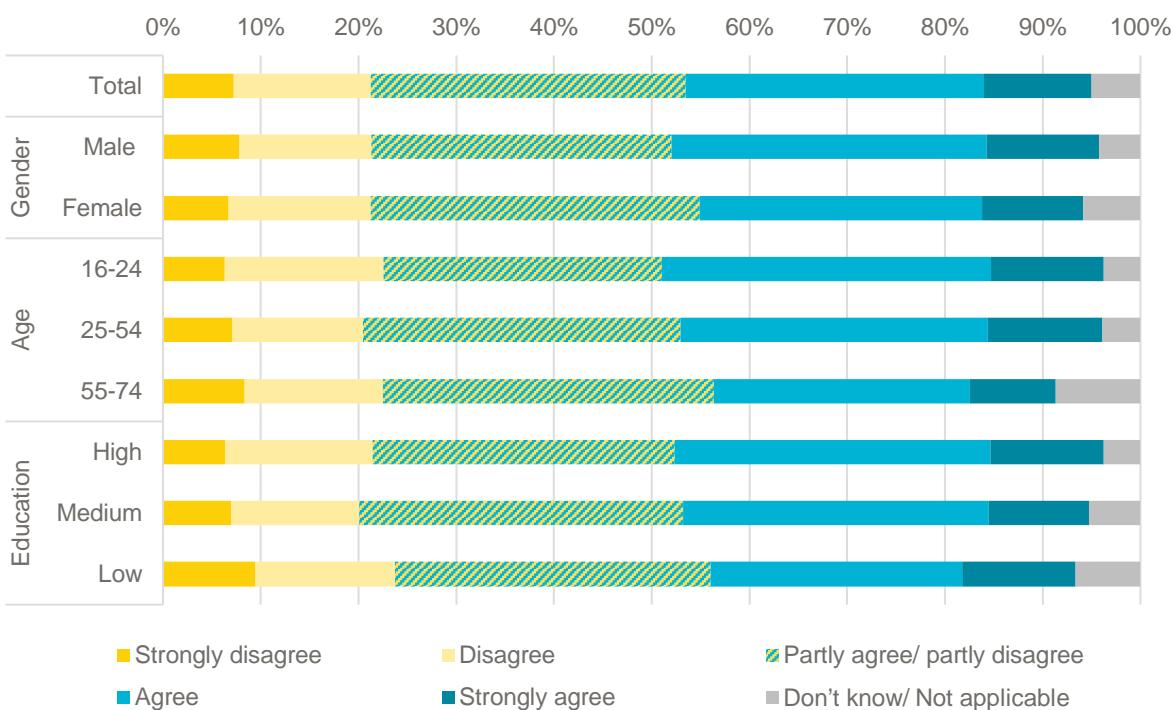
Analysis of Q24: "I have a good understanding of how much data is collected by messenger applications".

To examine the issue from another angle, we also asked respondents to indicate whether they were comfortable with the collection and use of their personal data by messenger applications. Overall, less than a quarter of surveyed internet users (23%) expressed agreement with this statement, and 44% of respondents disagreed with the statement, as shown in Figure 65. However, a higher

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[174] Teutsch, D., Masur, P.K. & Trepte, S. (2018). Privacy in mediated and nonmediated interpersonal communication: How subjective concepts and situational perceptions influence behaviors. *Social Media + Society*, 4(2), p.2056305118767134.

proportion of respondents (29%) expressed ambivalence or hesitance about this statement, perhaps reflecting the findings concerning lack of knowledge discussed above.

Differences observed here between sexes, as with the previous question about data privacy, are minor, with the rate of agreement among women (21%) lower than that observed among men (25%). However, younger users are more comfortable and less uncertain about how they feel towards data collection, compared with older respondents. This is fairly similar to the findings of earlier studies. For example, women have been found to be more engaged in privacy management[175], to be more likely to post non-publicly, [176] to have higher overall privacy concerns[177], as well as lower trust and confidence in social messaging providers. Meanwhile, young people (18-34 year-olds) were found likely to have a higher level of trust and confidence in social messaging providers than those over 35, and the latter were more trusting than those aged 55 and over[178].

Figure 65. Comfortable with data collection and use by messenger applications
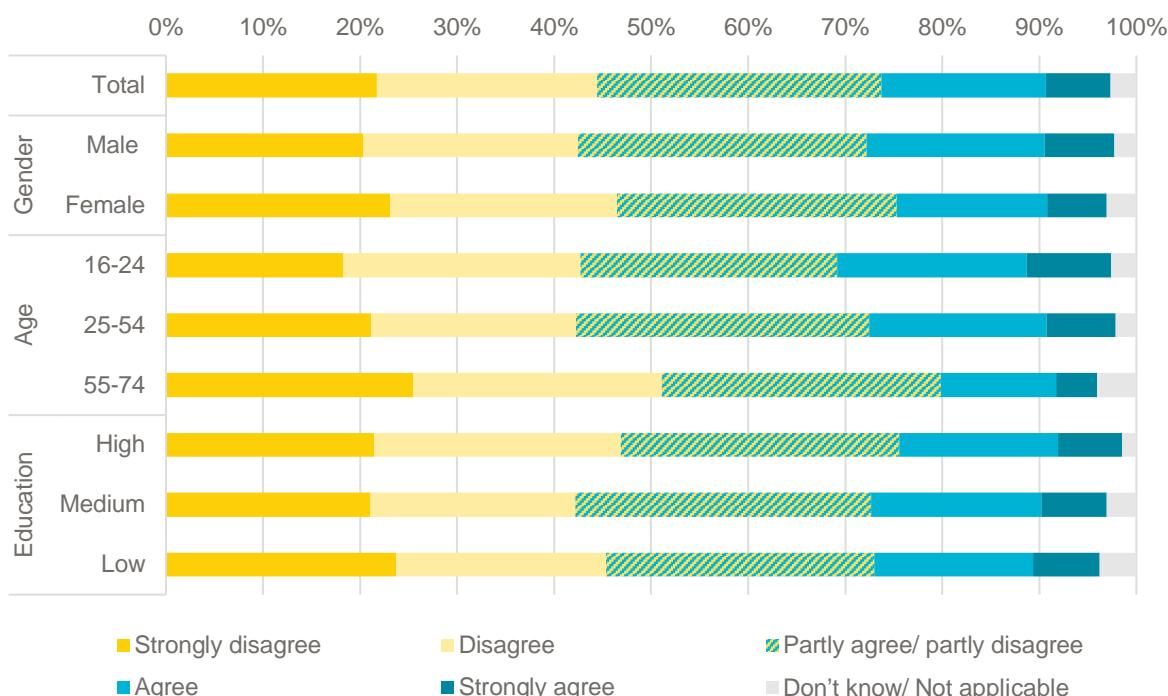
Analysis of Q24: "It is acceptable to me that messenger applications collect my personal data and use it for their purposes".

These findings were reflected in the observations made by our focus group participants. One woman, aged 28, indicated that she used an extension to analyse the terms and conditions of digital

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[175] Child, J.T. & Starcher, S.C. (2016). Fuzzy Facebook privacy boundaries: Exploring mediated lurking, vague-booking, and Facebook privacy management. *Computers in Human Behavior*, *54*, 483-490.

[176] Fiesler, C., Dye, M., Feuston, J.L., Hiruncharoenvate, C., Hutto, C.J., Morrison, S., ... & Gilbert, E. (2017, February). What (or who) is public? Privacy settings and social media content sharing. In *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing* (pp. 567-580).

[177] Shane-Simpson, C., Manago, A., Gaggi, N. & Gillespie-Lynch, K. (2018). Why do college students prefer Facebook, Twitter, or Instagram? Site affordances, tensions between privacy and self-expression, and implications for social capital. *Computers in Human Behavior*, *86*, 276-288.

[178] Harris Interactive (2019), Information Rights Strategic Plan: Trust and Confidence. Available at: https://ico.org.uk/media/about-the-ico/documents/2615515/ico-trust-and-confidence-report-20190626.pdf

platforms, thus providing better insights into privacy and data usage policies. Younger users may also blur the lines between public and private in ways that different from those of other generations. Another woman, 26, explained that she considers what she shares online to be public rather than private, and thus not a concern in terms of data collection and usage.

Figure 66 displays the cross-national variations behind these findings. The highest rates of agreement were observed in Germany (25%) and Spain (25%), where a quarter of respondents agreed with the statement, followed by smaller shares among respondents in the Netherlands (24%) and Romania (24%). The fewest respondents agreed with the statement in Estonia (13%), Portugal (15%) and Finland (15%).

Figure 66. Comfortable with data collection and use by messenger applications, by country
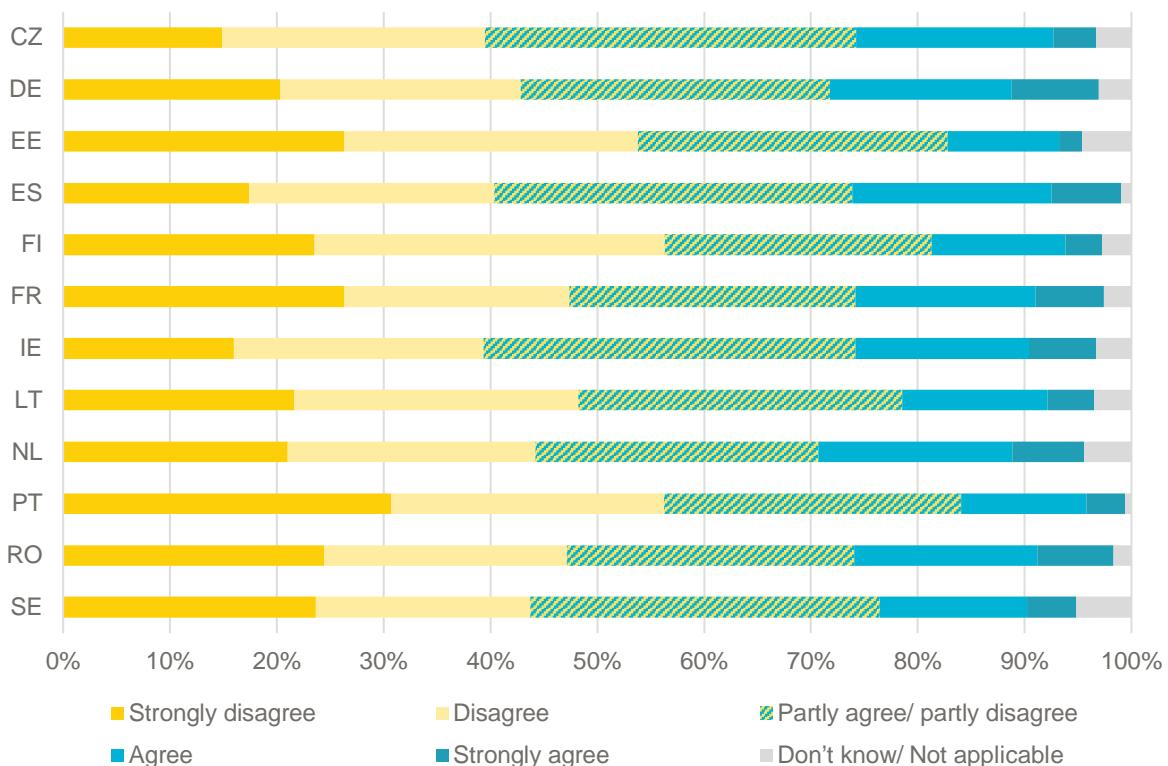
Analysis of Q24: "It is acceptable to me that messenger applications collect my personal data and use it for their purposes".

In the light of earlier research, this picture of cross-national variation presented is less clear. For example, the findings of an earlier study in 24 countries suggested that higher GDP per capita was associated with higher concern among participants with regard to the monitoring or sale of personal information, as well as with government surveillance of online communications[179]. This finding is not confirmed by our survey data.

In summary, our survey data underscores the reality of the privacy paradox with regard to messenger applications. Large majorities of respondents across various demographics and countries state that

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[179] Rho, E.H.R., Kobsa, A. & Nguyen, M.H. (2018). Differences in online privacy and security attitudes based on economic living standards: a global study of 24 countries.

the privacy and security of their personal data is important. However, our findings from the DCE (see Section 9.1) show that strong data privacy and security standards on messenger applications are less important to the users surveyed than the ease and convenience of messenger applications and being able to use them for free.

While the level of knowledge respondents have about personal data collection is important, significant percentages express a lack of confidence in their understanding of how much data collection actually occurs when using messenger applications. Even smaller percentages stated in the survey that they were comfortable with the way companies use this personal data for advertising and marketing purposes.

However, our interviews showed that while some users have concerns about privacy and the use of their data for marketing purposes, most interviewees "accepted the reality" that platforms use their data in exchange for communication services, and were not overly concerned about privacy issues. This may indicate the presence of "privacy cynicism" among consumers as a cognitive coping mechanism to deal with a complex data privacy landscape.[180] This factor may involve users rationalising the use of digital platforms, though without taking additional data precautions or adopting more protective behaviours. At the same time, from the broader market perspective, this can signal the market power (including through network effects) of the incumbent market leaders, as the services with higher privacy standards (e.g., Signal, Wire, Telegram) do not have such large numbers of users.

Nevertheless, there is also evidence that sudden changes in the terms and conditions of data use on popular applications can generate heightened awareness of privacy among users, as well as movement towards applications with stronger data privacy policies. This was clearly illustrated during the first months of 2021 with WhatsApp's announcement of a new data sharing agreement with Facebook[181]. This proposed change reportedly caused an estimated 30 million WhatsApp users to shift over to competing messaging services such as Signal and Telegram, which have stricter data privacy standards and policies. This can be interpreted as evidence that negative communication on privacy standards by influential people (in this case, Elon Musk declared he was abandoning WhatsApp[182]) can significantly alter user behaviour.

The wave of discontinuations among its user base temporarily forced WhatsApp to abandon its plans, though the change is still set to go ahead in May 2021, with users unwilling to adopt the changes being forced off the platform.[183] Overall, this incident can be seen as an ironic outcome for WhatsApp, given the firm's longer-term investment in marketing that portrays the application as possessing superior security and data security features. One of our interviewees mentioned receiving marketing messages about how WhatsApp encrypts all messages and how secure they are,

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[180] Hoffmann, C.P., Lutz, C. & Ranzini, G. (2016). Privacy cynicism: A new approach to the privacy paradox. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, 10(4).

[181] Hern, A. (2021). WhatsApp loses millions of users after terms update. *The Guardian*. Available at: https://www.theguardian.com/technology/2021/jan/24/whatsapp-loses-millions-of-users-after-terms-update; Doffman, Z. (2021). WhatsApp backlash-stop using signal or Telegram until you change these 4 Critical Settings. *Forbes*. Available at: https://www.forbes.com/sites/zakdoffman/2021/01/23/stop-using-signal-and-telegram-until-you-change-settings-after-whatsapp-and-imessage-privacy-backlash/?sh=46f5b003040d

[182] See more information at: https://www.independent.co.uk/life-style/gadgets-and-tech/whatsapp-privacy-update-elon-musk-signal-b1783950.html

[183] Hern, A. (2021) WhatsApp to try again to change privacy policy in mid-May. *The Guardian*. Available at: https://www.theguardian.com/technology/2021/feb/22/whatsapp-to-try-again-to-change-privacy-policy-in-mid-may

communications which impacted his responses to the evaluation of this platform in terms of the privacy dimension.

Willingness to pay for digital platform services

- The self-reports by consumers in relation to various survey questions, as well as the results from our discrete choice experiment (DCE), confirm that the use of messenger applications for free is their crucial and highly valued feature for all demographic segments.

- Our survey data shows that on average, willingness by users to pay for a main messenger application that is currently free, is rather low. The results by age group did not show notable differences, except that older respondents put a slightly stronger emphasis on functionalities rather than price.

- The zero cost of digital platform communication services, despite raising notable issues in relation to privacy and the use of consumer data, provides notable benefits in terms of consumer well-being.

The question of consumers' willingness to pay (WTP) for communication services provided by online platforms has generated considerable attention in recent years. A range of studies have examined the motivations underlying consumer behaviour in using messaging applications, data transfer services and paid advertising on SNS in order to assess the sustainability of efforts by firms to generate revenue through paid subscriptions. Many of these services are sustained financially by the transfer of consumer data from SNSs to third-party advertisers. Therefore, the question of consumer WTP both overlaps and contrasts with their willingness to accept (WTA) the direct or indirect exchange of personal data and exposure to advertising in return for access to these services.

As Sunstein[184] argues, these concepts "are best understood as reflecting people's predictions about effects on well-being, translated into monetary terms". Data from earlier surveys has shown that **perceived value** significantly influences intention to pay SNS subscription fees[185]. This remains contingent, however, on platforms being generally trusted by their users and providing a tangible increase in social capital and/or emotional value to different consumer groups[186]. Another factor here is the relevance of the platform to users and the overall cost of the membership services with which users engage[187].

Our survey results reveal fairly high satisfaction with digital platform services for interpersonal communication provided by digital platforms, and with the value consumers receive (a point discussed in more detail in Chapter 4). However, zero cost is an important part of this evaluation, and consumer willingness to pay for these services remains low. In the following sections of this chapter,

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[184] Sunstein, C.R. (2019). Valuing Facebook. *Behavioural Public Policy*, pp.1-12.
[185] Lu, H.P. and Hsiao, K.L. (2010). The influence of extro/introversion on the intention to pay for social networking sites. *Information & Management*, 47(3), pp.150-157.
[186] Han, B.O. & Windsor, J. (2011). User's willingness to pay on social network sites. *Journal of Computer Information Systems*, 51(4), pp.31-40.
[187] Vock, M., Dolen, W.V. & Ruyter, K.D. (2013). Understanding willingness to pay for social network sites. *Journal of Service Research*, 16(3), pp.311-325.

we discuss the survey findings and insights from earlier research regarding this aspect, as well as consumer willingness to pay and consumer surplus.

How much do the consumers value the fact that digital platform communication services are free of charge?

In general, the findings of our survey demonstrate consumers' appreciation of the fact that the digital platform communication services they use are free of charge. First, as presented in Section 4.3, respondents from all demographic segments indicated that the fact that messenger applications are free to use is one of their key **motivations** for using them. Second, as discussed in Section 7.2, the fact that messenger applications are free to use is one of their **main advantages compared with number-based interpersonal communication services**.

In addition to this, in one of the questions, we presented a hypothetical situation in which a **new application** is released. We asked respondents to indicate which factors would influence them to use it (see Figure 67 below). Three out of five respondents (61%) indicated that being able to use a new application for free would be a significant motivating factor in adopting it. This shares was almost identical among both men and women. Similar generational and cross-national patterns of variation are apparent here as well. Interestingly, the importance of a new messenger application being free to use was highest among older respondents. Only a slight majority (51%) of younger respondents aged 16-24 selected this option. This compares with almost three out of five (59%) respondents aged 25-54, and a much higher proportion (71%) of those aged 55-74 who did so. Clear patterns of cross-national variation are also apparent. A new messenger application being free to use is most important for users in Finland (70%), Ireland, Portugal, and Czechia (65%). The lowest level of importance is given to this by users in Lithuania (48%), Romania (55%) and the Netherlands (56%).

Figure 67. Factors determining the adoption of a new messenger application (% of respondents)
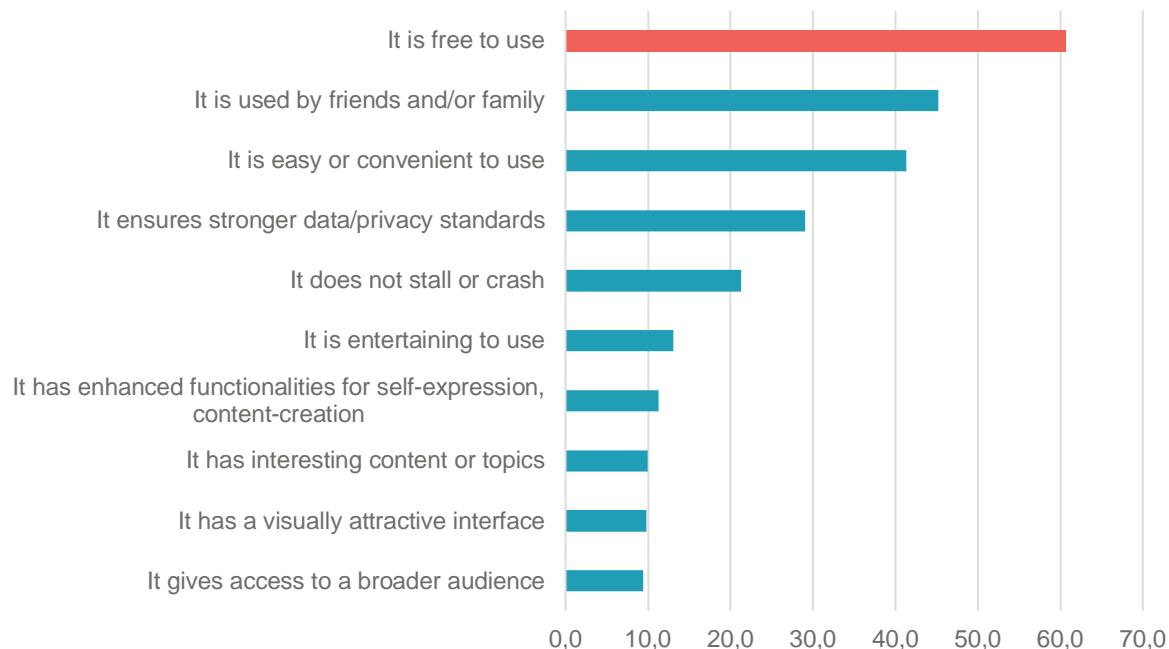
Analysis of Q23: Please imagine a situation in which a new online website or application is launched. The online website or application allows you to make calls and exchange personal messages, photos and videos with your friends, family and the wider public. What factors would be most important for you in deciding whether to start using it? Note: each respondent could select up to three factors.

Very much in line with these findings were the results of the simple discrete choice experiment (DCE) included in the survey questionnaire. This aimed to measure the utility of different aspects of various interpersonal communication service packages (see Box 5 below for the methodology).

Box 5. Discrete choice experiment

To better understand what features of communication services may drive consumer choices, the panel survey questionnaire included a small-scale discrete choice experiment (DCE). We looked into four specific attributes of electronic communication services, each having two to three dimensions, related to digital electronic services of communication: price, level of privacy and data security, functionalities and display of advertising. They were selected based on the concepts of interest for this study, sample size and focus on the response efficiency[188].

-     Attribute 1 (A1): Cost of service
        Level 1: Free
        Level 2: *EUR 10* per month[189]

-     Attribute 2 (A2): Personal data collection

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[188] While statistical efficiency is improved by asking a large number of difficult tradeoff questions, response efficiency is improved by asking a smaller number of easier trade-off questions. However, statistical efficiency is more crucial to aim for in small sample surveys. Given that our sample size was over 1000 responses per country, our confidence intervals were rather small even with a limited number of choice options (as confidence intervals are reduced as a function of the inverse of the square root of the sample size).

[189] The proposed price is based on the average price of a basic mobile plan in Europe: https://ec.europa.eu/digital-single-market/en/news/mobile-broadband-prices-europe-2019 Adjusted nationally by Eurostat's data on EU-27 purchasing power parities for communication prices in 2019: https://ec.europa.eu/ tat/web/purchasing-power-parities/visualisations. Presented in national currencies.

> Level 1: Only minimum collection of your personal data
> Level 2: Collection of your personal data to be used for tailored marketing and advertising (the ads you see online will be relevant to you)
>
> - Attribute 3 (A3): Key functionalities
>   Level 1: Convenient sharing of photos and videos
>   Level 2: High quality personal audio calls and messaging
>   Level 3: Convenient group chats
>
> - Attribute 4 (A4): Display of ads
>   Level 1: No ads in the user interface
>   Level 2: Display of ads and deals (relevant to you) in the user interface
>
> We deliberately selected the levels for each attribute to represent functionalities of traditional electronic communication services (i.e., mobile plan: calls and SMS), and features available on digital platforms but not on traditional electronic means of communication. The survey software was programmed to present each respondent with **six**[190] randomly generated and randomly allocated choice options, each between two unlabelled scenarios constructed of different attribute levels. This element of the survey resulted into a separate conjoint dataset, which was used to estimate the basic and commonly-used choice model, the *conditional logit* model, which is consistent with random utility theory[191]. Please see more details on the experimental design and analysis in Annex 1, Section 1.3.1.1.

The results of the conjoint analysis showed that the greatest utility for consumers was associated with the services being free of charge, while the remaining attributes were significantly less important (see Figure 68 below).

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[190] Some of the previous studies have found this number to be optimal with regard the level of respondent fatigue. For example: Tully, M. P., Bernsten, C., Aitken, M., & Vass, C. (2020). Public preferences regarding data linkage for research: a discrete choice experiment comparing Scotland and Sweden. BMC medical informatics and decision making, 20(1), 1-13.

[191] Van Dijk, J. D., Groothuis-Oudshoorn, C. G., Marshall, D. A., & IJzerman, M. J. (2016). An empirical comparison of discrete choice experiment and best-worst scaling to estimate stakeholders' risk tolerance for hip replacement surgery. Value in health, 19(4), 316-322.

Figure 68. DCE results: utilities[192] of different attribute levels
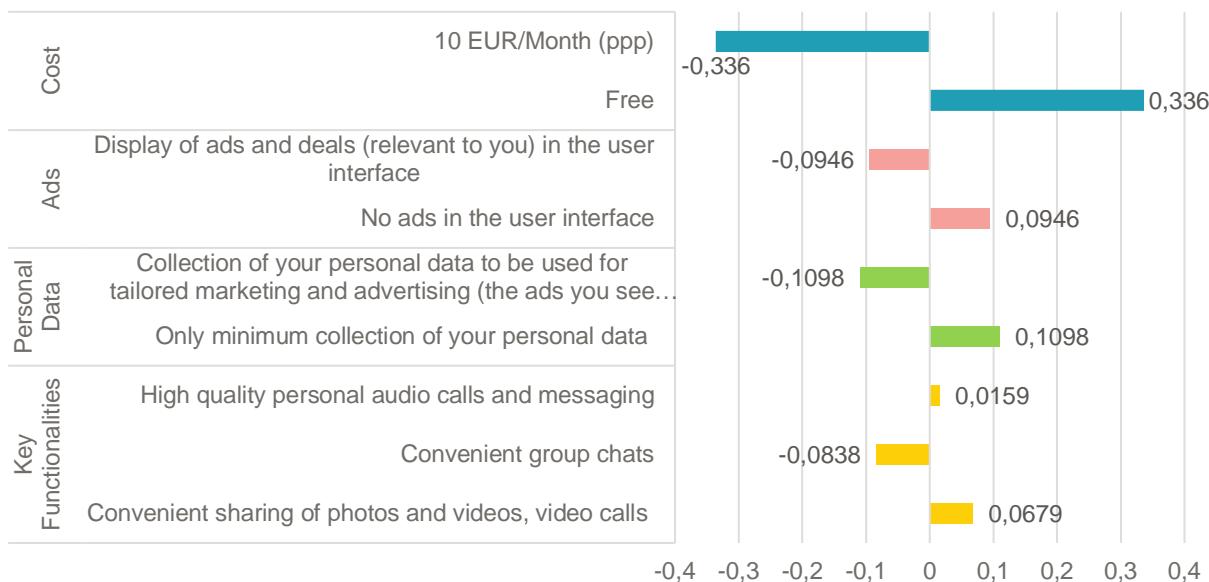
Analysis of Q25: DCE.

Furthermore, the estimated importance scores for different attributes (see Figure 69 below) once again showed that zero cost is more important than all of the other aspects of communication packages included in the experiment combined. This indicates a high level of willingness to accept platform data collection and advertising practices, as long as communication services are provided free.

Figure 69. DCE results: relative importance of attributes
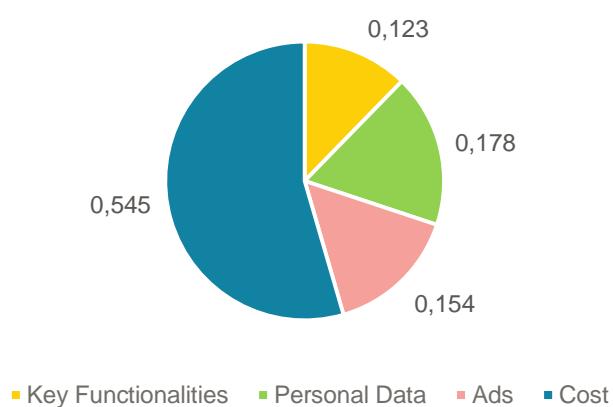
Analysis of Q25: DCE.

Analysis by demographic segment then showed that the relative importance of different attributes was the same across different groups of users, with only minor differences existing within groups and

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[192] Marginal effects of regression coefficients.

countries. For example, females placed slightly less importance on cost, and more importance on personal data, but the differences in general are minor.

Figure 70. DCE results: relative importance of attributes, by gender
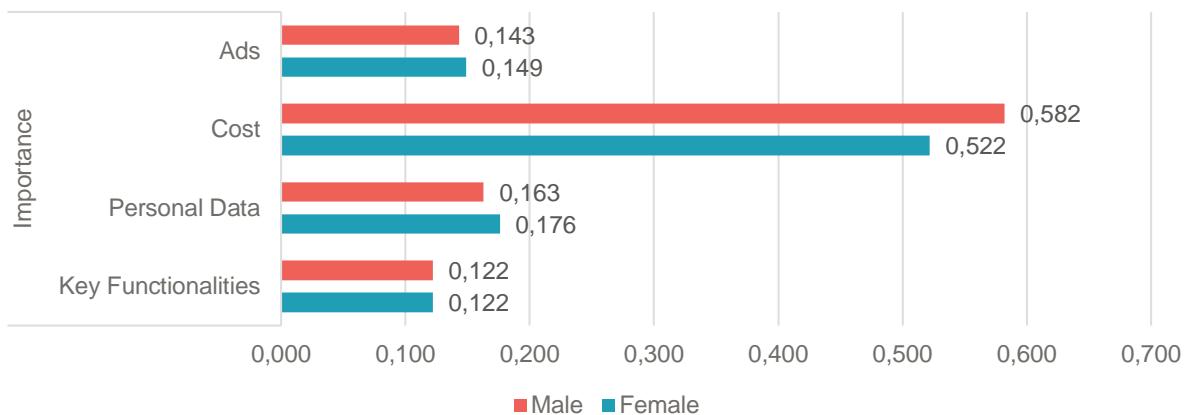
Analysis of Q25: DCE.

Meanwhile, the results by age group also did not show notable differences, except that the respondents in the oldest age group placed a slightly stronger emphasis on functionalities rather than price. The relative importance assigned to different attributes also did not vary notably according to the intensity of use of different means of interpersonal communication (i.e. applications vs mobile phone services).

Figure 71. DCE results: relative importance of attributes, by age group
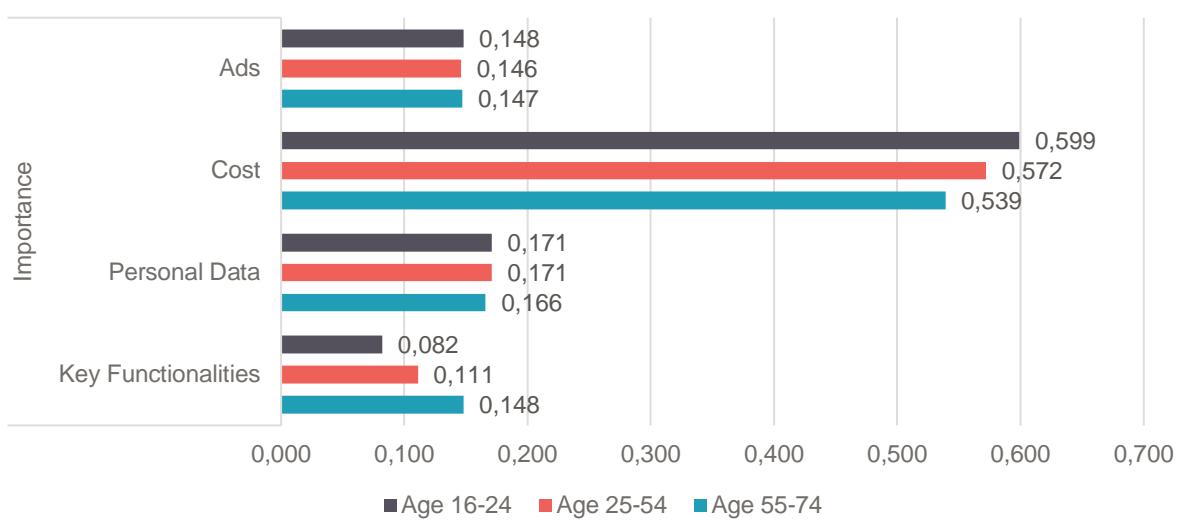
Analysis of Q25: DCE.

Overall, the data from different survey items consistently indicate that zero cost is more important to consumers in all groups, compared with personal data collection, the display of ads, or a specific set of functionalities for application users across all demographic groups.

Would consumers be willing to pay if platform services were not free?

The data from earlier studies show that consumers are often unwilling to pay for platform services that they have long been able to access and use for free. Most respondents surveyed in a study by Sunstein indicated that they would be willing to pay USD 0 for monthly subscriptions to access the most popular SNS platforms available on the market today: Facebook, Instagram, Twitter, and YouTube[193].

Meanwhile, Statista[194] reported that in October 2018, only 31% of internet users globally were willing to pay at least USD 1 per month to ensure the protection of their personal information on social network sites. This proportion was even lower in the most developed countries such as US (28%), UK (22%), Germany (20%) and the Netherlands (17%). While this suggests that most users are not willing to pay even a nominal fee to protect their personal information, the report does not reveal how willing consumer would be to pay for such services if they were not free already (with or without personal data protection), nor does it report the key factors that may influence different users' willingness to pay.

In line with these earlier findings, our survey data also clearly illustrates the **low level of willingness to pay**. The data analysis shows that willingness to pay for a user's main messenger application is rather low on average. Only one in five internet users surveyed (20%) stated that they would be willing to pay to send messages and make calls using their main messenger application if it was not free (see the figure below), with the levels of agreement slightly higher among men (22%) than women (18%). Overall, around one in four (24%) respondents provided an ambivalent or uncertain response to this statement.

Figure 72. General willingness to pay for messenger applications
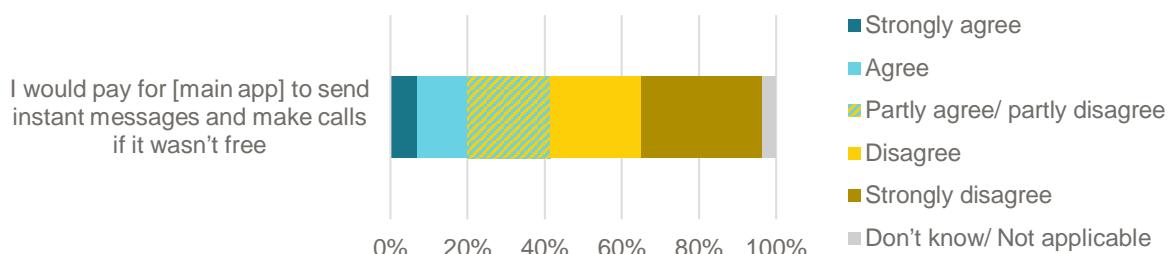
Analysis of Q24.

These findings were largely consistent between countries. The willingness of users to pay for the services of their main messenger application were highest in Germany (24%) and the Netherlands (25%), and lowest in Estonia (8%), Lithuania (11%) and Portugal (11%). Conversely, higher levels of disagreement were observed among respondents in Portugal (73%) and Estonia (71%) than elsewhere, whereas lower levels were seen among respondents in the Netherlands (45%) and Germany (49%).

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[193] Sunstein C.R., (2019). Valuing Facebook. *Behavioural Public Policy*, pp.1-12
[194] Statista (2021). Global consumer willingness to pay social media providers for data protection 2018. [online] Available at: https://www.statista.com/statistics/1025549/global-willingness-to-pay-social-media-providers-for-personal-information-protection/

With regard to the demographic characteristics influencing WTP, the results of a multivariate logistic regression show that males, as well as consumers with higher than median income, those without tertiary education, and those who used more messenger apps each month, were more likely to be willing to pay (i.e. they strongly agreed, agreed or partly agreed to the statement in Figure 72), while employment status and age were not significant factors in this model[195].

Interestingly, these findings on WTP for users of the most popular messenger applications are different from those found in the literature. The survey data shows that much lower percentages of users would be willing to pay for services on WhatsApp (20%) and Facebook Messenger (18%) than in other studies. Similar rates were observed among newer market entrants such as Snapchat (22%) and Viber (22%). Moreover, the percentages of respondents who were willing to pay for these services was higher among those who used more niche messenger applications such as Telegram (32%) and Discord (25%).

Participants in the interviews and focus groups also exhibited a low level of willingness to pay money for their messenger applications. Many expressed "being used to not paying for applications". Meanwhile, the market for messenger applications is large, offering numerous substitutes. Many participants in interviews and focus groups noted that in the event of a significant change to the cost policy of one application, they and their social circles would simply migrate to another application, that was free of charge. From a competition perspective, therefore, introduction of fees by the platforms is disincentivised.

However, some focus group participants expressed the view that platforms could "make" them pay if they gradually reduced the quality of their free services and offered better services for a fee. YouTube was cited as an example: one participant said he acquired a paid subscription because the platform showed an increasing number of ads, which made the free version difficult to use. Others then agreed, given a similar scenario in which they would consider paying for messenger applications such as WhatsApp and Facebook Messenger.

Measuring the increase in consumer wellbeing

As illustrated in the previous chapters, heavy engagement with free platform services and favourable assessment of platform features and functionalities by consumers allows us to assume that current status quo of free platform communication services introduces significant consumer surplus. This is recognised as an important measure of wellbeing, especially for digital goods that have a zero price and as a result are not reflected in GDP or productivity statistics [196]. In practice, however, consumer surplus is difficult to quantify, precisely due to the difficulty of measuring consumer willingness to pay in quantitative terms. To illustrate this, digital platforms may be Wasting Time Goods (WTG) – goods on which people spend time, but for which they are not, on reflection, willing to pay much (if anything). It is also possible that in the context of the WTP question, people may be giving protest answers, signalling their intense opposition to being asked to pay for something that they had

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[195] However, the final model including only statistically significant variables (male sex, high education, higher than median income, and number of apps used monthly) correctly predicted only 66% of cases, false negatives being the key problem. This indicates that some important aspects that could influence the willingness to pay were not measured in the survey.

[196] Brynjolfsson, E., Collis, A. & Eggers, F. (2019). Using massive online choice experiments to measure changes in well-being. *Proceedings of the National Academy of Sciences*, 116(15), 7250-7255.

formerly enjoyed for free. Their answers may be expressive, rather than reflective of actual welfare effects[197].

Although in the survey we did not ask the respondents how much exactly they would be willing to pay for messenger applications, a number of earlier studies have looked into this question. While they report fairly consistent findings on the generally low WTP for platform services, estimates as to specific prices differ notably – also depending on the operationalisation applied by researchers.

The most obvious way to operationalise this in consumer surveys is, of course, by asking consumers directly what sums they would be willing to pay. According to a survey conducted by the McGuffin Creative Group in the US, a majority of respondents reported that they would be willing to pay for WhatsApp (89%, an average of USD 2.38/month) and Facebook Messenger (66%, an average of USD 2.52/month), which were two of the most commonly used messaging applications in our questionnaire. The average annual payment proposed by consumers for most applications, however, barely surpassed USD 30. In addition, and somewhat differently from the studies discussed above, more than half of surveyed users reported a general WTP for YouTube, Instagram, Facebook, Snapchat and other social networking sites (72%, 70%, 64% and 77%, respectively)[198]. Similarly, another US consumer survey regarding an ad-free version of Facebook indicated that most consumers would be willing to pay up to USD 5 per month for it[199]. Interestingly, the European participants in our focus groups also named sums between EUR 5 and8 per month as being amounts they would consider paying for their main messenger applications if their interpersonal communication services were not free.

Another measure of willingness to pay is asking consumers how much they would have to be paid to *stop* using social media. For example, a 2017 survey in the US employing an experimental design showed that the median user would require compensation of around USD 48 to forgo Facebook for one month[200] - significantly more than users would be willing to pay for it, according to other surveys.

Furthermore, as discussed above, an additional dimension to consumer WTP for social networking platforms pertains, either directly or indirectly, to the perceived value of personal data shared with messenger applications and the willingness of consumers to sell or protect it. In an experiment conducted by Skatova et al.[201], researchers found that between 40% and 73% of UK users (depending on how the question was formatted) were willing to pay to protect their personal social media data (among other types of personal data), for an average maximum amount of around GBP 10 per month. Meanwhile, Benndorf and Normann[202] conducted an experiment which found that over 80%

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[197] Brynjolfsson, E., Collis, A. & Eggers, F. (2019). Using massive online choice experiments to measure changes in well-being. *Proceedings of the National Academy of Sciences*, 116(15), 7250-7255.

[198] McGuffin.com (2020). Study reveals what consumers would pay for their favorite free apps. Available at: http://www.mcguffincg.com/what-consumers-would-pay-for-popular-free-apps/

[199] Molla, R. (2018). How much would you pay for facebook without ads? Available at: https://www.vox.com/2018/4/11/17225328/facebook-ads-free-paid-service-mark-zuckerberg

[200] Brynjolfsson, E., Collis, A. & Eggers, F. (2019). Using massive online choice experiments to measure changes in well-being. *Proceedings of the National Academy of Sciences*, 116(15), 7250-7255.

[201] Skatova, A., McDonald, R., Ma, S. & Maple, C. (2019). Unpacking Privacy: Willingness to pay to protect personal data. *PsyArXiv*, pp.1-42. Available at: https://doi.org/10.31234/osf.io/ahwe4

[202] Benndorf, V. & Normann, H.T. (2017). The Willingness to Sell Personal Data. *Scandinavian Journal of Economics*, 4(120), pp.1260-1278.

of users would be willing to sell their contact and/or preference details for marketing purposes. Among those who were willing to do so, users reported being willing sell their contact details (for marketing purposes) for an average of EUR 15, and their Facebook personal data for EUR 19.

The difference between willingness to accept and willingness to pay is thus significant. For example, another 2019 survey in the US compared users' willingness to pay for platform services in comparison with their valuation of their personal data. The results demonstrated a strong endowment effect: the median American consumer was willing to pay just USD 5 per month to maintain data privacy on online platforms, but would demand USD 80 to allow access to personal data[203].

Nonetheless, a key challenge in analysing a consumer's willingness to use and pay for communication applications, and to share their personal data in return, is accounting for informational asymmetries. Consumers often lack the full information[204] concerning what data is collected, when and how it is collected, and how it is used[205]. Limited information also poses a difficulty for consumers in evaluating the intrinsic monetary value of their personal data[206]. It is likely that even if a significant proportion of consumers were willing to pay to use social networking sites to protect their data, the amounts that they would hypothetically be willing to pay would not exceed what the service providers can earn instead from exploiting their personal data. For example, Facebook is predicted to earn more than USD 225, and Instagram more than USD 125 in annual revenues per user in the US in 2021[207].

In the context of this specific study, another proxy for willingness to pay for number-independent means of interpersonal communication is the price of similar number-based services, which consumers paid before messenger applications became so popular. An estimation of WhatsApp's consumer surplus, based on this assumption and on our survey data, is therefore presented in the box below. When each different level of willingness to pay is considered, privacy and other adverse aspects aside, consumers seem to benefit notably from the free use of social network sites and number-independent means of interpersonal communication provided by the platforms.

Box 6. WhatsApp consumer surplus

> The situation of using free applications instead of paid number-based interpersonal communication services creates a considerable **consumer surplus (CS).** This can be understood as the difference between the highest price that consumers would pay and the actual price they pay, expressed using the formula below:
>
> $CS = Qd * \Delta P,$

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[203] Winegar, A. G. & Sunstein, C. R. (2019). How much is data privacy worth? A preliminary investigation. *Journal of Consumer Policy*, 42(3), 425-440.

[204] The privacy policies of many digital platforms' are long, complex, vague, and difficult to navigate. They also use different descriptions for fundamental concepts such as 'personal information', which is likely to cause significant confusion for consumers.

[205] Acquisti, A., Taylor, C. & Wagman, L. (2016). The Economics of Privacy. *Journal of Economic Literature*, 2(54), pp. 442– 492.

[206] Winegar, A.G. and Sunstein, C.R. (2019). How much is data privacy worth? a preliminary investigation. *Journal of Consumer Policy*, 42(3), pp. 425-440.

[207] Fischer, S. (2019). How much revenue Instagram makes per American user. Axios, available at: https://www.axios.com/how-much-revenue-instagram-makes-per-american-user-7e0ae536-831a-4090-93e8-72586314c049.html

Where Qd is the quantity demanded at equilibrium, where demand and supply are equal, and ΔP is the difference between the price the buyer is willing to pay and the price they are actually paying.

To estimate the size of CS more precisely, for the quantity we take the European users of WhatsApp, which is the most popular application, as demonstrated in our survey. A weighted estimate based on our survey indicates that there are 100.2 million users for whom WhatsApp is the main messenger application in the 12 survey countries.

We also know what price consumers are currently paying: the applications themselves are free to use. However, they do require access to the internet, which is in many cases paid. A globally observed trend in recent years has been a significant increase in mobile data usage (as compared with desktop internet usage). Moreover, earlier studies have shown that mobile data is a more important criterion for consumer willingness to pay for mobile bundles than SMS messages[208].

According to the latest data, mobile internet contributes half of global internet traffic, and vast share of it is used on applications [209], although not necessarily messenger applications. As of 2019, EU users consumed an average of around 6 GB of mobile data per month[210], while the average price of the cheapest 1 GB/month in the EU-27 countries was USD 0.89[211] in early 2020. This equals EUR 4.4 per month. However, the growing demand for mobile internet for use on applications has led to various reactions from market players. For example, to attract new subscribers and reduce churn among the current users, mobile operators increasingly practise "zero-rating" to offer consumers the chance to consume content from certain applications or services (very often falling under the scope of this study) without that consumption being counted against their data plans. It is therefore fairly safe to assume, for the purposes of this exercise, that the data used by messenger applications specifically, is close to zero including the internet costs (especially given that mobile data can be used for much more than just messenger applications).

There is no good data on what price exactly users would be willing to pay to use applications. Moreover, given that the most popular messenger applications are currently free of charge, it is unlikely that users would be willing to start paying (see more details in Section 8.2). Given that the most popular functionalities of applications are messages and calls – services essentially similar to those provided by number-based interpersonal communication services (see Section 4.2), and that messenger applications substitute these services (see Chapter 8), we took their prices as a proxy. We assume that in a world where free messenger applications were not available, consumers would use these paid services to obtain similar value. Based on the figures provided in a 2019 report by the European Commission, the average price in the EU for unlimited calls and SMS messages was EUR 16.44[212]

Based on the available data, as well as these estimated figures and assumptions, the consumer surplus in the 12 survey countries amounts to around EUR 1.65 billion (CS=100,233,000*16.44) per month. This rough estimate does not, however, consider the producer surplus, which in this case can be understood as access

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[208] Klein, A. & Jakopin, N. (2014). Consumers' willingness-to-pay for mobile telecommunication service bundles. *Telematics and Informatics*, 31(3), 410-421.

[209] Clement, J. (2019). Mobile internet usage worldwide - Statistics & Facts. Statista. Available at: https://www.statista.com/topics/779/mobile-internet/

[210] Statista (2015). Europe: Monthly mobile data usage per user, by country-2019. Statista Research Department. Available at: https://www.statista.com/statistics/612494/mobile-data-usage-per-user-per-month-in-western-europe/. The estimation relies on data from 7 EU countries.

[211] Dataset of mobile internet prices retrieved from: https://www.cable.co.uk/mobiles/worldwide-data-pricing/

[212] European Commission (2019). Mobile Broadband Prices in Europe 2019, available at: https://ec.europa.eu/digital-single-market/en/news/mobile-broadband-prices-europe-2019. Data was not specifically provided on the average price of unlimited calls and SMS, so we used two other indicators: the EU average price for a service package of 5GB mobile data only (EUR 13.79) and the EU average price for a service package of 5GB, unlimited calls and unlimited SMS (EUR 30.41). The number used was the price difference between these two.

to consumers' personal data and/or exposure to advertising, which consumers provide in exchange for the free use of messenger applications.

Conclusions and discussion

The present study builds on the existing body of research on the consumer use and perceptions towards social networking sites and the means of interpersonal communication provided by digital platforms, in the fields of technology, psychology, economics and consumer research. Using new data from a large-scale online panel survey, interviews and focus groups with European digital platform users, the study brings a number of new insights into the consumer perceptions and behaviours with regard to the interpersonal communication and information sharing services provided by digital platforms.

First, the findings fill gaps in the knowledge regarding European consumers specifically, focusing on the behaviours and motivations among people of different age groups. Most of the previous research on the behavioural aspects of user interactions with social networking sites and mobile applications has been conducted in the US, using fairly small samples of mostly young consumer groups. Second, in contrast to many earlier studies, this research focused on digital platforms as means of *interpersonal communication*, transforming the way such communication is approached, complemented and substituted by the new possibilities that the platforms offer to consumers. While messenger applications and social networking sites have been very widely analysed during the previous decade, they have most often been treated as a new means to broadcast and consume media and information. Within this new perspective of viewing the platforms of interest, the study also analysed previously little-investigated aspects of short-term changes in consumer behaviour with regard to these platforms, and in particular, changes in behaviours relating to the use of traditional electronic means of communication.

The study first confirms that in line with global trends, various digital products of Facebook, Inc. dominate European consumer choices in terms of both social network sites and number-independent means of interpersonal communication. Facebook and Instagram are the first and third most widely used social network sites, with YouTube in second place, across all 12 surveyed countries. Meanwhile, WhatsApp and Facebook Messenger dominate as the main messenger applications, although which one of these is preferred more differs by country.

Given this market situation, it is important to bear in mind the business models behind the services of both Facebook and Google (which operates YouTube). At their core, both platform operators offer free-of-charge services to consumers. In exchange, by using these services, consumers actively and passively share their personal and preference data, and provide their attention though constant engagement. The platforms monetise this through targeted advertising. This has implications for the issues of data privacy and consumer willingness to pay for platform communication services, also covered in the study.

However, although these applications were indicated by most of the application users surveyed as their first choice, consumer multihoming is very prevalent. Most consumers use multiple social network sites and messenger applications, and a notable share of them use several applications regularly. Very often, these multiple platforms serve different purposes for individual consumers:

they use them to access different types of information, and to communicate with friends and family from different social circles, different generations, and different countries. This is not, however, always an individual preference: because the different groups of people with which the consumer communicates – friends, family members, colleagues, community members – use different applications (and continuously adopt new ones), they are also pushed to adopt multiple applications to maintain communication with these groups. Nevertheless, in many cases the different messenger applications still belong to the same undertaking which is largely dominating the market (most notably Facebook). The high level of multihoming, therefore, is not necessarily a proxy for the state of competition in the market.

The study also shows that the motivations of consumers to adopt the messenger and social networking sites that they use are structured primarily around utilitarian and social considerations. The main reasons for using application services are that they can be accessed and used free of charge, that they are easy and convenient to use, and that they provide connections with the family and friends who are on the network. For social networking sites, hedonic factors of entertainment and passing time are also important for many consumers. However, the degree to which consumers seek these experiences varies widely by age, with older respondents valuing the social and utilitarian aspects of application usage more than younger respondents, and younger groups more often seeking entertainment.

Furthermore, our survey data underscores the reality of the privacy paradox with regard to messenger applications. Large majorities of respondents across various demographics and countries stated that the privacy and security of their personal data is important to them. However, does not appear to be as important as the benefits that digital platforms offer, which means that consumers are very willing to accept the practices of these platform as the price they pay for using their services, indicating a degree of privacy cynicism. In terms of demographic variation, younger users appear to be more aware about data privacy, but at the same time more comfortable with the way their data is used by messenger applications, which suggests that reduced privacy does not seem to threaten the increasing use of number-independent communication services in the future. Although some evidence shows that sudden changes in the terms and conditions of data use on popular applications can generate heightened awareness of privacy among users, as well a movement towards applications with stronger data privacy policies, this may influence consumer shifts towards other different digital platforms rather than back to traditional number-based communication services.

In fact, when considering the relationship between services provided by digital platforms and more traditional number-based electronic services of interpersonal communication, the study shows patterns of complementarity, but substitution seems to be a stronger trend. While the use of number-based services remains almost universal, more and more areas of interpersonal communication are increasingly dominated by messenger applications across various demographics of consumers. The younger the consumers, the more they are likely to prefer applications than number-based services. This is determined by a number of factors: additional functionalities, new modes of communication that allow an improved flow and fluidity of communication (with video calls, image sharing, status updates and time-limited stories now on the menu) and, most importantly – the zero cost of platform communication services for consumers.

The study found a very strong and unequivocal evidence of the importance to consumers of the zero cost of digital platform communication services. First, respondents from all demographic segments

indicated that the fact that messenger applications are free to use is one of their key motivations for using them. Second, zero cost is seen as one of their main advantages over number-based interpersonal communication services. Third, it is also key factor in deciding to adopt new applications for communication services. Finally, a small-scale discrete-choice experiment showed that zero cost is a more important feature in the choice of interpersonal communication services than specific functionalities, personal data collection and the display of advertising combined.

From the broader perspective, the cost-free availability to consumers of a wide spectrum of communication tools, combined with privacy cynicism, means a shift in power from suppliers in the telecommunications sector to consumers. Although the take-up of mobile plans remains universal, specific number-based communication services, such as phone calls and SMS are used less and less frequently. The study demonstrates that this decrease can be accelerated by the wide range of alternatives provided by digital platforms. This, in turn, point to additional questions for policy makers, regulators and telecommunications companies.

To begin with, while the regulation of platforms as players with significant market power is still under way, the issues for regulators in the telecoms sector are also changing. Instead of the competitive dynamic between individual telecommunications industry players as the key focus, regulators now face a complicated landscape that is populated both by ageing incumbents and by younger, digitally focused players interacting. The conditions and longer-term consequences of these interactions are not yet fully understood.

Further, as consumers are turning their attention to digital platform communication services, their use of mobile data is increasing. This shift presents a great challenge to the traditional core business of telecommunications companies. The products that telecommunications companies offer are changing, moving away from fixed bundles to products that incorporate mobile data as the key service. Internet access can also be expected to be the increasingly important factor in consumer willingness to pay for mobile bundles. However, further investigation of these topics would be necessary to better understand the scope and strength of this trend, and how it will likely shape the future markets of communication services.

From the consumer side, wide access to high-quality connectivity is also the key premise for tapping into the benefits of zero-cost interpersonal communication services provided by digital platforms. With their innovation potential, digital platforms quickly come up with new services for consumers, with the possibility to increase their wellbeing. However, the benefits of digital communications do not always accrue equally – as also demonstrated by the digital divides exposed by the pandemic[213] – and require focused action to ensure fair competition, affordability and the proliferation of digital skills. This is another potential direction for further research to inform policies.

Finally, while this study sheds new light on *consumer* attitudes and behaviours relating to the increasingly widespread and intensive use of number-independent interpersonal communication services, any regulatory actions will require further research, with a broader scope, into the changing realities. The landscape of digital platforms is extremely dynamic, which makes both the landscape and its effects on the markets difficult to predict. The plurality of actors and their interrelationships

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[213] Katz, R. (2020). Economic Impact of COVID-19 on digital infrastructure. International Telecommunication Union report, ITU Publications. Available at: https://www.itu.int/en/ITU-D/Conferences/GSR/2020/Documents/GSR-20_Impact-COVID-19-on-digital-economy_DiscussionPaper.pdf

in these markets only add to this complexity, within which consumers express their preferences and make choices between different services. Future studies looking into similar research questions could explore additional experimental and revealed preference methods to model the developments in the markets, which could further inform the best ways to proceed, both for industry players and for regulators.

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Annex 1. Panel survey methodology

1. Pre-fielding

1.1 Survey mode

To conduct the online survey, we programmed, managed and disseminated the questionnaires using our **in-house survey tool** SurveyGizmo (now Alchemer). The survey was accessible from a variety of devices, including desktop computers, smartphones and tablets.

With regard to the mode of data collection, we had access to thousands of people registered on different online panels across the survey countries. The **online panel survey solution** was provided by a commercial consumer panel aggregator, CINT (www.cint.com). All panellists accessible via CINT had provided detailed demographic information about themselves, which allowed for targeted quota sampling.

1.2 Definition of the respondents and sampling design

The survey sampling design aimed to gather a representative sample of European consumers of digital electronic means of communication, while taking into account the budgetary constraints of data collection on a large scale. This entailed certain limits with regard to the number of countries that it was feasible to cover with a proper sample size. We therefore implemented a country selection exercise, which allowed us to target a limited yet representative selection of countries. Our approach to country selection aimed to select countries that could represent broader groups of BEREC countries, similar with respect to the indicators relevant to this study. It involved two steps in defining the groupings of similar countries, based on two variables:

- The country level features pertinent to the use of digital services linked to interpersonal communication and the interactive exchange of information and media: internet connectivity, and use of digital communication platforms and services. These dimensions were operationalised using a set of country-level indicators from Eurostat, and analysed using hierarchical cluster analysis, resulting into clusters of BEREC countries based on similarities on these indicators.

- Geographical regions, providing the second dimension for country clusters.

Then the BEREC countries were clustered once again based on these two distinct groupings (i.e. geographical groups and clusters based on relevant Eurostat indicators), resulting into 12 unique clusters. From each of them, a single country was selected to represent the other countries in that cluster. Ultimately, **Estonia, Romania, Czechia, Lithuania, Spain, Portugal, Sweden, Finland, Netherlands, Germany, Ireland and France** were selected for the survey. The figure below illustrates the countries selected (marked with stars), and those countries that are represented by the selected countries (same colour).

Figure 1. Country selection

Our target population for the survey was internet users in the selected countries. To develop a reasonable coverage of respondents to represent this population, we followed a quota-based sampling design within each country.

The target was to collect around 12,600 respondents in total. To estimate the quotas, we used the official Eurostat statistics on the demographic characteristics of internet users. The quotas were allocated by age groups (15 to 24, 25 to 54 and 55 to 74) and sex (female/male). The exact sampling allocation in each quota is presented in Table 2.

Table 2. Number of target respondents in each quota

COUNTRY	SEX/AGE	16-24	25-54	55-74	TOTAL
Czechia	Female	62	322	129	1049
	Male	66	340	130	
Estonia	Female	67	314	157	1050
	Male	69	326	117	
Finland	Female	73	275	179	1049
	Male	77	285	160	
France	Female	81	302	155	1049
	Male	85	288	138	
Germany	Female	69	294	153	1051
	Male	75	304	156	
Ireland	Female	88	331	122	1049
	Male	91	313	104	
Lithuania	Female	80	329	145	1049
	Male	84	312	99	
Netherlands	Female	80	274	166	1050
	Male	81	282	167	
Portugal	Female	88	347	105	1051
	Male	90	314	107	
Romania	Female	84	325	107	1050
	Male	89	350	95	
Spain	Female	66	323	139	1051
	Male	70	322	131	
Sweden	Female	73	287	156	1051
	Male	80	303	152	

Source: PPMI, based on the newest Eurostat data (2019).
Note: total allocations might differ slightly from 1,050 due to rounding in the allocation of countries sex and age cells.

1.3 Questionnaire design

The survey questionnaire builds on the relevant best practices in questionnaire design, relevant question formulations from earlier surveys, and the existing body of knowledge on consumer behaviour towards social networking sites and messenger applications.

The questionnaire contained several blocks of questions, organised into thematically related and visually separated sections. **Demographic questions** were presented to all groups and designed to gather information that could be compared against official statistics in the post-field phase (i.e. education, income, use of internet). The section on the use of digital platforms served as **control questions,** designed to classify respondents into target sub-groups (i.e. consumers that use digital platforms for interpersonal communication and/or the exchange of information, and those who do not). To make sure that specific questions are seen only by those people who are in a position to answer them, we set up the questionnaire logic.

The overall layout was designed to create a consistent questionnaire with a good flow between blocks of questions. Questions were grouped by topic, and followed the principle of proceeding from general to more specific questions.

Good comprehension of each individual survey question and the overall questionnaire was further ensured through cognitive testing and piloting of the questionnaire (see the following section).

1.3.1.1   DCE: the experimental design

One of the blocks of the survey included a small-scale discrete choice experiment (DCE). This is a stated-preference method based on conjoint analysis, which allows researchers to investigate the relative attractiveness of a product or service as a function of its attributes. DCE allows the eliciting of individual preferences and an understanding of what specifically influences consumer choices, when they are asked to make decisions between discrete (mutually exclusive) alternatives. Each alternative is described by several characteristics (attributes and levels), and responses are used to infer the value placed on each attribute. Among other applications, this method is established in the measurement of willingness-to-pay.

The method has its theoretical foundation in random utility theory, and relies on the assumptions of economic rationality and utility maximization. In stating a preference, the individual is assumed to choose the alternative that yields his/her highest utility (individual benefit). Moreover, the utility yielded by an alternative is assumed to depend on the utilities associated with its composing attributes and attribute levels. In other words, Y_{iq} is the utility of individual q for the ith alternative, and is assumed to be a function of its attributes:

$$Y_{iq} = X_i\beta_i + \varepsilon_{iq}$$

where X_i is a vector of attributes for the ith alternative accompanied by a set of weights, β_i, that establish the relative contribution of each attribute to the utility associated with the ith alternative, and ε_{iq} is the residual capturing the unobserved variation in the characteristics of different options and any measurement errors.

DCEs are especially useful in determining the significance of the attributes that describe a good or service, and the extent to which individuals are willing to trade one attribute for another. In this survey, we looked into four specific attributes of electronic communication services, each having two or three dimensions relating to digital electronic communication services: price, level of privacy and data security, functionalities and the display of advertising. These were selected on the basis of the concepts of interest in this study, sample size, and a focus on response efficiency[214].

- Attribute 1 (A1): Cost of service

    Level 1: Free

    Level 2: *€10* per month[215]

- Attribute 2 (A2): Personal data collection

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[214] While statistical efficiency is improved by asking a large number of difficult trade-off questions, response efficiency is improved by asking a smaller number of easier trade-off questions. However, statistical efficiency is more crucial to aim for in small sample surveys. Given that our sample size was be over 1,000 per country, our confidence intervals would be rather small even with a limited number of choice options (as confidence intervals are reduced as a function of the inverse of the square root of the sample size).

[215] The proposed price is based on the average price of a basic mobile plan in Europe: https://ec.europa.eu/digital-single-market/en/news/mobile-broadband-prices-europe-2019 adjusted nationally by Eurostat's data on EU-27 purchasing power parities for communication prices in 2019: https://ec.europa.eu/eurostat/web/purchasing-power-parities/visualisations. Presented in national currencies.

Level 1: Only minimum collection of your personal data

Level 2: Collection of your personal data to be used for tailored marketing and advertising (the ads you see online will be relevant to you)

- Attribute 3 (A3): Key functionalities

Level 1: Convenient sharing of photos and videos

Level 2: High quality personal audio calls and messaging

Level 3: Convenient group chats

- Attribute 4 (A4): Display of ads

Level 1: No ads in the user interface

Level 2: Display of ads and deals (relevant to you) in the user interface

We deliberately selected the levels for each attribute to represent the functionalities of traditional electronic communication services (i.e. mobile plans: calls and SMS), as well as the features available on digital platforms but not on traditional electronic means of communication. This was important in the later analysis.

With regard to the experimental design, it is also important to note that when constructing all of the possible unique service profiles with these attributes and levels (i.e. full factorial design), we ended up with 24 possible combinations [$2^3 \times 3^1$] of hypothetical communication service packages, as well as 276 different combinations for choice tasks (i.e. choices between two options; [$2^3 \times 3^1 \times (2^3 \times 3^1 - 1)/2$]). To reduce this unmanageable number of potential alternatives for respondents to assess (and therefore control the respondent fatigue), we programmed the survey software to present each respondent with **six**[216] randomly generated and allocated choice options, each between two unlabelled scenarios (see the figure below). The individual respondents were randomly assigned a block of six choice options, and answered the questions in that block instead of the entire design. This means that we needed 251 respondents per tested segment (i.e. gender, age group) for a meaningful analysis. Our sample size allowed us to achieve this.

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[216] Some previous studies have found this number to be optimal with regard the level of respondent fatigue. For example: Tully, M.P., Bernsten, C., Aitken, M. & Vass, C. (2020). Public preferences regarding data linkage for research: a discrete choice experiment comparing Scotland and Sweden. *BMC Medical Informatics and Decision Making*, 20(1), 1-13.

Figure 2. Illustration of choice options

Due to the limitations imposed by the scope of the experiment (six questions) and the survey software, we did not program prohibited level pairs for the experiment. This was also necessary to allow a more robust statistical analysis and the estimation of utilities in this comparatively simple experimental design (i.e. with few attributes and levels to test). Given that our experimental design contains few attributes and attribute levels, even a single-level pair prohibition would impede the estimation of utilities.

After the data collection was completed, this element of the survey resulted into a separate conjoint dataset, which was analysed using R programme for statistical analysis, and the "mlogit" statistical package[217]. The respondents removed from the main dataset were also removed from the conjoint dataset after the data cleaning (see Section 3.1). Using it we estimated the most basic and commonly-used choice model, the *conditional logit* model, which is consistent with random utility theory[218]. The regression output table is presented below.

Table 3. DCE: conditional logit regression output

	Estimate	Std. Error	Z value	Pr (>|z|)	
(Intercept)	-0.20468	0.01350	-15.159	< 2e-16	***
Audio calls and messages	0.07574	0.01387	5.459	4.79e-08	***
Group chats	-0.39918	0.01389	-28.738	< 2e-16	***
Photos and videos	0 (*reference category*)	.	.	.	.
Collection of personal data for ads	-0.52107	0.01139	-45.750	< 2e-16	***

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[217] Technical documentation is available at: https://cran.r-project.org/web/packages/mlogit/mlogit.pdf; example of the procedure is available at: https://mran.microsoft.com/snapshot/2017-02-04/web/packages/mlogit/vignettes/mlogit.pdf
[218] Van Dijk, J. D., Groothuis-Oudshoorn, C. G., Marshall, D. A., & IJzerman, M. J. (2016). An empirical comparison of discrete choice experiment and best-worst scaling to estimate stakeholders' risk tolerance for hip replacement surgery. Value in health, 19(4), 316-322.

Only minimal data collection	0 (*reference category*)	.	.	.	.	
Display of ads	-0.44969	0.01138	-39.533	< 2e-16	***	
No ads	0 (*reference category*)	.	.	.	.	
Free	1.59313	0.01145	139.115	< 2e-16	***	
Paid	0 (*reference category*)	.	.	.	.	

The positive regression coefficients (i.e., preference weights) indicate that the attribute levels are preferred by respondents, while negative coefficients show the opposite. The coefficients obtained are then used to calculate average marginal effects[219] for each coefficient (i.e., utility values for each attribute level), which, added together for each attribute, are equal to zero (see the table below).

Table 4. Average marginal effects of regression coefficients

Factor	AME	SE	z	p	lower	upper
Display of ads	-0.0946	0.0024	-39.8695	0.0000	-0.0992	-0.0899
Free	0.3660	0.0024	154.2910	0.0000	0.3613	0.3706
Collection of personal data for ads	-0.1098	0.0024	-46.2744	0.0000	-0.1144	-0.1051
Audio calls and messages	0.0159	0.0029	5.4601	0.0000	0.0102	0.0216
Group chats	-0.0838	0.0029	-28.9000	0.0000	-0.0895	-0.0781

It is important to note that the absolute values of preference weights and utilities have no meaningful interpretation. Preference weights measure relative preference, which means that only changes between attribute-level estimates and the relative sizes of those changes across attributes have meaningful interpretations.

The utility values also feed into the estimation of importance for each attribute, indicating the "weight" of each attribute in consumer decision-making. The relative importance is estimated by adding up the difference between the maximum value (max) and the minimum value (min) for each attribute, and dividing the value (max-min) of the individual attributes by the number (max-min) of all attributes. The sum of the importance scores of all attributes equals to one.

1.3.1.2   Pre-testing

Once BEREC had confirmed the daft questionnaire, we employed testing methods both with and without data collection to identify problems and subsequently improve the questionnaire. Our testing process addressed three main types of issues:

-    Substantive issues, such as question content and validity.

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[219] In a linear model, the coefficients are the marginal effects of the explanatory variables on the explained variable. This is not the case for the multinomial logit model. The coefficients need to be transformed to obtain easily comprehensible results.

- Methodological and cognitive aspects of questions, such as understanding, wording, format, visual design, and other relevant aspects.

- Technical issues, such as ensuring appropriately programmed functions such as branching, piping, skips, and others.

We applied a combination of questionnaire testing methods: expert reviews, cognitive interviews, technical questionnaire testing, and a pilot study.

Expert reviews. To ensure the questionnaire tackled the most relevant aspects of consumer behaviour towards platforms, we thoroughly reviewed the questionnaire internally. This took place as part of a continuous internal review at different stages of the questionnaire development, from designing the first draft to finalisation. The researchers working on the study systematically analysed each question in terms of comprehension, information retrieval, judgement and response generation. The existing research on survey methodology[220] and our experience show that expert reviews provide great value in identifying problems with questions that may result in lower survey data quality.

Cognitive interviews. Cognitive interviews are directed at understanding the cognitive processes the respondent engages in when answering a question. During the pre-fielding phase (after receiving BEREC's comments of the draft Data collection report), we conducted **nine** in-depth one-on-one interviews with people from the target group of the survey. The interviewees were identified using the convenience sampling approach. They represented both sexes, three broad age groups (18-25, 26-35 and 35-45), and six different nationalities (French, Dutch, Lithuanian, Romanian/Portuguese and Croatian).

The interviews were instrumental in testing and **refining the survey questionnaire**. We used the techniques of think-aloud and probing to investigate how respondents understood the questions, whether they had any difficulties, how they arrived at their answers, and whether their replies were in line with our questions. This was an iterative process in which we conducted several rounds of interviews, allowing for changes and improvements in the questionnaire before we proceeded with the next interviewees.

The revisions included some aspects relating to wording, question order and questionnaire length. Because we noticed that the questionnaire tended to introduce some level of fatigue towards the end, we shortened the questionnaire by removing some questions about social networks (i.e. the platforms used for interactive exchange of files and media, which were emphasised as not being a primary focus in the tender Specifications).

Aside from questionnaire testing, the interviews were a source of qualitative insights, which we used for the data analysis in preparation of analysis report.

Questionnaire technical testing. To ensure the questionnaire was well implemented in our survey tool, we carried out the following steps:

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[220] Olson, K. (2010). An examination of questionnaire evaluation by expert reviewers. *Field Methods*, 22(4), 295-318.

- Reviewed technical quality and performed debugging, including testing survey branching, piping and filters.

- Ensured survey stability across browsers, devices and operating systems, by testing and reviewing visual displays, correct functioning of features/ responses and other aspects such as external links on different devices and software.

Piloting. Once the master questionnaire was confirmed and translated, we used a small sample of the target population to evaluate the final translated questionnaires in a real setting. We recruited 10-15 survey respondents per country, adding up to a total of 176 pilot completions. We used the data collected to analyse the paradata (time on each survey page, total survey taking time), break-off rate and place in the questionnaire, distributions of different answer options and the "Don't know" option, as well as open answers to "Other (please specify)" options. We also examined the structure of the dataset to make sure that the questionnaire's logic and recording of responses worked as intended. As neither any irregularities, nor any need for additional answer options were identified, we proceeded with the full launch of the survey without any changes to the questionnaires. Ultimately, the pilot responses remained in the final questionnaire as valid.

1.3.1.3   Questionnaire translation and validation of translations

The questionnaires were translated by professional and experienced translators who regularly work specifically with translations of survey questionnaires. The translations covered a total of 11 languages: Estonian, French, Finnish, Dutch, Romanian, Czech, German, Lithuanian, Swedish, Spanish and Portuguese. Once translated by native speakers, the questionnaires were proof-read by a second translator within the translation agency. When we received the translations at PPMI, we hired other independent translators to review the translations one more time and carry out linguistic and cultural checks. Only the questionnaires on which both the agency translators and the independent translators ultimately agreed were uploaded to the survey tool.

2. Fielding

The main fielding phase took place during the week of 21-28 September 2020. It consisted of respondent recruitment, monitoring of survey responses as they came in, and intervening if any issues were noticed. Additional responses were collected for quota top-ups after the first round of data validation on 8 October 2020.

During the survey fieldwork, the research team continuously monitored the data collection to ensure a smooth data collection process. Using our survey tool's built-in reporting functionalities, we ran summaries of all survey variables (descriptive statistics, frequencies) daily in order to detect any inadmissible values, unexpected variance or any other data patterns that required attention or possible intervention from the research team.

Responses identified as fraudulent responses were omitted from the dataset, and we collected replacements until we met the quotas. Ultimately, we collected 12,770[221] responses in the fieldwork, which then were cleaned and validated (reducing this total number).

3. Post-fielding

The post-field adjustments constituted the final step in the preparation of data for analysis. This consisted of data cleaning/validation and weighting. Later in this chapter, we present both procedures and their outcomes, reflected in the final dataset.

3.1 Data validation

Once the field stage had ended, we performed **advanced validations,** involving univariate and multivariate procedures. An example of univariate validation is checking distributions for all variables. Multivariate validation procedures involved finding interrelated variables and making logical checks that are used to find errors or inconsistencies (e.g. making sure that the acquired level of education was logically possible in view of a respondent's age, etc.).

The responses were also checked to prevent **duplicate completions** (the same person completing the survey twice) using identification variables from panel providers. Then, we filtered out **poor quality responses** (i.e. straight-liners, satisficing or other non-appropriate response patterns) and we tracked suspicious 'speeding' behaviours by checking the overall and page-by-page time users took to complete the survey. We assigned a specific weight, ranging from 0.5 to 3, for each of the tests implemented in data cleaning. We then removed all respondents who achieved a weighted flag score of 3 or more.

After the first round of cleaning, we lacked respondents from Ireland and the Netherlands. Specifically, we were left with 999 respondents in Ireland and 970 in the Netherlands. The sample sizes for the remaining countries exceeded 1,000 respondents. Therefore, we collected additional 42 responses to achieve the target sample sizes (we included extras in case some of these failed our quality standards). The same cleaning procedure was applied to the top-up responses as for the initial dataset (see the table above). In total, including both the top-up and the initial dataset, we removed 413 responses. The number of removed responses in each country is summarised below.

Table 5. Number of responses dropped per country

COUNTRY	CZ	DE	EE	ES	FI	FR	IE	LT	NL	PT	RO	SE	TOTAL
# RESPONSES DROPPED	30	45	15	33	20	41	48	15	69	17	33	47	413

This resulted in the final sample size of 12,399 responses (= the initial 12,770 responses + 42 top ups – 413 inconsistent). The final sample is summarised in the table below.

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[221] This number differs from the quota targets, because once we started the fielding, the number of invitations sent out was larger than the required number of responses. We could have closed the fielding once the quotas were full, but we chose not to do this immediately, in order to collect additional responses as a "buffer".

Table 6. Final sample, by country

COUNTRY	#
CZ	1,050
DE	1,028
EE	1,046
ES	1,034
FI	1,040
FR	1,023
IE	1,001
LT	1,041
NL	1,027
PT	1,050
RO	1,043
SE	1,016
Total	**12,399**

3.2.   Weights

Our sampling design (that is, the use of internet panels as a sampling frame) followed a non-probability sampling technique, meaning that responses did not come directly from a random sample of the population of interest. The self-selection biases among the people on online panels can produce biased results that do not represent the population of interest. To make the survey sample more representative of the population of interest, non-probability sampling surveys tend to rely on post-field adjustments such as weighting or modelling estimates, and on the assumptions behind these[222]. The survey data was weighted using a calibration procedure.

Given that survey target group – application users – are a subset of internet users, we used the Eurostat data on daily internet users for weighting. Compared to data from official statistics, the original sample underrepresented certain profiles of internet users such as individuals with a lower frequency of internet use, those with low formal education, and those either employed or self-employed. Very few of our respondents (1.54%) use the Internet less frequently than daily. Therefore, in our weight estimations, we assumed that all of the sample were daily Internet users. This was to avoid introducing other possible biases into the data (e.g. weighing the sample to be representative of less frequent Internet users when in fact there are very few of them in the sample). This, in turn, reduced the variability of weights, which allows for greater statistical power in subsequent analyses.

3.2.1   Calculation of post-stratification weights (raking)

In order to adjust for the differences between the sample and population distributions on key variables (known as 'control' or 'auxiliary' variables) and to ensure that the sample accurately

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[222] Mercer, A.W. et al. (2017) Theory and practice in nonprobability surveys: Parallels between causal inference and survey inference. *Public Opinion Quarterly*. 81, 250-279.

reflected the socio-demographic structure of the target population, we carried out post-stratification weighting. To calculate the post-stratification weights, we applied an iterative proportional fitting technique, also known as 'raking'. The raking algorithm uses known population totals and adjusts the marginal frequencies of control variables in the sample to those known population totals. It involves repeated estimation of weights across a selected set of variables in turn until the weights converge and stop changing[223]. Essentially, raking forces the survey totals of auxiliary variables to match the known population totals by assigning a weight to each respondent[224].

The survey was adjusted by country, and the raking procedure included the following three variables:

— age;
— gender;
— level of formal education;
— employment status.

The age and gender variables might seem superfluous, given that we based our quota calculations on these variables. Nevertheless, we include them in our weighting estimates because some quotas were filled beyond the minimum requirements and because the sample size within other quotas decreased when the inconsistent respondents were removed from the dataset.

We used the most recent Eurostat data (2019) to compute the weights for the survey data.

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[223] For more detail on iterative solutions to post-stratification weighting, see Johnson, D. R. (2008), 'Using Weights in the Analysis of Survey Data'. Available at: http://www.nyu.edu/classes/jackson/design.of.social.research/Readings/Johnson%20-%20Introduction%20to%20survey%20weights%20%28PRI%20version%29.pdf.

[224] Anderson, L. & Fricker Jr, R.D. (2015). Raking: An important and often overlooked survey analysis tool. *Phalanx*, 48(3), 36-42.

Table 7. Eurostat tables used for the computation of calibration data variables

Eurostat survey	Table label	Gender & Age	Formal education	Employment status	Indicator(s)
LFS	demo_pjan	X	X	X	Number of people from 16 to 74 years old in each country
LFS	edat_lfs_9903		X		Proportion of people in each country, by age group and education category
LFS	lfsa_pgacws			X	Number of employed, unemployed and inactive people in each country
LFS	lfsa_igar			X	Proportion of students in each country
ICT	isoc_ci_ifp_fu	X	X	X	Country proportions of daily internet users aged 16-74 by age group and gender; by education categories; and by employment status

Source: PPMI.

Note: Proportions for education and employment categories had to be computed for populations aged 15-74 as no public data was available for the age group 16-74.

3.2.2 Weight trimming

To avoid having extremely high weights that could increase the variability of estimates (by increasing the standard errors of estimates), weight trimming is often used by researchers at the expense of possibly reducing the representativeness of the weighted data.[225] In this survey, those weights that were three times larger than median weights in each country were trimmed to be equal to 3*median of the initial weight distribution in each country. This is a common approach used in various surveys[226], though it is important to note that there is no universally established rule for constant selection or trimming method. For example, in other surveys, weights are trimmed if they are greater than 4*median, or if they exceed a particular inter-quartile range.[227] In this case, we chose the constant 3 because weights in certain countries (e.g. Romania – please see the following section) varied substantially, so we imposed stricter trimming limits. This resulted in 4.8% of weights being trimmed across the countries (as a rule of thumb, no more than 5% of the weights should be trimmed to avoid introducing substantial bias into estimates).

3.2.3 Efficiency of weights

Survey weights reduce the bias of the estimates, but this comes at the cost of increasing their variance. A way of quantifying the variability of weights is the 'design effect due to weighting'. This was suggested by Leslie Kish[228], and is currently widely used as an indicator of increase in variance. The design effect $deff_w$ is defined as:[229]

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[225] Johnson, D.R. (2008), 'Using Weights in the Analysis of Survey Data'. Available at: http://www.nyu.edu/classes/jackson/design.of.social.research/Readings/Johnson%20-%20Introduction%20to%20survey%20weights%20%28PRI%20version%29.pdf.

[226] Van de Kerckhove, W., Mohadjer, L. & Krenzke, T. (2014). A Weight Trimming Approach to Achieve a Comparable Increase to Bias across Countries in the Programme for the International Assessment of Adult Competencies. Joint Statistical Meetings, Survey Research Methods Section, p. 656.

[227] Ibid.

[228] Kish, L. (1965). *Survey Sampling*. John Wiley & Sons, Inc., New York; Kish L. (1992). Weighting for unequal pi. *Journal of Official Statistics* 8(2):183–200

[229] Valliant, R. & Dever, J.A. (2018). *Survey Weights: A Step-by-step Guide to Calculation*. A Stata Press Publication, p. 71.

$$deff_K(w) = 1 + relvar(w) = 1 + n^{-1}\sum_s (w_i - \overline{w})^2/\overline{w}^2$$

where $relvar(w) = 1 + n^{-1}\sum_s(w_i - \overline{w})^2/\overline{w}^2$ is the relative variance of input weights. The larger the $deff_K(w)$ value, the more inefficient weights are feared to be. Similarly, the 'design factor' $deft_K(w)$, computed as the square root of the $deff_K(w)$, indicates the inflation factor for the standard errors once weighting is applied. From the $deff_K(w)$ we can also compute the $neff(w)$, or effective sample size. The effective sample size is the sample size that would have been required to obtain the same level of precision if no weighting had been required.

Table 8 below shows the design effect, design factor and effective sample size of the calibration weights in each country. We see that even after trimming the weights, the variance inflation was relatively high in Romania, where the effective sample size is around 70% of the unweighted responses.

Table 8. Efficiency of weights

Country	N	DEFF	DEFT	NEFF
CZ	1,050	1.08	1.04	971
DE	1,028	1.10	1.05	931
EE	1,046	1.21	1.10	863
ES	1,034	1.29	1.13	804
FI	1,040	1.20	1.10	866
FR	1,023	1.10	1.05	929
IE	1,001	1.22	1.11	817
LT	1,041	1.15	1.07	903
NL	1,027	1.17	1.08	878
PT	1,050	1.32	1.15	795
RO	1,043	1.43	1.19	731
SE	1,016	1.24	1.11	821

Source: PPMI.

3.2.4 Fit of weighted sample

In order to check how the weighting increased the representativeness of the population of our survey sample, and which groups of respondents were underrepresented in our initial sample, we compared the proportions of the auxiliary variables between the unweighted sample, the weighted sample and the population estimates in Annex 1.

Comparison of the columns 'unweighted %' and 'population %' in the table above shows that in most countries, our initial sample underrepresented certain profiles of daily internet users. In most countries, it underrepresented daily internet users with low or medium education, and overrepresented those who were highly educated. Furthermore, those who were employed or self-employed were also underrepresented, compared with other employment groups.

Weights help our sample to be a better small-scale representation of the entire population of daily internet users in each country. For example, the share of respondents with low education in Ireland in the unweighted sample (8%) increases substantially after weights are applied (to 17%), coming close to the actual share of daily internet users in Ireland who have low education (19%). Similarly, weights make the survey more representative of those who are employed or self-employed. In Denmark, for instance, the share of the unweighted sample falling into this employment category is 62%, which is 11% lower than the actual share of employed or self-employed daily internet users in Denmark (73%). Nevertheless, weights increase the relative importance of this employment category, making it match the population percentage (see the column 'weighted %').

However, even after weighting, our sample underrepresents those with low education in Romania and Portugal. The share of the weighted sample with low education in Portugal amounts to 15%, which is less than half of the target proportion (35%) even though it considerably improves on the unweighted sample, in which respondents with low education amount to only 6%. A similar issue appears in Romania. Attempting to reduce the difference between the final weighted sample and the population proportions of these groups would risk introducing an unacceptably high variance, i.e. our final estimates would rely too much on very few (heavily weighted) respondents. This could, on average, make final estimates substantially more distant from the population estimates than those coming from a slightly biased survey[230].

3.3.   Data analysis

The survey data was analysed mostly using the methods of descriptive statistics and data visualisation. The descriptive survey data analysis was performed on weighted survey data (as presented throughout the report and in Annex 3). Assuming that the weights applied have corrected for the coverage and sampling errors[231], we can use the table below for the margins of error for proportions[232] presented in the report. The difference between proportions was considered statistically significant if the proportion confidence intervals (expressed as the +/- value of the margin of error, e.g., +/- 3.1 percentage points) based on this table did not overlap.

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[230] This situation is similar to that described in Singh, A., Innnacchione, V. & Dever, J. (2003) Efficient Estimation for Surveys with Nonresponse Follow-Up Using Dual-Frame Calibration. Joint Statistical Meetings: Section on Survey Research Methods. (https://ww2.amstat.org/sections/srms/Proceedings/y2003/Files/JSM2003-000872.pdf) and explained in more general terms in Biemer,P. (2010). Total Survey Error: Design, Implementation, and Evaluation. *Public Opinion Quarterly*, 75(5), 817-848.

[231] This is a currently widespread practice for online planel surveys produced as evidence for policy makers.For example, see: Varley, R., Bagga, N., & Morgan, R. (2018). Consumer Views and Behaviours on Digital Platforms. Technical Report. Australian Competition and Consumer Commission, Roy Morgan; Kantar for the European Parliament (2020), Public opinion in the EU in time of coronavirus crisis. Available at: https://www.europarl.europa.eu/at-your-service/en/be-heard/eurobarometer/public-opinion-in-the-eu-in-time-of-coronavirus-crisis

[232] Estimated using the following formula: $z * \sqrt{\frac{p(1-p)}{n}}$, where n is the sample size, p – the proportion, and z value for the confidence level of 95% is 1.96.

Table 9. Margin of error of proportions at 95% confidence level (percentage points)

Sample size	Proportion									
	95%/ 5%	90%/ 10%	85%/ 15%	80%/ 20%	75%/ 25%	70%/ 30%	65%/ 35%	60%/ 40%	55%/ 45%	50%/ 50%
50	6.0	8.3	9.9	11.1	12.0	12.7	13.2	13.6	13.8	13.9
500	1.9	2.6	3.1	3.5	3.8	4.0	4.2	4.3	4.4	4.4
1000	**1.4**	**1.9**	**2.2**	**2.5**	**2.7**	**2.8**	**3.0**	**3.0**	**3.1**	**3.1**
1500	1.1	1.5	1.8	2.0	2.2	2.3	2.4	2.5	2.5	2.5
2000	1.0	1.3	1.6	1.8	1.9	2	2.1	2.1	2.2	2.2
3000	0.8	1.1	1.3	1.4	1.5	1.6	1.7	1.8	1.8	1.8
4000	0.7	0.9	1.1	1.2	1.3	1.4	1.5	1.5	1.5	1.5
5000	0.6	0.8	1.0	1.1	1.2	1.3	1.3	1.4	1.4	1.4
6000	0.6	0.8	0.9	1.0	1.1	1.2	1.2	1.2	1.3	1.3
7000	0.5	0.7	0.8	0.9	1.0	1.1	1.1	1.1	1.2	1.2
8000	0.5	0.7	0.8	0.9	0.9	1.0	1.0	1.1	1.1	1.1
9000	0.5	0.6	0.7	0.8	0.9	0.9	1.0	1.0	1.0	1.0
10000	0.4	0.6	0.7	0.8	0.8	0.9	0.9	1.0	1.0	1.0
11000	0.4	0.6	0.7	0.7	0.8	0.9	0.9	0.9	0.9	0.9
12000	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**	**0.8**	**0.9**	**0.9**	**0.9**	**0.9**
13000	0.4	0.5	0.6	0.7	0.7	0.8	0.8	0.8	0.9	0.9
14000	0.4	0.5	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.8
15000	0.3	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.8

Additional inferential analyses were run to quantify the correlations between selected variables. More specifically, the following analyses were implemented:

- Pierson's two-tailed test to check the correlations between numeric variables (e.g. number of applications used and age).
- Multiple linear regression to control the influence of intervening factors on the numeric dependent variables (e.g. number of applications used).
- Multiple logistic regression to check the influence of different factors on a categorical (dichotomous) dependent variable (e.g., willingness to pay).
- Conditional logit model to analyse the DCE dataset and estimate utilities (see more details on the methodology in Section 1.3.1.1 of this annex).

Following a common practice in statistical research, unweighted survey values were used in the inferential analyses. This helped to avoid adverse effects of weighting, such as increase in standard errors and instabilities, while the same control variables as used for weighting were still included the multivariate analyses.

4. Quality assurance

The caveats and limitations of the survey can be explained using the Total Survey Error (TSE; see the figure below) [233] framework. This was employed as a quality control tool for the implementation of the three stages of the survey (pre-fielding, fielding and post-fielding). Generally, the framework implies that there are two general sources of error in survey statistics: measurement (questionnaires) and representation (sampling, non-response, post-fielding adjustments). These errors can manifest at various stages of data collection and processing. Our aim was to minimise the possibility of such errors at every step of our survey implementation, to ensure the validity and reliability of the data.

Figure 3. Total Survey Error (TSE) framework
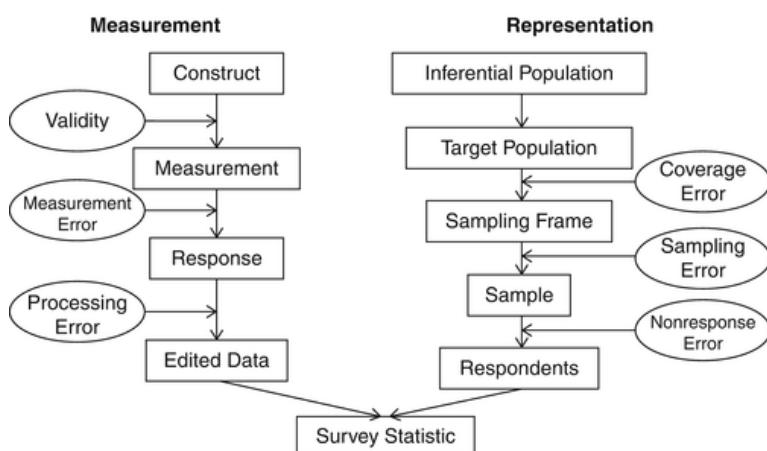
Source: Saris, W.E. (2014) Total Survey Error. In: Michalos, A.C. (ed.) *Encyclopedia of Quality of Life and Well-Being Research*.

4.1   Measurement

The key risks associated with the precision of measurement relate to several characteristics of the survey mode.

First, the survey was an online, self-administered survey. Lack of the presence of an interviewer meant that respondents were trusted to understand the questions as we intended. To mitigate the related risks, we tested the questionnaire thoroughly before its launch, conducted pilot data collection, and analysed the responses to identify any issues (for more details, see Section 1.3.1.2).

Second, some issues may arise from respondent motivations. In opt-in panels, the members have sought out the panel and signed up to take surveys, usually in order to earn cash or rewards. An array of measuring problems related to this is discussed in the literature, including false answers,

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[233] Weisberg, H. F. (2009). The total survey error approach: A guide to the new science of survey research. University of Chicago Press. Although the TSE was designed as a framework for probability-based surveys, researchers agree that in the absence of single more suitable model, it is useful for non-probability surveys (as this one) as well. See Baker, R., Brick, J.M., Bates, N.A., Battaglia, M., Couper, M.P., Dever, J. A., ... & Tourangeau, R. (2013). Report of the AAPOR task force on non-probability sampling. *Journal of Survey Statistics and Methodology*, 1(2), 90-143.

careless responses, satisficing and giving the same answer repeatedly, among others[234]. Therefore, we developed and applied detailed approaches to identify fraudulent responses (see Section 3.1).

Third, a common source of measurement error is questionnaire translations. The translators aimed to provide questionnaire texts of an equivalent meaning and connotations to the original English language questionnaire, rather than exact word-for-word translations. To mitigate this risk, we implemented additional reviews of the translations described in 1.3.1.3.

4.2   Representation

Use of internet access opt-in panels unavoidably results into non-probability samples. This is because the **sampling frame** (i.e. the list of all those within a population who can be sampled) consists of people who opt-into the panel, and are provided with monetary or other incentives by the panel operator. If the panel is made up of people who are in some ways systematically different from the population that we are seeking information about, the risk exists of obtaining survey estimates that will differ from the true values in the population of interest.

This means **coverage error** and various non-observable self-selection biases may exist, which can become the source of systematic survey error. This cannot be addressed using the statistical tools that allow us to measure and address random errors (such as confidence intervals and confidence levels).

Nonetheless, some statisticians argue that ultimately the data quality of online panels can be fairly similar to probability samples, because the latter still suffer from non-response error[235] which introduces the same issues[236]. Researchers have found that in both sampling approaches, the final results are not very different[237]. This may be even more true in the post-COVID-19 period, which introduced great challenges with regard to face-to-face and telephone surveys and decreased response rates further. Moreover, a mildly biased but large Internet survey can produce **more reliable estimates than an unbiased but small survey** – not only due to the non-response error, but also random errors due to the small sample sizes. This is very important, given that panel surveys are tens of times cheaper than other alternatives, and allows researchers to survey a considerably large sample of respondents.

It is also important to note that the goals of this specific survey were not the same as in usual sociological surveys, which aim to collect data representing various strata in society and the overall country populations. The target population of this survey were the users of digital electronic means of communication, which is a specific sub-group within the general populations. Using an online panel survey is a very suitable approach for this specific study, in which the target group are platform users, and therefore internet users. Although not representing non internet users is often regarded as a key drawback of online panels, it becomes an advantage for this specific study.

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[234] See, for example, Hays, R.D., Liu, H. & Kapteyn, A. (2015). Use of internet panels to conduct surveys. Behavior Research Methods, 47(3), 685-690.

[235] This type of error is not relevant when we speak about non-probability quota samples.

[236] Svensson, J. (2014). Web panel surveys–a challenge for official statistics. In: Proceedings of Statistics Canada Symposium.

[237] Hill, S.J., Lo, J., Vavreck, L. & Zaller, J. (2007). The opt-in Internet panel: Survey mode, sampling methodology and the implications for political research. Unpublished manuscript at the University of California, Los Angeles, California.

Furthermore, to address both biases in online panel samples and non-response in the probability samples, **weighting procedures** are usually applied in the post-fielding phase to increase the representativeness of the sample in comparison with the target population. The post-field adjustments allowed us to deal with methodological challenges inherent in the use of online panels. To implement these, in the survey we also collected data that could be compared against 'gold standards' (i.e. age, gender, education indicators from Eurostat official data) and used the relation between variables to fine-tune our sample and ensure its representativeness with regard to the target population.

4.3   Analysis

All the quantitative analyses presented in the report underwent a quality control process, when all the descriptive and inferential analyses were re-run to ensure that all the variable transformations and estimations are correct.

Annex 2. Survey questionnaire

Use of Internet and Technologies

1) How often, on average, did you use the internet over the last 3 months? *
( ) Every day or almost every day
( ) At least once a week (but not every day)
( ) Less than once a week

2) Which of the following devices do you own/have access to for your personal use?*
Please select all that apply.
[ ] Smartphone (e.g. iPhone, Android phone)
[ ] A mobile phone (other than smartphone)
[ ] A tablet (e.g. iPad or Android tablet)
[ ] Laptop
[ ] Desktop computer
[ ] Smartwatch
[ ] Smart TV (internet connected TV)
[ ] Voice controlled device (e.g. Google Home, Amazon Alexa, Amazon Echo, Apple HomePod etc.)
[ ] Landline phone
[ ] None of the above

Logic: If answer to Q2 = "none of the above", then the respondent was disqualified.

Use of Communication Services

3) Over the past 3 months, how often would you say you used the following means of communication for <u>personal purposes (</u>i.e. not work-related)?*

	Daily	At least once a week	At least once in two weeks	At least once a month	Less often than once a month	Never	Don't know
Landline phone calls	( )	( )	( )	( )	( )	( )	( )
Mobile phone calls (using SIM card, rather than an app)	( )	( )	( )	( )	( )	( )	( )
SMS or MMS messages (using SIM card, rather than an app)	( )	( )	( )	( )	( )	( )	( )
Email	( )	( )	( )	( )	( )	( )	( )

4) Over the past 3 months, how often would you say you used each of the following online websites or apps for <u>personal purposes</u> (i.e., not work-related)?*

	Daily	At least once a week	At least once in two weeks	At least once a month	Less often than once a month	Never	Don't know
WhatsApp	( )	( )	( )	( )	( )	( )	( )
Facebook Messenger	( )	( )	( )	( )	( )	( )	( )
Snapchat	( )	( )	( )	( )	( )	( )	( )
Telegram	( )	( )	( )	( )	( )	( )	( )
Discord	( )	( )	( )	( )	( )	( )	( )
FaceTime	( )	( )	( )	( )	( )	( )	( )
i-Message (online messages, not SMS)	( )	( )	( )	( )	( )	( )	( )
Viber	( )	( )	( )	( )	( )	( )	( )
Skype	( )	( )	( )	( )	( )	( )	( )

5) Over the past 3 months, how often would you say you used each of the following online websites or apps for <u>personal purposes</u> (i.e. not work-related)?*

	Daily	At least once a week	At least once in two weeks	At least once a month	Less often than once a month	Never	Don't know
Facebook (Social Network)	( )	( )	( )	( )	( )	( )	( )
YouTube	( )	( )	( )	( )	( )	( )	( )
Instagram	( )	( )	( )	( )	( )	( )	( )
TikTok	( )	( )	( )	( )	( )	( )	( )
Twitter	( )	( )	( )	( )	( )	( )	( )
Pinterest	( )	( )	( )	( )	( )	( )	( )
Tumblr	( )	( )	( )	( )	( )	( )	( )
Reddit	( )	( )	( )	( )	( )	( )	( )

Disqualification logic: If the answer to Q4 = "Less often than a month", "Never", or "Don't know" for all the application categories, then the respondent was disqualified.

Display logic: If the answers to Q4 and Q5 = "Daily", "At least once a week", "At least once in two weeks", or "At least once a month" for a specific app, then that app is displayed in Q6.

6) For what purposes do you use the selected online websites or apps?*

Please select all that apply.

	Personal messages or audio calls	**Group** messages or audio calls	Personal or group **video** calls	Sending messages, files, videos or photos **privately** (e.g. in personal messages or group chats)	Sharing messages , files, videos or photos **publicly** (e.g. posts visible to your friends, contacts, followers)	Following the activities, updates, and posts of friends, family and/or other people	Accessing infor-mation, selling or buying goods/ services and other purposes	None of these
WhatsApp	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Facebook Messenger	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Snapchat	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Telegram	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Discord	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
FaceTime	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
i-Message	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Viber	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Skype	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Facebook (social network)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
YouTube	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Instagram	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
TikTok	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Twitter	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Pinterest	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Tumblr	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Reddit	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Situational Preferences

7) Which means of communication do you prefer to contact your friends or family members?*

Please select up to two preferred options.
[ ] WhatsApp
[ ] Facebook Messenger
[ ] Snapchat

[ ] Telegram

[ ] Discord

[ ] FaceTime

[ ] i-Message (online messages, not SMS)

[ ] Viber

[ ] Skype

[ ] SMS or MMS (using SIM card, rather than an app)

[ ] Mobile phone calls (using SIM card, rather than an app)

[ ] Landline phone calls

[ ] Email

[ ] None of the above

[ ] Other (please specify): _____ *

8) Which means of communication do you prefer when you need to <u>contact someone urgently</u>?*

Please select up to <u>two</u> preferred options.

[ ] WhatsApp

[ ] Facebook Messenger

[ ] Snapchat

[ ] Telegram

[ ] Discord

[ ] FaceTime

[ ] i-Message (online messages, not SMS)

[ ] Viber

[ ] Skype

[ ] SMS or MMS (using SIM card, rather than an app)

[ ] Mobile phone calls (using SIM card, rather than an app)

[ ] Landline phone calls

[ ] Email

[ ] None of the above

[ ] Other (please specify): _____ *

9) Which means of communication do you prefer when you wish your communication to be <u>secure and encrypted</u>?*

Please select up to <u>two</u> preferred options.

[ ] WhatsApp

[ ] Facebook Messenger

[ ] Snapchat

[ ] Telegram

[ ] Discord

[ ] FaceTime

[ ] i-Message (online messages, not SMS)

[ ] Viber

[ ] Skype

[ ] SMS or MMS (using SIM card, rather than an app)

[ ] Mobile phone calls (using SIM card, rather than an app)

[ ] Landline phone calls

[ ] Email

[ ] None of the above

[ ] Other (please specify): _____ *

10) Which means of communication do you prefer to communicate with someone in <u>another</u> <u>country</u>?*

Please select up to <u>two</u> preferred options.

[ ] WhatsApp

[ ] Facebook Messenger

[ ] Snapchat

[ ] Telegram

[ ] Discord

[ ] FaceTime

[ ] i-Message (online messages, not SMS)

[ ] Viber

[ ] Skype

[ ] SMS or MMS (using SIM card, rather than an app)

[ ] Mobile phone calls (using SIM card, rather than an app)

[ ] Landline phone calls

[ ] Email

[ ] None of the above

[ ] Other (please specify): _____ *

App Usage

11) Over the past 3 months, which of these online websites or apps did you use most frequently?*

Please select <u>one</u> app/online website which you use most frequently.

( ) WhatsApp

( ) Facebook Messenger

( ) Snapchat

( ) Telegram

( ) Discord

( ) FaceTime

( ) i-Message (online messages, not SMS)

( ) Viber

( ) Skype
( ) Other (please specify): _____ *

Display logic: If the answer to Q5 = "Daily", "At least once a week", "At least once in two weeks", or "At least once a month" for a specific app, then that app is displayed in Q12.

12) Over the past 3 months, which of these online websites or apps did you use most frequently?*

Please select one app/online website which you use most frequently.
( ) Facebook (Social Network)
( ) YouTube
( ) Instagram
( ) TikTok
( ) Twitter
( ) Pinterest
( ) Tumblr
( ) Reddit
( ) Other (please specify): _____

Reasons for Use

13) What are the key reasons why you use [app/online website selected in question 11]?*

Please select up to three main reasons.
[ ] It is used by family members and/or friends
[ ] It allows for content creation
[ ] It allows for self-expression
[ ] It has useful functionalities
[ ] It has a visually attractive design
[ ] It is easy and convenient to use
[ ] It is free to use
[ ] It is entertaining to use
[ ] It ensures high standards of data security/privacy
[ ] Other (please specify): _____

14) What are the key reasons why you use [app/online website selected in question 12]?*

Please select up to three main reasons.
[ ] It is used by family members and/or friends
[ ] It allows for content creation
[ ] It allows for self-expression
[ ] It has useful functionalities
[ ] It has a visually attractive design
[ ] It has interesting content and information

[ ] It is easy and convenient to use

[ ] It is free to use

[ ] It is entertaining to use

[ ] It ensures high standards of data security/privacy

[ ] Other (please specify): _____

15) If [app/online website selected in question 11] suddenly stopped working, what kind of communication services would you use instead, in the short term?*

( ) Mobile phone calls (using SIM card, rather than an app)

( ) SMS or MMS messages (using SIM card, rather than an app)

( ) Landline phone calls

( ) Email

( ) Another online website or app

( ) Other (please specify): _____

( ) Don't know

Display logic: If the answer to Q15 = "Another online website or app", then Q16 is displayed.

16) Which app would you use?*

( ) WhatsApp

( ) Facebook Messenger

( ) Snapchat

( ) Telegram

( ) Discord

( ) FaceTime

( ) iMessage App (online messages, not SMS)

( ) Viber

( ) Skype

( ) Other (please specify): _____ *

( ) None of these

Alternative Preferences

17) Imagine a situation in which [app/online website selected in question 11] stops working and is discontinued permanently. Which kind of communication services would you use instead, in the long term?*

( ) Mobile phone calls (using SIM card, not an app)

( ) SMS or MMS messages (using SIM card, not an app)

( ) Landline phone calls

( ) Email

( ) Another online website or app

( ) Don't know

( ) Other (please specify): _____ *

( ) None of these

Display logic: If the answer to Q17 = "Another online website or app", then Q18 is displayed.

18) Which online website or app would you use?*

( ) WhatsApp

( ) Facebook Messenger

( ) Snapchat

( ) Telegram

( ) Discord

( ) FaceTime

( ) i-Message (online messages, not SMS)

( ) Viber

( ) Skype

( ) Other (please specify): _____ *

( ) None of these

19) How frustrating, if at all, would you find such a situation, in which [app/online website selected in question 11] stops working and is discontinued permanently?*

( ) Not at all frustrating

( ) Somewhat frustrating

( ) Quite frustrating

( ) Very frustrating

( ) Don't know

20) How would you evaluate the communication services provided by [app/online website selected in question 11] on the following dimensions? *

	Very poor	Poor	OK	Good	Very good	Don't know/ Not applicable
Functionalities available	( )	( )	( )	( )	( )	( )
Privacy of your personal data and communications	( )	( )	( )	( )	( )	( )
User interface	( )	( )	( )	( )	( )	( )
Convenience	( )	( )	( )	( )	( )	( )
Reliability (i.e., it works properly, does not get jammed, etc.)	( )	( )	( )	( )	( )	( )
Entertainment value	( )	( )	( )	( )	( )	( )

Changes in Behaviour

21) Over the past 12 months, have you changed the online website or messenger app which you use most often to communicate with friends or family? In other words, was your main messenger app different to the one you use currently, [app/online website selected in question 11]?*

( ) Yes
( ) No
( ) Don't know

22) Over the past 12 months, would you say that your use of the following means of communication: *

	Increased	Decreased	Stayed the same	Don't know
SMS or MMS messages (using SIM card, rather than an app)	( )	( )	( )	( )
Mobile phone calls (using SIM card, rather than an app)	( )	( )	( )	( )
Landline phone calls	( )	( )	( )	( )
Email	( )	( )	( )	( )
Messaging apps, such as [app/online website selected in question 11]	( )	( )	( )	( )

App Experiences

23) Please imagine a situation in which a new online website or app is launched. The online website or app allows you to make calls and exchange personal messages, photos and videos with your friends, family and the wider public. What factors would be most important for you in deciding whether to start using it?*

Please select up to three options.

[ ] It is free to use
[ ] It is used by friends and/or family
[ ] It ensures stronger data/privacy standards
[ ] It has enhanced functionalities for self-expression, content-creation
[ ] It gives access to a broader audience
[ ] It is easy or convenient to use
[ ] It has a visually attractive interface
[ ] It is entertaining to use
[ ] It does not stall or crash
[ ] It has interesting content or topics
[ ] Other (please specify): _____
[ ] I would not be interested

[ ] Don't know

24) To what extent do you agree or disagree with the following statements?*

	Strongly disagree	Disagree	Partly agree/ partly disagree	Agree	Strongly agree	Don't know/ Not applicable
The privacy and security of my personal data are important when using messenger apps	( )	( )	( )	( )	( )	( )
I regularly use multiple messenger apps	( )	( )	( )	( )	( )	( )
I like to try new messenger apps for communication and content-sharing when they are launched	( )	( )	( )	( )	( )	( )
I have a good understanding of how much of my personal data is collected by messenger apps	( )	( )	( )	( )	( )	( )
I value the brand of [app/online website selected in question 11] and associate it with high-quality services	( )	( )	( )	( )	( )	( )
It is acceptable for me that messenger apps collect my personal data and use it for their purposes	( )	( )	( )	( )	( )	( )
It is important to me that messenger apps are free of charge	( )	( )	( )	( )	( )	( )
I would pay for your main messenger app to send instant messages and make calls if it weren't free	( )	( )	( )	( )	( )	( )
It has just become a habit to use [app/online website selected in question 11] rather than other messaging apps	( )	( )	( )	( )	( )	( )
Instant messages via mobile messenger apps allow me to better express myself than SMS messages	( )	( )	( )	( )	( )	( )
I have changed my use habits or stopped using a messenger app due to stress or anxiety	( )	( )	( )	( )	( )	( )
I make fewer calls or send fewer SMS using my SIM card because I use messenger apps	( )	( )	( )	( )	( )	( )

Preferences

25) In this section you are presented with sets of two imaginary options of app features for your daily communication with friends and/or family. We would like you to think about each option as if you were making a decision between them in the real world, and if only those two options were available. Please indicate which option you would prefer.*

Key Functionalities	Convenient group chats	Convenient sharing of photos and videos, video calls	High quality personal audio calls and messaging	Convenient group chats	High quality personal audio calls and messaging	Convenient group chats
Personal Data Collection	Only minimum collection of your personal data	Collection of your personal data to be used for tailored marketing and advertising (the ads you see online will be relevant to you)	Only minimum collection of your personal data	Collection of your personal data to be used for tailored marketing and advertising (the ads you see online will be relevant to you)	Collection of your personal data to be used for tailored marketing and advertising (the ads you see online will be relevant to you)	Only minimum collection of your personal data
Display of Ads	Display of ads and deals (relevant to you) in the user interface	Display of ads and deals (relevant to you) in the user interface	No ads in the user interface	No ads in the user interface	Display of ads and deals (relevant to you) in the user interface	Display of ads and deals (relevant to you) in the user interface
Cost of Service	€10 per month	€10 per month	€10 per month	Free	€10 per month	Free

Note: each respondent received six randomly generated choice tasks to select from two options, generated based on the dimensions defined in the table.

About You

26) What is the highest level of education that you have achieved?*

( ) Primary level of education
( ) Lower secondary level of education
( ) Upper secondary level of education
( ) Post-secondary, non-tertiary level of education
( ) Short-cycle tertiary education
( ) Lower tertiary education, BA level

( ) Higher tertiary education, MA level

( ) Higher tertiary education, PhD

27) Which of the following <u>best</u> describes your current situation?*

( ) Employed

( ) Self-employed

( ) Unemployed

( ) Student

( ) Retired

( ) Full-time homemaker

( ) Other not in the labour force (incl. inactive, in compulsory military service)

28) What is your usual personal monthly income after taxes? *

( ) Up to €1,100

( ) €1,101 - €1,500

( ) €1,501 - €2,100

( ) €2,101 - €2,900

( ) €2,901 - €3,800

( ) Over €3,800

( ) I prefer not to answer

Note: Response options were adjusted by country and presented in national currencies. The national response options were prepared using the most recent Eurostat data on national income quantiles. In the dataset, the quantiles were also used as reporting values for cross-country comparison.

29) Do you have close friends and/or family members who live in a different country than you do? *

( ) Yes, **most** of my close friends and family members live in a different country (-ies) than me

( ) Yes, **some** of my close friends and/ or family members live in a different country (-ies) than me

( ) No, my close friends and family members live in the same country as me

( ) Don't know

Annex 3. Descriptive analysis

Figure 1. Age distribution
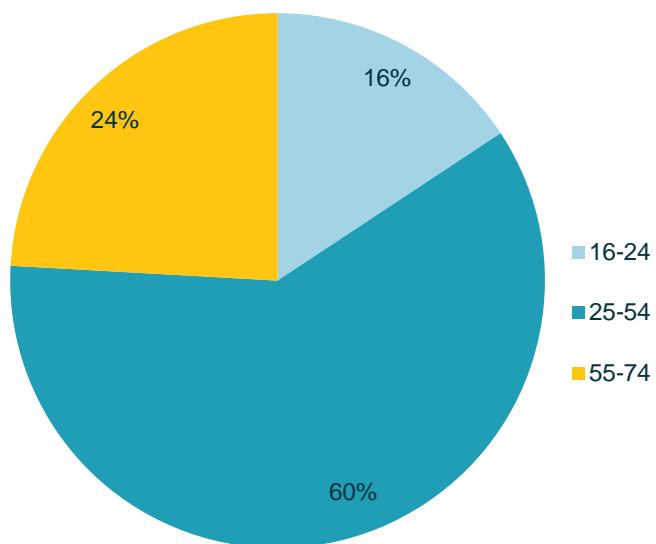
Figure 2. Distribution by sex
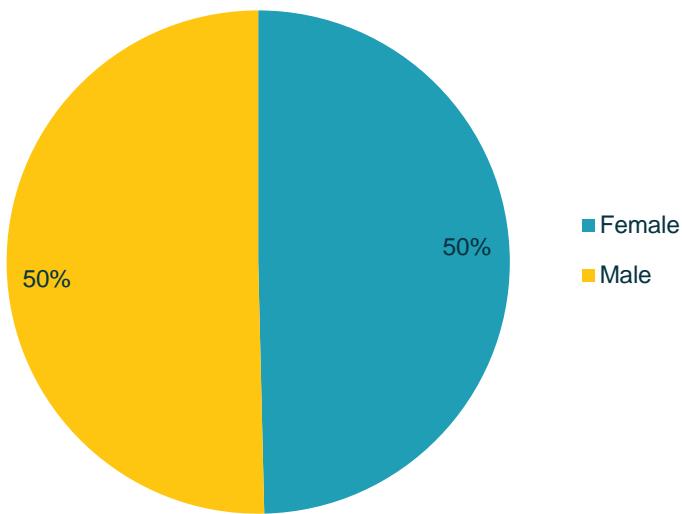
Figure 3. Distribution by country
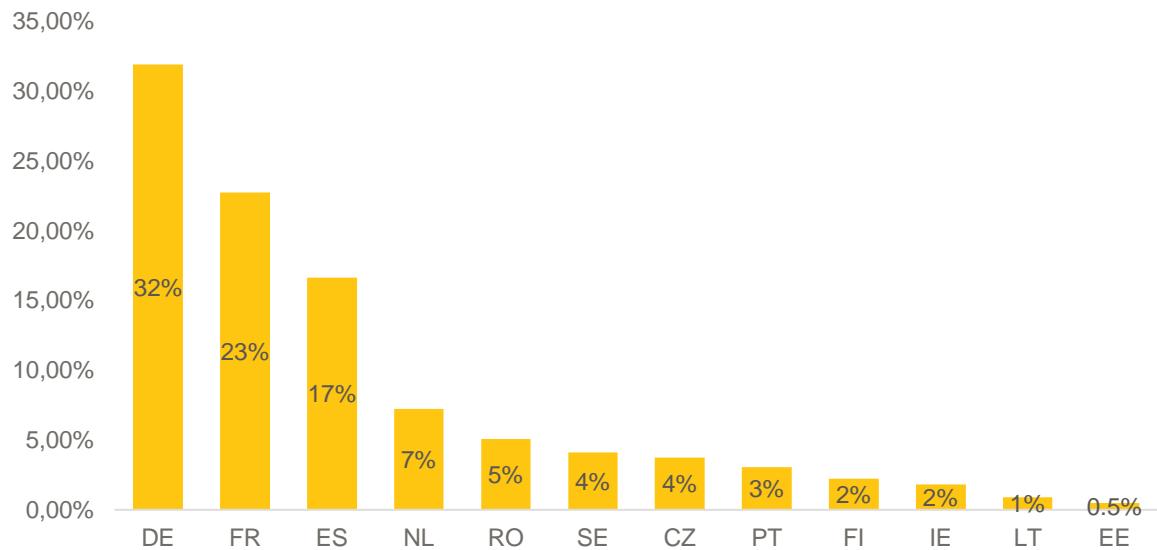
Figure 4. Q1: How often, on average, did you use the internet over the last three months?
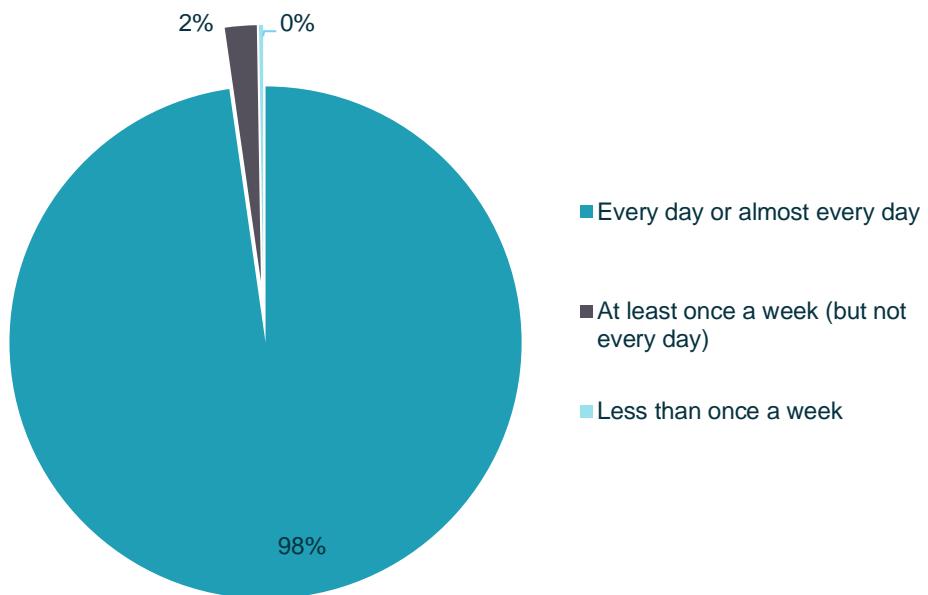
Figure 5. Q2: Which of the following devices do you own/have access to for your personal use?
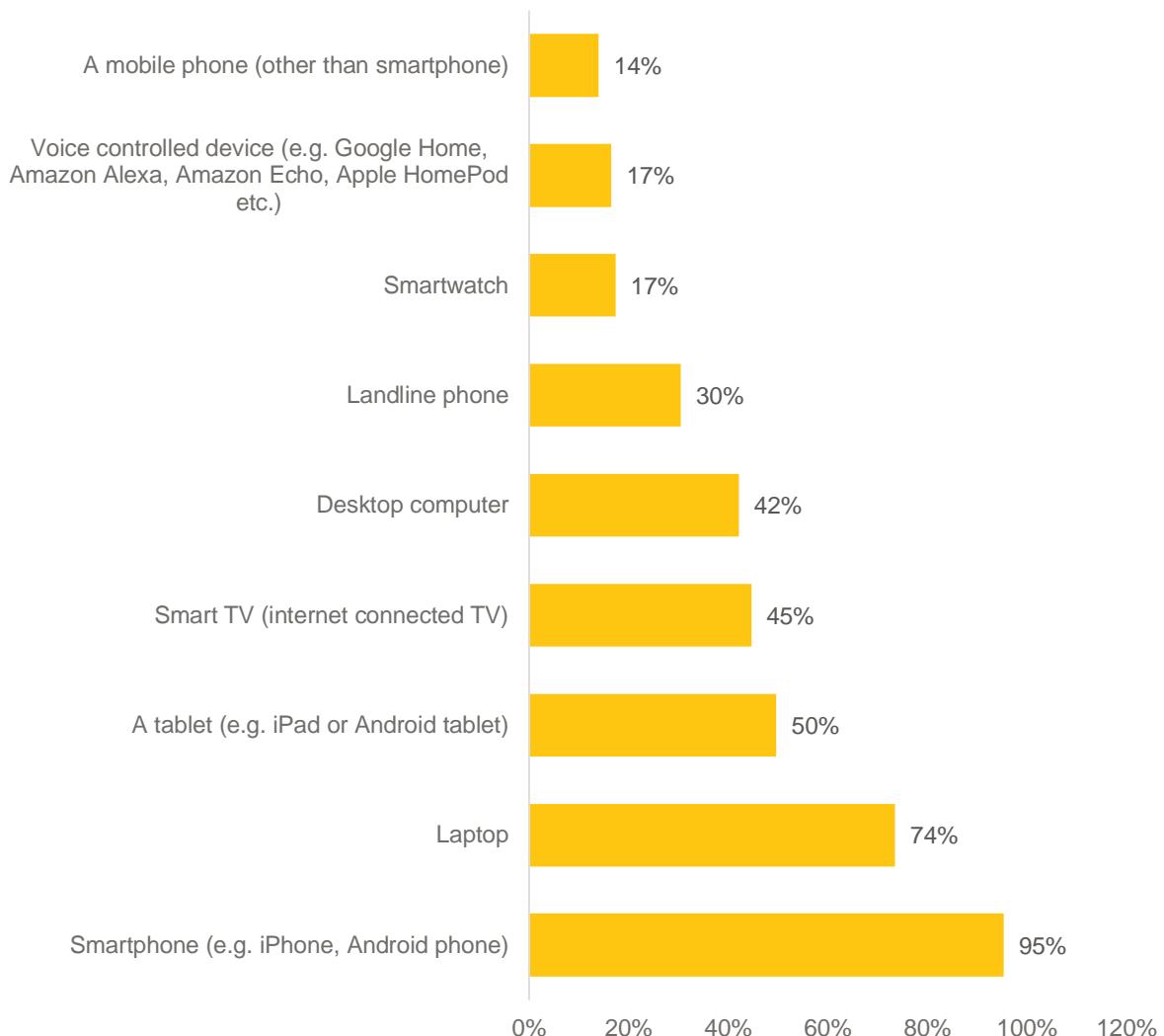
Figure 6. Q3: Over the past three months, how often would you say you used the following means of communication for personal purposes (i.e. not work-related)?

	Landline phone calls	Mobile phone calls (using SIM card, rather than an app)	SMS or MMS messages (using SIM card, rather than an app)	Email
Daily	28%	59%	44%	71%
At least once a week	23%	26%	20%	19%
At least once in two weeks	8%	7%	8%	5%
At least once a month	6%	4%	7%	2%
Less often than once a month	9%	2%	11%	2%
Never	25%	2%	10%	1%
Don't know	1%	1%	1%	0%
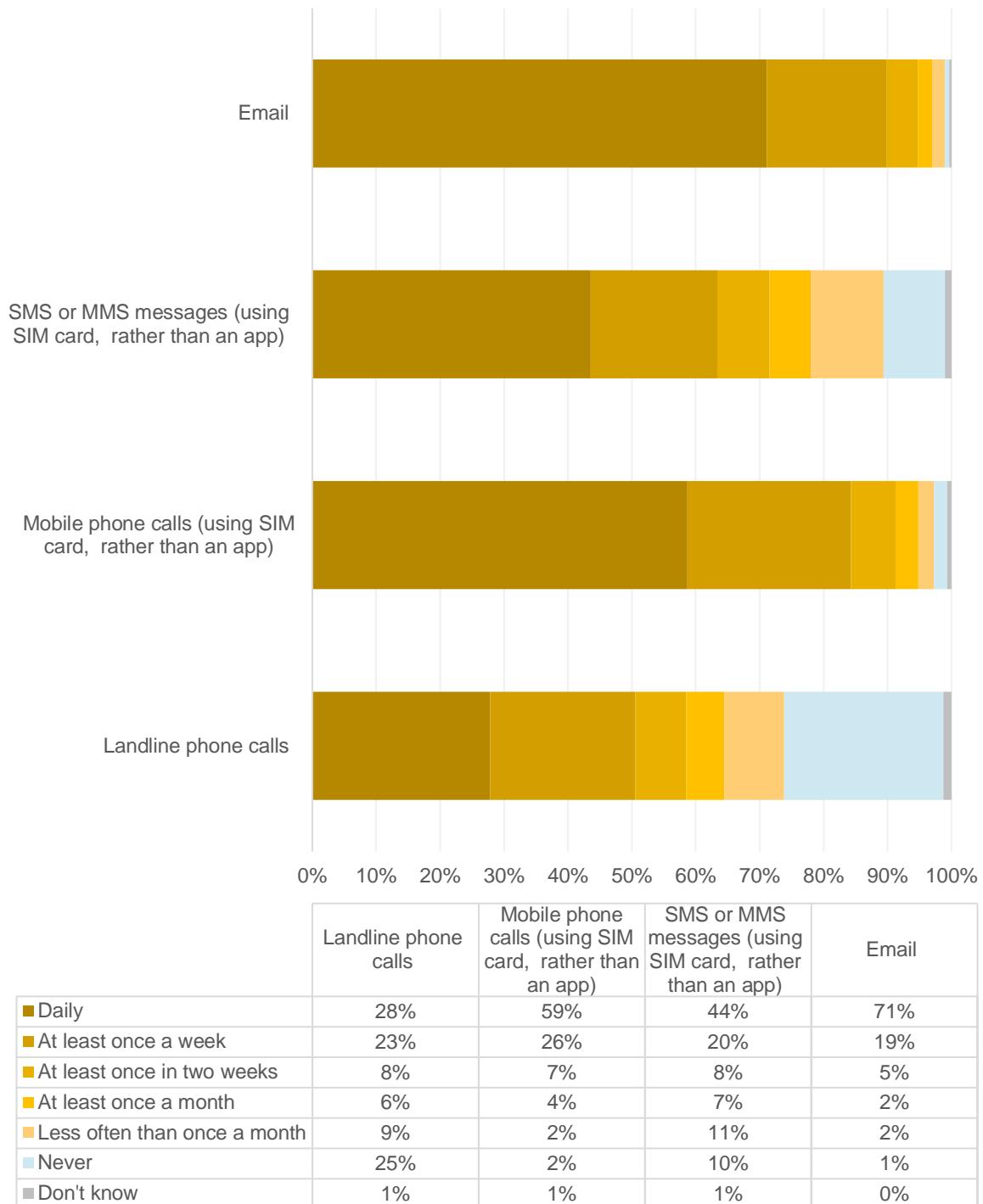
Figure 7. Q3: Frequency of use of mobile phone services (using a SIM card rather than an app for either phone calls or messages)
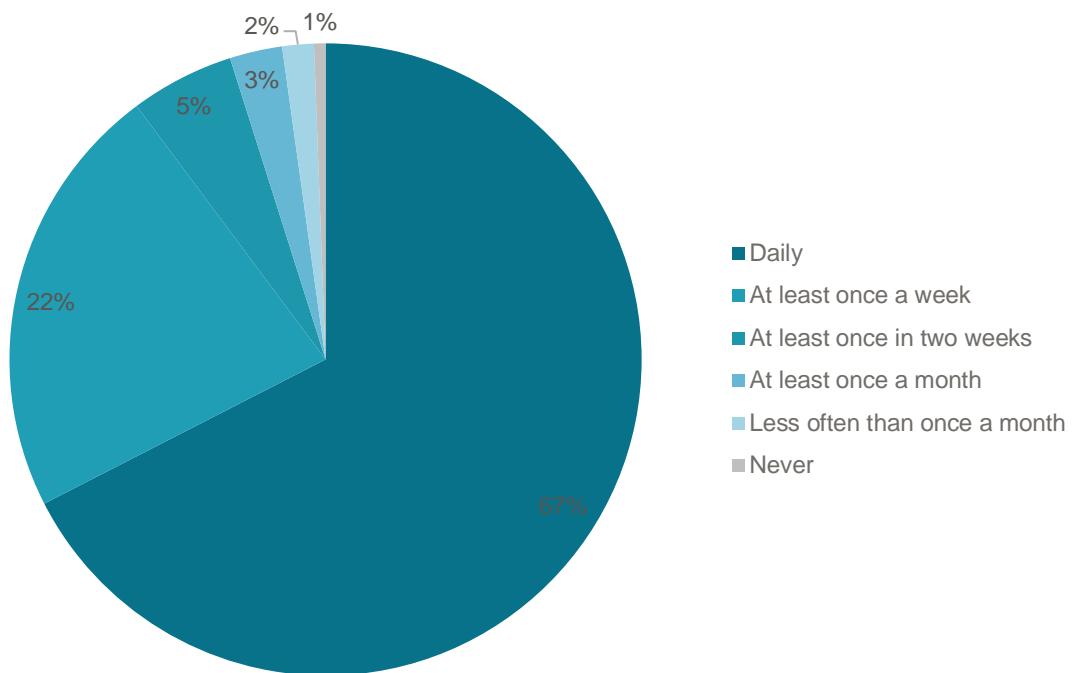
Figure 8. Q4: Over the past three months, how often would you say you used each of the following online websites or apps for personal purposes (i.e. not work-related)?

	Whats App	Faceb ook Messe nger	Snapc hat	Telegr am	Discor d	Faceti me	i-Messa ge (online messa ges, not SMS)	Viber	Skype
Don't know	0%	1%	2%	2%	4%	2%	3%	3%	2%
Never	12%	20%	58%	66%	69%	59%	49%	74%	46%
Less often than once a month	3%	7%	6%	6%	5%	9%	6%	5%	17%
At least once a month	4%	6%	4%	3%	3%	6%	4%	3%	10%
At least once in two weeks	4%	8%	5%	5%	4%	6%	6%	4%	7%
At least once a week	14%	18%	8%	7%	5%	9%	11%	5%	10%
Daily	62%	40%	17%	11%	10%	9%	22%	6%	9%
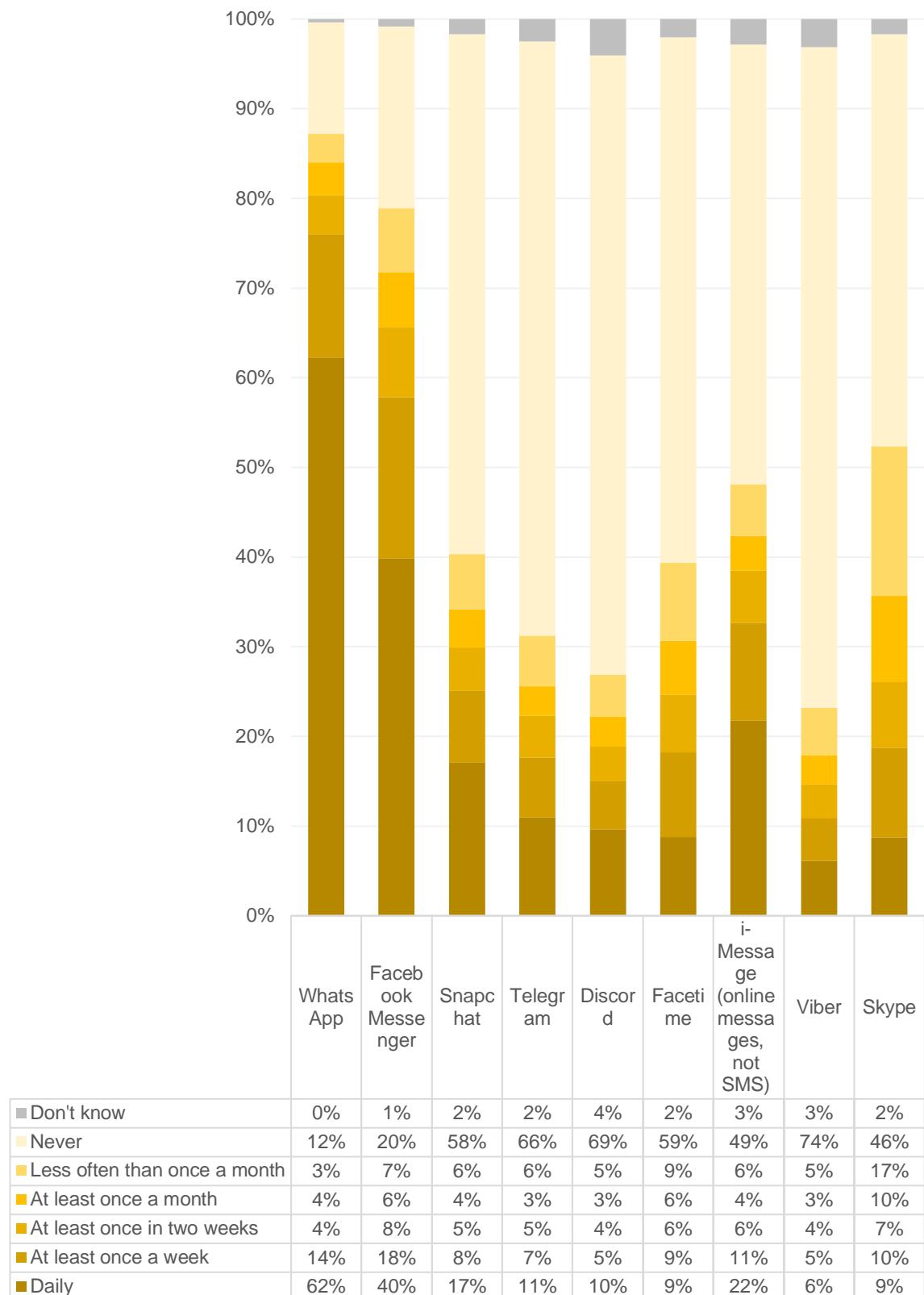
Figure 9. Q4: Frequency of use of at least one messenger app
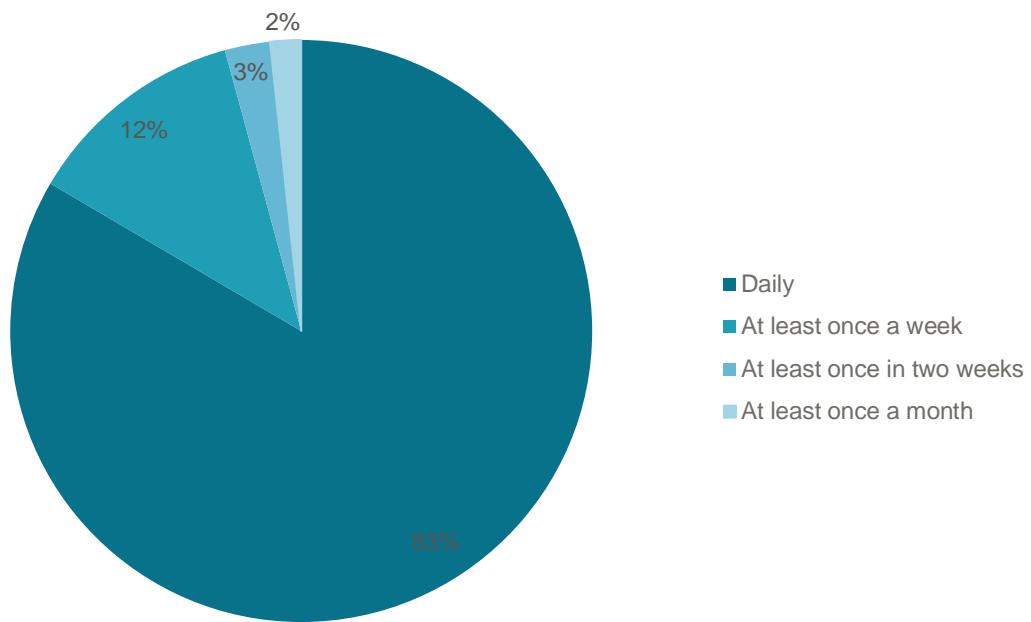
Figure 10. Q5: Over the past three months, how often would you say you used each of the following online websites or apps for personal purposes (i.e. not work-related)?

	Facebook (Social Network)	Youtube	Instagram	TikTok	Twitter	Pinterest	Tumblr	Reddit
Don't know	0%	0%	1%	1%	1%	2%	2%	2%
Never	15%	8%	34%	64%	53%	51%	79%	75%
Less often than once a month	4%	4%	4%	5%	7%	9%	5%	5%
At least once a month	3%	6%	4%	4%	4%	7%	3%	3%
At least once in two weeks	4%	8%	5%	4%	6%	7%	3%	3%
At least once a week	14%	25%	12%	8%	10%	12%	4%	5%
Daily	59%	47%	41%	13%	19%	12%	4%	5%
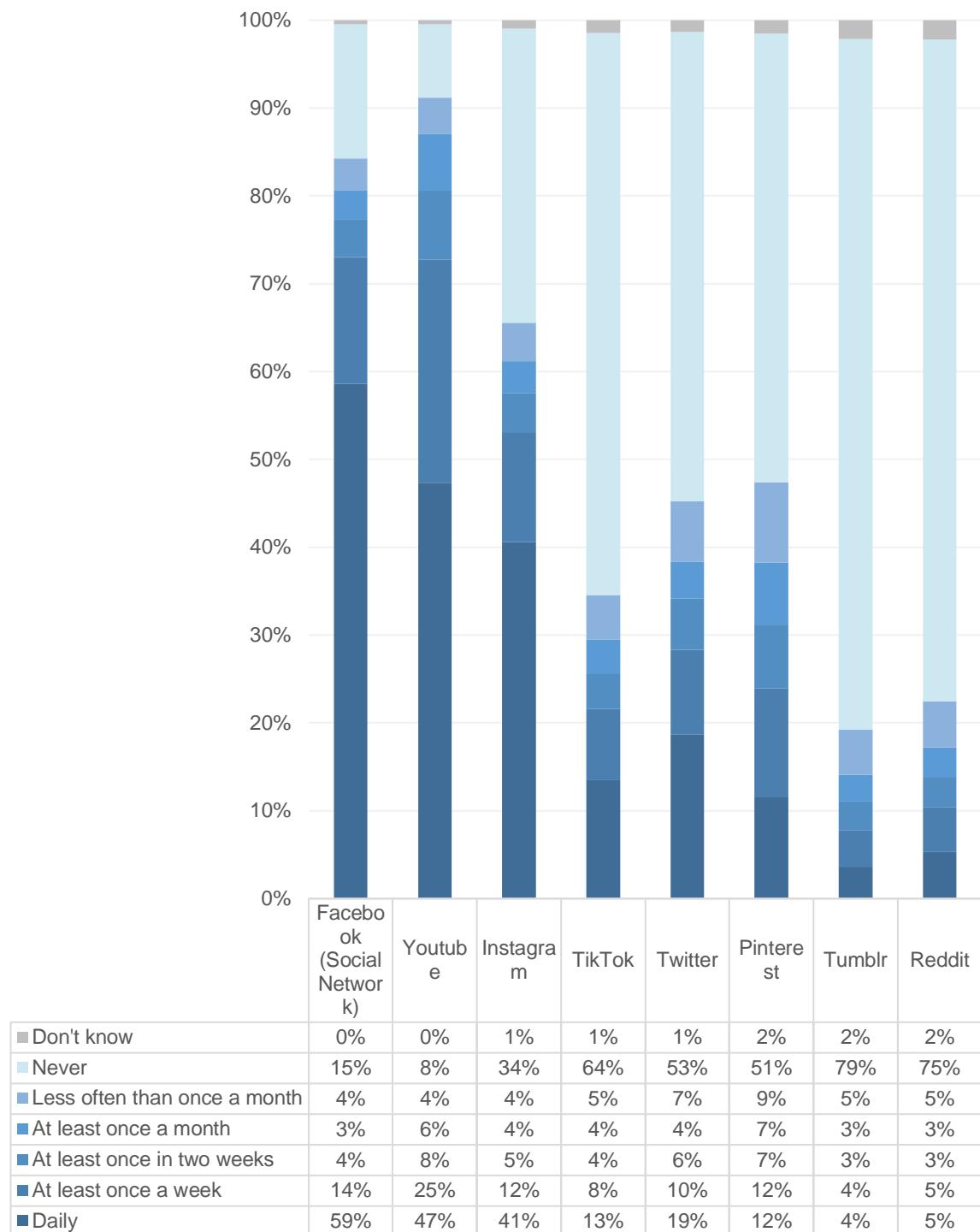
Figure 11. Q5: Frequency of use of at least one social media site
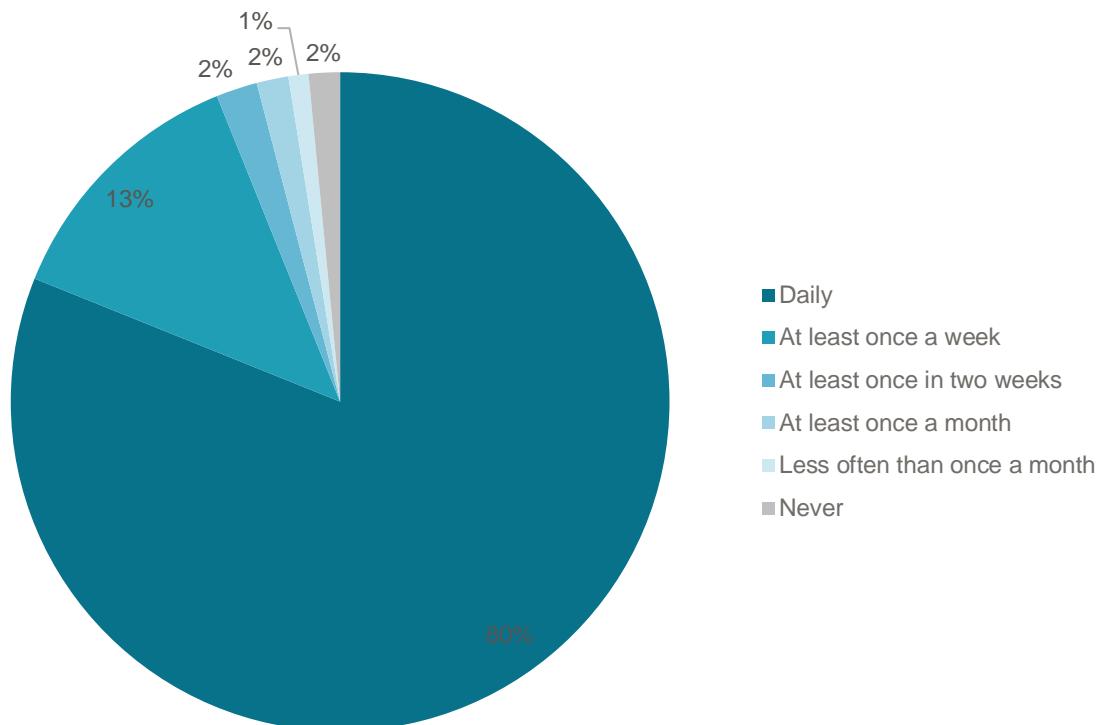
Figure 12. Q6: For what purposes do you use the selected apps?

	Whatsapp	Facebook Messenger	Snapchat	Telegram	Discord	FaceTime	i-Message (online messages, not SMS)	Viber	Skype
Personal messages or audio calls	68%	52%	17%	11%	9%	14%	26%	8%	18%
Group messages or audio calls	40%	22%	9%	8%	8%	7%	9%	4%	9%
Personal or group video calls	28%	16%	6%	4%	6%	10%	6%	4%	14%
Sending messages, files, videos or photos privately (e.g., in personal messages or group chats)	38%	25%	10%	7%	5%	5%	10%	4%	6%
Sharing messages, files, videos or photos publicly (e.g., posts visible to your friends, contacts, followers)	14%	13%	7%	4%	4%	3%	4%	2%	3%
Following the activities, updates, and posts of friends, family and/or other people	12%	12%	8%	4%	3%	2%	4%	1%	2%
Accessing information, selling or buying goods/ services and other purposes	3%	6%	2%	2%	1%	1%	2%	1%	1%
None of these	1%	3%	3%	3%	3%	3%	5%	2%	2%

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Figure 13. Q6: For what purposes do you use the selected social media sites?

	Facebook (Social Network)	YouTube	Instagram	TikTok	Twitter	Pinterest	Tumblr	Reddit
Personal messages or audio calls	38%	13%	27%	6%	10%	6%	4%	4%
Group messages or audio calls	18%	5%	11%	3%	5%	3%	3%	3%
Personal or group video calls	11%	5%	7%	3%	3%	3%	2%	2%
Sending messages, files, videos or photos privately (e.g., in personal messages or group chats)	26%	8%	20%	5%	8%	5%	3%	3%
Sharing messages, files, videos or photos publicly (e.g., posts visible to your friends, contacts, followers)	31%	14%	23%	7%	10%	6%	3%	3%
Following the activities, updates, and posts of friends, family and/or other people	38%	33%	30%	11%	16%	13%	3%	4%
Accessing information, selling or buying goods/ services and other purposes	16%	17%	7%	2%	5%	9%	1%	2%
None of these	3%	19%	2%	3%	3%	6%	2%	2%

Figure 14. Q7: Which means of communication do you prefer to contact your friends or family members?

Means of communication	Percentage
Other	1%
None of the above	1%
Viber	1%
Discord	3%
Telegram	3%
FaceTime	3%
i-Message (online messages, not SMS)	4%
Skype	4%
Email	6%
Snapchat	6%
Landline phone calls	8%
SMS or MMS (using SIM card, rather than an app)	13%
Mobile phone calls (using SIM card, rather than…	25%
Facebook Messenger	28%
WhatsApp	66%
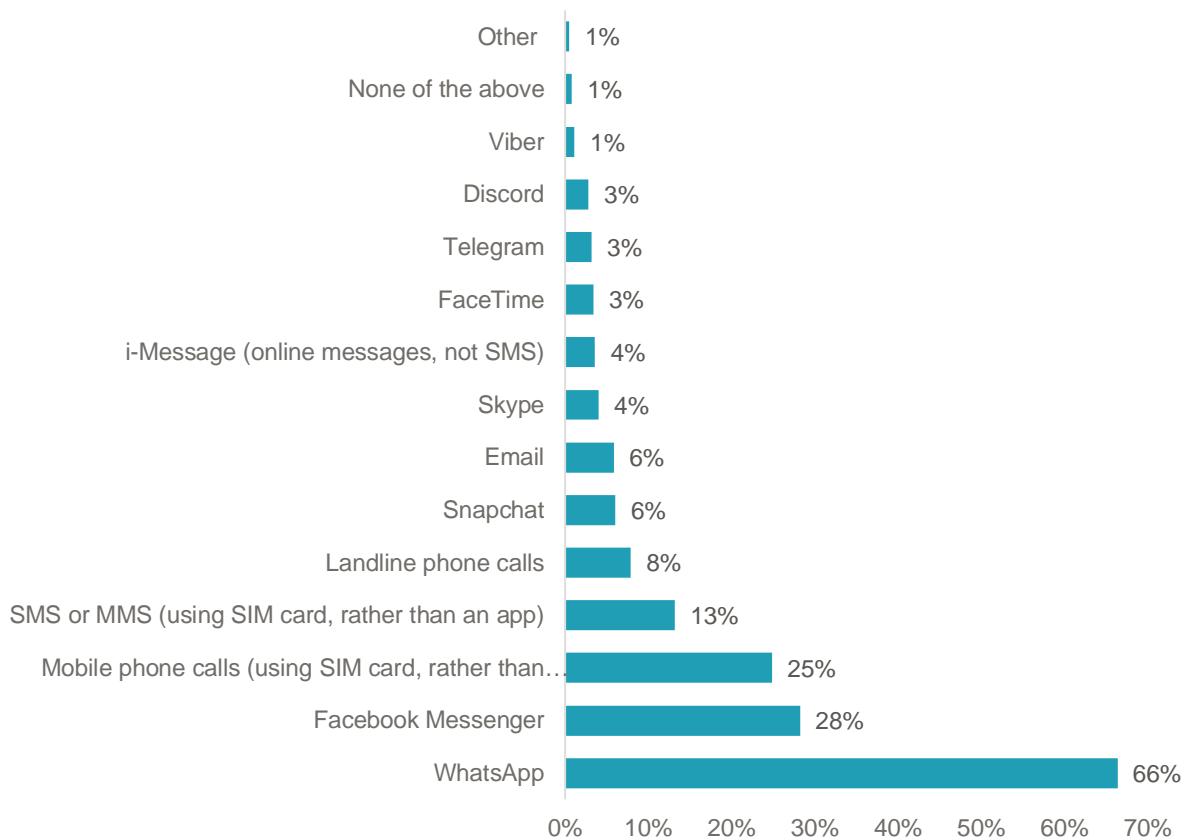
Figure 15. Q7: Word cloud for "other – please specify"

Figure 16. Q8: Which means of communication do you prefer when you need to contact someone urgently?
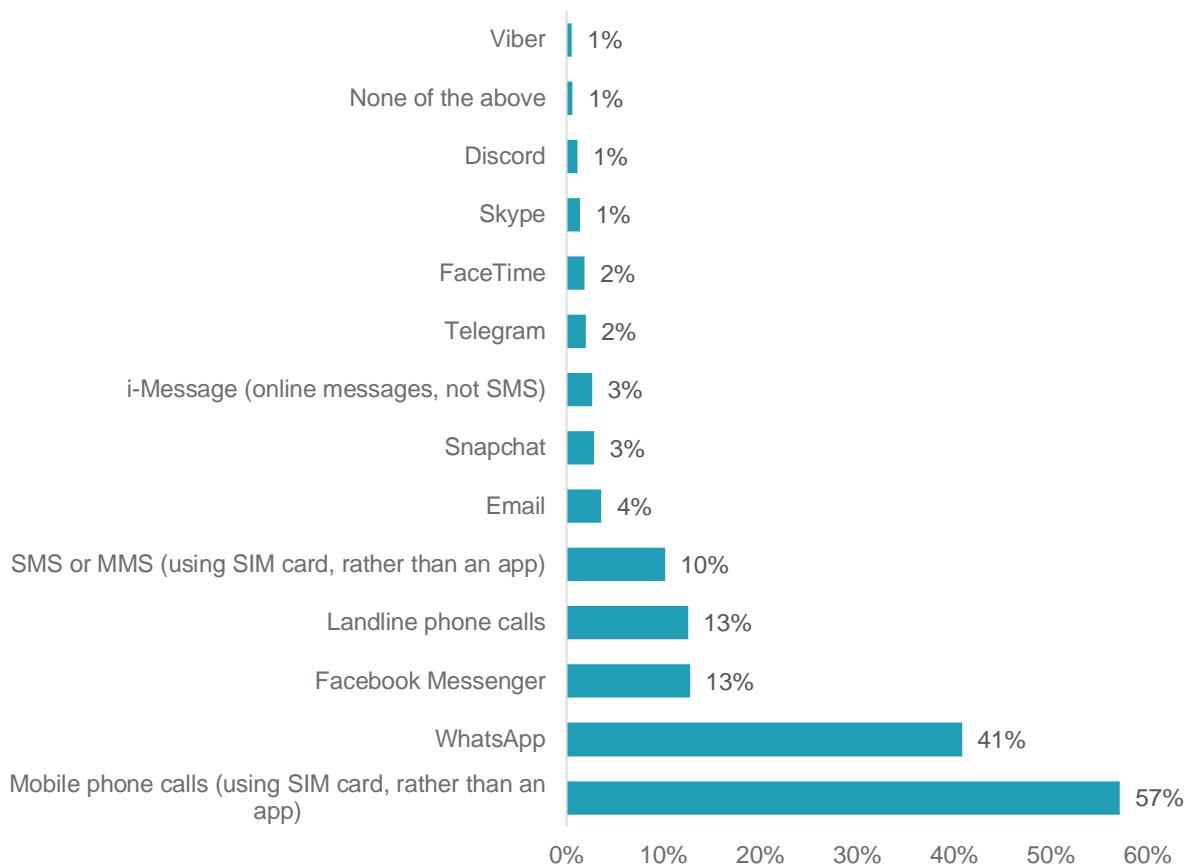
Figure 17. Q8: Word cloud for "other – please specify" (0.27% responses)

Figure 18. Q9: Which means of communication do you prefer when you wish your communication to be secure and encrypted?
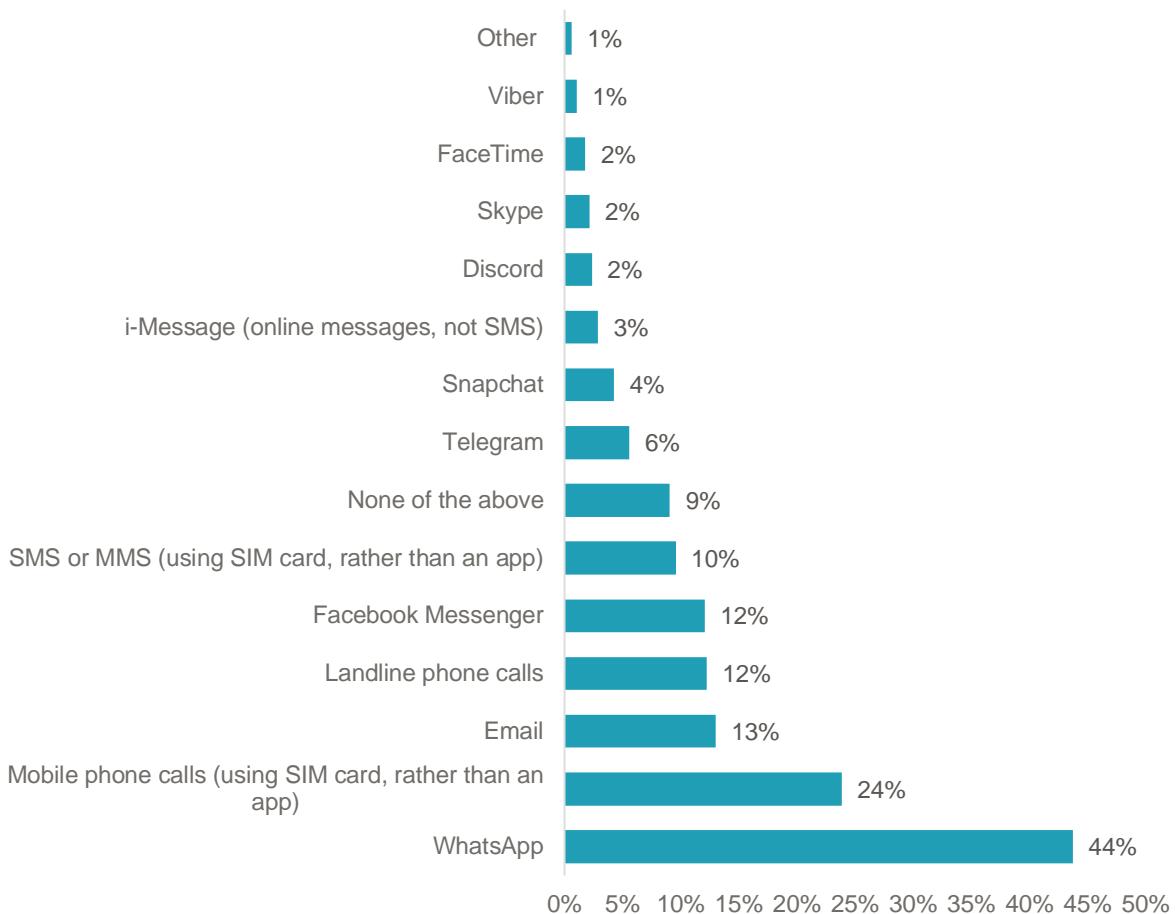
Figure 19. Q9: Word cloud for "other – please specify"

Figure 20. Q10: Which means of communication do you prefer to communicate with someone in another country?
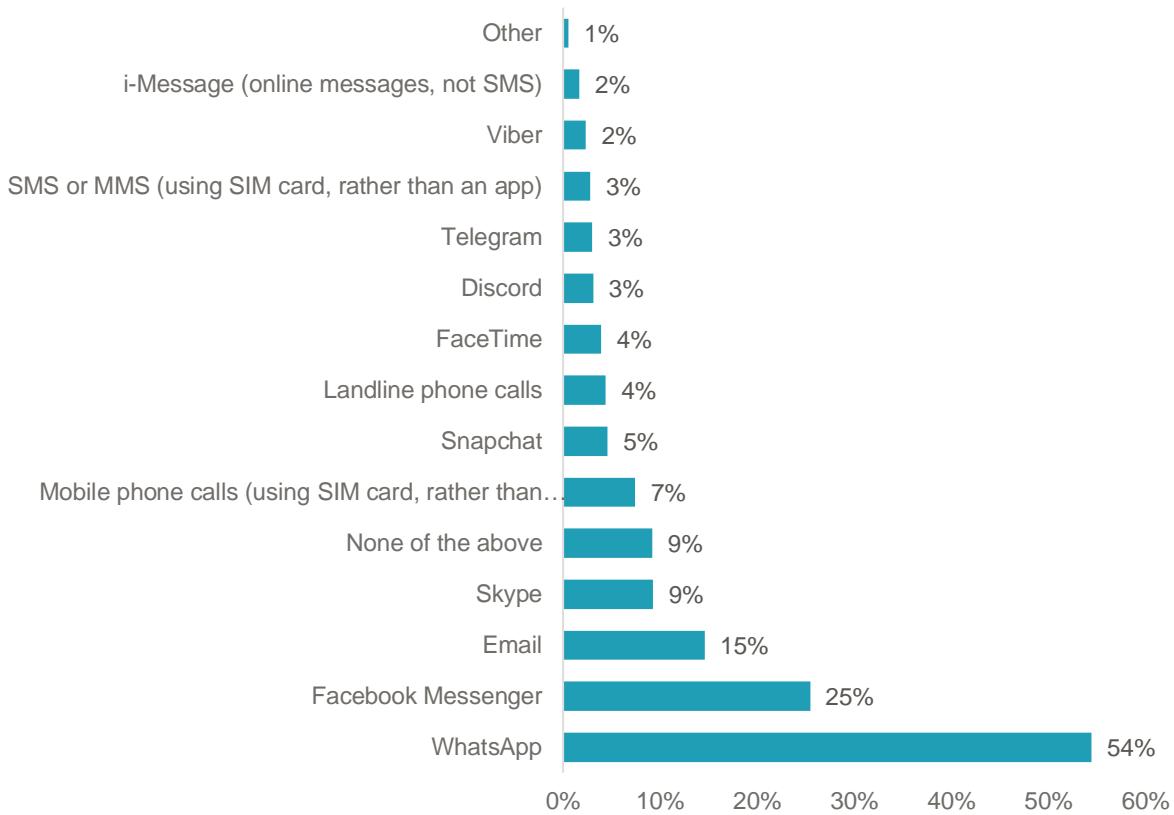
Figure 21. Q10: Word cloud for "other – please specify"
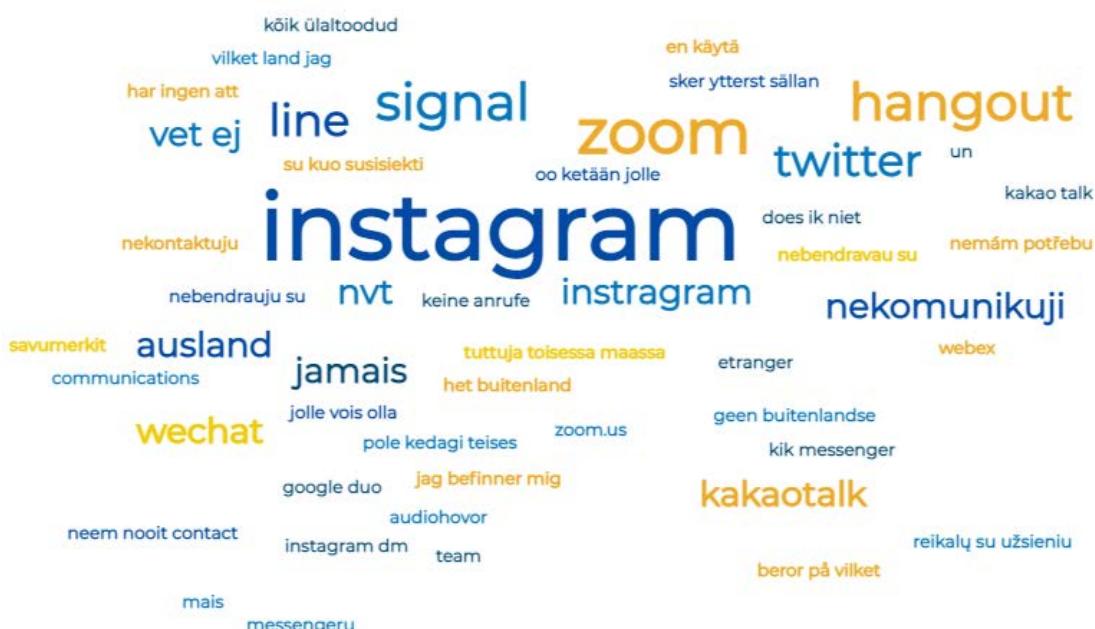
Figure 22. Q11: Over the past three months, which of these apps did you use most frequently?
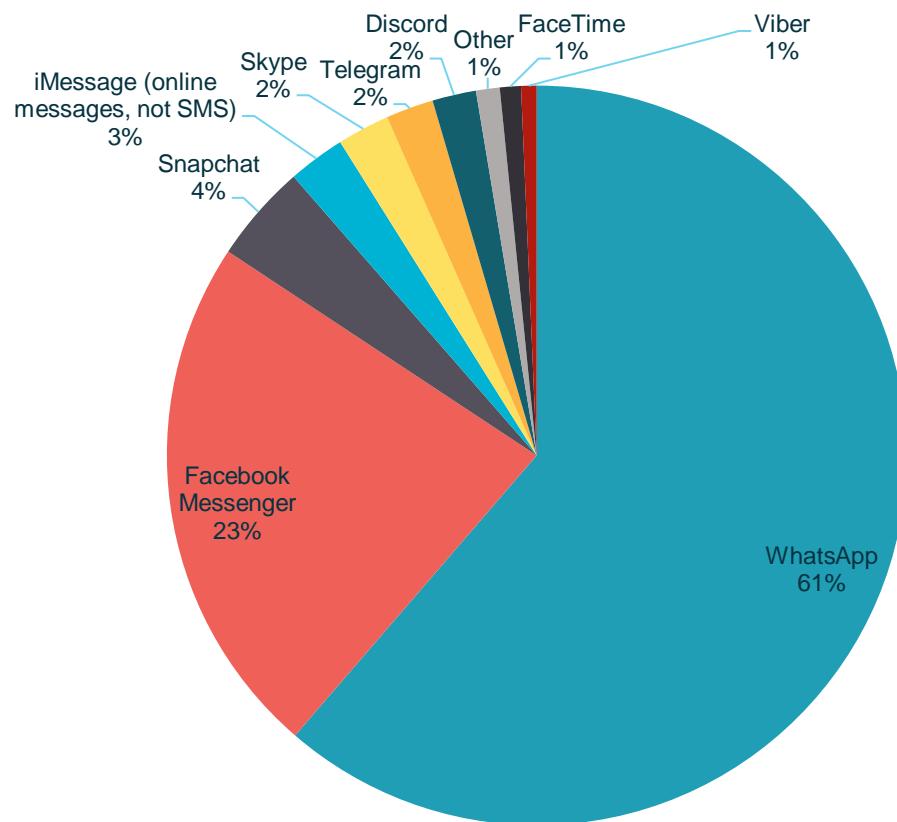
Figure 23. Q11: Word cloud for "other – please specify"
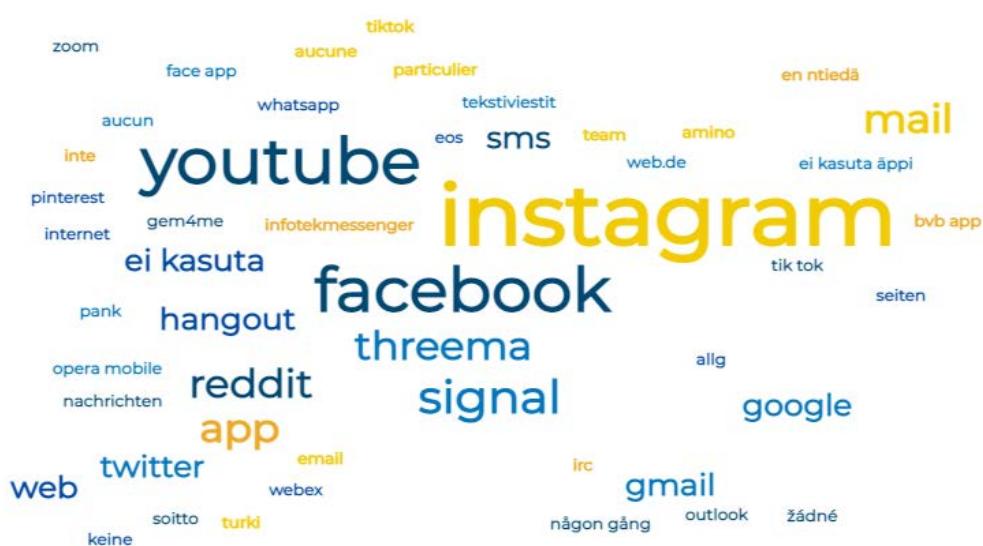
Figure 24. Q12: Over the past three months, which of these online websites did you use most frequently?
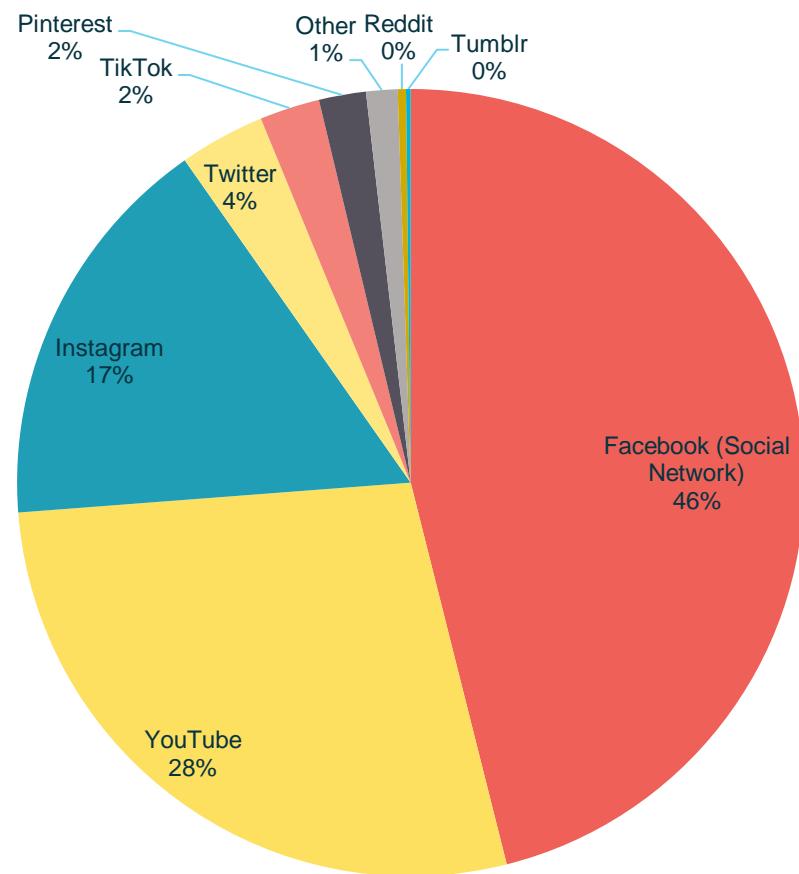
Figure 25. Q12: Word cloud for "other – please specify"

Figure 26. Q13: What are the key reasons why you use [main app]?

Reason	Percentage
Other	1%
It allows for content creation	5%
It has a visually attractive design	7%
It allows for self-expression	8%
It ensures high standards of data security/privacy	11%
It is entertaining to use	13%
It has useful functionalities	22%
It is used by family members and/or friends	57%
It is easy and convenient to use	58%
It is free to use	60%
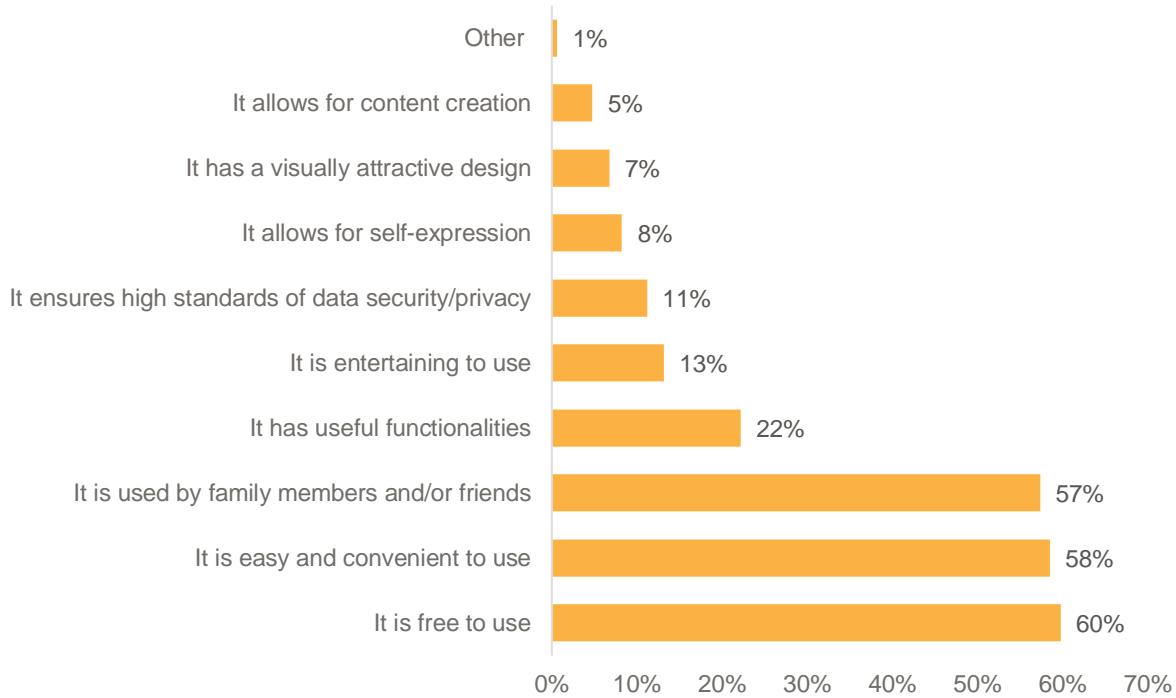
Figure 27. Q14: What are the key reasons why you use [main online website]?

Reason	Percentage
Other	1%
It ensures high standards of data security/privacy	5%
It has a visually attractive design	9%
It allows for self-expression	11%
It allows for content creation	13%
It has useful functionalities	16%
It has interesting content and information	28%
It is used by family members and/or friends	33%
It is entertaining to use	33%
It is easy and convenient to use	35%
It is free to use	46%

Figure 28. Q15: If [main app] suddenly stopped working, what kind of communication services would you use instead, in the short term?
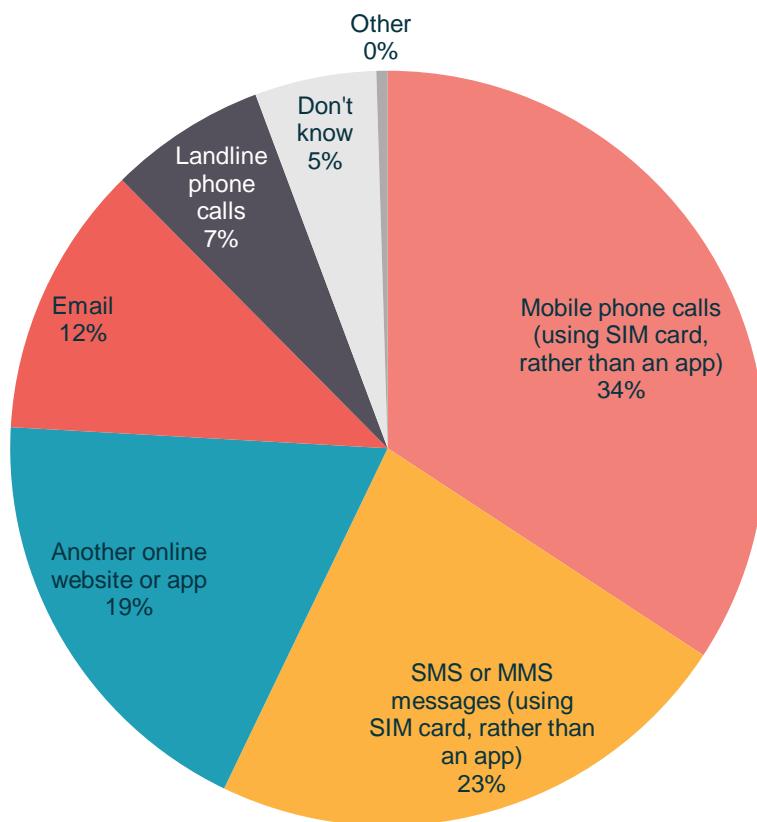
Figure 29. Q15: Word cloud for "other – please specify" (0.48% of individual responses)
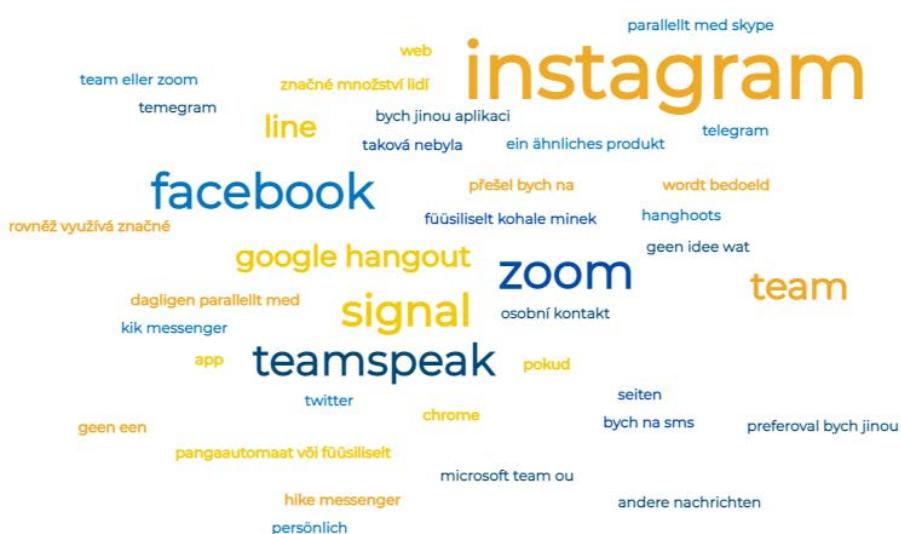
Figure 30. Q16: Which app would you use?
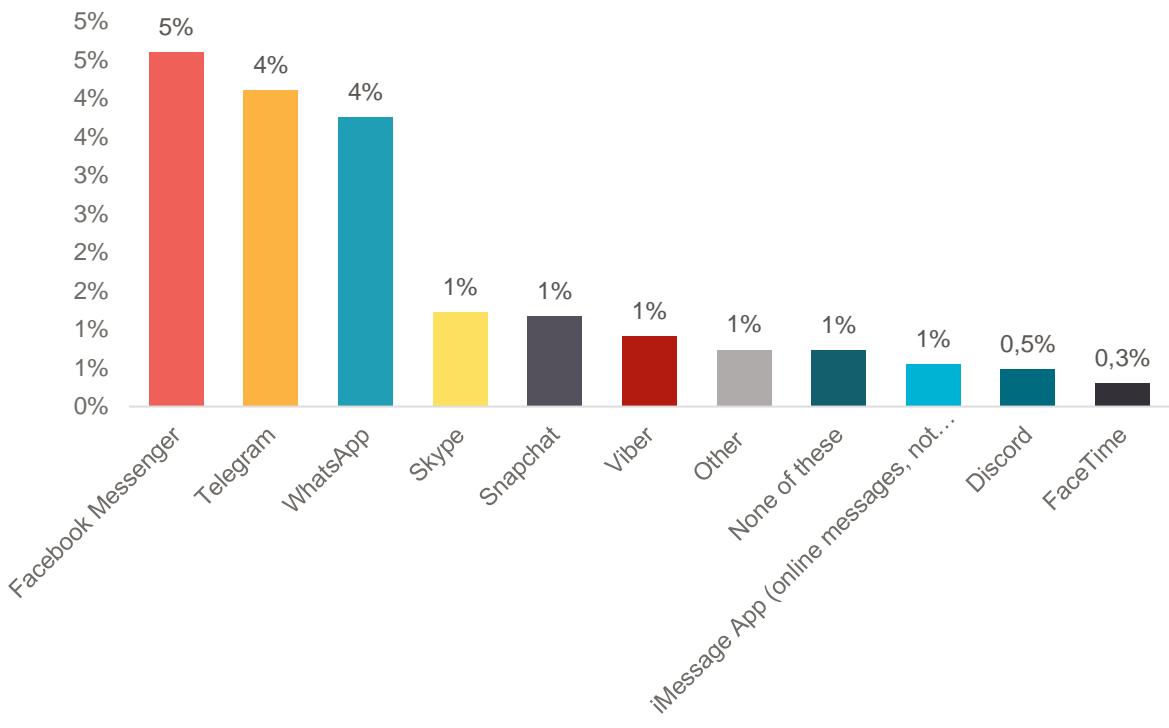
Figure 31. Q16: Word cloud for "other – please specify"
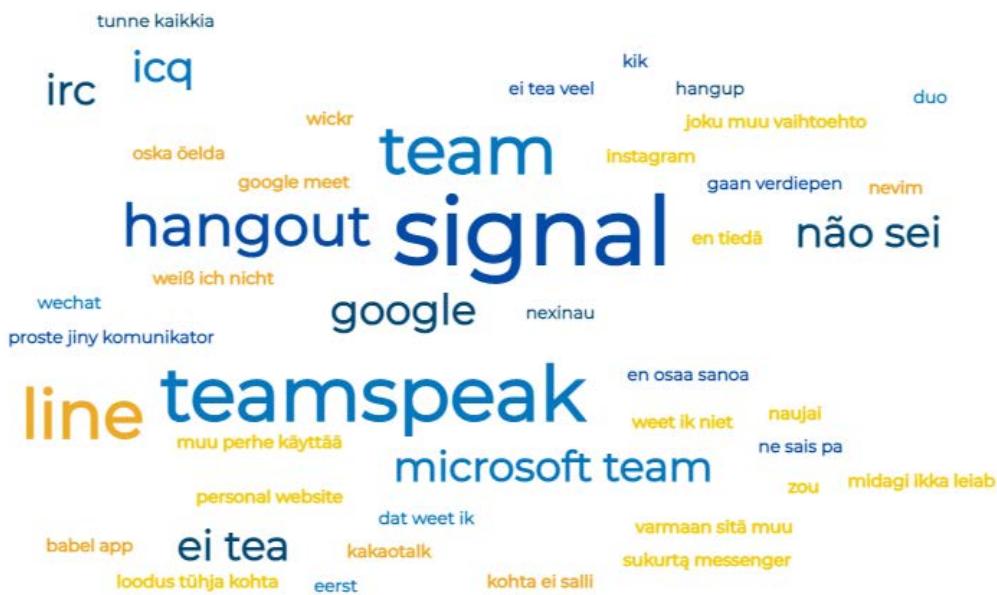
Figure 32. Q17: Imagine a situation in which [main app] stops working and is discontinued permanently. Which kind of communication services would you use instead, in the long term?
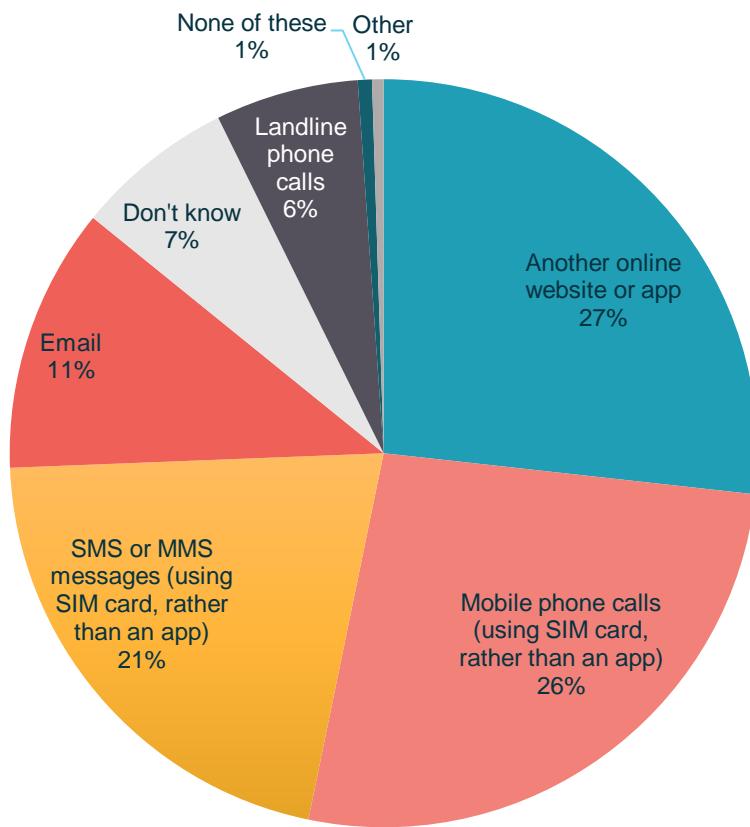
Figure 33. Q17: Word cloud for "other – please specify"

Figure 34. Q18: Which online website or app would you use?
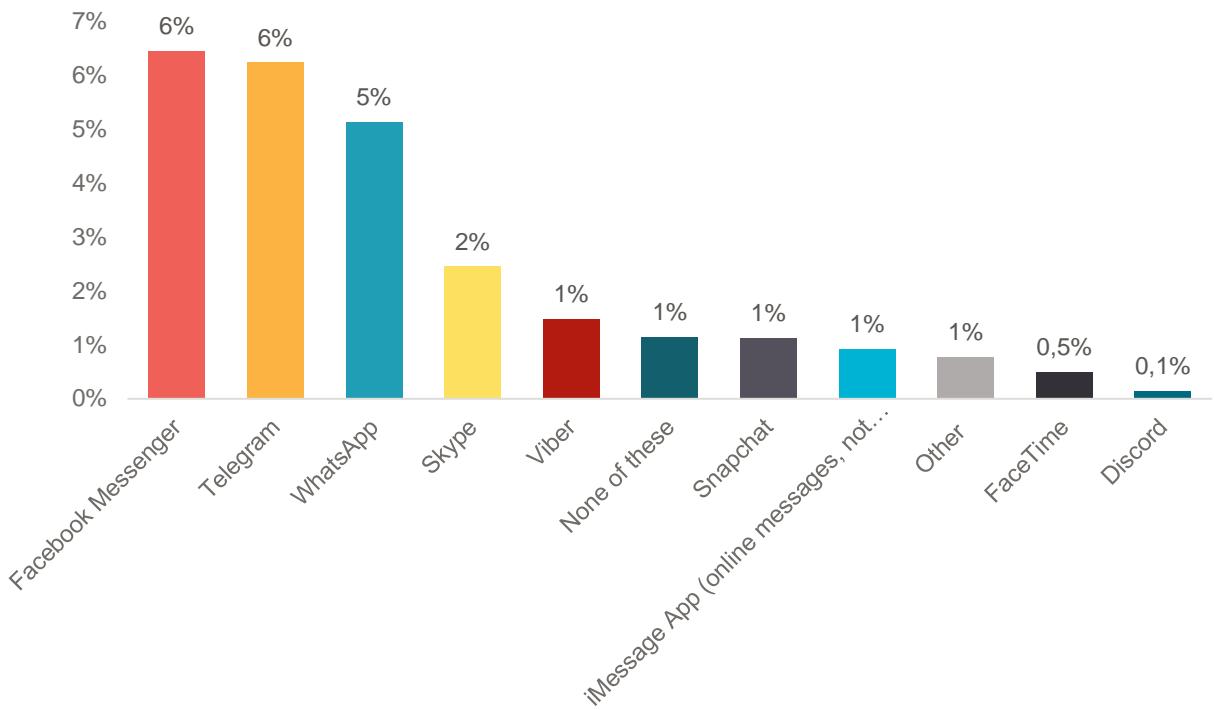
Figure 35. Q18: Word cloud for "other – please specify"

Figure 36. Q19: How frustrating, if at all, would you find such a situation, in which [main app] stops working and is discontinued permanently?
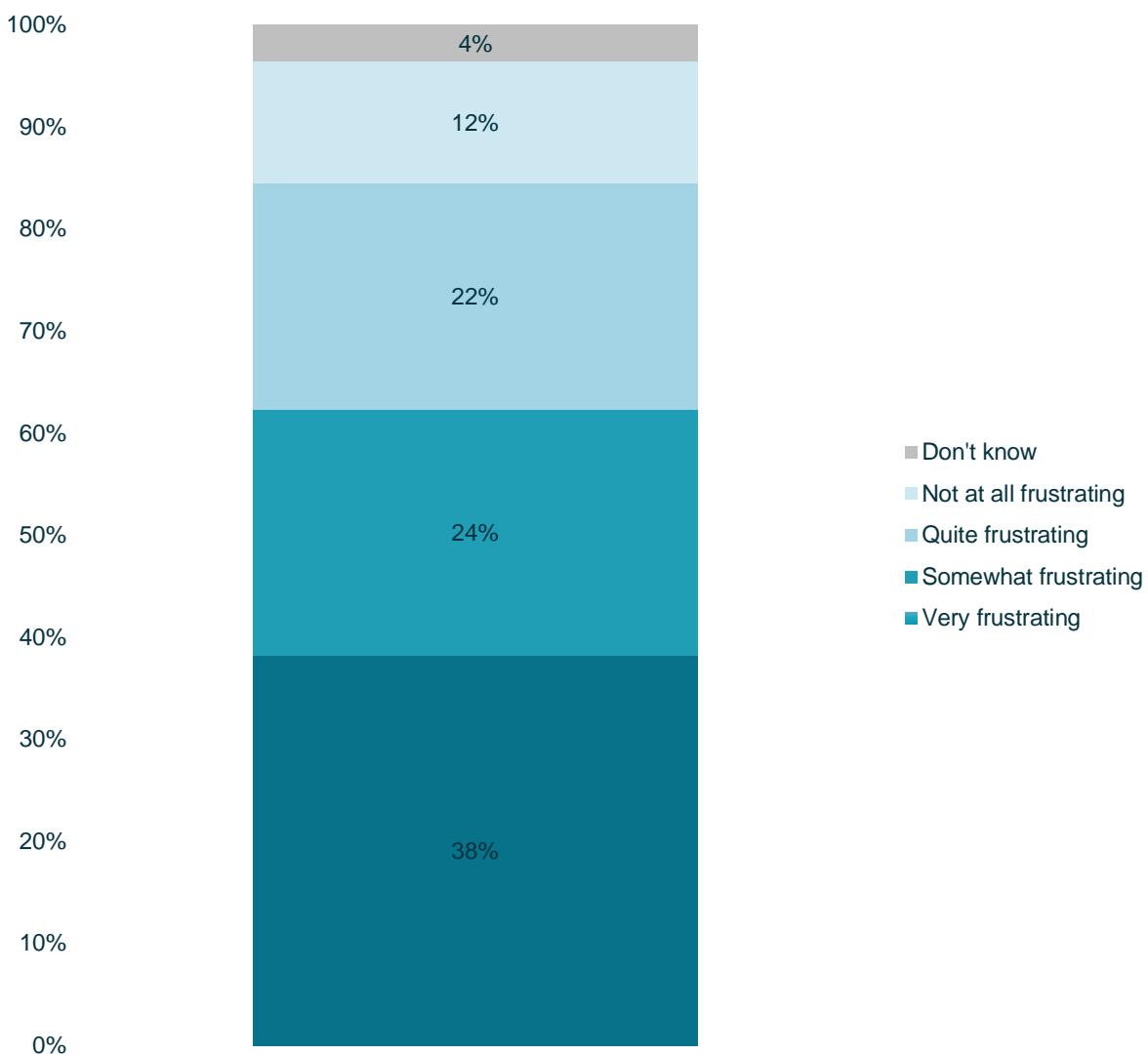
Figure 37. Q20: How would you evaluate the communication services provided by [main app] (the one chosen in question 11) on the following dimensions?
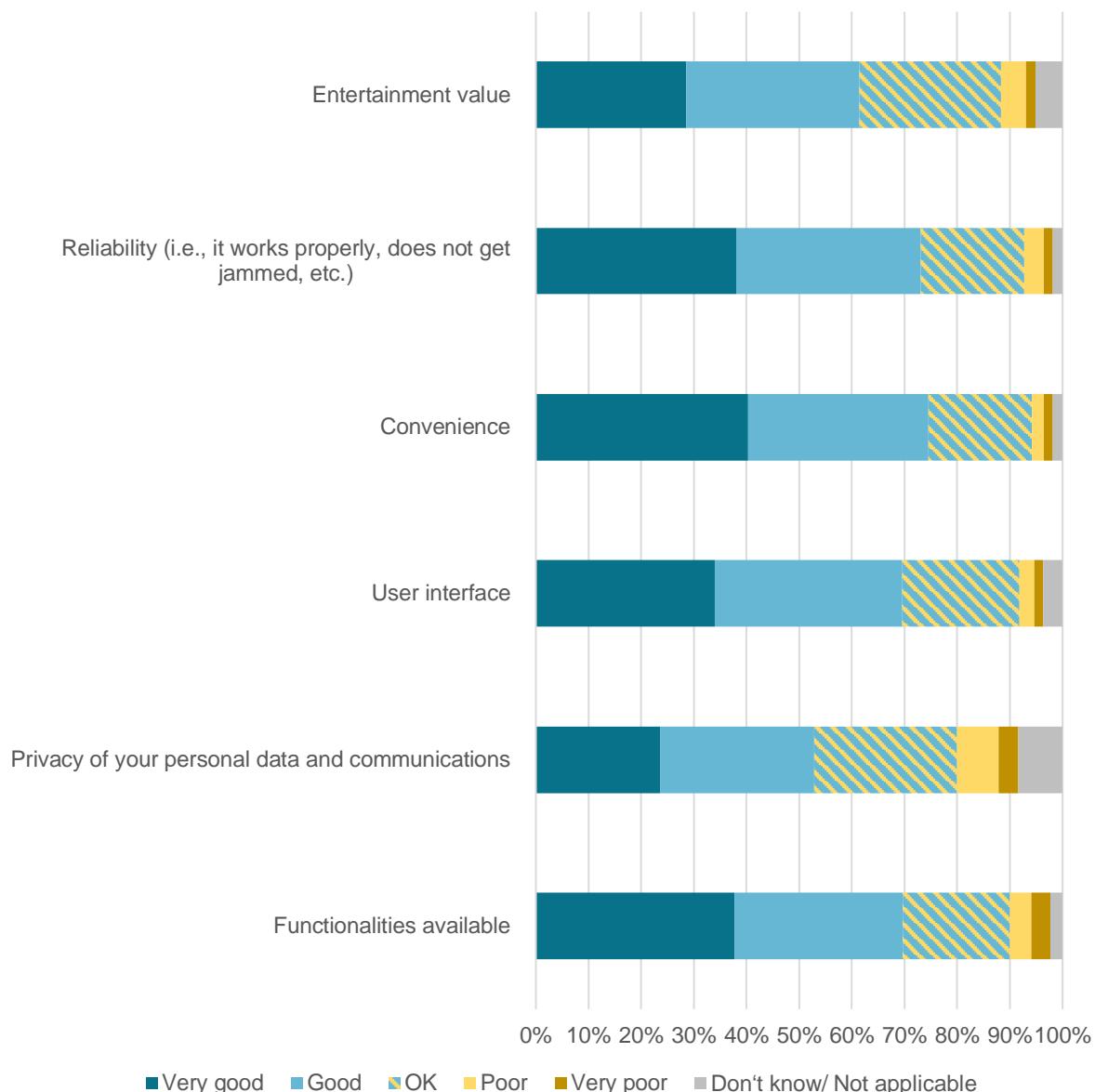
Figure 38. Q21: Over the past 12 months, have you changed the online website or messenger app which you use most often to communicate with friends or family?
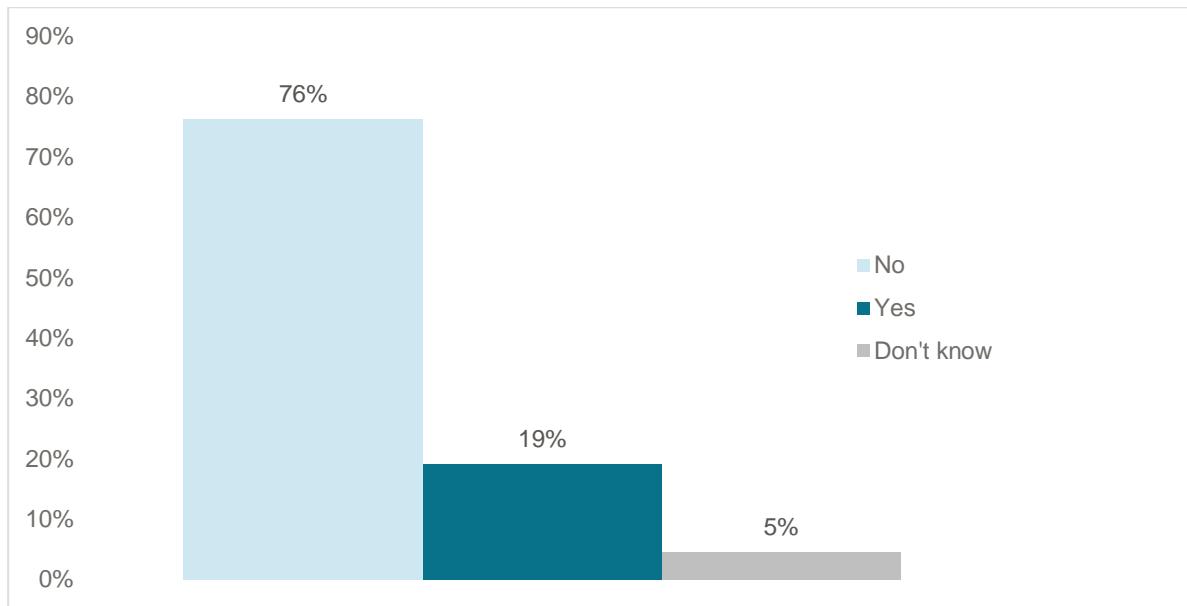
Figure 39. Q22: Over the past 12 months, would you say that your use of the following means of communication:
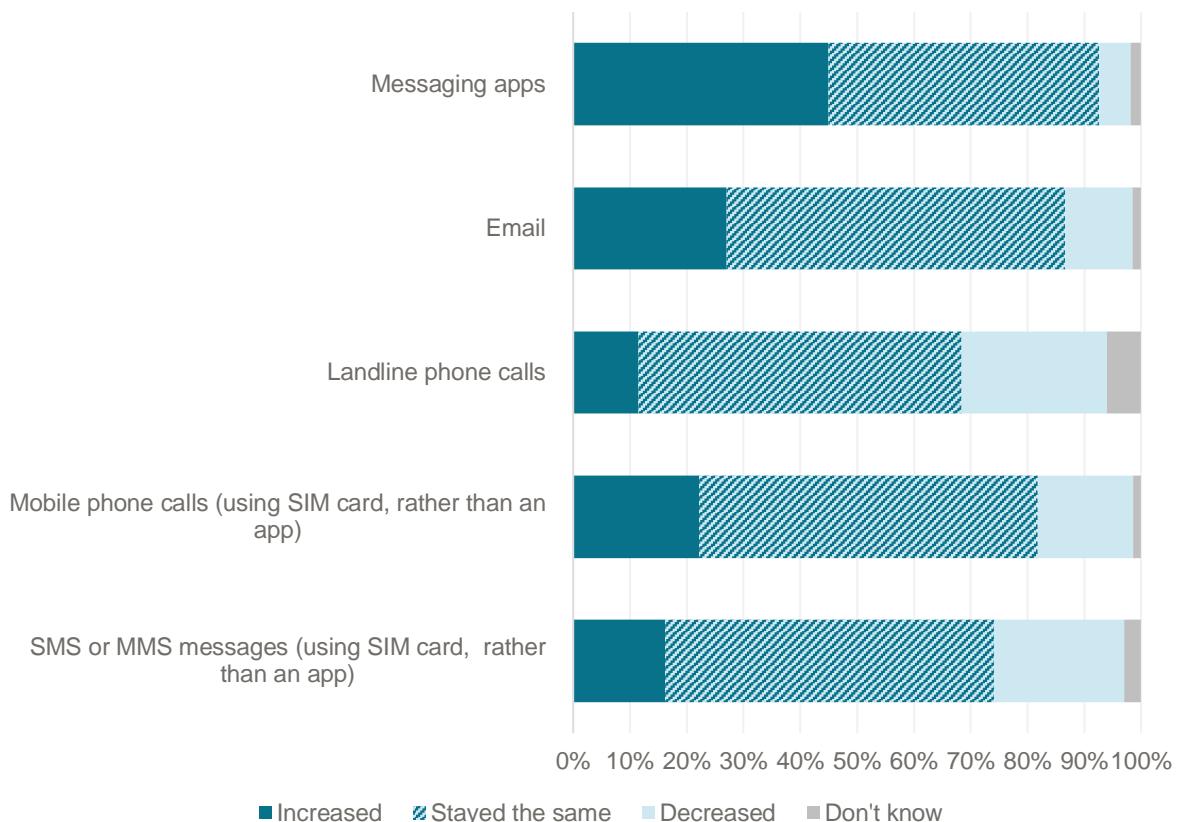
Please imagine a situation in which a new online website or app is launched. The online website or app allows you to make calls and exchange personal messages, photos and videos with your friends, family and the wider public?

Figure 40. Q23: What factors would be most important for you in deciding whether to start using it?
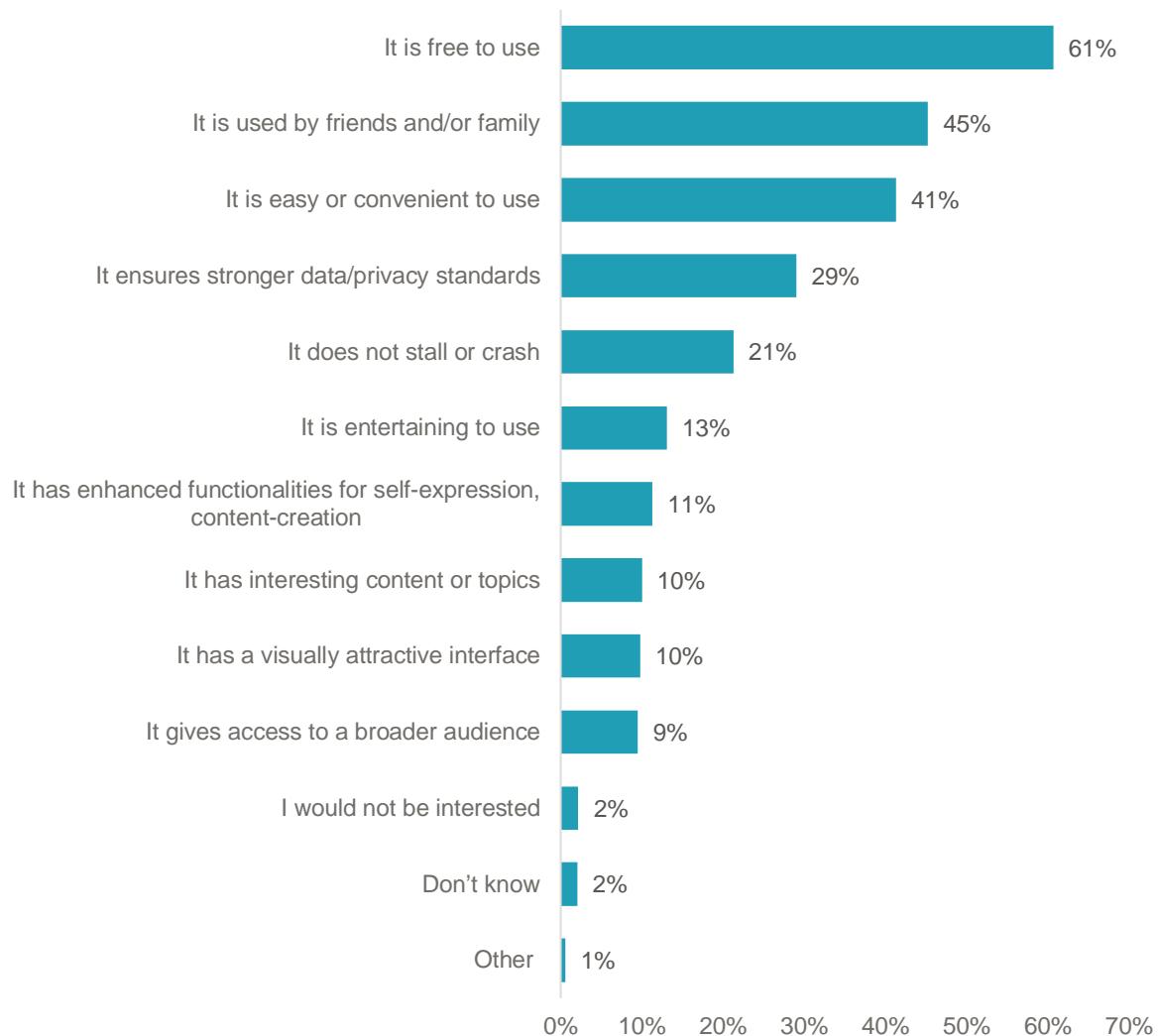
Figure 41. q24: To what extent do you agree or disagree with the following statements?

Legend:
- Strongly agree
- Agree
- Partly agree/ partly disagree
- Disagree
- Strongly disagree
- Don't know/ Not applicable
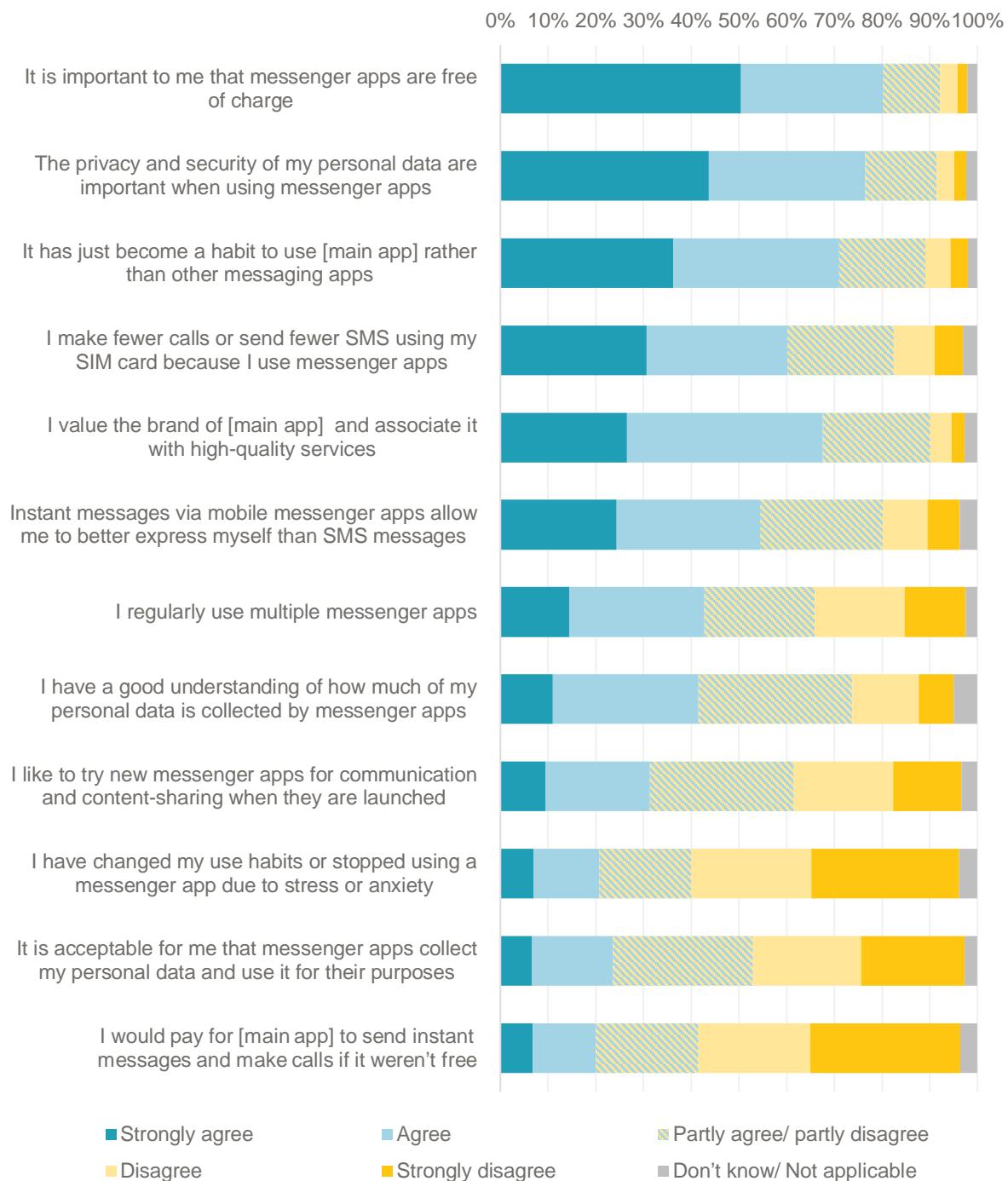
Figure 42. Q25: What is the highest level of education that you have achieved?
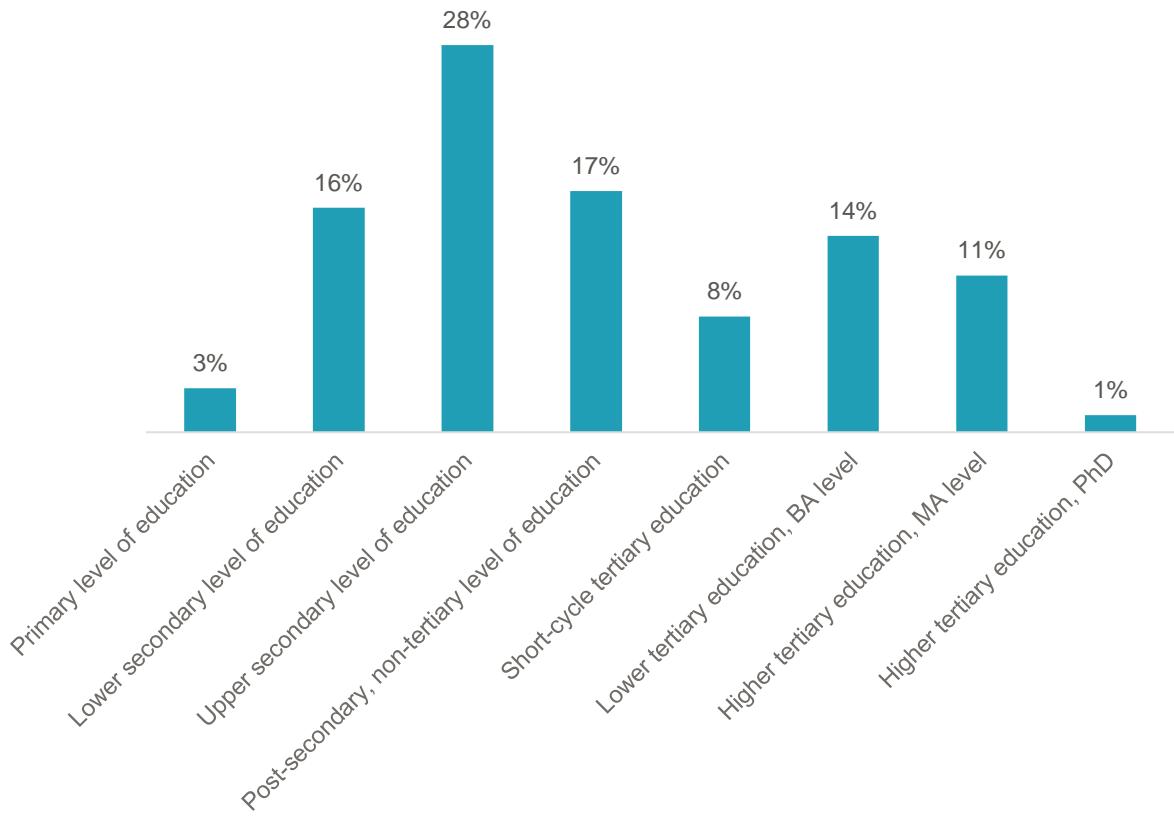
Figure 43. Q25: Distribution of education levels
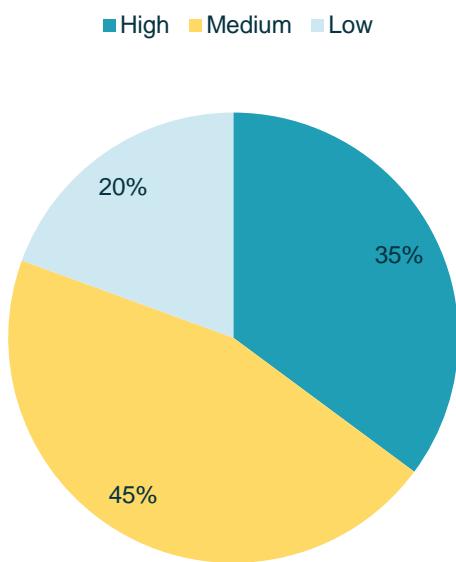
Figure 44. Q26: Which of the following best describes your current situation?
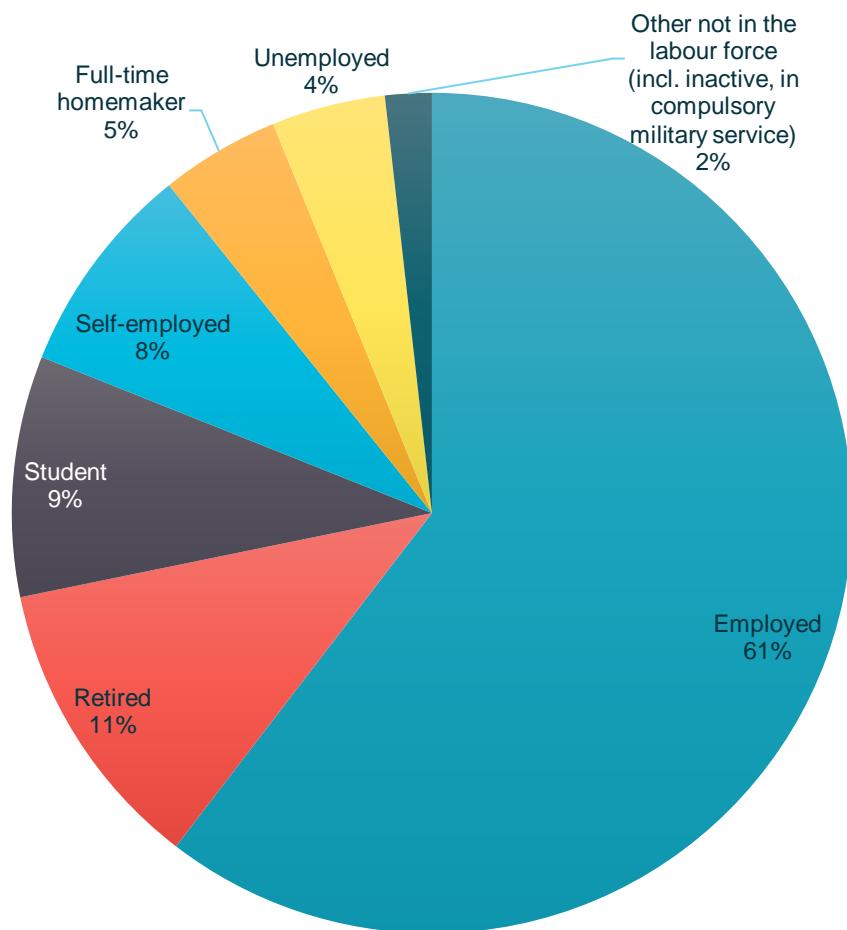
Figure 45. Q27: What is your usual personal monthly income after taxes?
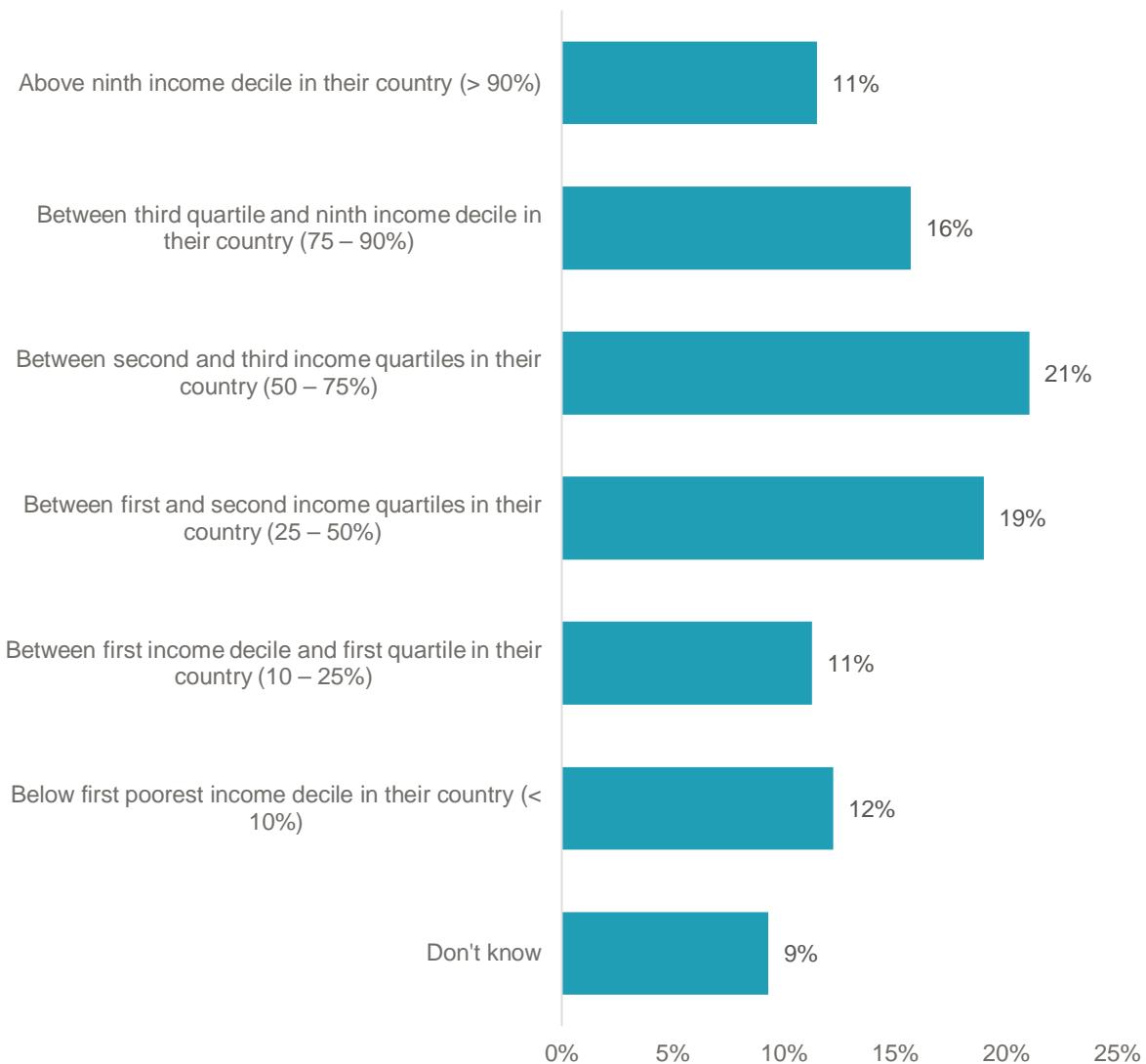
Figure 46. q28: Do you have close friends and/or family members who live in a different country from you?

Don't know
2%

Yes, most of my close
friends and family
members live in a
different country (-ies)
than me
16%

No, my close friends
and family members
live in the same
country as me
47%

Yes, some of my close
friends and/ or family
members live in a
different country (-ies)
than me
35%
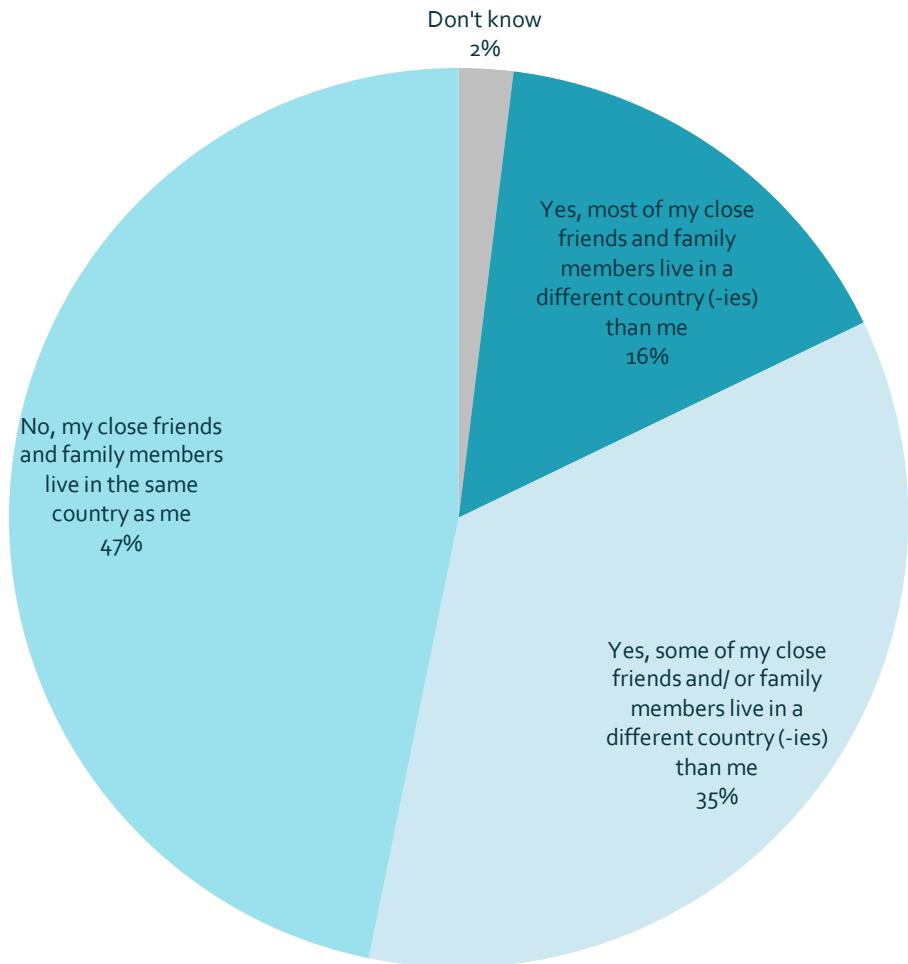
Annex 4. Focus group notes

Focus Group 1
Participants:

Code	Gender	Age	Education level	Country of origin	Country of Residence
[1]	Male	64	Post-secondary non-tertiary education	UK	Spain
[2]	Female	28	Master's or equivalent level	France	UK
[3]	Female	44	Master's or equivalent level	Lithuania	UK

Code for observations made by the note taker: [N]

1. How important, would you say, are the messenger apps in your daily life?

[1]: Uses apps for personal and business-related communication. Facebook is used for contacting grandchildren, Skype is no longer used, WhatsApp and messenger platforms are used most. These platforms do not carry additional costs, because you can use them with Wi-Fi.

- In business, communication is moving on to social media platforms and messaging platforms – WhatsApp is used more often than phone calls (*…)You get fewer responses with phone calls*(…) than when you contact clients through WhatsApp. They are looking into platforms for better business communication with clients – the best platform now would be WhatsApp.
- Facebook is the most widely used platform in the property world. Facebook video, sells better on Facebook. More than 60% of their business inquiries comes from Facebook.
- He uses Zoom as well. Working with people from different countries requires the use of such platforms as Zoom to easily access the world.

[2]: *"I really don't use Facebook"* (before Covid she did "*more of calendar thing"*, but only for events, to get ideas where to go out). I Use the Messenger app – *"a convenient way for not having to ask people for their number"* and to directly message them.

- Everyone uses data, therefore you can keep up with people especially if you have international connections and friends with whom you do not need to keep up to date using their phone number.
- Twitter is the medium she uses the most.
    - o This is the platform mostly used by researchers
    - o As a project admin and communications officer, everything she communicates is through Twitter
    - o *"(…) a tweet can travel really far."*
- Used Facebook for her previous job – *"felt really constrained (…) was not a good way to reach people"*. However, for social enquires Facebook could be good.
- For personal messages, she mostly uses Messenger and WhatsApp. She sometimes uses Twitter for personal messages, but not for her main communication.

[3]:
- She uses emails for work communication, or other *"special platforms"* that are used by clients**.**

- Facebook Messenger, WhatsApp and Skype are used to connect with family and friends. In general, she uses WhatsApp the most since it is the platform used by most of the people she needs to contact.
- She still likes Skype – she likes the big screen for talking, the fact that you need to be sitting in front of a computer rather than holding your phone in front of you is appealing to her.
- Messenger is used mainly for messages (she uses it the least out of all messaging platforms).
- Twitter – used to obtain information, since lots of institutions use Twitter for news and updates
- [N]: She does not like this because the information can reach you very late, she mentioned this quite a few times throughout the discussion
  - Children's school or extracurricular activities post updates on classes on Twitter– the notification reaches her after a couple of hours or even after a day. *"(…) it's not fit for the way it is used now"*

[2]: In response to what others said, she came to the conclusion that some platforms are better for reacting rather than communicating or engaging.
- For example, Instagram is used for reacting to someone else's post or activity; however, you would rarely start a conversation there. If she wants to catch up, she uses a platform such as Messenger.
- With friends, she uses so many platforms and is unsure which platform she should use to message them.
  - [N]: Notices that using so many different platforms sometimes gets confusing

[3]:
- She agrees with what was said, and says that in the morning when she wakes up there are *"too many platforms to check"* for notifications. She has to check e-mail, Twitter, WhatsApp and Messenger.
- Now some organisations upload some information on to Instagram even though they previously used Twitter. "I haven't seen it on Facebook and then they say, "Oh actually, we posted it on Instagram." She gets confused which platform to check for updates (she doesn't have an account for Instagram, but does think she might need to get one in the future. *"Is there an end to this?"* – She questions how many apps she will have to get in the future
  - [N]: She seems not to want to include another platform on her list; however, you can feel that planning to get an Instagram account is seen as something inevitable – as more companies move to the platform, she knows that there will be no option other than to join Instagram. Also, the respondent appears overwhelmed by the number of platforms

[2]:
- New platforms emerge every day and usually people are against more new platforms. [2] Downloaded Snapchat *"to please friends, and never used it",* and subsequently deleted it. With TikTok it was the same; she has the app because she saw how popular it started to become, but she doesn't go on it often. The TikTok platform seems more suitable for the younger generation. She observes that the young generation adapts instantly to newly developed apps. It does not take them long to become familiar with the interface (if the interface is easy to use), they start using it instantly.

[1]: He notices that Instagram is not good for business, because the audience on the platform is too young for his real estate business. Buying real estate is not of interest to the people on Instagram. The same goes for Twitter and TikTok.

- Instagram is good for popularising your business events because you can target a specific geographic location; it was useful for their road shows.
- TikTok is used by his grandchildren to send lip-sync videos, and thus he uses it only for personal purposes.
- *"I don't even touch Twitter for the moment."*

[N]: general notes:

- All the participants were using apps for both personal and business purposes, agreeing they are of utmost importance in their daily life.
- The most widely used app for communication was WhatsApp, followed by Messenger. In terms of platforms: Facebook and Twitter.
- Participants mentioned some platforms (Twitter, Instagram) that they might use in the future, even though they don't need it now.

2.   Why do you use the specific apps that you use, and not others?

[1]:

- He questions how many apps he can use before it becomes ineffective?
- Therefore, he expresses a preference for **proactive** platforms that deliver messages to him: *"(…) where I get notifications rather than like in TikTok and Twitter, where I have to go and look for it, interrogate (…)"*.
- Twitter is too slow with sending a proactive message, and he also thinks he's too old for TikTok.

[2]:

- For her, Messenger allows direct messages without needing to see the newsfeed. On other apps, you need to go through the newsfeed and *"all these distractions before you reach the inbox"*.
- Gmail is sometimes better to use for communication. When one of her friends wanted to communicate through email, at first she thought it was odd; however liked it in the end because it was a more pleasant experience than communicating through Snapchat and other apps (which are meant for more visual communication and require users to take photos), *"for text messages, you don't want all of these distractions."*

[3]: Uses Skype, WhatsApp and Messenger for reasons such as their development. Skype came on to the market first, and was the only way to communicate –she therefore learned how to use it, and has stayed with it since.

- She prefers WhatsApp to Messenger, and she would like not to even use the latter. WhatsApp is easier for her. However, she uses Messenger to contact specific people who prefer Messenger.
- She explained why she does not use more platforms: *"for the moment [the platforms I use] satisfy me. I had to start using Twitter more because some companies I need to hear news from are using it".* She thinks she will need to get Instagram in a few months, as some

companies might start using it to post updates and she will need to follow them. But downloading Instagram will happen *"purely because of necessity, not because of choice"*.

[N]: On this topic, all the respondents seemed overwhelmed by the number of platforms they used, and how many more are being developed. They are not surprised by the fact they need to adapt and use new platforms, but they do not seem happy about it.

3.   Do the different apps have different purposes for you?

[1]:
- They don't serve different purposes.
- Aside from TikTok, which is only used for family. All other apps are used for both business and personal use. He tries to keep his business Facebook profile separate from his personal Facebook profile.
    - Communicating through texts on WhatsApp means people are less pressured. They first need to accept you, and then it is easier to sell something through text messages than via a phone call. It also makes it easier to include images or videos when communicating.

[2]: Apps serve multiple purposes for her:
- Finding inspiration and new content.
    - For work, she uses apps to find content, to share, and to find new institutions that can be involved in projects.
    - For her graphic design studies, she uses Instagram for inspiration *"As a way to look for visuals"*.
- Communication purpose: she used direct communication even during the pandemic.
- Apps used to have a bigger impact on her social life. She might be convinced to go to events because her friends have clicked 'Interested' on Facebook, thus she is also inclined to go there.

[3]: Mostly uses it to communicate with friends and family.
- More and more, she now uses WhatsApp when she has issues with a product. Rather than calling the company, she has started to reach out to companies through WhatsApp, finding it more effective for contacting airlines, shops. *"A new thing for me, and at the moment I am very happy with it"*.

[2]: Agreed that she used Twitter messages for the same purpose. Direct messaging for airline companies. 90% of the time an answer is usually more satisfactory through such platforms.

[3]: Facebook sometimes yields too many complaints, she thinks maybe then she should use Twitter.

[1]: He also uses LinkedIn for networking. To find buyers and for complaints, he can also use LinkedIn to directly message a CEO.

[2]: *"They call it [LinkedIn] the new Facebook".* The newsfeed is very similar to Facebook, and posts are becoming more and more personal and inspirational.

[1]: Via LinkedIn, you can market product and reach out to specific professional groups (medics, for examples).

[N]: general notes:
- Apps serve communication purposes for everyone.
- Apps can also be useful for inspiration, filing complaints and acting as a liaison for reaching some companies/people.
- Apps are also used in people's professional lives in various ways (finding clients, marketing, communicating with partners/colleagues).

4. What are the worst aspects of messenger apps?

[1]:
- *"Gives anybody accessibility to you."*
  - Fake accounts, clients are also sometimes not nice and can attack you even though there are no problems.
- Getting messages during the night via WhatsApp – *"everybody thinks they own you (…) and everybody thinks you have to respond immediately"*
- *"It can get quite emotive on some of the messaging platforms"*

[2]: So many notifications *"can quickly get a bit overwhelming".* You don't want to read all the messages, however not opening notifications is nagging. Muting is not a solution, because you can still see them come up in your inbox.

[1]: When you get offers, you get WhatsApp messages. All the replies also come as notifications. Messaging can wipe out a lot of your daily activities.

[2]: Three years ago, needed WhatsApp to contact a person and can still can see those old messages – doesn't need that history.

[3]:
- One company deleted old information that she was looking for on their Twitter. She was upset that she could not find older messages.
- In reply to [1]: she often does message or email during the night, and hopes these people just answer when they are available.
- A negative side: too much information that is often the same. A lot of messages are shocking. Usually they are short messages, but this could become a problem if the messages are longer.

[1]: Messages means losing effectiveness, because you are constantly distracted (*"you cannot resist that ping ping"*). A useful feature on apps would be to schedule messages, preparing them in advance and sending them all at once. *"(…) because messages rely on curiosity (…), it does break your flow (…). You can always block people".*

[3]: She sometimes can't resist looking at messages. She had to change her phone and her previous information could not be retrieved – on WhatsApp, the data was not saved to the cloud, so it was all lost. This is a negative aspect, as apps are not reliable way to keep your information. She is now more careful and saves things on an external drive.

[1]: *You cannot add an emotion to a message* (an emoji is not enough). He regrets some of his messages and the way he responds. He says he would be very wealthy if had a pound for every message he regretted sending.

[2]: in response to [1]: that is why people use audio/video messages more often. *"I don't use them for professional activities",* but for marketing and brands that sell through social media. Immediacy is important, and *"you can add more warmth to your message"*. The message becomes less dry.

[1]: Very few people use WhatsApp for business.

[3]: Audio messages are becoming more popular. Audio messages can save time.

[2]: She notices an age gap there: her sister only communicates through audio messages with her friends. *"I would use it sometimes when I have something complex to explain".*

[N]: Negative aspects:
- You become too accessible to everybody at any time of the day
- The notifications distract you and affect your productivity – it seems everyone is annoyed by the number of notifications.
- Information is not saved, or for some users the information on their phone is too old
- Messages can lack emotion and you cannot express yourself properly

5. **What about mobile phone (using SIM card)? In what circumstances would you rather use a mobile phone than a messenger app, and vice versa?**

[1]:
- He would never use phone messages. "*Cannot remember the last time I sent a text message*". WhatsApp and Messenger are used for texting.
- I make many phone calls – however, calling someone also happens over WhatsApp or Messenger.
- *"My phone bills are nothing these days"* because he only needs data to contact people, as opposed to phone calls and messages as well. He always checks if his clients use WhatsApp after getting their number.

[2]:
- *"90% of my texts are from companies."*
- Uses them once in a while, since some friends do not use WhatsApp; however, *"it's really rare"*. She puts GBP 15 on her account and it lasts for months.
- She calls her parents. She sometimes wants to talk to them on Skype or Zoom; however, for that she needs to inform them in advance to be online. Thus, she would much rather call them on the landline as they will be around.
- She says that her use of phone calls has reduced over time.

[3]: Uses traditional communication much less.
- School clubs or the school itself post information on Twitter or other social media platforms. The notifications reach her very late and she then wonders: "Why don't they use traditional SMS", since it would reach her faster.

- Apps are complicated for her when travelling (no Wi-Fi, no data). Messaging or phone calls are quicker for contacting people, since getting online takes longer when travelling.
- Traditional means are becoming less popular, but there are situations in which they are more convenient.

[N]: She expressed a bit of frustration that some people/companies prefer social media for contacting people as opposed to traditional means of communication.

6. How do you feel about regular messages and phone calls? Compared to messenger apps, what are the best and worst things about using a SIM card to send messages or make calls?

Why do you prefer digital platforms to traditional means of communication?

[1]:
- The fact that you can share videos and photos as if you were using a computer.
- Also, the biggest factor is cost.
- Apps are cheaper to use, he does not have a landline at home but he has Wi-Fi. It is just cheaper for him. Most of his contacts use apps.

[2]:
- WhatsApp is better for sending a picture or a video *"It's dead easy"* compared with a text (you have a size limit). Her grandma still sends pics via text –it's hard to save them, quality is reduced. Apps are much easier, more convenient.
- In terms of travelling – data used to be very expensive; however, buying a SIM card is now so expensive. *"(…) you can just take your internet connection (…) and WhatsApp someone"*. Before sending a message to family in another country was so expensive and now apps make it easier to connect.

[3]: Wants to see a face when she is calling. She also notes that when you are messaging, you want to add videos, photos, and an emoji, which makes app more convenient for communicating.

[1]: Apps are useful for business profiling. WhatsApp has a profile pic – easier to get to know a client (their age group), you can get their hobbies and interests from Facebook.

[N]: general notes:
- The participants barely use traditional means of communication any more, and agree that digital platforms have replaced them.
- All expressed a preference for change, and noted that digital platforms are more convenient to use in most cases.
    a. Only three cases were mentioned in which traditional communication serves better: 1) contact with parents who do not use platforms often; 2) when travelling; 3) to obtain immediate news and updates
- Cost of communication was the main factor considered – how expensive traditional communication is compared with having data to use apps, as well as how expensive it is to communicate internationally.
- Convenience was also one of the main factors in the preference for apps. Platforms have allowed participants to share images and videos more conveniently, to connect globally without additional hurdles (such as acquiring a SIM card), and to understand the person who

is behind the screen or phone number (seeing a face when calling and having a profile pic to check was listed as an important factor in connecting).

7. **How do you approach the data privacy rules before downloading a new app? How aware do you generally feel about how your data is collected and used, and for what purposes?**

[1]:
- His privacy practice depends on the company's practice. They do update after their information technology group agrees; however, he needs approval due to the nature of their business.
- In terms of the data collected for his personal use, "far *more data is collected than anybody has any idea about. (…) It is a downside; however, what can you do about it? (…) I am quite relaxed about it"*. He avoids spam, has never been scammed.
- If you stick to the rules, your security is ensured (password policy)
- *"Perhaps I should worry more about it."*

[2]: *"You cannot download an app if you don't accept the terms and conditions anyway."*
- For her, the conditions are a bit worrying.- She never really knows what she is getting herself into.
- It is the only way to communicate, and you have to *"blindly accept it"*.
- By applying basic principles, you can avoid security breaches.
- WhatsApp might use your data, and even Google might use your confidential information. Even if you have GDPR in place, you are still not sure what is used.
- *"You never really know how your data is used."*
- *"You just have to use WhatsApp (…) You know it's worrying(…) but if you start thinking about it, you couldn't use anything"*
- Even owning a smartphone could be dangerous to your data protection.

[3]:
- "I cannot control it at the moment". Using an app means accepting data collection.
- *"I am not too worried. It is mostly used by the companies for their needs, I fear in the future that when we search we will get results based on our profiles (…) It's not happening now."*
- She confessed she is suspicious of Amazon after [1] mentioned that it already collects data and gives you results based on it.
    - Noticed how Amazon gives out your data to marketing companies, and has now switched to eBay

[2]:
- Even chatting with your friends can lead to targeted ads: "*You know your phone is listening to you"*

[3]:
- She told a story about how she met a random person and talked with him (she did not know his name or have any contacts of his and he did know her). Then, when she opened Facebook, he appeared as a friend suggestion*. "It might have been a coincidence."*

- Another explanation she offered was that companies tracked their phone locations and noted their proximity.

8.   How do you generally feel (concerned or calm) about the amount of data collected about you?

[1]:
- Not concerned.
- They don't have information that is sensitive such as his banking details. Data collection benefits his business's marketing, so he does not mind. "*It's life (…) (they) invested in this technology*"

[2]:
- From an ethical point of view, it's wrong.
- There is nothing you can do besides not using any platforms. *"You just have to (…) accept it."*
- It's unfair that Amazon has access to this data, because they have enough money already.
- It's unfair also because you would have to pay extra for more privacy and security. She notes all this unfairness, but in the end says: *"You just have to ride along (…) and you can't spent too much time mulling over it."*
- She cannot sign out of platforms, because then she could not work. The solution is not to worry too much.

[3]:
- It's not a nuisance to her yet
- When they come up with something else to do with the data, she might worry –especially if they use it in a negative way: *"I do not worry at the moment."*

[N]: General notes:
- Everyone expressed uncertainty as to their knowledge regarding how much data is collected and how that data is used. However, not all of the participants appeared aware of the extent of data collection, and thought client profiling was not a present-day phenomenon – demonstrating a lack of knowledge regarding data collection and privacy.
- No one offered a solution to ensuring data protection, and the general feeling of the participants could be summarised as being the inevitability of data collection.
- They do fear for the future of data collection; however, at present there is little worry among the participants.

9.   If the messenger app were suddenly not free, how much would you be willing to pay to continue using it?

[1]: Hopes that there could be a corporate licence if the app became paid. He would be willing to pay EUR 7-8.

[3]: If WhatsApp introduced a fee, everyone would move to another platform.

[2]: She thinks people would move to a different platform.
- A hoax went around that WhatsApp would become paid, and everyone was panicking.

- There are alternatives that are as good, so you could switch to those if, say, WhatsApp became paid. She lists Telegram as an example.
- She said she would be willing to pay EUR 3 but not much more, probably because her business doesn't depend on it. Also, her choice would depend on whether her clients moved to another platform or not.

[3]: *"I could pay as much as needed (…) as long as it was used by someone who I badly need to talk to."* However, once everyone moves she said she would look for an alternative and no longer pay.

10. <u>What features would apps need to have in order that you would be willing to pay for them?</u>

[1]:
- He does not think there are any additional features that he would pay for, aside from batching up messages. But apps pretty much deliver *"everything I want"*.
- Facebook succeeds due to the feature of allowing to message groups. His business spends around a million per year on Facebook, due to the success of marketing on Facebook. He would not add many apps, since it would involve learning the interface again.
- I had to learn to use Zoom because it is *"the future",* but it took three weeks.

[3]: She is sure that new features will come up soon but cannot think of any at the moment.

[2]: Cannot think of anything she would pay for.
- The app Teams is too overwhelming, WhatsApp should not develop further (*"I like that it is simple").* Developers might still come up with something that you do not yet know you need.

[1]: Trialling a new auto-responding feature because of a lot of enquiries his business gets. Not a fan, but the volume of enquiries requires it.

[3]: Interested in the use of artificial intelligence to delete unnecessary messages or group them; However, *"I am not sure I would be ready to pay for that"*.

[2]: She would enjoy getting reminders on WhatsApp. It could be helpful to have this feature on the same app, without having to download a new one designed specifically for that purpose – but she would not pay for such a feature

[N]: General notes:
- The cost people are willing to pay is dependent on who is using the paid-for platform. The participants would choose a free alternative as long as their contacts moved to another platform
- There is a lack of willingness to pay for increased privacy or a reduced number of ads. All the participants have come to terms with data collection, and do not express any concerns for now.
- They all agreed that apps have all the necessary features for now, and that they would not pay for any additional ones.

<u>MOST IMPORTANT ASPECT OF TODAY'S SESSION:</u>

[1]: Said it was nice to hear similar views.

[2]: Said it was interesting to see a different way of using things due to various activities and demographics, but in the end it's all really similar.

[3]: Likes to hear different views and opinions.

Focus Group 2

Code	Gender	Age	Education level	Country of origin	Country of residence
[1]	Male	32	Master's or equivalent level	Bolivia	Germany
[2]	Female	25	Master's or equivalent level	Lithuania	Lithuania
[3]	Female	27	Bachelor's or equivalent level	Lithuania	Lithuania
[4]	Male	27	Master's or equivalent level	Lithuania	Lithuania
[5]	Female	26	Master's or equivalent level	Lithuania	Germany
[6]	Female	28	Master's or equivalent level	Romanian	Belgium
[7]	Female	29	Master's or equivalent level	Croatia	Denmark
[8]	Female	26	Master's or equivalent level	Italy	Italy

Code for observations made by the note taker: [N]

1. **In recent years, how did your usage of messenger apps change? (e.g., in terms of which apps you used, for what purposes you d them, , though which devices, what you used as your main app, etc.?**

- **Can you indicate these changes, covering the period of the last three years?**

[1]: Uses the same apps as he did three years ago (WhatsApp, Facebook, Instagram). The only change is that he started using the video function more, the reason being the start of the pandemic, when he started to use this function to speak to family or friends. He finds WhatsApp better than Skype for that.

[6]: *There have been a few changes, the constants have been Messenger and Facebook, of course.* Still uses messenger, but over the years started to use WhatsApp more. Also started to use Twitter for work (to follow people [authors] that she is interested in); started using LinkedIn more as well.

[3]: Was a fan of Skype a few years ago, but stopped using it. This year she started using Slack, Google Hangouts, Zoom. Has used Messenger for many years and it remains her main messenger app.

[5]: Moving from one country to another made her change her communication habits often. In 2018 shifted from Skype to Zoom for business and work, both she and other people prefer platforms that do not have a 40 minute limit.
- In academia, sharing documents switched from Google Drive to Teams.
- She has become a recent user of Twitter, which she uses to find professional connections.
- Facebook and Instagram – *the time I spend on them has decreased significantly because of more duties arising elsewhere*.

[2]: Moving meant my usage changed, depending on which platform was most widely used in the country. She adjusts according to where she lives. Thus, she uses Messenger when in Lithuania; when she was in Holland she switched to WhatsApp.

[8]: A few years ago, mostly used Facebook and YouTube, but not any more. Uses Instagram, Twitter and LinkedIn more (for finding professional connections).

- Uses Skype for personal communication (as well as using WhatsApp, Messenger a lot). Some friends are still attached to Skype, so she uses it to video call them.
- She notes that her habits tend to serve all of these *small bubbles of friends* depending on which platforms they prefer.
- Overall, the communication platforms haven't evolved that much for her.

[4]: He uses Messenger the most, since 2009 he has been *in quite a monogamous relationship* with it. WhatsApp – occasionally, for *short-term communications*. He started using Discord from time to time during the pandemic because he began engaging in online gaming, and therefore needed Discord as it is the *go-to communication platform for that*.

- He said he hated Instagram; however, he likes the fact that on the platform you can communicate with more people who you don't know that well (e.g. influencers, musicians) – *a unique form of communication.*
- [N]: the participant often expressed negative views towards Instagram throughout the discussion, but also it became clear that he uses the platform quite often for content and communication. This presented an interesting relationship with a platform on which he acknowledges and dislikes the fact that the platforms affect his psychology, requires time, but he nevertheless cannot stop using it.

[7]: Her usage of communication apps is based on closeness to people. Messenger is used for friends/acquaintances; WhatsApp for communicating with family; Hangout/Zoom, for professional purposes. LinkedIn is not used for communication; ResearchGate – sometimes, but she notes that the communication is not *intensive, everyday communication*.

- Recently, to contact her friend in Saudi Arabia, she started using Botim, a completely different platform, because people there use it and it provides a better connection.

[5]: The country context also matters: people in Ukraine mostly use Telegram, and she uses the platform only to communicate with people from there. She used WeChat when spending a semester in China, since other European platforms are censored.

- LinkedIn – she had a Premium account and used it actively (every day for 2-3 hours) when she was looking for a job; once she got a job she decreased her use to once a month. Thus, her use of LinkedIn is dependent on her employment situation.
- Communication platforms differ in terms of generations (WhatsApp she uses for contacting her grandparents; Viber, her parents; Messenger, siblings and friends of a similar age).
- Her use of most platform changed after the introduction of ads and algorithms*, that's why people moved away from using Facebook so much*.

[8]: She notes that her use of Twitter evolved the most. She began using it in 2011 because she could not open a profile on Facebook (her parents would not allow it). She first used the platform to post personal content; however, after a few years she began to use it more for professional purposes.

[6]: She uses Facebook for news and articles. She still spends a lot of time creating a feed on which she can learn things, as opposed to simply seeing posts made by friends.

[N]: general notes:

- Habits depend on the people you need to contact, since various social groups prefer different platforms, so users adapt and create their communication habits based on what other people are using/what the most popular app is in the country, etc.

- Over the years, WhatsApp and Messenger have remained the dominant communication platforms for many participants. There has been a shift from Skype to Zoom or to other platforms as the need for a video function has increased, in addition to habits changing as people have begun to use more various platforms in general.

2. **What are the worst aspects of messenger apps?**

[7]: Having many options can be nice, but she says the number of platforms and notifications is overwhelming (she describes it as *clutter*). She says there is pressure stemming from the fact that if you don't create an account (on a particular platform), you might be missing out on content or something. She would prefer to have one or two platforms, *but with time it's getting harder*...

[5]: Constant changes in design (interface) make it difficult for older generations to adapt and continue to use platforms. This practice is annoying, and seems unnecessary to her.
- She has also noticed that Instagram tries to make you spend more time on the platform (that is why it created reels videos). The information draws you in, as she put it: *you can easily get lost in how much time you spend on it.* She tries to remain aware of this issue.

[4]: He finds it harder to say what he likes about platforms, compared with what he hates. He explains the psychological side-effects of social media, which he regards as not applying to a particular platform, but rather to social media in general. Apps are created to *exploit your psychology and to make use of these little dopamine doses*.
- He notes the negative aspect of Facebook now being more interested in ads than in content. *It's meaningless when you think about it*. Instagram makes him feel disconnected, it seems like a *fake world* (he references influencers and their content).
- Even though he hates a lot of things about social media, he still uses it due to *fear of missing out*; he does not know how to fight the negative aspects. He says he tries to stay conscious, but feels it is just *exploiting his brain.*

[1]: There are not many things he hates about apps. According to him, some things can be improved. Following on from what the previous participant said, he agrees that social media plays with the emotions of younger generations (FoMo).
- [N]: He sees the negative psychological effects as more of a problem for other people; he does not feel affected by the negative aspects of platforms.
- He would improve the random ads he gets on the platforms.
- Overall, he has a good experience with the social networking sites he uses.

[2]: She uses Messenger and WhatsApp daily. However, what she does not like is that on Messenger, audio messages have a limit of one minute, whereas on WhatsApp they do not. She gets irritated when she gets cut off while recording an audio message.
- [N]: it seems that the overall negative aspect is that features on similar communication platforms function differently, which is annoying to her.

[6]: Annoyed by the content she receives, as it always seems repetitive. She then has FoMo regarding some quality content. Things on her feed get *obscured.* She clicks on stuff to make sure she gets the news later, and she tries *to fight the algorithm… it seems futile*, though.

[5]: Posts often have negative connotations, which is why the pandemic made people clean their social media feeds, meaning she has also unfollowed less positive people. Wholesome social media – positive content – she sees as a counterbalance to this negative aspect. She feels this clean-up really helped her.

[8] She notes hate speech and hateful comments as a drawback (on Twitter and Facebook), perhaps because she is engaged in a lot of social activism online (she reads and posts about social rights, gender equality, LGBTQ issues). Negativity and hatred make it difficult to engage with the content emotionally; it even places a burden on absorbing the information. *There is a lack of accountability for users*.

- A negative feature of apps in this instance is that the reporting of hateful content is not immediate. Before hateful speech is taken down, a lot of people have already read it.
- She also dislikes echo chambers – she does not like reading something that is close to her own opinion, but feels that drifting away to other chambers is risky because you might be exposed to *verbal violence*.

[4]: Social networking sites *try to be a lot of things at the same time*. He dislikes what he perceives as apps often stealing and copying functions/features from other platforms on which they proved to be successful. He finds Facebook Marketplace unnecessary, Facebook videos annoying (he uses YouTube for that), and says Instagram reels are copied from TikTok. Believes that people have their own reasons for using an app, but they try to introduce new unnecessary stuff. Says it is overwhelming to have all of these different functions on one platform.

[3]: Ads themselves are not frustrating to her, but their content is frustrating. Personalised ads that show her what she was looking for are OK (for example, if she was looking for shoes, she does not mind ads that offer her different shoe options), but getting ads about babies because she is in her mid-20s is frustrating.

- Messenger turned off some functionalities in Europe – she was frustrated by this.
- She also notes that Instagram stories are too long and that maybe there should be a limit to them. Muting some people on Instagram is a function she likes.

[7]: Agrees with what has been said. Some people are not as aware of echo chambers as she is, and therefore radicalism or conspiracy theories influence personal perceptions of truth and objectivity. It makes people *more distant,* due to the polarisation of opinions. To avoid this negative aspect, she unfollows a person if she notices such content.

- She noticed one good aspect of apps after an earthquake in her hometown. A few days after the incident, she left her home country. She said that not being at home was weird but that Facebook was really helpful in finding support through posts, social groups: *I found it on Facebook, it was flooded with news, posts, support… it also helped with fundraising*.

[5]: She notes another good feature on Facebook: marking yourself safe. This is useful during accidents/catastrophes (e.g. a landslide happened close to where her parents live), when you want to know whether the people close to you are safe. The feature also served her during an earthquake

in Nepal, *it was nice to know people I know were safe during such events*. Also, you she sees the ability to fundraise on your birthday as a good feature.

- Muting people is also a good feature, as it gives her the option to mute/unfollow people whose views are different from her own.
- She dislikes internet trolls – she does not like them befriending her. She also gets tagged on Instagram on inappropriate content.

[N]: General notes:

- Many participants referred to the emotional drawbacks of social media, pointing out the psychological burden of engaging with content. This might stem from hateful, violent content, but also from fake content on Instagram and other platforms.

- Participants were mainly unhappy about some inconsistencies among the features of similar apps, but also feel overwhelmed by the way some apps try to be everything at once and include too many functions that ought to belong to specific apps.

- Overall, content is the most negative aspect of apps. People are unsure how to deal with it every time. Muting and reporting are features that are appreciated, but some people noted some issues with these as well.

3. **How did your use of mobile services change in the past five years? In terms of calls, SMS messages, mobile data use…**

[6]: She does not use SMS messages, unless in specific circumstances. She does not have a plan in the country she moved to because she only really needs internet. She says that she probably sent 10 messages in the past four months and, to her surprise, that still counted as majoritarian use of SMS messages, according to the operator. All of her other communications happened on platforms.

[1]: He hasn't really used mobile services in the past year/year and a half; he receives calls sometimes, but rarely makes calls. For him, online platforms are free and even if cable internet might not be that good where he lives, his mobile data (4G) is quite strong. Therefore, he uses landline calls and SMS messages less due to economic reasons.

[2]: She was never an active user of mobile services; however, now she uses them even less. She prefers social media. Platforms are better for using when you are abroad, even beyond the EU, as it is easier to find Wi-Fi than to find and insert a SIM card.

[3]: 15 years ago, texting was quite common. She remembers she did it when internet was not as accessible. However she now only calls her parents on her phone, as well as reserving restaurants, or sometimes calling an Airbnb owner. SMS messages are used only for postal services, when travelling, and communicating with those without internet.

[4]: *When I can avoid a call, I avoid it* and *that explains a lot about my relationship with it* (phone services). He does still call to talk to his parents, grandparents, other relatives. There is no real difference for him in terms of money, since his plans don't differentiate in terms of the number of messages, only in terms of data. He uses apps for taxi and restaurant services, *if I can't use an app* (to access a service provider), *usually I don't use their service*.

[7]: She has two phone numbers and doesn't remember one of them, which she says explains a lot about her use of phone calls and SMS messages. She uses it occasionally for services, so she does need a number and messages for payment authorisation, but she does not call anyone. Before contacting a person, she first looks to see if she can call that person using WhatsApp, and only uses mobile calls as a last resort.

[8]: She never uses SMS messages; however, she calls her grandparents because they don't have internet but they have a landline. She sometimes calls her parents. When she can't reach them via a mobile phone, she will call them on the landline.

[5]: She has moved to many countries, and thus her number has had to change many times. The reason she still has a local number where she lives is to verify accounts, to access mobile banking and for access to internet data. Her last call was on the 2 January, and her rare calls are usually to contact customer support.

[6]: She buys a plan that includes SMS messages and calls so that she can buy a phone more cheaply. She would not really use them if they weren't part of the deal.

[N]: General notes:
- The participants don't use mobile phone services any more, or use them very rarely.
- Instances in which phone services come in handy are for contacting older generations (parents, grandparents), contacting various services (restaurants, customer support), and having a number for various authorisation purposes.
- Everyone expressed their preference for online communication apps and social media over mobile phone services.

4. **Do you read the data privacy rules before downloading a new app? Do you generally feel aware about how your data is collected and used, and for what purposes?**

[6]: She uses an extension to check privacy terms. It summarises the information about the terms and conditions that platforms ask you to agree to and indicates how infringing some conditions are. *It makes it easy for you to check… you never read those* [terms and conditions].
- Even though the extension is useful for new apps, with most popular apps that she needs to use, she just ignores how very liberal they are with her data. She cannot convince her friend to switch from WhatsApp in order to have better data protection, and therefore continues to use it.
- She describes her approach to privacy as being conscious about her mistakes and about data collection. She watches documentaries about data collection and is tempted to delete Facebook and other apps, but in the end has not done so.
- There is a sense of *surrender*: according to her, if you want to use a platform, you have to accept its terms. For Facebook and Twitter, if you want to you use them *you don't have an actual choice.*

[1]: Agrees with what the previous participant said and notes that *they* (platforms) *already know everything about me to be honest*. He does not understand why there was such a *big fuss* about WhatsApp selling data to Facebook, and he believes that data collection will get much worse in the

future and *they know everything*. In the end, he says, everything is known about you already and if you want to use it, you have to agree to it and *you are basically giving yourself to the Devil*.

- [N]: The respondent did not seem to care about data collection as much as the other participant;, he seemed to be the most at ease with this fact.

[4]: In some countries, people care more about this issue and use platforms such as Telegram, on which your data is safer. Preferring safer apps depends on your relationship with your government and whether you trust it. For this reason, he notes, people in Belarus use Telegram and have greater concerns over data privacy.

[5]: She personally does not have any concerns about privacy and data collection because the things she shares are not that private, so she does not mind people seeing these posts.

- To deal with personalised commercial ads, she deletes her cookies and browsing history. This helps her to avoid receiving more ads.
- Her lack of concern is also related to the fact that she lives in a country with a trustworthy government. She understands that in China, your data is always watched and you are ranked socially, ([N]: which does seem disturbing to her); this is why she used Telegram while she was there.

[3]: She says you just have to accept the conditions and the data collection. However, she is very careful with her friends on Facebook and Instagram, because she shares a lot of personal stuff. She ensure she deletes people who are not close to her, which is how she ensures her content is safer. She is also careful with the pictures she sends via WhatsApp.

[8] It's not that easy for her to reject terms and conditions because, she notes, you cannot ask your contacts to move to another platform. Therefore, you are *trapped as a user in this sense*. Her lack of worries stems from the fact that she lives in a free country.

- Problems in Italy arise with Telegram as the platform is used for sharing illegal pornographic content. The reason why this material circulates online is because Telegram is "safer".

[N]: General notes on privacy:

- Participants mostly seem to have come to terms with data collection and a lack of privacy on digital platforms. There is a general feeling of acceptance and surrender when it comes to data policies on apps.

- Participants are well aware of data collection and try to stay alert with regard to the issues. Some even take direct action (e.g. using extensions to check terms and conditions, or being thorough with which accounts have access to their content). Aside from this, participants do not seem eager to take extra steps to achieve greater privacy.

- Another reason why participants tend to ignore the problem of data collection is because they know they need to use specific apps to contact their friends/family. Even if they want to use a safer platform, they are unable to switch, as most of their contact will remain on the less safe app.

5. **If you could choose to pay for messenger apps or social media, to ensure that they don't collect your personal data for advertising, or that they don't display ads, how much would you be willing to pay?**

[6]: EUR 5. That is what she pays for Netflix, so she would maybe pay that or less. She mentions that she would pay that much for Messenger.

[1]: EUR 5-10 as a single payment for purchasing the app; however, he always goes for the free option. Also: what does it mean about taking your data? If they offer me this for a lifetime I would pay. Instead, he thinks data safety would only last for a year and then they would sell it anyway.

[2]: EUR 5. She pays that much for Spotify and other apps. However, if she were to pay this much for a communication platform, she would expect Messenger, for example, to work better in order to make it reasonable to pay that much.

[3]: Would pay up to EUR 5, with the condition they would *offer something more*. *Some kind of features that would help me to communicate, teach my mum how to use Facebook, for example*. Otherwise, this would not sell.

[4]: Maybe Facebook could do what YouTube did: make a premium subscription that you can buy. He is really happy with his YouTube's premium package, as it saves him time and makes him less distracted. Maybe he would be willing to pay in order to be less distracted on Facebook.
- He is *kind of okay* with data collection, so not sure whether he would actually pay.
- YouTube is a different case, since it has a monopoly in terms of video streaming. WhatsApp and Messenger do not have a monopoly because you can use other apps, thus a premium subscription would not sell.

[7]: She would definitely pay up to EUR 5. However, if people stopped using the platform, since it was no longer free, she would also stop using it. If she were guaranteed that the same contacts would use the platform, she would pay. Data privacy is a selling point for her.

[8]: More open to paying up to EUR 10 to purchasing the app, because she does not know how she feels about paying on a monthly basis. She is not sure she would buy if a lot of people discontinued using the platform.

[5]: Payments for digital platforms depend on circumstances (per month, she already spends EUR 70-80 on subscriptions). She pays for Spotify and , since she finds the amount of ads unbearable, and that is why she needs a subscription. However, for communication platforms she is not that concerned with privacy – thus, she would probably not pay at all, unless the communication platform had a monopoly; then she would be forced to pay. As long as there are alternatives, she would not be willing to pay.

[4]: It also depends on how the premium Messenger account would work. If it disallowed you from contacting some people who don't have the premium version, it would lose its purpose of letting you reach everyone. One feature that could be included in the premium package is an algorithm that successfully flags and blocks inappropriate content on your feed.

[N]:

- The participants were not keen to pay for a communications app. Most would be willing to pay around EUR 5 to ensure the safety of their data.
- What is important is that the willingness to pay mostly depends on who else uses the platforms. Most participants made it clear that if the people they need to contact use the platform they would pay; however, if their contacts discontinued using the app, there would be no reason for them to pay and secure their data.
- A different case exists with YouTube, because more than one participant noted that paying for YouTube's premium is reasonable, as the ads on the platform can be unbearable. This leads to the understanding that personalised ads are not generally a great annoyance on communication platforms.

6. **How important is the fact that apps are free? Rank its importance from 1 to 9, where 9 is very important and 1 is not at all important.**

[6]: 7

[1]: 7

[2]: 8

[3]: 7

[4]: 3

[7]: 6-7

[8]: 8

[5]: 8

[N]: Participants struggled a little to decide their answer; however, most clearly consider apps being free to be a very important factor.