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Article

Set in Stone? Mobile Practices Evolution in Later Life

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Abstract
In what ways do mobile communication practices change through later life? To what extent do sociodemographic characteristics, country of residence, and well-being relate to these changing practices? To answer these questions, we used an online, longitudinal study targeting internet users aged 60 and over in six countries (Austria, Canada, Israel, the Netherlands, Spain, and Romania). The focus is on the 3,125 respondents who declared using a mobile phone in every wave (2016, 2018, and 2020). Results show an increasing usage diversification already before the Covid-19 pandemic. A latent class analysis identified three different styles of mobile practices. The most sophisticated relies on almost all the analyzed functions, while the most unsophisticated is limited to voice calls, texting (mainly SMS), and photographs to a lesser extent. Finally, a multinomial analysis provided a picture of the individual characteristics related to the usage styles in the period. The most relevant dimensions were country of residence and age, followed by internet use intensity. The country of residence is relevant to explaining usage because the telecommunications price structure determines the priority given to the mobile phone in (senior) individuals' everyday lives. The article contributes nuanced evidence of the trajectories of digital practices in later life. At the same time, the findings support and better inform country-based policies, services, and products for more effective inclusion of the older population in today's hyper-digitized societies.

Keywords
60+; digital practices; diversity in later life; international comparison; smartphone practices

Issue
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1. Introduction

In a hyper-connected world of pervasive mobile communication, digital divides tend to affect the older population more (Friemel, 2016), an issue of concern due to the inequalities they cause. Studies focusing on the mobile phone divide as a source of exclusion find that such a divide is shaped by age, gender, income, and educational level (Hong et al., 2016; Hwang & Nam, 2017; Lee et al., 2015; Tsetsi & Rains, 2017). Moreover, while sociodemographic factors explain the mobile phone divide, an international comparison shows that national policies and culture are also relevant in shaping mobile practices (Beneito-Montagut et al., 2022). Moving beyond the concerns of the digital divide, there is an increasing interest in disconnection and its multidimensionality (Chia et al., 2021). A dynamic approach can bring nuances to the study of disconnection, as the relationship with digital devices is not necessarily immovable. From our perspective, an understanding of (complete or selective) disconnection should incorporate the interconnection of, on one side, agentic and structural elements and, on the other, personal, social, and technological contexts of (non-)adoption and use (Neves et al., 2018).

We are interested in mobile communication adoption in later life from an everyday perspective. Available studies show that older individuals use smartphones less frequently than their younger counterparts (Beierle,

2021; Hwang & Nam, 2017; Lee et al., 2015) and for shorter periods (Andone et al., 2016; Parry & Sewall, 2021). Thus, age is negatively associated with usage intensity (De Nadai et al., 2019). While younger adults rely on smartphones mainly for entertainment, older adults tend to prefer seeking information and using them as a regular phone (Andone et al., 2016) and primarily for social purposes (Hwang & Nam, 2017; Lee et al., 2015). Research focusing exclusively on the older population provides nuanced results. Earlier stages of older age are more associated with the use of mobile internet, although affinity and attitudes also have an influence (Seifert & Schelling, 2015). Higher educational backgrounds enhance seniors' ability to use the internet (Hong et al., 2016), while age and education predict engagement in the social uses of smartphones (Rosenberg & Taipale, 2022). The smartphone's main purpose tends to be accomplishing practical tasks involving strong social bonds (Caliandro et al., 2021) because, as described by older users, the mobile phone helps them cope with daily living (Seifert & Schelling, 2015).

As the mobile phone is a multi-purpose device, there are different ways of approaching its usage, and one option to determine usage style is analyzing the typology of functions/features and their diversity (e.g., Falaki & Estrin, 2010; Rosales & Fernández-Ardèvol, 2019). Due to the ever-changing digital landscape, it is common to find different classifications depending on the development of the digital landscape or the analytical goals of the study (e.g., Chan, 2018; De Nadai et al., 2019; Litt, 2013; Stevic et al., 2021). Lower levels of usage diversity tend to attach to more basic usages, in extreme cases restricted to exclusively using voice calls. Conversely, the higher the diversity, the more sophisticated the usage is, as the accumulation of functions/features necessarily involves more differentiated skills (Rosales & Fernández-Ardèvol, 2019). Such an approach does not necessarily evaluate particular features or functions, which can range from gaming to emailing, or from using social network sites to listening to podcasts, to name a few. Instead, an aggregated approach avoids qualifying the degree of complexity attached to individual features or functions, as their sophistication might depend not only on the way the user appropriates them but on the particular mobile application(s) attached to that function. For instance, at present, ordinary voice calls and SMS tend to be considered basic features while e-banking would be considered highly sophisticated. Yet, it is difficult to evaluate the sophistication of other activities such as gaming or using social network sites when they are considered in generic terms. For that reason, we consider it appropriate to approach mobile phone usage as the accumulation of the used functions or features.

In the case of older people, there is a particular interest in the relationship between digitization and well-being—measured either as life or health satisfaction. However, the results are not straightforward (see a summary in Hofer et al., 2019). For instance, many social media usages of mobile phones are positively associated with life and health satisfaction among older adults in seven countries (Rosenberg & Taipale, 2022). A study in Switzerland found a positive relationship between online information-seeking and older adults' life satisfaction (Hofer et al., 2019). Also, research conducted in Israel during the most challenging moments of Covid-19 (Nimrod, 2020) showed that a general increase in internet use was not related to an increase in older adults' well-being. Instead, the increased use of online leisure functions was the only positively related dimension. Finally, some analyses found that smartphone users might have broader social networks (Barrantes et al., 2023; Hwang & Nam, 2017; Silver & Huang, 2019), which should positively influence well-being as it enables the maintenance and reinforcement of socialization. In sum, results suggest that it is not digitization in general but particular features or functions (meaning particular goals) that positively associate internet usage with well-being.

Despite the increasing interest in studying the everyday uses of mobile phones by older people (e.g., Rosenberg & Taipale, 2022; Seifert & Schelling, 2015), scarce studies are taking longitudinal approaches. When they do, they usually rely on tracking tools (Andone et al., 2016; Caliandro et al., 2021; Fernández-Ardèvol & Rosales, 2017; Parry & Sewall, 2021; Rosales & Fernández-Ardèvol, 2019). In a longitudinal qualitative study with older adults, Pang et al. (2015) described the patterns of appropriation and disappropriation of mobile phones over time, showing a relationship to previous experiences, attitudes, and social support. Furthermore, the repertoire of popular mobile applications tends to be homogeneous over short periods (Fernández-Ardèvol & Rosales, 2017; Parry & Sewall, 2021). Studies indicate that the use of different smartphone features increases over time (Fernández-Ardèvol & Rosales, 2017; Seifert, 2022) but remains stable for the older groups (Rosales & Fernández-Ardèvol, 2019). However, these longitudinal studies usually refer to short periods, include different samples over time, or involve relatively young populations. Finally, these refer to single countries, so one particular cultural and economic context.

In this article, we analyze the evolution of the mobile digital practices of internet users aged 60 and over with a longitudinal approach, meaning that the same participants responded to a survey in three waves between 2016 and 2020. We study six countries: Austria, Canada, Israel, the Netherlands, Romania, and Spain. Available data show how these constitute relevant and diverse cases from the Global North in terms of digitization and relative cost of mobile communication compared to fixed broadband—measured as the percentage of the gross national income per capita (GNI p.c.; see Figure 1). In Canada and Romania, the price structure is detrimental to mobile communication as their basket prices are significantly higher than the fixed broadband baskets (ratio [2]/[1]: 1.7 and 1.4, respectively). However, the digitization landscape differs. Canada shows high

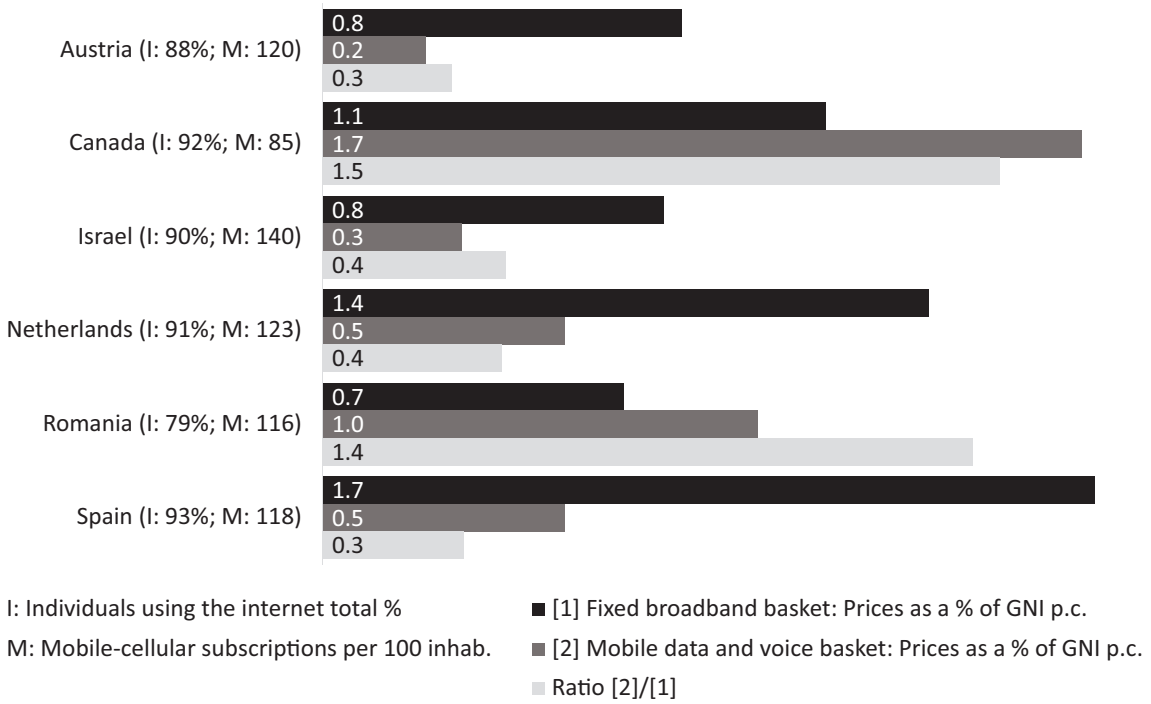

Figure 1. Digitization and telecommunication prices (selected baskets) in the studied countries. Notes: I—In Austria, the Netherlands, and Romania, populations over 75 years old are not included; [2] refers to low consumption basket (70 min voice calls + 20 SMS + 500 MB). Source: Author's work based on International Telecommunication Union (n.d.).

internet penetration (92% of individuals using the internet). At the same time, it faces the highest mobile communication costs in relative purchase capacity (1.7% of the GNI p.c.), resulting in the lowest mobile penetration in the study (85 mobile-cellular subscriptions per 100 inhabitants). Contrastingly, in Romania, internet penetration is the lowest (79%), and relatively high mobile communication prices do not seem to prevent high mobile penetration (116 mobile-cellular subscriptions per 100 inhabitants). In the other four countries, mobile prices are comparatively lower than fixed broadband prices (ratio below 0.5). However, fixed broadband is relatively more expensive in Spain (1.7% of the GNI p.c.) and the Netherlands (1.4%) than in Austria and Israel (0.8% both). Along those lines, Alexopoulou et al. (2022) discuss how EU countries' welfare states relate to the old-age digital divide. The EU countries in our study belong to three categories of welfare states: Austria and the Netherlands belong to the conservative welfare model, Spain to the Southern European, and Romania to the Central and Eastern European model.

The two guiding research questions that inspire our study are, first, in what ways do mobile communication practices change through later life? Second, to what extent do sociodemographic characteristics, country of residence, and well-being relate to these changing practices?

Our analysis shows how mobile digital practices are not steady. Instead, they can dynamically increase or decrease over time. Results also demonstrate how the country context is even more relevant than the traditional sociodemographic characteristics, while another two relevant dimensions to explain mobile phone usage are age and internet use intensity. Finally, traditional determinants of the digital divide are still in operation.

2. Data and Methods

2.1. Data

The data belong to a longitudinal panel study that collected data from the same participants biannually in three waves: 2016 (W1), 2018 (W2), and 2020 (W3). The data was anonymized. The initial design targeted the online population aged 60 and over (no upper threshold) in six countries: Austria, Canada, Israel, the Netherlands, Romania, and Spain (Loos et al., 2018). The questionnaire was administered online except in Romania, where a telephone-based survey was used. The data set constitutes a unique sample of the evolution of older individuals' (mobile) digital practices from an international perspective. However, the panel did not replace participants, so it is not possible to generalize the results to the 60+ online population.

The article focuses on participants who declared using a mobile phone in the three waves. Once selected, the cleaning process included deleting cases with either inconsistent data or a significant amount of missing data in at least one wave, giving a final sample size of 3,125 participants (Table 1). The sample is distributed unevenly among countries, with almost half of the respondents located in Spain and Austria (25% and 23%, respectively).

Table 1. Sociodemographic characteristics.

N = 3,125	Waves (W)		
%	W1	W2	W3
Country [1]			
Austria	23.0		
Canada	11.8		
Israel	13.2		
Netherlands	12.8		
Romania	13.8		
Spain	25.3		
Geography			
Big urban conglomerates	47.6	49.0	48.8
A town or a small city	31.1	29.2	29.0
Countryside	21.2	21.6	21.6
Do not know	0.2	0.2	0.6
Gender [1]			
Male	55.2		
Female	44.8		
Age			
60 to 69	73.2	62.9	50.9
70 to 79	24.6	33.1	42.3
80+	2.2	4.0	6.9
Education [1]			
Primary or less	7.8		
Secondary	52.5		
Tertiary	39.6		
Unknown	0.1		
Income			
Above the average	41.9	41.6	39.5
Similar to the average	15.5	17.0	15.5
Below the average	32.7	31.5	31.1
Unreported	9.9	9.9	13.9
Employment			
Active	20.6	15.8	10.1
Inactive	4.4	2.8	1.6
Retired or unpaid position	74.8	80.6	86.3
Other	0.3	0.8	2.0

Note: [1] Constant over time.

Also, almost half of the participants live in large urban areas (48%). The socioeconomic characteristics reflect the existing digital divides in the studied countries and the evolution of personal circumstances. There are more men (55%) than women (45%), and the group of young older adults (60–69 years of age) shrinks over time, moving from 73% in W1 to 51% in W3. Most participants completed secondary education (53%), with 40% reaching the tertiary level. The income level remains steady, with around 40% reporting incomes above the country average. Finally, participants active in the labor market decreased from 21% in W1 to 10% in W3, while those retired or in an unpaid position increased from 75% to 86%. The remaining variables considered in the analysis (see Figure 2) are, first of all, the set of mobile phone functions (20 categories) that determine the mobile phone usage style. Second, an index of internet use diversity based on the activities conducted online on the previous day. Third, a variable that gathers respondents' way to obtain Covid-19 updates and related information in W3. Finally, there are two indicators of perceived subjective well-being: one refers to life satisfaction in general and the other to health satisfaction.

2.2. Methods

First, we identified participants' mobile phone usage styles based on the functions collected as dichotomous

N = 3,125	Waves (W)		
%	W1	W2	W3
Which functions do you use on your mobile phone? (multiple choice)			
Voice calls	81.2	85.7	86.6
Photos	74.2	79.0	82.3
SMS	66.4	67.9	67.3
Email	54.8	60.4	65.5
Inst mess	53.5	58.3	64.2
Alarm	58.6	57.1	55.2
Calendar	51.9	54.2	53.7
Web Browser	46.7	48.8	54.0
GPS Mapps	42.4	48.4	49.3
SNS	34.3	38.6	41.8
Down Apps	34.7	38.2	41.4
Web Apps	31.4	38.3	43.5
Rec video	34.7	30.4	34.4
MMS	21.3	22.0	22.0
TV Video	16.9	21.8	25.6
Games	17.6	19.2	18.9
Music player	14.7	17.7	19.5
Radio	15.9	16.6	16.1
Podcast	2.3	3.5	6.0
Other	1.6	0.9	1.3
Internet use diversity *(index 0 to 10) Mean (SD)*	3.6 (2.1)	3.6 (2.0)	4.0 (2.0)
Ways of gathering Covid-19-related Information			
Analog media	—	—	48.4
Digital media	—	—	42.0
Interpersonal communication and others	—	—	9.5
How satisfied are you with your life as a whole?			
Low	5.5	5.3	6.1
Medium	28.6	28.3	30.4
High	65.1	65.4	62.6
Prefer not to answer	0.8	0.9	0.9
Unknown	0.0	0.0	0.0
How satisfied are you with your health as a whole?			
Low	9.6	9.1	11.6
Medium	39.1	40.9	40.2
High	50.3	49.1	47.5
Prefer not to answer	1.1	0.6	0.6
Unknown	0.0	0.2	0.1

Figure 2. Variables in the analysis. Note: For details on variable construction, see Table S1 in the Supplementary File.

categories (see Figure 2). The most convenient method is latent class analysis, a subset of structural equation modeling appropriate for multivariate categorical data (e.g., Weller et al., 2020). Latent class analysis classifies respondents (cases) according to their maximum likelihood of class membership. We relied on the poLCA package for R software (Linzer & Lewis, 2011) to identify classes in W3, as it provides the most unambiguous picture of the dynamics in the studied period. Because the landscape of mobile applications changes very fast, the picture in W1 is already outdated. The model assessment relies on usual information criteria, AIC, and adjusted BIC (see Figure S1 in the Supplementary File). To allow comparison across time, we replicated the same classification algorithm for W1 and W2. We created a Sankey diagram (Riehmann et al., 2005) to illustrate the dynamic flow of participants among classes through time.

Second, we employed adjusted multinomial logistic regressions to analyze the determinants associated with usage styles. The endogenous variable was the class of belonging. A stepwise approach based on residual deviance allows for deciding what variables to include in a given model. The model specification is the same for each wave to facilitate comparison, except for one pandemic-related variable incorporated into W3. Missing values in continuous variables were imputed using predictive mean matching (Sharma, 2018). No statistically significant differences between the original and the imputed variable were found in the sensitivity analysis consisting of a comparison of distributions employing

an ANOVA test. To assess the appropriateness of model specification, we ran interaction analyses among the variables in the model. Finally, Cox-Snell and Nagelkerke's statistics estimated the overall model fit (Hua & Choi, 2021). We employed R (version 4.0.5) and R Studio (version 1.4.1103) for the analysis and PowerBI for graphics and figures.

3. Results and Discussion

3.1. Evolution of Usage Practices (not Set in Stone)

Figure 3 gathers the three classes—or usage styles—we identified once the optimal model was determined. For each class, bars depict the different functions' popularity and evolution along waves. Lines refer to the sample average and provide context for a more nuanced interpretation of each class. Class 1 is markedly below the average, Class 2 remains similar, and Class 3 is significantly above it. We consider classes as appropriation styles. They move from traditional, limited usage (Class 1), where voice calls and traditional SMS are the two most used features, to advanced usage (Class 3), where at least 25% of the participants in the class use almost all the functions. In between them, Class 2 represents the average usage. Class 1 gathers all the panelists who have featured mobile phones in the sample, whereas Classes 2 and 3 imply smartphone use because of the reported functions. Several non-voice functions are at least as prevalent in these two classes as voice calls. Interestingly, taking pictures is more relevant than voice calls for respondents in Classes 2 and 3, and the array of reported functions shows how synchronous voice communication has been displaced by other activities, pointing toward forms of appropriation similar to younger age cohorts (Thulin, 2018).

Usage increases as the number of used functions increases from 7.6 in W1 to 8.5 in W3 (statistically

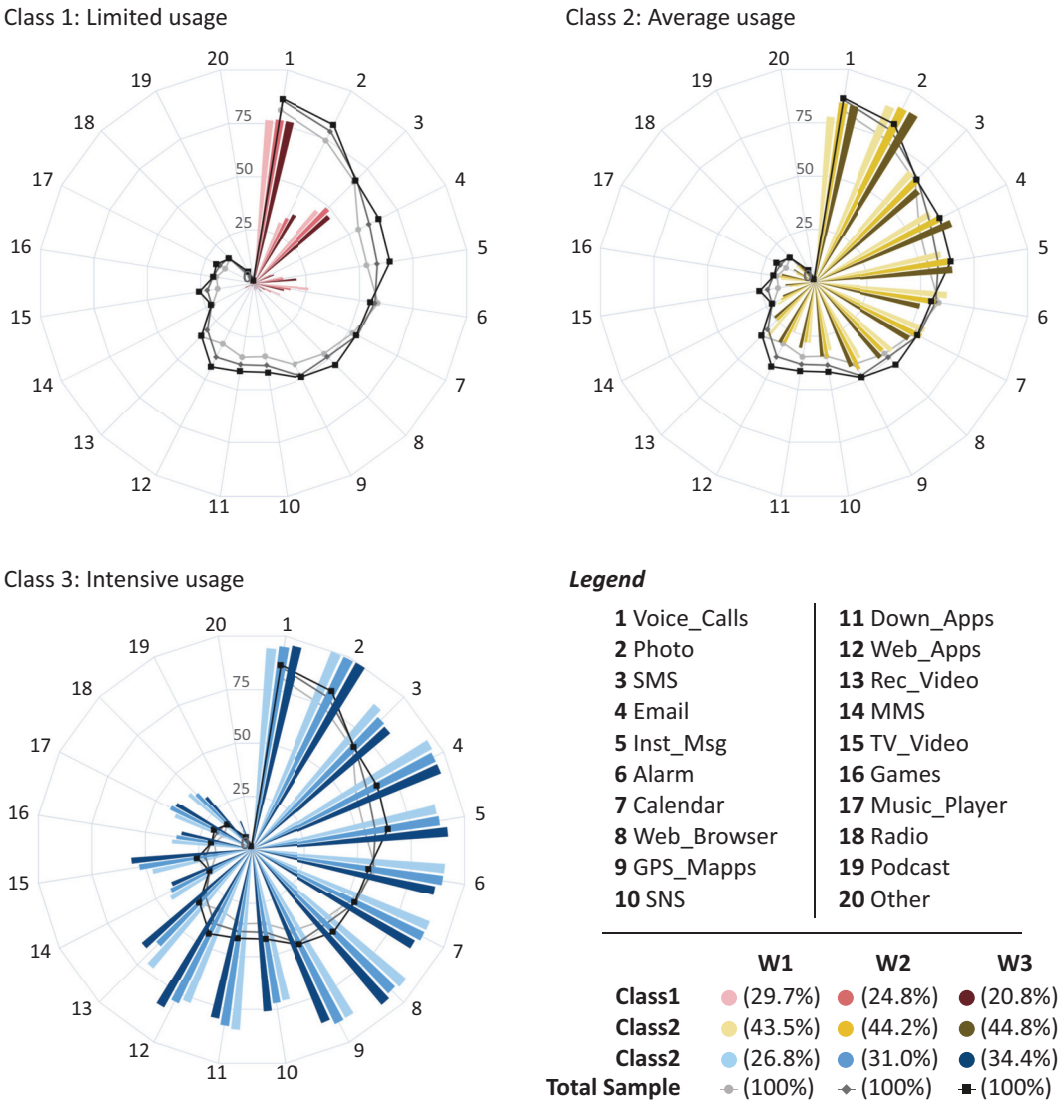

Figure 3. Mobile phone usage: Three classes, sample average, and evolution through waves. Note: See the data in Table S3 in the Supplementary File.

significant differences; ANOVA $p < 0.001$). This general trend aligns, first, with the contraction of Class 1, which shrinks from 30% of the sample in W1 to 21% in W3; second, the steadiness of Class 2 (W1: 44%; W3: 45%); and third, the expansion of Class 3 (W1: 27%, W3: 34%). An uncritical techno-deterministic approach would assume that digital practices develop and grow by default once a device becomes part of individuals' everyday lives or they acquire digital skills (Hargittai & Micheli, 2019). Nevertheless, the Sankey diagram shows a more diverse, richer picture (Figure 4). First, almost one in two participants (49%) remain in the same class during the period, meaning that usage styles are mainly steady. Second, one in four (25%) increase usage as they jump from Class 2 to Class 3 or from Class 1 to Class 2 (sometimes even to Class 3) and do not move back. Finally, some respondents move backward and forward (15%), or even just backward (11%) among classes. Therefore, maintaining or increasing mobile usage is a general trend, but it should not be taken for granted individually. Users can also step back, and we argue that this is not an exclusive behavior of later life. Changes in values and personal interests through life stages shape how individuals use their mobile phones, for example when women (Ganito, 2017) and young individuals (Syvertsen & Enli, 2020) decide to step away from using the smartphone, particularly to improve life balance (Chia et al., 2021).

It would be imprecise to frame such variability of results in terms of the decline associated with aging, as interventionist approaches would do (Peine & Neven, 2019). Instead, the longitudinal study allows observing individuals who dynamically decide how to use the mobile phone to meet their changing communication goals and interests. As discussed by Fernández-Ardèvol et al. (2017), older individuals might be the best example to interpret how individuals of any age decide how to connect to their network and the world at large as, at some point, they can filter and limit (circumscribe) how and to what extent to connect in non-face-to-face situations. Such variability must be interpreted by considering the mobile phone as another communication channel; as the current media landscape evolves in terms of devices and services, so do the particular ways individuals decide to use them (De Nadai et al., 2019; Tsetsi & Rains, 2017).

3.2. Determinants of Usage Styles: Multinomial Logistic Regressions

The multinomial logistic models report the odds ratios (ORs) corresponding to a 95% confidence interval at a 5% significance level (see Table 2). Values above (below) one reflect a positive (negative) relationship between the explanatory and the endogenous variable. The reference category is Class 2 (average usage), so results must be interpreted in comparison to this class.

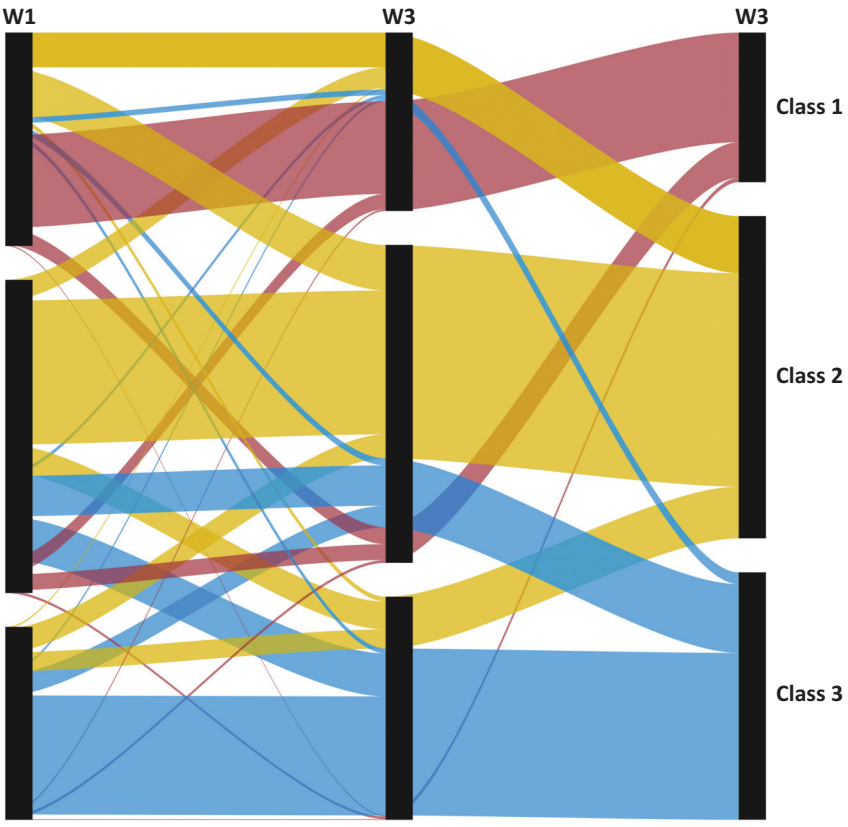

Figure 4. Sankey diagram of individuals' evolution: Usage class of belonging in each wave. Note: See data in Table S4 in the Supplementary File.

Table 2. Multinomial regressions: Class of belonging in each wave.

		W1		W2		W3	
Usage style or Class (reference: Class 2) OR		Class 1 (*n* = 927)	Class 3 (*n* = 838)	Class 1 (*n* = 775)	Class 3 (*n* = 969)	Class 1 (*n* = 650)	Class 3 (*n* = 1,075)
Geographical context							
Country (reference: Austria)	Canada	2.1*	1.5*	2.2*	1.05	2.2*	0.8
	Israel	0.6*	2.3*	0.6*	2.0*	0.7	2.3*
	Netherlands	0.9	1.0	0.9	0.8	0.8	0.9
	Romania	1.9*	0.9	2.9*	1.2	2.2*	2.0*
	Spain	0.5*	1.5*	0.5*	1.5*	0.6*	1.6*
Geography (reference: big urban conglomerates)	A town or small city	1.2	0.8	1.1	1.0	1.3*	1.1
	Countryside	1.1	0.9	1.1	0.8	1.0	1.1
	Do not know	6.5	NR	4.6	NR	2.6	NR
Digital practices							
Internet use diversity (0–10)		0.8*	1.4*	0.8*	1.4*	0.8*	1.3*
Information gathering Covid-19 (reference: analog)	Digital media	—	—	—	—	0.8*	1.5*
	Interpersonal communications					1.2	0.9
Perceived well-being							
Health satisfaction (reference: low)	Medium	0.6*	1.0	1.1	1.3	1.0	1.1
	High	0.7*	1.2	1.0	1.3	0.8	1.1
	Prefer not to answer	0.5	1.4	0.6	0.7	6.0	0.4
	Unknown	NR		NR		NR	
Life satisfaction (reference: low)	Medium	1.0	0.9	0.9	1.1	1.3	1.4
	High	1.0	0.9	0.6	1.1	1.1	1.6
	Prefer not to answer	1.1	0.7	2.0	0.8	0.2	1.6
	Unknown	NR		NR		NR	
Sociodemographic variables							
Sex (reference: male)	Female	1.0	0.8*	0.9	0.7*	0.8	0.8*
Age (reference: 60–69)	70–79	1.5*	0.6*	1.4*	0.7*	1.3*	0.8*
	80+	3.1*	0.3*	3.0*	0.4*	2.4*	0.2*
Education (reference: primary or less)	Secondary	0.9	1.2	0.8	1.3	0.7	1.0
	Tertiary	0.8	1.5*	0.6*	1.4	0.7	1.4
	Unknown	NR		NR		0.6	NR
Income (reference: similar to the average)	Above the average	0.7*	0.8	0.7*	1.2	0.8	1.4*
	Below the average	0.9	0.8	0.9	1.1	1.5*	1.3
	Unreported	0.9	0.9	0.8	1.1	1.3	1.2
Employment (reference: active)	Inactive	1.3	0.8	0.7	0.7	1.0	0.5*
	Retired or unpaid position	1.4*	0.8	1.3	0.7*	1.1	0.5*
	Other	NR		1.4	NR	1.1	0.6
Intercept (reference: Class 2)		1.4	0.1*	1.0	0.1*	0.8	0.2*
Model fit							
Cox Snell (< 1)		0.271		0.274		0.269	
Nagelkerke (0–1)		0.307		0.310		0.306	
AIC		5,845.0		5,807.3		5,720.8	
Residual deviance		5,733.0		5,687.3		5,588.8	

Notes: * $p < 0.05$; the em-dash (—) indicates the question was not asked; NR indicates the data was not reported due to a reduced number of observations.

First, in terms of the geographical context, the only dimension contributing to explaining usage styles is the country of residence due to differentiated telecommunications price structures. First, Canada, with high internet penetration, constitutes a singularity. The country has expensive (voice and data) mobile communication prices in local purchase capacity terms. In addition, digital landline-based communications are comparatively cheaper. Such a context would justify the higher odds for a limited mobile phone usage style (higher OR values for Class 1 in all the waves), as Canadians might prefer cheaper options to fulfill their communication goals (Sawchuk & Crow, 2010; Sawchuk & Lafontaine, 2020). Second, Romania shares the highest odds of limited usage with Canada in all the waves (higher OR values associated with Class 1), but the country context is substantially different. Among the countries in the study, Romania has the lowest levels of individual internet users and mobile broadband subscriptions, with relatively high telecommunication costs. These would justify the trend toward limited mobile usage in all the waves. However, after the Covid-19 outbreak, some changes appeared in 2020. Romanian respondents increased their odds of intensive usage in W3 (2.01 in Class 3), meaning that some participants intensified their mobile phone usage. The situation might respond to the imposed social isolation together with a lack of access to landline-based internet.

Third, Israel and Spain exhibit intensive usage. Both have higher mobile data broadband subscriptions than fixed ones and lower relative mobile communication prices. Notably, respondents are more likely to belong to Class 3 and less likely to belong to Class 1 vis-à-vis Class 2, with Israelis showing higher odds of using the mobile phone more intensely (OR values for Class 3 equal or over two). The result aligns with older people's preference to rely more on mobile than landline-based digital communications in these two countries (Central Bureau of Statistics, 2021; National Statistics Institute, 2021). Finally, the Netherlands and Austria appear to move together as there are no significant differences (non-statistically significant ORs for the Netherlands). These two countries, in the same welfare regime, show a more balanced mobile and fixed internet usage.

Second, regarding digital practices, results show that higher levels of internet use diversity increase the likelihood of belonging to Class 3 (intensive usage). The opposite applies to Class 1 (limited usage). Because the mobile phone is not an isolated everyday device, there is a positive relationship between mobile and internet use intensity, indicating complementarity, not displacement, within digital repertoires (e.g., Hänninen et al., 2021). Along those lines, in 2020 (W3), participants that rely on the internet to obtain information regarding Covid-19 issues are more likely to have a higher intensity of mobile phone usage (Class 3), meaning that their communication styles are aligned regardless of the particular communication goals.

Third, regarding perceived well-being, life satisfaction is independent of the usage styles (OR parameters not statistically significant), whereas health satisfaction is in most cases independent. Higher levels of health satisfaction are associated with a higher likelihood of average usage (Class 2) vis-à-vis limited usage (Class 1) but only in W1. The OR parameters associated with both well-being dimensions change magnitude over time, suggesting a non-steady relationship with use styles. Available evidence shows particular links between given functions and perceived well-being (Hofer et al., 2019; Nimrod, 2020; Rosenberg & Taipale, 2022), whereas the models consider usage in aggregated terms. Results for the aggregated usage suggest that instead of the intensity of mobile phone usage, what counts should be the meaning individuals place on this particular form of mediated communication (Chan, 2018; Stevic et al., 2021) and, particularly, but not only, if it is used to reinforce existing social networks (Barrantes et al., 2023). This means well-being does not necessarily correlate with usage intensity, which is relevant to avoid techno-deterministic assumptions in the relationship between well-being and digital communication.

Finally, the sociodemographic characteristics operate as control variables and align with expected results reflecting the digital divide dimensions (Hong et al., 2016; Taipale, 2016). First, Class 3 is more masculinized than Class 2 (OR < 1), confirming a gender divide that takes longer to close in older ages (Friemel, 2016). The comparatively more feminized style is Class 2, which appears to be aligned with some studies that argue women tend to show less sophisticated usages (Ganito, 2017). Second, participants are older in Class 1 than Class 2, although the reduction in the parameters—mainly in the 80+ category (W1: 3.11; W3: 2.44)—points toward some convergence in age. In contrast, Class 3 gathers the youngest participants, confirming that younger respondents declare higher usage intensity (De Nadai et al., 2019). Third, limited usage (Class 1) relates to income levels below the average (above the average: 0.7 in W1; below the average: 1.45 in W3). Fourth, the educational attainment that best appears to explain class differences is tertiary education, as some parameters are statistically significant. Overall, the class with the lowest educational attainment would be Class 1 (all OR < 1), whereas higher educational attainment associates with Class 3 (all OR > 1). Finally, those who are not active in the labor market show limited or average usage styles, a trend that intensifies over time (Class 3 with OR < 1).

4. Conclusions

We relied on a unique longitudinal study targeting internet users aged 60 and over in six countries (Austria, Canada, Israel, the Netherlands, Spain, and Romania). Our analysis focused on the 3,125 respondents who declared using a mobile phone in all the waves (2016,

2018, and 2020). We identified three different styles of mobile practices that serve as key indicators of usage: traditional or limited usage, average usage, and advanced usage. The first relies primarily on voice calls, texting (mainly SMS), and photographs to a lesser extent. Moreover, the other two show an incremental use of non-voice applications linked to the smartphone, while the advanced usage style constitutes a form of appropriation similar to younger age cohorts.

The first research question focused on the ways mobile communication practices change through later life. Results show a general trend toward an increase in the average number of mobile phone functions used among older individuals—even before the emergence of the Covid-19 pandemic. Moreover, the analysis of the usage styles evolution provides a more nuanced picture. Few participants declare a usage contended to feature mobile phones, meaning that a majority have smartphones connected to the internet. Mobile practices, far from immovable, change over time and do not necessarily follow a linear script. Remarkably, while half of the sample remains steady in terms of usage styles (49%), the other half jumps forward (25%) or backward (11%), or forward and backward (15%) between usage styles. Therefore, regarding the first research question, we conclude that mobile practices are not set in stone. Not even in later life, as this research demonstrates. Such a result should be considered to analyze disconnection and reconnection as an agentic way of relating to the mobile phone in later life.

The second research question aims at determining to what extent sociodemographic characteristics, country of residence, and well-being relate to the described changing practices. We demonstrate that the country context is even more relevant than the traditional sociodemographic characteristics to explain usage styles. However, results show how digital divides, and particularly mobile divides, are still in operation—with gender and age being the most relevant factors. Nevertheless, the cross-country analysis is fruitful in showing how price structure plays an essential role in the universalization of access, meaning that affordability is also a key element of the digital divide in the Global North. When mobile data is comparatively more affordable than broadband internet, older individuals tend to use the mobile phone more sophisticatedly, as high prices in broadband internet constitute a barrier to adoption (International Telecommunication Union, n.d.). Digital practices and mobile usage are related, and this research confirms the evidence. Therefore, when there are previous digital channels, once the mobile channel is appropriated, it is used to complement not replace other digital channels. Thus, beyond the mobile phone, we can infer that digital practices, in general, are also dynamic and change through time. Further research should be conducted to better understand their combined dynamics over time because individuals combine digital devices in their everyday life. For instance, it is common to use different devices to access social network sites, send emails, or watch multimedia content. And while calling might be linked to the mobile phone, a computer tablet is now a good alternative as sometimes regular calls and those using platforms such as WhatsApp become indistinguishable. Therefore, studies that focus exclusively on one device (the mobile phone, in our case) should be expanded. Finally, well-being—measured as life and health satisfaction—is not necessarily associated with mobile practices when considered in aggregated terms, as in this study. Again, further research should explore specific goals of smartphone usage concerning well-being.

The main limitation of the study is the lack of representativeness of the sample. Besides, as the focus was on internet users in W1, the study is not able to capture the dynamics of mobile phone users who might start using the internet during the observed period. A strength of this longitudinal study is that it naturally caught the Covid-19 pandemic, the lockdowns, and the associated process of accelerated hyper-digitization as the last wave of data collection was conducted in November 2020.

This study contributes nuanced evidence of the trajectories of digital practices in later life (still an understudied field), particularly how price structures play a key role in the universalization of (mobile) internet access. It constitutes a timely and relevant contribution to communication studies from an everyday perspective in later life. The findings can support and inform better country-based policies, services, and products for more effective inclusion of the older population in today's hyper-digitized societies.

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Conflict of Interests

The authors declare no conflict of interests.

Supplementary Material

Supplementary material for this article is available online in the format provided by the author (unedited).

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