Chapter 5
Developing a Questionnaire to Investigate Older Individuals' Cell Phone Use and Age-Inclusive Implementation through Technology

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Abstract No questionnaires to obtain information about older South Africans' cell phone use were available. This chapter details the development of three new questionnaires for this purpose. The iGNiTe questionnaire (Version 1) addressed the need for information about older persons' cell phone use and intra/intergenerational relations. Items, in English, were derived from the literature and current research, subsequently translated into Afrikaans, and piloted. Trained student fieldworkers used devices to collect responses from selected older individuals ($n = 128$). The results of exploratory factor analyses and reliability coefficients then informed the we-DELIVER questionnaire (Version 2) for collecting data on older persons' cell phone use and service needs. Subject experts' revisions preceded piloting. Questionnaires were translated from English into Setswana, Sesotho, and isiZulu and administered by student fieldworkers. The results ($n = 302$) were analysed and literature and theory consulted to develop Version 3, AG*e*Connect. We present what we believe to be the first online questionnaire (https://ageconnect.questionpro.com/) designed to longitudinally study and document data on older individuals' cell phone use here and abroad. (Afrikaans, English, Setswana, Sesotho, and isiZulu are five of South Africa's 11 official languages).

Keywords AG*e*Connect questionnaire · Age-inclusive · Cell phone technology · Intergenerational facilitation · Older individuals · Questionnaire design

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5.1 Introduction

Population ageing, or what Kaplan et al. (2017 p. v) call the "longevity revolution", bears testimony to the remarkable modern health and medical advancements that have been achieved globally (WHO, 2015, 2020). While longevity is to be celebrated, the reality is that the growing number of older individuals' age-related care needs are also increasing exponentially (see Chap. 1). The World Health Organization (WHO) proposed a framework for including older individuals in the provision of affordable and accessible care and primary health services, and for doing so in age-integrated societies and communities (WHO, 2015, 2020) where people of all ages have access to infrastructure (e.g. housing, safe neighbourhoods, and physical spaces for recreation, etc.), services (basic and municipal), transport, the social environment (education, recreation, physical, and spiritual activities (Kaplan et al., 2017; Walsh et al., 2017; Warth 2016; WHO, 2007), and technology (Lui et al., 2009; Menec et al., 2011). In age-inclusive communities and societies, people at every stage of life attend to their commonalities or shared interests in a trusting and reciprocal, caring manner (Annan, 1998; Kaplan et al., 2017; United Nations, 2002). Intergenerationality is, therefore, implicit in the notion of age-inclusiveness and is promoted by social connectedness, engagement, and respect (Annan, 1998; Steels, 2015).

The use of information and communication technology (ICT) is globally considered a feasible approach for providing age-integrated services (WHO, 2015). In developed countries, for example, technology is used to link older individuals with their healthcare teams, communities, and social services, while also providing healthcare workers with useful information (Calvert Jr et al., 2009; Cerrito et al., 2015; WHO, 2015). Planning and implementing appropriate ICT interventions (*e*Interventions) to enhance older individuals' inclusivity assume that relevant knowledge about their use of technology is available, but this is not always the case. In this chapter, we present the longitudinal iterative process we followed to develop a questionnaire on older persons' cell phone use for a variety of research purposes. We provide a version (online and included at the end of this chapter) for further revisions and development—to the best of our knowledge, this is the first online questionnaire developed specifically to collect this kind of information for developing country conditions.

Specifically, the wide uptake of cell phones in sub-Saharan Africa presents unexplored opportunities to promote and improve access to service delivery for all, including older individuals. This is particularly relevant in an emerging country such as South Africa, where the increasing numbers of older individuals, the rise in non-communicable diseases, and wavering (instrumental as well as emotional) support from younger people present obstacles to the appropriate delivery of social and healthcare services to older individuals (see Chap. 1). Because little is known about how older individuals in South Africa use cell phones, and no relevant questionnaires accessible for the purpose of obtaining this information could be found, a dedicated questionnaire was developed, following a pragmatic approach.

Fig. 5.1 Sequential development of versions of a questionnaire on older persons' cell phone use applied to different research processes

Pragmatism assumes that knowledge (in this instance, regarding older individuals' cell phone use) is obtained through iterative processes to find solutions for problems in physical and social contexts (in our case, related to service delivery) (Campbell, 2011; Dixon, 2019; Rorty et al., 2004).

Several self-designed questionnaires for collecting information about the cell phone use of older individuals have been referenced in the literature, but the full questionnaires are for the most part not provided—only descriptions of the sections included in the questionnaires are reported (Lee 2007; Rahim et al. 2020). To address this gap, we decided to develop our own and make it publicly available. In addition, we believed that reporting on the developmental process would assist researchers with similar needs to draw up further relevant questionnaires. As Foxcroft (2004) advised, the research context, the target population, potential sociocultural influences, and the appropriate method of administration need to be considered throughout the process of developing a questionnaire.

Our first questionnaire (Version 1) was developed in 2014 to obtain baseline data of older individuals' cell phone use in South Africa, as part of a small self-funded study entitled Older Individuals' Cell Phone Use and Intra/Intergenerational Networks (iGNiTe). Version 1 was subsequently adapted to create Version 2 in 2017, when funding had been obtained for the project called we-DELIVER: Holistic Service Delivery to Older People by local government through ICT. Based on our findings, we then developed Version 3—the AG*e*Connect questionnaire—which we present in this chapter. The sequential development of the three versions of the questionnaire is shown in Fig. 5.1 and the process we followed is discussed in detail in the rest of this chapter.

5.2 The iGNiTe Questionnaire (Older Individuals' Cell Phone Use and Intra/Intergenerational Networks)

The need to obtain information about older South Africans' cell phone use stimulated a discussion among three social gerontologists (Jaco Hoffman, Doris Bohman, and Vera Roos) and resulted in the development of the iGNiTe questionnaire. The items that they suggested for inclusion were based on their collective social

gerontological expertise (sociology, nursing, and psychology) (V. Roos personal communication, 6 February 2017). Items were not organized according to specific categories in the questionnaire but served to collect information on the following topics:

- Biographical information: items related to older individuals' age, gender, place of residence, level of education, and household composition;
- Items required for application of The South African Advertising Research Foundation's (SAARF) Universal Living Standards Measure (SU-LSM™) (this measure, developed as a research tool, has become a widely used segmentation tool in South Africa (Haupt, 2017; South African Audience Research Foundation, 2017): the original measure consisted of 25 questions that classified the population into levels from 1 to 10, with 1 indicating very low income and minimal access to services, and 10 indicating high income and full access to services; the latest version of the SU-LSM™ consists of 29 questions and provides a more refined version of living standards, including ownership of certain household items (Eighty20, n.d.; Haupt, 2017; SAARF, 2017);
- Cell phone information: items about older participants' access, ownership and use of cell phones, as well as details about their functionalities;
- Cell phone user patterns: items including questions about older individuals' use of specific cell phone functions, ranging from basic to more advanced, and frequency of use;
- Social networks around older persons' cell phone use: items on social arrangements around older individuals' cell phone use;
- Cell phone use competence: items related to older individuals' self-perceived knowledge, skills, and attitude;
- An open-ended question at the end of the questionnaire: this asked older participants how they had experienced participating in the technology-based questionnaire about their cell phone use.

In 2014 a concurrent mixed methods research design (see Fetters et al., 2013) was applied and the iGNiTe questionnaire was administered to older participants ($n = 128$) in three communities in the Potchefstroom area (120 km south-west of Johannesburg) in the North West province of South Africa. In addition to the questionnaire, three qualitative methods were employed to collect further information from a total of 52 older individuals, who participated in semi-structured interviews ($n = 23$), focus groups ($n = 10$), and the visual data-collection Mmogo-method® (Roos, 2008, 2016) ($n = 19$).

5.2.1 Participants and Data Collection

Purposive sampling was used to identify three day-care centres for older persons in the Potchefstroom area in close proximity to the researchers, and criterion sampling was applied to select the older participants (see Patton, 2002). Participants were

selected based on the following inclusion criteria: persons 60 years or older who had access to a cell phone, and who did not present with any observable cognitive impairments preventing them from interacting coherently with the researchers. Version 1 of the questionnaire was uploaded onto digital devices (cell phones or tablets) to capture responses directly on the SurveyToGo application (dooblo.net, 2005). Informed by the idea that age-inclusiveness is promoted through intergenerationality (Kaplan et al., 2017), we invited students familiar with the vernacular and sociocultural context of the older participants to be trained as fieldworkers (see Chaps. 3 and 4). Drawing on pragmatism and Dewey's (1998) notion that communication is transformation, we assumed that the communication processes between the younger and older people could alter or redirect the older individuals' relationship with technology positively (Dixon, 2019). Unfortunately, owing to problems including lack of transport and child care responsibilities, some older individuals—mainly from low-resourced areas around Potchefstroom (Promosa and Ikageng) to which they had previously been removed—were unable to attend on the day the data were collected. Consequently, data skewed towards people with higher LSM levels were obtained. The biographical information of participants is provided in Table 5.1.

Results were skewed towards the majority of the selected older participants living in Potchefstroom (almost 60%) who had completed 12 years of formal education including those with postgraduate degrees. The remaining participants reported primary level educational levels or no formal education. In this sample of older participants, about half reported higher LSM scores (57.5% on levels 8 to 10) and the rest reported LSM levels 4 to 7.

The findings from the semi-structured interviews, focus groups, and the Mmogo-method® gave information (first reported as part of master students' dissertations; later published in articles) about the following topics related to the older participants' cell phone use: lack of basic skills and knowledge to use cell phones compensated for by applying various relational strategies (Steyn et al., 2018); perceived level of competence in using cell phone devices and different cell phone features (Leburu et al., 2018); assistance from younger people with cell phone use (Leburu et al., 2018; Scholtz, 2015); and reasons for using cell phones (Lamont et al., 2017). The findings of the analysed data which are reported in the published articles informed revisions to Version 2 of the questionnaire.

5.2.2 Statistical Analysis and Results from the iGNiTe Questionnaire

The sample was described from the results of a frequency analysis and descriptive statistics, including means and standard deviations. The content validity of the questionnaire was confirmed by the three social gerontologists (Jaco Hoffman, Doris Bohman and Vera Roos), who reviewed the subject matter. Reliability was

Table 5.1 Characteristics of the iGNiTe participants ($n = 128$)

Item	Category	Frequency	Percentage
Gender	Male	26	20.3
	Female	102	79.7
Education	No education	6	4.7
	Primary school	28	21.9
	High school	23	18.0
	Matric certificate	38	29.7
	Degree/diploma	27	21.1
	Postgraduate	6	4.7
Area	Ikageng	28	21.9
	Promosa	17	13.3
	Potchefstroom	83	64.8
Living with	Nobody else	26	22.6
	Spouse	45	39.1
	Children	35	30.4
	Grandchildren	35	30.4
	Siblings	2	1.7
	Parents	0	0.0
	Grandparents	0	0.0
	Friends	8	7.0
LSM score	1	0	0.0
	2	0	0.0
	3	2	1.6
	4	3	2.4
	5	8	6.3
	6	26	20.5
	7	15	11.8
	8	11	8.7
	9	22	17.3
	10	40	31.5

Note. Living with... percentage given out of 100% for each category presented in Table 5.1

determined with Cronbach's alpha (α), with the suggested acceptable cut-off value of $\alpha > 0.70$ (Field, 2018). Because no factor structure existed, reliability was calculated for the questionnaire as a whole, and for two possible subscales identified by visual inspection. These two subscales were labelled Frequency of feature use (including items 15 to 28, e.g. "How often do you make and receive calls?", "How often do you go on the internet?", "How often do you take photos?"), and Attitude towards the phone (including items 32.1 to 32.7, e.g. "The phone menu is understandable", "My airtime limits my functions", "I know how to work with my phone"). The reliability coefficients were found to be unacceptable for one potential subscale (attitude towards phone: $\alpha = 0.64$) but acceptable for the complete questionnaire and the other potential subscale (iGNiTe questionnaire: $\alpha = 0.89$; and frequency of feature use: $\alpha = 0.78$).

Exploratory factor analyses (EFAs) were applied to explore the factor structure of the questionnaire. The iGNiTe questionnaire did not contain specific sections: the list of 41 items began with the biographical questions, followed by the rest in no particular order. EFAs were conducted on the two visually identified possible subscales: Frequency of feature use, and Attitude towards the phone. Based on the EFA results, it was suggested that Frequency of feature use could be split into three factors: "Basic feature use", "Advanced texting and imaging", and "Internet-dependent features". The number of items could be reduced. For example, item 17 did not load on a factor at all ("How often do you send and receive an MMS?"). Items could also be added (e.g. "How often do you look at the time?") to collect more detailed information where necessary, or rephrased (e.g. "How often do you play music/radio?") based on the different ways phone technology has changed. The potential subscale for Attitude towards the phone indicated a one-factor structure, with only four of the seven items loading on the factor. The suggestion was to re-evaluate whether the items included did in fact measure attitude and whether they were clear and unambiguous. The intent of the EFAs was to explore the factor structure of the questionnaire and to provide suggestions that might improve model fit and reliability levels of the questionnaire, thereby increasing the quality of data collected in future.

Although these suggestions from the iGNiTe results were considered for the development of the second we-DELIVER version, it was noted that the very small ratio (1:3.12) between the number of items (41) and the sample size ($n = 128$), was a definite limitation to a confident interpretation of the results from the EFAs.

5.3 The we-DELIVER Questionnaire (Holistic Service Delivery to Older People by Local Government through ICT)

In 2017, funding was obtained to gather data about older South Africans' cell phone use to promote municipal service delivery. The small self-funded iGNiTe study was deliberately expanded to include a wider range of communities. Continuously revising and modifying a solution based on the outcomes of actions in order to address the problem appropriately is in line with a pragmatic approach (Dixon, 2019). Accordingly, the iGNiTe questionnaire was revised drawing on the results of the original statistical analyses and transdisciplinary consultation by the research team, which consisted of senior and junior researchers, as well as student fieldworkers, from subject disciplines: law, public administration, demography and population studies, development studies, social work, psychology, language studies, biokinetics, information systems and socio-gerontology (see Chap. 4 for a detailed discussion). Qualitative findings obtained from the iGNiTe study further informed revisions. The specific focus of the we-DELIVER project on service needs informed inclusion of items in this regard (https://we-deliver.github.io/team). In Version 2 (we-DELIVER), items were arranged in sections, and items with specific topics were added or revised for greater clarity. For example, reference to the use of

multimedia messaging services (MMSs) was removed, and questions about taking selfies and making voice recordings were added. Table 5.2 summarizes the changes made for the we-DELIVER questionnaire.

The we-DELIVER questionnaire was developed to obtain specific information about older individuals' cell phone use and their needs for municipal services. Five questions relevant to addressing the we-DELIVER project informed the revisions of Version 1:

1. Which cell phones and cell phone functionalities do older persons use in the context of multigenerational families?
   - To how many cell phones do older persons have access?
   - Which types of cell phones are used?
   - To whom do the cell phones belong?
   - Who else has access to the cell phones?
   - Who chose the cell phones being used?
   - Who pays for the data and airtime?
2. What are the cell phones used for?
   - Basic cell phone features?
   - Advanced cell phone features and imaging?
   - Internet-dependent cell phone features?
   - Care needs and relational regulation?
3. What is older persons' self-perceived competence (knowledge, skills, and attitudes) with regard to their use of cell phones?
4. What service needs are addressed by using a cell phone?
5. What are the intergenerational patterns around older persons' cell phone use?

5.3.1 Structure of the we-DELIVER Questionnaire

The structure of the we-DELIVER questionnaire (Version 2) is presented in Fig. 5.2.

- Biographical information: age, gender, level of education, living arrangements, and household size.
- About the cell phone: items related to access and ownership.
- Cell phone user patterns: participants' self-reported ability to use the phones' different features, categorized as basic, advanced, and internet-dependent.
- Cell phone user patterns: care and relational regulation consisted of items about reasons for using cell phones in relation to making and receiving contact with people. Specific items about social, health, and emergency service needs were included under this heading to answer the research questions guiding the we-DELIVER project.
- Perceived competence (knowledge, skills, and attitude).
- Intergenerational patterns: items about how contact is made, who is contacted, and frequency of contact.

Table 5.2 Changes made to the iGNiTe questionnaire (Version 1) in developing the we-DELIVER questionnaire (Version 2)

	Questionnaire section	Changes made	Motivation
1.	Biographical information (incl. age, gender, location, living situation)	Some changes (e.g. questions on number of children, grandchildren and other people in the household were added)	Additions were made to get a better picture of the participants
2.	Living standards measure (SU-LSM™)	Retained for a more nuanced depiction of the participants' living standards	No changes. Independent questionnaire
3.	About the cell phone (s)	Some changes (e.g. questions were added on who chose the phone, who makes decisions about what happens on the phone; the option of rented phones was replaced with shared phones)	Changes were made to have more detailed information about older individuals' ownership and access to cell phones
4.	Cell phone user patterns including 4 sub-sections	– The section was extended, revised, and categorized for ease of reporting (see changes under relevant sub-sections) – In sub-sections (a) to (c) on the use of features, the answering format was changed: First, a choice between "Yes", "No", and "I ask someone to help me" was given, before the frequency of using or requesting help was asked ("A few times a day", "Once a day", "Once a week", "Once a month") – Sub-section (d) was added to collect information on how older persons maintained certain relationships by using cell phones, and how they turned to specific people as resources in order to manage such use	Changes were made for more detailed information about participants' cell phone use, agency, and whom they ask for assistance
	(a) Basic features (5 questions)	– Questions were added about looking at the time, as well as the date and calendar	Changes to sub-sections (a) to (c) were based on removing items on outdated applications or statistical analysis of iGNiTe results, adding items on more recently developed cell phone technology and applications
	(b) Advanced features and imaging (8 questions)	– Questions were added on taking selfies, looking at photos on the cell phone, making voice recordings on WhatsApp, and setting reminders for appointments – The question on using MMSs was removed, as was the option of using Mxit, with only the	

(continued)

Table 5.2 (continued)

	Questionnaire section	Changes made	Motivation
		option of using WhatsApp retained	
	(c) Internet-dependent features (7 questions)	– Questions were added relating to reading the latest news, using Google and cell phone or internet banking – The questions on sending "Please call me" messages and using GPS were removed	
	(d) User patterns: Care needs and relational regulation (8 questions)	– Newly added sub-section – Questions were added to establish motivation for using cell phones, types of communication (e.g. to have conversations or to ask for help) – Specific questions were added about social, health, and emergency services	The addition of sub-section (d) was based on qualitative findings from the iGNiTe study. Specific items were added to address the question about service needs
5.	(a) Knowledge, skills, and attitude	– This section was extended, revised, and categorized for ease of reporting (see changes under relevant sub-sections) – Sub-sections (a) and (b) were added to collect information about knowledge and skills. Answer options included only "Yes" or "No" – Sub-section (c) was extended with more questions on attitude, and existing questions were either adapted or removed. The scale of measurement ranged from 1 (Strongly disagree) to 4 (Strongly agree), based on the qualitative findings of the iGNiTe study and literature review Matteson et al., 2016)	The addition of sub-sections (a) and (b) was based on qualitative findings from the iGNiTe study Changes to sub-section (c) were made in order to refine information collected specifically about attitude
	a. Knowledge (11 questions)	– Questions added included items on knowledge about switching the cell phone on and off, sending messages, and using the internet	
	b. Skills (6 questions)	– Questions added included items on ability to explain features easily to others, use almost all features, and check the airtime/data balance on cell phone	
	c. Attitude (13 questions)	– Questions were added to collect information about	

(continued)

Table 5.2 (continued)

	Questionnaire section	Changes made	Motivation
		perceptions of cell phones as dangerous or useful, ease of use, preferences, etc.	
6.	Intergenerational patterns (9 questions)	Section was extended to include reasons for contacting and being contacted by certain persons	To obtain more comprehensive insight into intergenerational support and contacts
7.	Open-ended question	No changes were made	

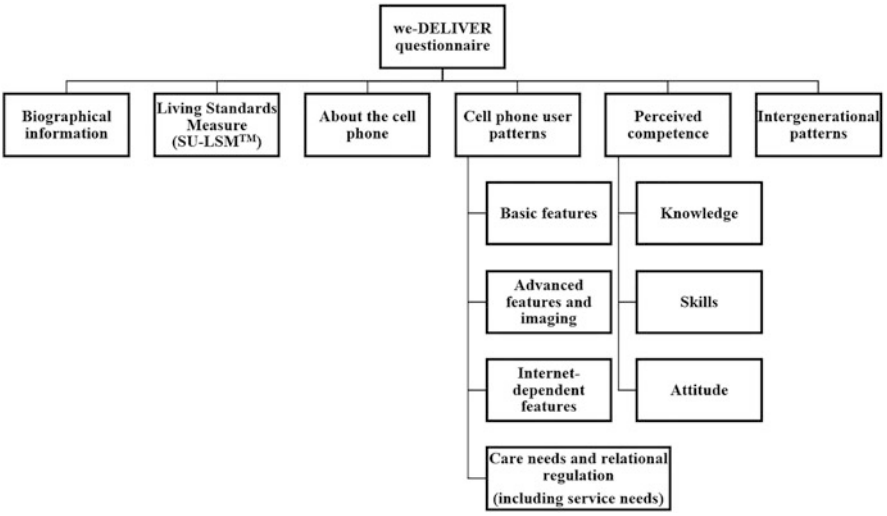

Fig. 5.2 Structure of the we-DELIVER questionnaire

5.3.2 Translation and Pilot Study

Two socio-gerontologists (Vera Roos and Jaco Hoffman) with extensive research and practical experience of topics related to issues affecting the lives of older persons, together with a transdisciplinary research team (consisting of first- and second-language Setswana-speakers) formulated the additional and revised items for the we-DELIVER questionnaire. The questionnaire was translated from English into Setswana by researchers in African languages at the Mahikeng campus of the North-West University (NWU). Setswana is the main language used in Lokaleng and Ikageng, two of the selected communities. The translated version was given to 15 mother-tongue Setswana speakers to verify its comprehensibility by identifying ambiguous or unclear wording. It was translated back into English by a translator affiliated to the NWU language directorate. The transdisciplinary research team

compared the two English versions to check for accuracy and the appropriateness of the translation for the particular setting for which it was intended. This process was followed to check the language accuracy of linguistics experts who were not familiar with the target languages, to examine the quality of the translation, and to detect potential errors (see Foxcroft & Roodt, 2018).

After piloting the translated questionnaire with older persons ($n = 27$), the research team discussed issues related to the wording of items that lacked equivalent constructs in the indigenous languages. For example, there is no word in Setswana for "air conditioner". Another issue concerned the use of concepts that were not familiar in rural contexts, such as access to home security services (one of the SU-LSM™ questions); some participants in the pilot study responded affirmatively by saying that they owned a dog. The transdisciplinary input was used to revise, simplify, and finalize the questionnaire. Finally, to ensure consistent quality, a community psychologist, who was not part of the research team but was familiar with Setswana and the relevant sociocultural context, checked the questionnaire word by word to ensure that the phrasing would yield accurate information for addressing the research questions, and would also be easily understandable so as to encourage optimal participation. Revisions were made before the questionnaire was translated into Sesotho and isiZulu (the main languages used in the other target communities) by a lecturer affiliated to the languages department of the NWU's Vanderbijlpark campus and who was familiar with the vernacular and sociocultural context of the research communities.

5.3.3 Data Collection and Participants

Questionnaires were uploaded on digital devices (cell phones or tablets) and trained student fieldworkers captured the participants' responses ($n = 302$) on SurveyAnalytics (https://www.surveyanalytics.com).

Purposive sampling (see Patton, 2002) was used to select communities located close to the three NWU campuses (in Mahikeng, Potchefstroom and Vanderbijlpark). The older participants were selected by criterion sampling (see Patton, 2002) and included persons 50 years or older who had access to a cell phone, and who did not present with any observable cognitive impairments that would have prevented them from interacting coherently with the researchers. The older individuals who participated in the we-DELIVER project resided in Lokaleng, Ikageng, and Sharpeville (see Chap. 3 for a detailed discussion of the research communities), of whom 15 (5.0%) lived in unspecified areas. Four participants did not indicate where they live. Participation was skewed towards women; fewer than a quarter of the participants were male. In this sample, 70% of the participants had completed primary school educational levels or had no education, and only 2.0% had completed a postgraduate education. Almost half (48.2%) lived in households of 5 or more people, including those who lived with their children (54.9%) and/or their

grandchildren (57.2%). With regard to the SU-LSM™, only 7.4% reported LSM levels of 8 to 9, whereas the majority (75.6%) indicated levels 4 to 7, and almost a quarter noted LSM levels 1 to 3. Table 5.3 provides information about participants' characteristics.

5.3.4 Statistical Analyses and Results

Results of the data analyses are discussed in detail in Chap. 6, here results pertaining specifically to the revision of the we-DELIVER questionnaire are presented. They informed revisions and the development of Version 3 (AG*e*Connect). Included in this section, therefore, are the results for means with standard deviations, internal consistency, confirmatory factor analyses, and exploratory factor analyses.

5.3.4.1 Descriptive Statistics and Reliability

SPSS 26 (IBM Corporation, 2020) was used to calculate the descriptive statistics and reliability coefficients. The means (M) are reported with their associated standard deviations (SD) to assist with interpretation of the meaningfulness of the calculated averages. The M for each variable is calculated according to that specific measurement scale and should therefore not be compared directly with other means. The generally recognized range for an acceptable SD is anywhere between −1.00 and + 1.00. An SD outside that range is interpreted as being too widely distributed for its M to be meaningful (Field, 2018). Cronbach's alpha (α) was used to compute reliability coefficients with a suggested cut-off point for acceptable reliability of 0.70 (Field, 2018). Reliabilities for subsections of the we-DELIVER questionnaire are provided with their descriptive statistics in Table 5.4.

The number of working cell phones per household was reported to be, on average, just above 2 ($M = 2.24$, $SD = 1.78$), with most participants indicating that they sometimes used a cell phone (Scale: 0–2; $M = 1.07$, $SD = 0.62$), especially its basic features (Scale: 0–3; $M = 2.45$, $SD = 0.89$). Advanced and internet-dependent features were used much less (Scale: 0–3; $M = 0.38$, $SD = 0.60$, and $M = 0.29$, $SD = 0.54$, respectively). Regarding levels of knowledge and skill as well as attitude toward cell phones, participants reported the following (on a scale of low, medium, high): Average self-perceived level of knowledge = 1.64 ($SD = 0.71$); Average self-perceived level of skill = 1.40 ($SD = 0.63$); and Average self-reported attitude toward cell phones = 1.94 ($SD = 0.97$).

There were two subsections in which reliability was found to be below the preferred 0.70 threshold: "Frequency of use of basic features" ($\alpha = 0.49$), and "Perceived level of skill" ($\alpha = 0.63$). "Frequency of use of advanced features" and "Frequency of use of internet-dependent features" resulted in acceptable alphas of 0.76 and 0.70, respectively. "Perceived level of knowledge" showed a reliability index of 0.87, while the subsection "Attitude" achieved an alpha of 0.83. On closer

Table 5.3 Characteristics of the we-DELIVER participants ($n = 302$)

Item	Category	Frequency	Percentage
Gender	Male	73	24.2
	Female	229	75.8
Education	No education	84	28,0
	Primary school	132	44,0
	High school	63	21,0
	Matriculation certificate	11	3.7
	Degree/diploma	4	1.3
	Postgraduate	6	2,0
Area	Lokaleng	103	34.6
	Ikageng	94	31.5
	Sharpeville	86	28.9
	Other	15	5.0
Size of household	Living alone	73	27.2
	2 persons	19	7.1
	3 persons	25	9.3
	4 persons	22	8.2
	5 persons	19	7.1
	6–7 persons	45	16.8
	8–9 persons	31	11.6
	10–14 persons	27	10.1
	15–19 persons	7	2.6
Living with	Nobody else	73	24.5
	Spouse	139	46.6
	Children	162	54.9
	Grandchildren	167	57.2
	Siblings	27	9.1
	Parents	2	0.7
	Grandparents	3	1,0
	Friends	4	1.4
	Other people	31	10.5
LSM score	1	7	2.4
	2	12	4.1
	3	31	10.5
	4	38	12.8
	5	56	18.9
	6	95	32.1
	7	35	11.8
	8	10	3.4
	9	9	3.0
	10	3	1.0

Note. Living with... percentage given out of 100% for each category presented in Table 5.3

Table 5.4 Descriptive statistics and reliability coefficients

		M	SD	α
1.	Size of household	4.97	3.80	–
2.	SU-LSM™ score (scale: 0–10)	5.28	1.75	–
3.	Number of working cell phones in the household	2.24	1.78	–
4.	Cell phone use frequency by participant (scale: 0–2)	1.07	0.62	–
5.	Feature use frequency (scale: 0–4)			
	– basic features	2.45	0.89	0.49
	– advanced features	0.38	0.60	0.76
	– internet-dependent features	0.29	0.54	0.70
7.	Perceived level of knowledge (scale: low, medium, high)	1.45	0.67	0.86
8.	Perceived level of skill (scale: low, medium, high)	1.28	0.56	0.63
9.	Attitude (scale: low, medium, high)	1.94	0.97	0.83

M = Mean; SD = Standard deviation; α = Cronbach's alpha

Table 5.4 shows that, on average, about 5 persons lived in a household ($M = 4.97$, $SD = 3.80$) that averaged just above level 5 on the SU-LSM™ ($M = 5.28$, $SD = 1.75$). The averages seem reasonable; however, their distributions are large, and these two means should be interpreted accordingly

Table 5.5 Fit statistics of confirmatory factor analyses

Model	χ^2	*df*	RMSEA	CFI	TLI	SRMR
Frequency of feature use	Non-positive definite latent variable covariance matrix					
Knowledge, skill, and attitude	851.74	402	0.07	0.91	0.91	0.13

χ^2 = chi-square; *df* = degrees of freedom; RMSEA = root mean square error of approximation; CFI = comparative fit index; TLI = Tucker-Lewis index; SRMR = standardized root mean square residual

inspection of the two unsatisfactory subsections, it was not possible to pinpoint any specific item in either that might have influenced their reliability coefficients negatively. Before adapting or removing items could be considered, however, model fit needed to be investigated.

5.3.4.2 Confirmatory Factor Analysis (CFA)

CFAs were conducted to attempt to confirm the proposed factor structures of the applicable latent variables of the we-DELIVER questionnaire. The robust maximum likelihood estimator (MLR) was specified, because it considers the skewness and kurtosis found in the data. CFAs were conducted for two subsections: "Frequency of use of features" (containing three factors: basic, advanced, and internet-dependent features) and "Knowledge, skill, and attitude" (three factors). For measurement of "Frequency of use of features" the scale *Never*, *Once a month*, *Once a week*, *Once a day*, and *A few times a day* was used, regardless of whether participants used it themselves or asked someone to help them. The results of the two CFAs are provided in Table 5.5. Fit statistics reported include chi-square (χ^2; with lower values

indicating better fit) and degrees of freedom (*df*), as well as the root mean square error of approximation (RMSEA; acceptable <0.08; excellent <0.05), the comparative fit index (CFI; acceptable >0.90; excellent >0.95), the Tucker-Lewis index (TLI; acceptable >0.90; excellent >0.95), and the standardized root mean square residual (SRMR; acceptable <0.08) (Wang & Wang, 2020).

Neither of the two 1-factor models (Frequency of feature use, and Knowledge, skill, and attitude) could be used for further analysis. "Frequency of feature use" produced a non-positive definite latent variable covariance matrix, indicating a negative or residual variance for a latent variable, a correlation between two latent variables larger than or equal to 1.00, or a linear dependency among more than two latent variables. Also, even though "Knowledge, skill, and attitude" achieved acceptable levels for CFI, TLI and RMSEA, the SRMR value was too high (SRMR = 0.134). A correlation between Knowledge-item 11 (*I know how to check my cell phone balance*) and Skill-item 6 (*I can check my cell phone balance on my own*), was measured as 0.994, suggesting that these two items could be combined, as they were measuring the same information. Two Skill items and three Attitude-items did not load well on their respective factors (loadings should be $\beta > 0.35$), indicating that some items could be removed without jeopardizing the strength of the constructs. The high correlation between the variables Knowledge and Skill ($r = 0.989$) might also be an indication that participants did not distinguish between the two concepts, or that the phrasing of the items made the distinction unclear.

Because of the described problems with the two models, it was decided to carry out EFAs on the two factors (Frequency of feature use, and Knowledge, skill, and attitude).

5.3.4.3 Exploratory Factor Analysis

Mplus 8.6 (Muthén & Muthén, 1998–2021) was used to explore the factor structure of the items. The same steps were followed for both. First, an initial EFA was performed to ascertain the number of possible factors (with Eigenvalues >1.00) contained within the specified items. Then the number of factors to be extracted was specified and the resulting model fit compared. Last, a new factor structure was suggested, if needed, and items to be removed or adapted indicated.

Frequency of Feature Use The three factors (Basic, Advanced, and Internet-dependent) contained 20 items in total. Corresponding with Eigenvalues larger than 1.00, one to five factors were programmed to be extracted from the 20 items. After inspection of the separate EFAs, it was found that the item "listen to the radio/music" did not load very strongly on a specific factor in any of the EFAs, but instead showed several significant cross-loadings between different possible factors. For future use the decision was made to split this item into "Listen to music" (under basic features) and "Listen to the radio" (under advanced and data-dependent features). This was because the participant could already have had music stored on the phone but would have to use data in order to connect to a radio station. Inspection of the possible

factor structure solutions extracted from the data included comparison of the models' Akaike information criteria (AICs) and sample-size adjusted Bayesian information criterion (ABICs) values (with lower values indicating better fit) (Wang & Wang, 2012). As model fit improves with the possibility of more factors, these comparisons had to be balanced with the patterns of significant loadings of the respective items for the five possible factor structure solutions. Finally, the most appropriate solution was to split the items into four factors for use in the next version of the questionnaire:

- Basic feature use (3 items: make and receive calls; look at the time; look at the date and calendar);
- Intermediate feature use (5 items: send and receive SMSs; use the alarm clock; set reminders, e.g. for appointments, to take medication; give and receive family news; listen to music saved on the cell phone);
- Advanced and data-dependent feature use (11 items: use WhatsApp etc.; play games; send voice notes e.g. on WhatsApp; use the calculator; send and receive email; use Google to search for information; access Facebook [and/or other social media platforms, e.g., Twitter, Instagram]; use internet banking; read local and/or international news; listen to the radio; Watch TV/videos, e.g. YouTube, Netflix); and
- Imaging feature use (3 items: take photos; take selfies; look at photos).

It was also apparent from the statistical results that participants sometimes not only used the features themselves, but also asked someone else for help. Therefore, the measurement scale was changed, and Yes and No replaced with categories to indicate frequencies. A choice of *Never* would indicate a No answer, but choosing any of the other options implied a Yes answer. The categories indicating frequency of feature use were also revised, because they referred to different time intervals, such as a day, a week, or a month. For consistency, the categories were changed to time intervals related to a month: Once a month, A few times a month, Every day of the month. The same time intervals were also used to indicate the how often the participants would ask others to assist them with cell phone features.

Perceived Knowledge and Skill The 17 items of perceived levels of knowledge and skill were used to determine the possible number of factors they contained. The applicable Eigenvalues indicated a possibility of three factors. The outcomes of the EFAs showed that two items either did not load significantly at all or cross-loaded significantly on the explored factors: "I require assistance to explore new features" and "I am not competent enough to use all my cell phone features". These items were removed. As seen from the CFA results, the participants did not seem to distinguish between knowledge and skill. It was decided to change the format of the answers and provide three options in order to gather information on the two concepts combined: "Not at all", "With difficulty", and "With ease". After each grouping of items, a question was added regarding the participant's interest in learning more about the combination of features.

The best solution was to split the remaining 15 items into three factors for the new version of the questionnaire:

- Basic competence (4 items: Can you: switch a cell phone on and off; make calls; operate cell phone independently, and lock and unlock). The question whether participants would like to learn more about the basic features was added;
- Advanced competence (8 items: Can you: send messages; use advanced features, e.g. WhatsApp, Facebook; take photos; create new contacts; connect to the internet; explain different features to others; use almost all features; and use new features). The question whether participants would like to learn more about the advanced features was added; and
- Data/airtime management competence (4 items: Can you: upload airtime; buy airtime using a cell phone; buy data using the cell phone; and check the airtime/data balance). The added question was also included to determine if participants would like to learn more about the data/airtime management features.

Attitude This was measured with 13 items, which were used in an EFA to determine if there might be more than one factor present within the construct. Based on Eigenvalues higher than 1.00, three factors were possible. Two items did not load significantly onto any factor for any factor combination: "I see my cell phone as a dangerous gadget" and "I don't like cell phones", and they were removed from the revised questionnaire.

A three-factor solution was suggested by the EFA outcomes, which also complements the theoretical base of three components of attitude (Matteson et al., 2016):

- Affective component (How do you feel about cell phones) (4 items: I like cell phones; I like to use a cell phone; my cell phone is easy to use; my cell phone is very important to me);
- Cognitive component (How do you think about cell phones?) (5 items: A cell phone makes things easier; a cell phone is a wonderful instrument for communicating with people; a cell phone is helpful in reminding me of important things, e.g. appointments; I prefer less complex cell phones; I prefer pushbuttons, not touchscreens);
- Behavioural component (Why do you use cell phones?) (3 items: A cell phone makes me more independent; a cell phone makes me feel competent; I learn new things on cell phones).

Results of the statistical analysis, transdisciplinary input and consideration of relevant literature and theory, informed the revision of the we-DELIVER questionnaire to develop AG*e*Connect. Changes made are presented in Table 5.6.

Table 5.6 Changes to the we-DELIVER questionnaire to inform the AG*e*Connect questionnaire

Section	Sub-section/Description	Changes	Motivation
1. Biographical information (heading added)	1.1 Age What was your age on your last birthday?	Question reworded. Online: Predetermined options ranging from 50–120 included	"Year of birth" created confusion; predetermined options limit incorrect transmission of information
	1.2 Language What language is predominantly spoken in your home?	Add item with 11 official South African languages	Language is used here as proxy for sociocultural context
	1.3 Gender	"Other (please specify)" was added	To accommodate self-identified gender preference
	1.4 Place of residence What is the name of the place where you live?	Question reworded	To limit confusion about place of residence and temporary place (for example, when visiting)
	1.5 Highest level of education	Options were added	A range of categories allows for detail about different educational levels
	SU-LSM™ to determine the standards of living of participants (https://www.eighty20.co.za/lsm-calculator/)	Complete independent questionnaire excluded	Questionnaire is specific to South Africa
2. Household structure (heading added)	2.1 Do you live alone?	No change in item	– If yes, exclude irrelevant questions – If no, obtain number of people Online: choose predetermined categories
	2.2 With whom of the following people do you live?	Wording was changed to refine question	Repetition of different options extended the time of completion; predetermined categories were refined to include all possibilities, without unnecessary repetition
3. Cell phone information, use and access (heading revised)	3.1 How many working cell phones are there in the household?	Question reworded	Edited for clarity
	3.2 To whom does each cell phone belong?	Item and categories added	To determine access and ownership more specifically; relevant to planning interventions
	3.3 How often do you use a cell phone?	No change. Time intervals of responses were changed	To ensure consistent comparable time intervals across questionnaire

(continued)

Table 5.6 (continued)

Section	Sub-section/Description	Changes	Motivation
	3.4 By "never" do you mean:	Item was added	Clarity needed for what is meant by "never", to ensure it meant that participants did not use cell phones at all, and to give option to opt out of questionnaire
	3.5 Is the cell phone that you mostly use:	Wording of item revised; constructs 'borrow' and 'share' were reworded: – borrow (not your own but someone else's that you can use) – Share (your own and you share it with other people)	To focus on the cell phone mostly used and to avoid confusion with semantics
	3.6 If the cell phone belongs to you, who chose it for you?	Wording of item revised; more categories added	Question was edited for clarity about choice and agency in acquiring the device; categories were informed by data analysis
	3.7 Did you want this phone?	No change	Not applicable
	3.8 Please provide a reason for your previous answer	Options to explain Yes/No were added	Reasons for Yes/No provide detail related to the choice of the cell phone.
	3.9 Whose cell phone do you mainly use?	Item reworded; more categories added	To prevent confusion with semantics; categories were informed by data analysis
	3.10 With whom do you mainly share the cell phone?	Item reworded; more categories added	To prevent confusion with semantics; categories were informed by data analysis
	3.11 Regardless of whether the cell phone is your own, borrowed, or shared, who decides what can be done on the cell phone?	Item reworded	To clarify the question; to determine access
	3.12 What type of cell phone do you mostly use?	Item reworded	Difficult to determine the type of phone from photos; categories were informed by data analysis
	3.13 Who is your service provider?	Item added	Information could be used for funding applications

(continued)

Table 5.6 (continued)

Section	Sub-section/Description	Changes	Motivation
	3.14 How are the network services paid for?	Wording revised	Question was language edited
	3.15 Who mainly pays for the network services/airtime/data?	Item reworded; categories refined	To clarify the question; to identify the person who mainly pays for it; categories were informed by data analysis
	3.16 In your view, what is the most important reason for having a cell phone?	No change to item; predetermined categories added	To clarify the question; categories were informed by data analysis
	3.17 What do you use the cell phone primarily for?	Item reworded; predetermined categories added	Open-ended answers yielded confusing results; categories were informed by data analysis
	3.18 What do you do when you experience difficulties with your cell phone?	No change; one category was reworded	Category was language edited
4. Cell phone user patterns (heading revised)	4.1 Basic feature use 4.2 Intermediate feature use 4.3 Advanced and data-dependent feature use 4.4 Imaging feature use	Items and categories revised; time intervals changed	Statistical analysis informed item structure; some cell phone feature use was outdated; to ensure consistent comparable time intervals across questionnaire
5. Competence (no change)	5.1 Basic competence 5.2. Advanced competence 5.3. Data/airtime management competence	Items and categories revised; time intervals changed	Statistical analysis informed the item structure; to ensure consistent comparable time intervals across questionnaire
6. Attitude (no change)	6.1 How do you feel about cell phones 6.2 What do you think about cell phones 6.3 Why do you use cell phones	Items and categories revised	Statistical analysis informed the item structure; literature informed revisions
7. Interpersonal contact using cell phones (heading revised)	7.1 What do you do when you receive a call?	Item was split into separate questions about call and text; more categories were added	To avoid double-barrelled question; more options to identify helping person more accurately; analysis of data informed more options
	7.2 Why would you choose that (those) specific person(s)? (Choose one or two options only.)	Wording changed	Edited for clarity; more options to obtain an accurate description of why a particular person is asked; analysis of data informed more options

(continued)

Table 5.6 (continued)

Section	Sub-section/Description	Changes	Motivation
	7.3 What do you do when you receive a text?	See 7.1	See 7.1
	7.4 Why would you choose that (those) specific person(s)? (Choose one or two options only.)	Wording changed	Edited for clarity; more options to get an accurate description of why a particular person is asked; analysis of data informed more options
	7.5 Whom do you phone if you need urgent help?	Wording changed; options refined	Edited for clarity; to cover most likely options
	7.6 Why would you choose that (those) specific person(s)?	Item added	To get an accurate description of why a particular persons is asked
	7.7 Whom do you contact just to talk to?	Item reworded. More categories were added	Question was edited for clarity; categories were informed by data analysis
	7.8 Whom do you mainly ask for help with your cell phone?	Item reworded. More categories were added	Question was edited for clarity; categories were informed by data analysis
	7.9 Why do you ask that (those) specific person(s)?	Item reworded. More categories were added	To clarify question; to get an accurate description of why a particular person is asked; categories were informed by data analysis
	7.10 How old are the people you mainly ask for help to use a cell phone?	Item added	To identify inter/intragenerational patterns of assistance
	7.11 What is the general attitude of people when you ask them to help you with a cell phone?	Item reworded. Options were linked to specific age categories	To identify inter/intragenerational patterns of assistance
	7.12 What do people generally do when you ask them for help with a cell phone?	Item reworded. Options were linked to specific age categories	Question was edited; to identify nature of inter/intragenerational patterns of assistance
	7.13 Do people expect anything in return for their help?	Item reworded	Question was edited for clarity
	7.14 How often do you contact the following people on a cell phone?	Item reworded. More categories were added	Question was edited for clarity; categories were informed by data analysis; consistency of time intervals across questionnaire
	7.15 Why do you contact these people?	More categories were added	Categories were informed by data analysis
			To determine reciprocity of contact; consistency of

(continued)

Table 5.6 (continued)

Section	Sub-section/Description	Changes	Motivation
	7.16 How often are you contacted on a cell phone by the following people?	Item was added with categories and time intervals	time intervals across questionnaire
	7.17 Why are you contacted by these people?	Item was reworded. More categories were added	Question was edited; categories were informed by data analysis
	Do you or someone else on your behalf use the cell phone to get information about services (a list of social and healthcare services)	All items were removed	The focus of the we-DELIVER questionnaire was to obtain specific information about older participants' service needs. The AG*e*Connect questionnaire has a different focus
8.Open-ended question	How did you experience the data-collection process?	No change	Not applicable

5.4 AG*e*Connect Questionnaire (Age-Inclusive *e*Connections Between Generations for Interventions and Cell Phone Technology)

Here we present the AG*e*Connect questionnaire (Roos et al., 2022). The online version (https://ageconnect.questionpro.com/) has self-directed instructions, but for the MS Word version at the end of the chapter we suggest application guidelines.

5.4.1 Structure of the AGeConnect Questionnaire

The structure in Fig. 5.3 presents the different sections of the questionnaire:

- Biographical information: age, language, gender, place of residence, level of education;
- Household structure: living arrangements;
- Cell phone information, use and access: items related to access and ownership;
- Cell phone user patterns: use of specific cell phone features, divided into four subsections: Basic, Intermediate, Advanced and data-dependent, and Imaging features;
- Competence: divided into three subsections: Basic, Advanced, and Data/airtime management competence;
- Attitude: divided into Affective component (What do you feel about cell phones?), Cognitive component (What do you think about cell phones?), and Behavioural component (Why do you use cell phones?);

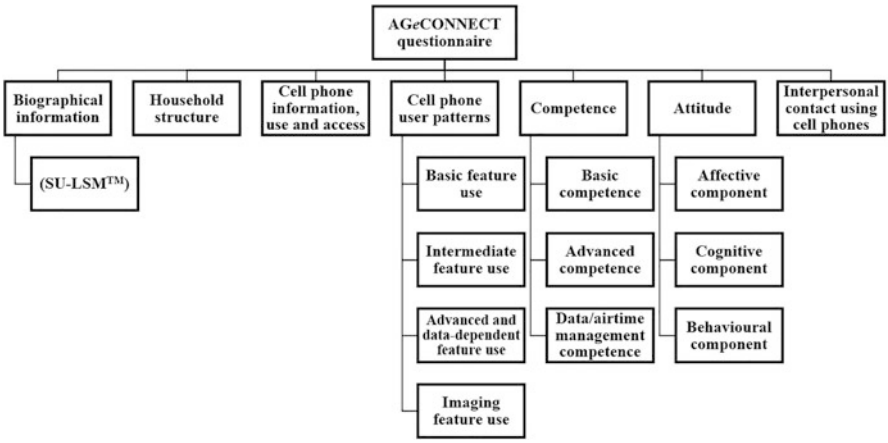

Fig. 5.3 Structure of the AG*e*Connect questionnaire

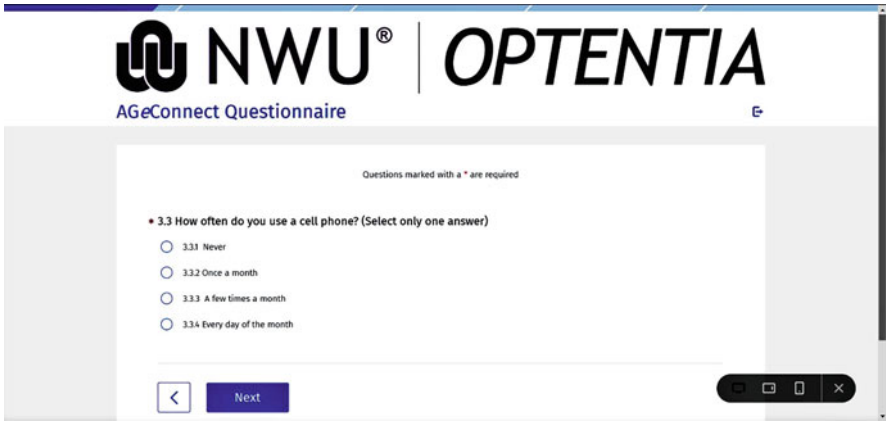

Fig. 5.4 Screenshot of question showing various options

– Interpersonal contact using cell phones: items related to actions performed to make contact with, and be contacted by, other people;
– An open-ended question at the end of the questionnaire asked older participants how they had experienced participating in a technology-based questionnaire about their cell phone use.

In the construction of the online questionnaire, certain logics were used to allow users to skip irrelevant questions to save time based on their answers. This process is illustrated in Fig. 5.4 where the question asks older participants how often they use a cell phone. If a participant selects the option “Never”, irrelevant follow-up questions

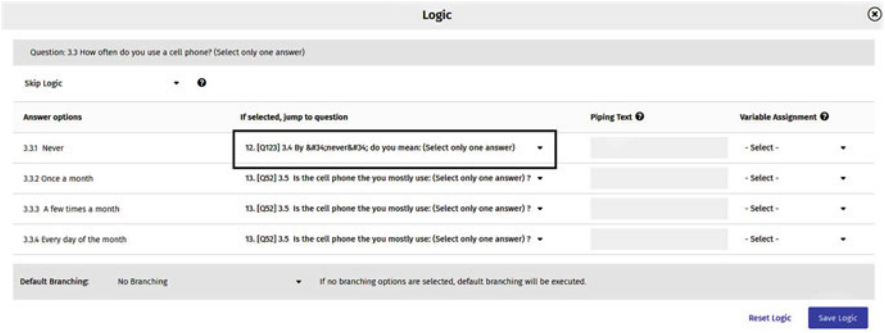

Fig. 5.5 Screenshot of back-end programming with the instruction to skip irrelevant options and move on to the next question

are excluded, as illustrated in Fig. 5.5, which shows the back-end programming with the instruction to skip to the next relevant question.

5.4.2 Guidelines for Using the AGeConnect Questionnaire

The purpose of the AG*e*Connect questionnaire was to gather information on how older persons use cell phones in relation to their close and distant social relationships, their care and social needs, and their perceived levels of competence to use basic and advance cell phone features.

Items under specific headings can be revised to fit the specific context, such as:

– Biographical information

  - Which language is predominantly spoken in your home?
  - What is the name of the place where you live?
  - What is your highest level of education?

– Cell phone information, use and access

  - Who is your service provider?
  - How are the network services paid for?

The AG*e*Connect questionnaire was designed for digital completion by the participants themselves or with the assistance of trained (younger) fieldworkers. In the digital version (compiled on QuestionPro https://www.questionpro.com), when a question is answered, the applicable follow-up questions open and irrelevant questions are skipped.

Training for younger people on how to use the questionnaire should include ways to create an optimal interpersonal context before setting out to capture older participants' responses on digital devices (see Chap. 7). Although the questionnaire was designed to be completed in a conversational manner, younger facilitators need

consciously to refrain from using leading prompts. It is also recommended that younger people who administer the questionnaire should be familiar with the vernacular and sociocultural context of the older participants (see Chap. 3).

When collecting data, the younger facilitators should select only the relevant option and not offer all possible answers provided for a particular question. For example, in response to item 3.6: "If the cell phone belongs to you, who chose it for you?" the participant could respond "My friend", which informs a follow-up question, such as: "Is your friend younger or older than you or the same age as you?" Based on the answer, the person administering the questionnaire would then capture the relevant response. The final question relating to how older participants experienced the data collection session reveals descriptive qualitative data. The rationale for including this question was to allow for coding and for improving items or the process of application for future purposes. In addition, it was intended as a means for obtaining valuable insight into this age-inclusive manner of data collection.

The questionnaire may be used by any researcher interested in the fields of gerontology or the utilization of mobile technology. Build into the design is its potential to be revised for addressing related research questions in future. As such, the version of AG*e*Connect described in this chapter represents opportunities for continuing work in progress, and should not be regarded as final.

5.5 Conclusion

Promoting age-integrated societies and communities effectively through technology depends on including people of all ages in age-appropriate and context-specific ways. Achieving this ideal calls for knowledge of older individuals' cell phone use to enable inclusivity, and, where relevant, through supportive facilitation by younger people who are familiar with the sociocultural contexts of the older persons. This approach not only yields useful data to develop technology artefacts or for planning interventions, but also demonstrates technology use and through facilitated intergenerational engagement in optimal interpersonal contexts can help to get the buy-in of older adults for use of such technology in future.

This chapter ventured into the uncharted territory of self-designed questionnaire development to capture older individuals' responses regarding their cell phone use in a context characterized by diversity. The longitudinal development of our data-collection tool is transparently reported, as we designed and revised our questionnaires to fit their specific purpose. The rigorous processes that we followed to ensure reliability and validity included: statistical analyses, transdisciplinary input, consultation of recent literature reviews (including context-relevant qualitative studies), and inclusion of items based on relevant theory. This part of the larger study sets the scene for using the first—to our knowledge—online, digital questionnaire for the South African context, with the aim of yielding much-needed quantifiable information about older individuals' cell phone use as the basis for developing *e*Interventions. Finally, by investigating the psychometric properties of the

AG*e*Connect (Version 3) questionnaire, we invite revisions to stay abreast of ever-evolving technology developments and to find creative and effective ways—for example, through trained younger people who can offer supportive facilitation—to deal with the digital divide and to keep advancing older individuals' inclusivity.

AG*e*Connect QUESTIONNAIRE

The purpose of the AG*e*Connect questionnaire is to gather information on the ways older persons use mobile technology in their physical and social environments, and on their levels of competence and their attitudes.

The questionnaire is meant to be completed electronically, whether by the participants themselves or with the assistance of trained fieldworkers.

1. Biographical information

1.1. What was your age on your last birthday? _____

1.2. What language is predominantly spoken in your home? (Select only one answer).

1.2.1. Afrikaans	□
1.2.2. English	□
1.2.3. isiNdebele	□
1.2.4. isiXhosa	□
1.2.5. isiZulu	□
1.2.6. Sepedi	□
1.2.7. Sesotho	□
1.2.8. Setswana	□
1.2.9. siSwati	□
1.2.10. Tshivenda	□
1.2.11. Xitsonga	□
1.2.12. Other (please specify)	□

1.3 What is your gender? (Select only one answer)

1.3.1. Male	□
1.3.2. Female	□
1.3.3. Other (please specify)	□

1.4. What is the name of the place where you live?

_____.

1.5. What is your highest level of education? (Select only one answer)

1.5.1. No formal education	□
1.5.2. Some primary school	□
1.5.3. Completed primary school	□

(continued)

1.5.4. Some high/secondary school	□
1.5.5. Completed high/secondary school	□
1.5.6. Some post-school education/training	□
1.5.7. Completed post-school certificate/training	□
1.5.8. Completed degree/diploma	□
1.5.9. Completed postgraduate studies	□

2. Household structure

2.1. Do you live alone? (Select only one answer)

2.1.1 Yes (Skip to Q3.1)	□	2.1.2 No	□

2.2. With whom of the following people do you live? (Include number for each relevant option)

2.2.1. Spouse	□
2.2.2. Children	□
2.2.3. Grandchildren	□
2.2.4. Other younger people	□
2.2.5. Other older people	□

3. Cell phone information, use, and access

3.1. How many working cell phones are there in the household?

_____.

3.2. To whom does each cell phone belong? (Answer more than one option as relevant)

3.2.1. To me	□
3.2.2. Spouse	□
3.2.3. Children	□
3.2.4. Grandchildren	□
3.2.5. Other younger people	□
3.2.6. Other older people	□

3.3. How often do you use a cell phone? (Select only one answer)

3.3.1. Never (Skip to Q3.4)	□
3.3.2. Once a month (Skip to Q3.5)	□
3.3.3. A few times a month (Skip to Q3.5)	□
3.3.4. Every day of the month (Skip to Q3.5)	□

3.4. By “never” do you mean: (Select only one answer)

3.4.1. I never use it	□
3.4.2. I don’t want one	□
3.4.3. I always ask someone else to use a cell phone on my behalf	□
3.4.4. I don’t have a cell phone, and I never use or borrow someone else’s (skip to Q8)	□

3.5. Is the cell phone that you mostly use: (Select only one answer)

3.5.1. Your own (Skip to Q3.6, Q3.7, and Q3.8)	□
3.5.2. Not your own but someone else's which you can use (Skip to Q3.9)	□
3.5.3. Your own and you share it with other people (Skip to Q3.10)	□

3.6. If the cell phone belongs to you, who chose it for you? (Select only one answer)

3.6.1. Myself	□
3.6.2. Spouse	□
3.6.3. Children	□
3.6.4. Grandchildren	□
3.6.5. Friend(s) younger than me	□
3.6.6. Friend(s) of my age	□
3.6.7. Friend(s) older than me	□
3.6.8. Younger family member(s)	□
3.6.9. Family member(s) of my age	□
3.6.10. Older family member(s)	□
3.6.11. Employer (work)	□
3.6.12. Other (please specify)	□

3.7. Did you want this cell phone? (Select only one answer)

3.7.1. Yes (Skip to Q3.8.1. For reasons)	□
3.7.2. No (Skip to Q3.8.2. For reasons)	□
3.7.3. Unsure (Skip to Q3.9)	□

3.8. Please provide a reason for your previous answer.
3.8.1. Please provide a reason for your previous Yes answer.
(Choose one or two options only) (Skip to Q3.11)

3.8.1.1. As a replacement	□
3.8.1.2. It is easy to use	□
3.8.1.3. It is affordable	□
3.8.1.4. It is strong (durable)	□
3.8.1.5. I liked it	□
3.8.1.6. Other (please specify)	□

3.8.2. Please provide a reason for your previous No answer.
(Choose one or two options only) (Skip to Q3.11)

3.8.2.1. I wanted another cell phone	□
3.8.2.2. I don't know how to use it	□

(continued)

3.8.2.3. I don't have any use for it	□
3.8.2.4. I didn't choose it	□
3.8.2.5. Other (please specify)	□

3.9. Whose cell phone do you mainly use?
(Choose one or two options only) (Skip to Q3.11)

3.9.1. Spouse	□
3.9.2. Children	□
3.9.3. Grandchildren	□
3.9.4. Friend(s) younger than me	□
3.9.5. Friend(s) of my age	□
3.9.6. Friend(s) older than me	□
3.9.7. Younger family member(s)	□
3.9.8. Family member(s) of my age	□
3.9.9. Older family member(s)	□
3.9.10. Employer (work)	□
3.9.11.Other (please specify)	□

3.10. With whom do you mainly share the cell phone? (Choose one or two options only)

3.10.1. Spouse	□
3.10.2. Children	□
3.10.3. Grandchildren	□
3.10.4. Friend(s) younger than me	□
3.10.5. Friend(s) of my age	□
3.10.6. Friend(s) older than me	□
3.10.7. Younger family member(s)	□
3.10.8. Family member(s) of my age	□
3.10.9. Older family member(s)	□
3.10.10. Employer (work)	□
3.10.11. Other (please specify)	□

3.11. Regardless of whether the cell phone is your own, borrowed, or shared, who decides what can be done on the cell phone? (Select only one answer)

3.11.1.Myself	□
3.11.2.Other people	□

3.12.What type of cell phone do you mostly use? (Select only one answer)

3.12.1. Pushbutton	□
3.12.2. Touchscreen	□

3.13. Who is your service provider? (Select all relevant options)

3.13.1. Vodacom	□
3.13.2. MTN	□
3.13.3.Cell C	□
3.13.4. Telkom	□
3.13.5. Other (please specify)	□

3.14. How are the network services paid for? (Select all relevant options)

3.14.1. A contract	□
3.14.2. Pay-as-you-go	□
3.14.3. Top-up	□

3.15. Who mainly pays for the network services/airtime/data? (Select only one answer)

3.15.1. Myself	□
3.15.2. Spouse	□
3.15.3. Children	□
3.15.4. Grandchildren	□
3.15.5. Friend(s) younger than me	□
3.15.6. Friend(s) of my age	□
3.15.7. Friend(s) older than me	□
3.15.8. Younger family member(s)	□
3.15.9. Family member(s) of my age	□
3.15.10. Older family member(s)	□
3.15.11. Employer (work)	□
3.15.12. Other (please specify)	□

3.16. In your view, what is the most important reason for having a cell phone? (Choose one or two options only)

3.16.1. Because my spouse/children/family insist/s	□
3.16.2. To make my life easier	□
3.16.3. To contact other people	□
3.16.4. To be contacted by other people	□
3.16.5. For emergency situations	□

3.17. What do you use the cell phone primarily for? (Select only one answer)

3.17.1. Communication	□
3.17.2. Provide and/or receive help	□
3.17.3. Assistance with daily responsibilities/tasks/errands	□
3.17.4. Other (please specify)	□

3.18. What do you do when you experience difficulties with your cell phone? (Choose one or two options only)

3.18.1. Leave it	□
3.18.2. Try to figure it out	□
3.18.3. Read the manual	□
3.18.4. Ask for help	□
3.18.5. Google the problem	□
3.18.6. Other (please specify)	□

4. Cell phone user patterns

4.1. Basic feature use

4.1.1 How often do you use a cell phone to: (Select only one answer)

	Never	Once a month	A few times a month	Every day of the month
4.1.1.1. Make and receive calls	□	□	□	□
4.1.1.2. Look at the time	□	□	□	□
4.1.1.3. Look at the date and calendar	□	□	□	□

4.1.2. How often do you ask someone to help you to: (Select only one answer)

	Never	Once a month	A few times a month	Every day of the month
4.1.2.1. Make and receive calls	□	□	□	□
4.1.2.2. Look at the time	□	□	□	□
4.1.2.3. Look at the date and calendar	□	□	□	□

4.2. Intermediate feature use

4.2.1 How often do you use a cell phone to: (Select only one answer)

	Never	Once a month	A few times a month	Every day of the month
4.2.1.1. Send and receive SMSs	□	□	□	□
4.2.1.2. Use the alarm clock	□	□	□	□
4.2.1.3. Set reminders, e.g. for appointments, to take medication	□	□	□	□
4.2.1.4. Give and receive family news	□	□	□	□
4.2.1.5. Listen to music saved on the cell phone	□	□	□	□

4.2.2. How often do you ask someone to help you to:
(Select only one answer)

	Never	Once a month	A few times a month	Every day of the month
4.2.2.1. Send and receive SMSs	□	□	□	□
4.2.2.2. Use the alarm clock	□	□	□	□
4.2.2.3. Set reminders, e.g. for appointments, to take medication	□	□	□	□
4.2.2.4. Give and receive family news	□	□	□	□
4.2.2.5. Listen to music saved on the phone	□	□	□	□

4.3. Advanced and data-dependent feature use
4.3.1. How often do you use a cell phone to: (Select only one answer)

	Never	Once a month	A few times a month	Every day of the month
4.3.1.1. Use WhatsApp	□	□	□	□
4.3.1.2. Play games	□	□	□	□
4.3.1.3. Send voice notes on, e.g. WhatsApp	□	□	□	□
4.3.1.4. Use the calculator	□	□	□	□
4.3.1.5. Send and receive email	□	□	□	□
4.3.1.6. Use Google to search for information	□	□	□	□
4.3.1.7. Access Facebook (and/or other social media platforms, e.g. twitter, Instagram)	□	□	□	□
4.3.1.8. Use internet banking	□	□	□	□
4.3.1.9. Read local and/or international news	□	□	□	□
4.3.1.10. Listen to the radio	□	□	□	□
4.3.1.11. Watch TV/videos, e.g. YouTube, Netflix	□	□	□	□

4.3.2. How often do you ask someone to help you to:
(Select only one answer)

	Never	Once a month	A few times a month	Every day of the month
4.3.2.1. Use WhatsApp	□	□	□	□
4.3.2.2. Play games	□	□	□	□
4.3.2.3. Send voice notes on, e.g. WhatsApp	□	□	□	□
4.3.2.4. Use the calculator	□	□	□	□
4.3.2.5. Send and receive email	□	□	□	□
4.3.2.6. Use Google to search for information	□	□	□	□
4.3.2.7. Access Facebook (and/or other social media platforms, e.g. twitter, Instagram)	□	□	□	□

(continued)

4.3.2.8. Use internet banking	□	□	□	□
4.3.2.9. Read local and/or international news	□	□	□	□
4.3.2.10. Listen to the radio	□	□	□	□
4.3.2.11. Watch TV/videos, e.g. YouTube, Netflix	□	□	□	□

4.4. Imaging feature use

4.4.1 How often do you use a cell phone to: (Select only one answer)

	Never	Once a month	A few times a month	Every day of the month
4.4.1.1. Take photos	□	□	□	□
4.4.1.2. Take selfies	□	□	□	□
4.4.1.3. Look at photos	□	□	□	□

4.4.2. How often do you ask someone to help you to:
(Select only one answer)

	Never	Once a month	A few times a month	Every day of the month
4.4.2.1. Take photos	□	□	□	□
4.4.2.2. Take selfies	□	□	□	□
4.4.2.3. Look at photos	□	□	□	□

5. Competence

5.1. Basic competence

5.1.1. Can you: (Select only one answer)

	Not at all	With difficulty	With ease
5.1.1.1. Switch a cell phone on and off	□	□	□
5.1.1.2. Make calls	□	□	□
5.1.1.3. Operate a cell phone independently	□	□	□
5.1.1.4. Lock and unlock a cell phone	□	□	□
5.1.1.5. Do you want to learn more about any of these basic features?	Yes □no □		

5.2. Advanced competence

5.2.1. Can you: (Select only one answer)

	Not at all	With difficulty	With ease
5.2.1.1. Send messages (SMSs)	□	□	□
5.2.1.2. Use advanced features, e.g. WhatsApp, Facebook	□	□	□
5.2.1.3. Take photos	□	□	□

(continued)

5.2.1.4. Create new contacts	□	□	□
5.2.1.5. Connect to the internet, e.g. Google	□	□	□
5.2.1.6. Explain different cell phone features to others	□	□	□
5.2.1.7. Use almost all cell phone features	□	□	□
5.2.1.8. Use new features on a cell phone	□	□	□
5.2.1.9. Do you want to learn more about any of these advanced features?	Yes □ no □		

5.3. Data/airtime management competence

5.3.1. Can you: (Select only one answer)

	Not at all	With difficulty	With ease
5.3.1.1. Upload airtime	□	□	□
5.3.1.2. Buy airtime using a cell phone	□	□	□
5.3.1.3. Buy data using a cell phone	□	□	□
5.3.1.4. Check airtime/data balance	□	□	□
5.3.1.5. Do you want to learn more about any of these data/airtime management features?	Yes □no □		

6. Attitude

6.1. How do you feel about cell phones: (Select only one answer)

	Strongly disagree	Disagree	Agree	Strongly agree
6.1.1. I like cell phones	□	□	□	□
6.1.2. I like to use a cell phone	□	□	□	□
6.1.3. My cell phone is easy to use	□	□	□	□
6.1.4. My cell phone is very important to me	□	□	□	□

6.2. What do you think about cell phones: (Select only one answer.)

	Strongly disagree	Disagree	Agree	Strongly agree
6.2.1. A cell phone makes things easier	□	□	□	□
6.2.2. A cell phone is a useful instrument for communicating with people	□	□	□	□
6.2.3. A cell phone is helpful in reminding me of important things, e.g. appointments	□	□	□	□
6.2.4. I prefer less complex cell phones	□	□	□	□
6.2.5. I prefer pushbuttons, not touchscreens	□	□	□	□

6.3. Why do you use cell phones: (Select only one answer)

	Strongly disagree	Disagree	Agree	Strongly agree
6.3.1. A cell phone makes me more independent	□	□	□	□
6.3.2. A cell phone makes me feel competent	□	□	□	□
6.3.3. I learn new things on cell phones	□	□	□	□

7. Interpersonal contact using cell phones

7.1. What do you do when you receive a call? (Select only one answer)

7.1.1. I answer it myself (Skip to 7.3.)	□
7.1.2. I ask my spouse to answer	□
7.1.3. I ask a younger family member to answer	□
7.1.4. I ask a family member of my age to answer	□
7.1.5. I ask an older family member to answer	□
7.1.6. I ask a younger community member to answer	□
7.1.7. I ask a community member of my age to answer	□
7.1.8. I ask an older community member to answer	□

7.2. Why would you choose that (those) specific person(s)?
(Choose one or two options only)

7.2.1. I trust them	□
7.2.2. They live close to me	□
7.2.3. They are younger than me	□
7.2.4. They are the same age as me	□
7.2.5. They are older than me	□
7.2.6. They are educated and have knowledge and resources	□
7.2.7. They are family	□
7.2.8. They won't judge me	□
7.2.9. Other (please specify)	□

7.3. What do you do when you receive a text? (Select only one answer)

7.3.1. I answer it myself (Skip to 7.5)	□
7.3.2. I ask my spouse to answer on my behalf	□
7.3.3. I ask a younger family member to answer on my behalf	□
7.3.4. I ask a family member of my age to answer on my behalf	□
7.3.5. I ask an older family member to answer on my behalf	□
7.3.6. I ask a younger community member to answer on my behalf	□
7.3.7. I ask a community member of my age to answer on my behalf	□
7.3.8. I ask an older community member to answer on my behalf	□

7.4. Why would you choose that (those) specific person(s)? (Choose one or two options only)

7.4.1. I trust them	□
7.4.2. They live close to me	□
7.4.3. They are younger than me	□
7.4.4. They are the same age as me	□
7.4.5. They are older than me	□
7.4.6. They are educated and have knowledge and resources	□
7.4.7. They are family	□
7.4.8. They won't judge me	□
7.4.9. Other (please specify)	□

7.5. Whom do you phone if you need urgent help? (Choose one or two options only)

7.5.1. No one (Skip to 7.7.)	□
7.5.2. Spouse	□
7.5.3. Children	□
7.5.4. Grandchildren	□
7.5.5. Friend and/or community member(s)	□
7.5.6. Emergency services	□
7.5.7. Other family members (please specify)	□

7.6. Why would you choose that (those) specific person(s)? (Choose one or two options only)

7.6.1. I trust them	□
7.6.2. They live close to me	□
7.6.3. They are younger than me	□
7.6.4. They are the same age as me	□
7.6.5. They are older than me	□
7.6.6. They are educated and have knowledge and resources	□
7.6.7. They are family	□
7.6.8. They won't judge me	□
7.6.9. Other (please specify)	□

7.7. Whom do you contact just to talk to? (Choose one or two options only)

7.7.1. No one	□
7.7.2. Spouse	□
7.7.3. Children	□
7.7.4. Grandchildren	□
7.7.5. Friend(s) younger than me	□
7.7.6. Friend(s) of my age	□

(continued)

7.7.7. Friend(s) older than me	□
7.7.8. Younger family member(s)	□
7.7.9. Family member(s) of my age	□
7.7.10.Older family member(s)	□
7.7.11. Neighbours	□
7.7.12. Younger community member(s)	□
7.7.13. Community member(s) of my age	□
7.7.14. Older community member(s)	□
7.7.15. Other (please specify)	□

7.8. Whom do you mainly ask for help with a cell phone?
(Select only one answer)

7.8.1. No one (Skip to 7.14)	□
7.8.2. Spouse	□
7.8.3. Children	□
7.8.4. Grandchildren	□
7.8.5. Friend(s) younger than me	□
7.8.6. Friend(s) of my age	□
7.8.7. Friend(s) older than me	□
7.8.8. Younger family member(s)	□
7.8.9. Family member(s) of my age	□
7.8.10. Older family member(s)	□
7.8.11. Neighbours	□
7.8.12.Younger community member(s)	□
7.8.13.Community member(s) of my age	□
7.8.14.Older community member(s)	□
7.8.15.Other (please specify)	□

7.9. Why do you ask that (those) specific person(s)?
(Choose one or two options only)

7.9.1. I trust them	□
7.9.2. They live close to me	□
7.9.3. They are younger than me	□
7.9.4. They are the same age as me	□
7.9.5. They are older than me	□
7.9.6. They are educated and have knowledge and resources	□
7.9.7. They are family	□
7.9.8. They won't judge me	□
7.9.9. Other (please specify)	□

7.10. How old are the people you mainly ask for help to use a cell phone? (Select only one answer)

7.10.1. Younger than me	□
7.10.2. Same age as me	□
7.10.3. Older than me	□

7.11. What is the general attitude of people when you ask them to help you with a cell phone? (Choose at least one answer per age group)

	Friendly	Helpful	Neutral	Unhelpful	Unfriendly	Irritated	Angry
7.11.1. Younger person(s)							
7.11.2. Person (s) of my age							
7.11.3. Older person(s)							

7.12. What do people generally do when you ask them for help with a cell phone? (Choose at least one answer per age group)

	They help with a positive attitude	They always help	They sometimes help	They help but with a negative attitude	They never help	They ignore me
7.12.1. Younger person(s)	□	□	□	□	□	□
7.12.2. Person(s) of my age	□	□	□	□	□	□
7.12.3. Older person (s)	□	□	□	□	□	□

7.13. Do people expect anything in return for their help? (Choose at least one answer per age group)

	Nothing	Yes, money	Yes, airtime	Yes, co-use of the cell phone	Other
7.13.1. Younger person (s)					
7.13.2. Person(s) of my age					
7.13.3. Older person(s)					

7.14. How often do you contact the following people on a cell phone? (Select one answer for every option listed)

	Never	Once a month	A few times a month	Every day of the month
7.14.1. Spouse	□	□	□	□
7.14.2. Children	□	□	□	□
7.14.3. Grandchildren	□	□	□	□
7.14.4. Younger family members	□	□	□	□
7.14.5. Family members of your age	□	□	□	□
7.14.6. Older family members	□	□	□	□
7.14.7. Younger friends	□	□	□	□
7.14.8. Friends of your age	□	□	□	□
7.14.9. Older friends	□	□	□	□
7.14.10. People from church	□	□	□	□
7.14.11. Any other person	□	□	□	□

7.15. Why do you contact these people? (Choose one or two options only)

7.15.1. To hear how they are	□
7.15.2. I am lonely, I miss them	□
7.15.3. I like talking to them	□
7.15.4. To provide/receive important news	□
7.15.5. To ask for advice, e.g. personal problem	□
7.15.6. To ask for help, e.g. leaking tap	□
7.15.7. To send them money	□
7.15.8. To ask for money	□
7.15.9. To fight with them	□
7.15.10. Other (please specify)	□

7.16. How often are you contacted on a cell phone by the following people? (Select one answer for every option listed)

	Never	Once a month	A few times a month	Every day of the month
7.16.1. Spouse	□	□	□	□
7.16.2. Children	□	□	□	□
7.16.3. Grandchildren	□	□	□	□
7.16.4. Younger family members	□	□	□	□
7.16.5. Family members of your age	□	□	□	□
7.16.6. Older family members	□	□	□	□
7.16.7. Younger friends	□	□	□	□

(continued)

7.16.8. Friends of your age	☐	☐	☐	☐
7.16.9. Older friends	☐	☐	☐	☐
7.16.10. People from church	☐	☐	☐	☐
7.16.11. Any other person	☐	☐	☐	☐

7.17. Why are you contacted by these people? (Choose one or two options only)

7.17.1. To hear how I am	☐
7.17.2. They are lonely, they miss me	☐
7.17.3. They like talking to me	☐
7.17.4. To provide/receive important news	☐
7.17.5. To ask for advice, e.g. personal problem	☐
7.17.6. To ask for help, e.g. leaking tap	☐
7.17.7. To send me money	☐
7.17.8. To ask for money	☐
7.17.9. To fight with me	☐
7.17.10. Other (please specify)	☐

8. How did you experience the data-collection process?

_____.

This is the end of the questionnaire. Thank you for your time and participation!

References

Annan K. (1998, October 1). *UN International Conference on Ageing Press release.*. Retrieved from: https://www.un.org/press/en/1998/19981001.sgsm6728.html.

Calvert, J. F., Jr., Kaye, J., Leahy, M., Hexem, K., & Carlson, N. (2009). Technology use by rural and urban oldest old. *Technology and Health Care, 17*(1), 1–11.

Cerrito, A., Bichsel, L., Radlinger, L., & Schmid, S. (2015). Reliability and validity of a smartphone-based application for the quantification of the sit-to-stand movement in healthy seniors. *Gait & Posture, 41*(2), 409–413.

Campbell, P. L. (2011). *Peirce, pragmatism, and the right way of thinking*. Sandia National Laboratories.

Dewey, J. (1998). *The essential Dewey: Pragmatism, education, democracy* (Vol. 1). Indiana University Press.

Dixon, B. (2019). Experiments in experience: Towards and alignment of research through design and John Dewey's pragmatism. *Design Issues, 35*(2), 5–12. https://doi.org/10.1162/desi_a_00531

Eighty20. (n.d.). *LSM calculator.* https://www.eighty20.co.za/lsm-calculator/

Fetters, M. D., Curry, L. A., & Creswell, J. W. (2013). Achieving integration in mixed method designs–principles and practices. *Health Services Research, 48*(6 Pt 2), 2134–2156. https://doi.org/10.1111/1475-6773.12117

Field, A. (2018). *Discovering statistics using IBM SPSS statistics (5ed.)*. SAGE.

Foxcroft, C. D. (2004). Planning a psychological test in the multicultural south African context. *SA Journal of Industrial Psychology, 30*(4), 8–15.

Foxcroft, C., & Roodt, G. (2018). *An introduction to psychological assessment in the south African context* (5th ed.). Oxford University Press Cape Town.

Haupt P. (2017). *The SAARF Universal Living Standards Measure (SU-LSMTM): 12 years of continuous improvement.*. http://www.saarf.co.za/LSM/lsm-article.asp.

IBM Corporation. (2020). *IBM SPSS statistics for windows, version 26.0*. IBM Corporation.

Kaplan, M., Sanchez, M., & Hoffman, J. (2017). *Intergenerational pathways to a sustainable society*. Springer Nature.

Lamont, E., De Klerk, W., & Malan, L. (2017). Older age south African persons' experiences of their needs with cell phone use. *Journal of Psychology in Africa, 27*(3), 260–266.

Leburu K., Grobler H., & Bohman D. M. (2018). *Older people's competence to use mobile phones: An exploratory study in a south African context.* Unpublished Master's dissertation: North-West University, Vanderbijlpark Campus, South Africa. Retrieved from https://repository.nwu.ac.za/handle/10394/32051

Lee Y. S. (2007). *Older adults' user experiences with mobile phones: Identification of user clusters and user requirements* (Doctoral dissertation, Virginia Tech).

Lui, C., Everingham, J., Warburton, J., Cuthill, M., & Hl, B. (2009). Review article. What makes a community age-friendly: A review of international literature. *Australasian Journal on Ageing, 28*(3), 116–121.

Matteson, M. L., Anderson, L., & Boyden, C. (2016). "Soft skills": A phrase in search of meaning. *Portal: Libraries and the Academy, 16*(1), 71–88.

Menec, V. H., Means, R., Keating, N., Parkhurst, G., & Eales, J. (2011). Conceptualizing age-friendly communities. *Canadian Journal on Aging, 30*(3), 479–493. https://doi.org/10.1017/S0714980811000237

Muthén L. K. and Muthén, B. O. (1998–2021). *Mplus user's guide* (8th) : Muthén & Muthén.

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Sage.

Rahim, S., Qutoshi, S. B., Abida, S., Muhammad, F., & Hussain, I. (2020). Access and use of mobile phone in daily life activities by rural women of Gilgit-Baltistan, Pakistan. *Mobile Information Systems, 2020*, 8835877. https://doi.org/10.1155/2020/8835877

Roos, V. (2008). The Mmogo-method®: Discovering symbolic community interactions. *Journal of Psychology in Africa, 18*(4), 659–668. http://www.tandfonline.com/doi/abs/10.1080/14330237.2008.10820249#.VGCob_noRs8

Roos, V. (2016). Conducting the Mmogo-method. In V. Roos (Ed.), *Self-constructed visual research towards understanding relational experiences: The Mmogo-method* (pp. 19–32). Springer.

Roos, V., Silvestre, S., & De Jager, T. (2017). Intergenerational care perceptions of older women and middle adolescents in a resource-constrained community in South Africa. *Journal of Gerontological Social Work, 60*(2), 104–119. http://www.tandfonline.com/doi/org/10.1080/01634372.2016.1268231

Roos V. Hoffman J.R., Erasmus M. and Bothma E. (2022). AG*e*Connect questionnaire (age-inclusive *e*Connections between generations for interventions and cell phone technology). https://ageconnect.questionpro.com.

Rorty, R., Putnam, H., Conant, J., & Helfrich, G. (2004). What is pragmatism? *Think. Philosophy for Everyone, 8*, 71–87.

Scholtz S. E. (2015). Assistance seeking behaviour in older persons regarding the use of their mobile phones. (Masters dissertation, North-West University (South Africa), Potchefstroom Campus).

South African Audience Research Foundation (SAARF) (2017). *Living Standards Measurement.* http://www.saarf.co.za/lsm/lsms.asp

Steels, S. (2015). Key characteristics of age-friendly cities and communities: A review. *Cities, 47*, 45–52.

Steyn, S., Roos, V., & Botha, K. H. F. (2018). Cell phone usage relational regulation strategies of older south Africans. *Journal of Psychology in Africa, 28*(3), 201–205.

United Nations. (2002). Political declaration and Madrid international plan of action on ageing. *Second World Assembly of Aging.*. Retrieved from: https://www.un.org/development/desa/ageing/madrid-plan-of-action-and-itsimplementation.html

Walsh, K., Scharf, T., & Keating, N. (2017). Social exclusion of older persons: A scoping review and conceptual framework. *European Journal of Ageing, 14*, 81–98. https://doi.org/10.1007/s10433-016-0398-8

Wang, J., & Wang, X. (2020). *Structural equation modelling applications using Mplus* (2nd ed.). Wiley.

Wang, J., & Wang, X. (2012). *Structural equation modelling: Applications using Mplus*. Wiley.

Warth, L. (2016). The WHO global network of age-friendly cities and communities: Origins, developments and challenges. In T. Moulaert & S. Garon (Eds.), *Age-friendly cities and communities in international comparison: Political lessons, scientific avenues, and democratic issues* (pp. 37–46). Springer.

World Health Organization. (2007). *New guide on building age-friendly cities.*. https://www.who.int/news/item/01-10-2007-new-guide-on-building-age-friendly-cities.

World Health Organization. (2015). *World health statistics 2015*. https://www.who.int/docs/default-source/gho-documents/world-health-statistic-reports/world-health-statistics-2015.pdf

World Health Organization. (2020). Decade of healthy ageing: Plan of action. https://www.who.int/publications/m/item/decade-of-healthy-ageing-plan-of-action.