Journal of Retailing and Consumer Services xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

Journal of Retailing and Consumer Services

journal homepage: www.elsevier.com/locate/jretconser

The role of cognitive age in explaining mobile banking resistance among elderly people

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ARTICLE INFO

Keywords:
Mobile banking
Resistance behavior
Elderly population
Cognitive age

ABSTRACT

This study investigates mobile banking resistance among elder individuals. More specifically, and on the basis of cognitive age as a moderator, a multigroup analysis was conducted to compare the relationships between psychological and functional barriers. Data was collected from 425 elder mobile banking non-users, and SmartPLS 3 was used to assess the structural model and run a multigroup analysis. The results indicate that tradition and image barriers affect usage, value, and risk barriers. In turn, all barriers influence resistance behavior. Furthermore, cognitive age was found to moderate these relationships. The study sheds light on the relationships between psychological and functional barriers and their effects on resistance behavior. In addition, it highlights the heterogeneity between cognitively young elders and cognitively old elders regarding their perceptions of mobile banking barriers.

1. Introduction

Mobile banking is a value-added service that has many advantages for customers, including ubiquity, convenience, and cost-efficiency (Lin, 2011). However, customers remain skeptical about its adoption, despite the initial expectations of academics and practitioners (Claudy et al., 2015). It could therefore be more interesting to explore the reasons for resistance than the reasons for adoption (Laukkanen, 2016). Although research on the diffusion of innovation perspective has produced a rich and valuable body of cumulative knowledge, many scholars assume that it has little to say about resistance behavior and fail to consider the reasons against technology acceptance (Claudy et al., 2015). It should be noted that resistance should not necessarily be treated as the mere opposite of adoption (i.e., non-adoption), but rather as a specific form of behavior that may manifest as rejection, postponement, or opposition (Kleijnen et al., 2009). Previous research shows that the inhibitors to adoption are not necessarily enablers for resistance, which proves that resistance is conceptually distinct from non-adoption (Claudy et al., 2015; Kleijnen et al., 2009). Indeed, "extensive research shows that people's motives to adopt and reasons to resist innovation differ qualitatively, and they influence people's decisions in different ways" (Claudy et al., 2015, p. 528). More specifically, people resist innovation for different reasons (reasons against), regardless of other reasons for adoption (e.g., perceived relevance, positive attitude, and felt desire) (Claudy et al., 2015; Ram and Sheth, 1989).

Although relevant to consumer research, the technology adoption literature is affected by a pro-innovation bias according to which "innovations are always good, improvements over existing products or services, and consumers always want to adopt the newest products and services" (Laukkanen, 2016, p. 2432). This reasoning does not provide any explanation for the alarming failure rates (50–90%) or the slow penetration rates of the majority of innovations (Claudy et al., 2015). Such failures and slow penetration rates, which are mainly due to consumer resistance, "represent mis-investments," "are especially harmful…and might even endanger the competitiveness of companies" (Heidenreich et al., 2016, p. 2440). In contrast, the innovation resistance model (Laukkanen, 2016; Ram and Sheth, 1989) seems to be more appropriate for investigating consumer resistance since it examines the set of psychological (tradition and image barriers) and functional barriers (usage, value, and risk barriers) that prompt consumer resistance responses.

According to the literature, such resistance is much more rooted among older individuals than younger ones. This might explain why many firms tend to target the young generations and overlook the old ones. However, companies that make this strategic choice may miss profitable opportunities, as the elderly segment represents good potential in terms of size, wealth, and consumption patterns. The world's

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https://doi.org/10.1016/j.jretconser.2018.07.009

population is getting older at an unprecedented rate, and the elderly population is increasing faster than any other age cohort. The elderly segment is expected to grow even more in the near future thanks to improvements in health care and financial status (United Nations, 2015). The rise of this age segment is much more noticeable in developed countries where the proportion of older persons exceeds 23% of the total population (United Nations, 2015). These changes in the demographic structure could generate promising business opportunities for companies, including banks (Kohlbacher et al., 2015). Consequently, companies should proactively rethink their strategies in a way that effectively fits the new market realities (Shukla, 2008).

The overwhelming majority of marketers use chronological age as one of the main criteria for market segmentation. For instance, high-tech services are mainly targeted at young people, who are seen as being enthusiastic about and familiar with technological innovations (e.g., Venkatesh et al., 2012). Older individuals, on the other hand, are typically portrayed as lacking enthusiasm, having high dispositional resistance to innovation, showing stress and anxiety toward novelty, and being rigid and unable to learn how to use technologies (Oreg et al., 2009). This negative stereotyping is likely to mislead companies, since the new elderly generation has undeniably fostered a “revolution in lifestyles and living arrangements” (Casper et al., 2015, p. 41). Accordingly, we have adopted a more positive perspective on ageing, assuming that, compared to chronological age, cognitive age is a much better and accurate criterion for market segmentation, as it “captures an essence of age not revealed by one's chronological age” (Van Auken and Barry, 1995, p. 108).

The objectives of this study were twofold. First, we explored the phenomenon of resistance among elders by shedding light on how functional and psychological barriers affect mobile banking resistance and the interplay that is likely to occur between them. More specifically, we argue that innovation resistance is determined by individuals' perceptions of an innovation's functional barriers, which in turn are impacted by individuals' psychological barriers. Second, we assessed the potential moderating role that cognitive age might play in the relationships between functional barriers, psychological barriers, and mobile banking.

The remainder of the article is structured as follows. The next section reviews the literature on cognitive age and resistance behavior and presents the conceptual model with the proposed relationships. The third section explains the research methodology. Results and research implications are reported in sections four and five. Finally, the last section presents limitations and future research avenues.

2. Literature review

The bulk of the literature on innovation argues that its adoption or resistance is often subject to individuals' sociodemographic characteristics, such as age and gender (Venkatesh et al., 2012), and education (Shaikh and Karjaluoto, 2015). Our study is an inaugural attempt to examine resistance through the lens of cognitive age.

2.1. Cognitive age and innovation

Chronological age, which is calculated based on the year of birth, is traditionally used as a criterion for market segmentation (Van Auken and Barry, 1995; Venkatesh et al., 2012). This approach routinely associates older people with negative clichés (e.g., older people are more resistant to new technology than young people) and thereby contaminates the comprehension of the market (Sudbury and Simcock, 2009). However, there is an emerging body of research based on the assumption that lumping older individuals together as part of a homogenous group fails to acknowledge the differences in attitudes and behaviors that obviously exist among them (Sherman et al., 2001). Indeed, silver consumers do not share common beliefs, values, attitudes, desires, or behaviors (Kohlbacher and Chéron, 2012; Sherman et al., 2001).

Souiden and Diagne (2009) argue that attitudes toward and consumption of certain products (e.g., cosmetics for men) are largely explained by individuals' perceptions of themselves as being much younger than their biological age, and by their efforts to preserve their youthfulness. This has been corroborated by findings that highlight the non-significant impact of chronological age on consumer behavior compared to cognitive age (e.g., Baker et al., 2007). Many older people are confident and comfortable embracing the latest high-tech tools and software solutions in different areas of daily life, including automated household devices, intuitive mobile applications, and connected cars. Thus, their usage is no longer restricted to young individuals and increasingly associated with the elderly (Arning and Ziefle, 2010).

Some researchers have begun to recognize that cognitive age, which refers to any self-perceived age other than the birth age (Stephens, 1991), is a more authentic reflection of an individual's values and a better predictor of their consumption intentions and behaviors. As such, it contributes more than chronological age to our comprehension of people's self-image and consumption behaviors (Kohlbacher and Chéron, 2012; Sudbury and Simcock, 2009; Wilkes, 1992). Recent literature on ageing empirically shows that the use of chronological age as a segmentation criterion is no longer an effective way to explain behavioral differences among the elderly (Shukla, 2008). It classifies elders on the basis of their cognitive age in comparison with their chronological age (Hong et al., 2013). Cognitively old elders, who perceive themselves as older than their chronological age, exhibit higher scores on cautiousness, vigilance, cognitive rigidity, reluctance, dispositional resistance, routine seeking, anxiety toward technologies, and risk aversion, and lower scores on self-esteem and self-confidence. Cognitively young elders, who perceive themselves as younger than they actually are, show higher levels of self-confidence, self-respect, innovativeness, positive self-image, novelty-seeking, open-mindedness, curiosity, self-fulfillment, spirit of adventure, well-being, creativity, sense of accomplishment, excitement, willingness to try innovations and accept change, and risk taking (Chen and Chan, 2014; Oreg et al., 2009; Schiffman and Sherman, 1991; Stephens, 1991; Wilkes, 1992).

2.2. Innovation resistance

Consumer resistance is regarded as a prominent cause of innovation failure (Claudy et al., 2015). To explore this phenomenon, Ram and Sheth (1989) suggested using the innovation resistance model. According to these authors, the main barriers responsible for innovation resistance can be classified into two categories: functional barriers (i.e., usage barrier, value barrier, and risk barrier) and psychological barriers (i.e., tradition barrier and image barrier).

2.2.1. The role of functional barriers: usage, value, and risk barriers

The usage barrier, the first type of functional barrier, refers to doubts about the effectiveness of an innovation, since at the pre-adoption stage, people are unable to identify the full spectrum of advantages associated with its adoption (Antioco and Kleijnen, 2010). Accordingly, “it is uncertain whether consumers will benefit from this change in the long run” (Antioco and Kleijnen, 2010, p. 1703). In the context of our study, non-users usually believe that mobile banking is far from being beneficial, convenient, and helpful, and that it does not make banking transactions easier and faster, as claimed by the banking industry (Laukkanen, 2016). Laukkanen et al. (2007) reported that mobile banking is perceived as inconvenient because of the tininess of the screens and keyboards of mobile devices. A subsequent study (Laukkanen, 2016) notede that mobile banking is perceived as time-consuming and effortful because of the limited information that is displayed and processed on the device. Previous literature offers a wealth of support for the relevance of usage barrier as a key hindering factor of mobile banking adoption (Laukkanen, 2016).

For our study, we postulate that cognitively old elders would be less

willing to engage in learning activities and less likely to find innovations convenient, and that they would tend to underestimate their usefulness. Conversely, cognitively young elders would be more likely to find innovations suitable for them since they are deeply attached to new products and services, technology savvy, avid learners, and responsive to acquiring novel information (Sherman et al., 2001). Thus, we hypothesize that:

H1. *For elder consumers, the impact of the usage barrier on mobile banking resistance would be a) significant and positive and b) moderated by cognitive age, such that the effect would be stronger (weaker) for cognitively old (young) elders.*

The value barrier refers to "the performance-to-price ratio compared with product substitutes" (Antioco and Kleijnen, 2010, p. 1703) and is similar to Venkatesh et al.'s (2012) concept of price value. When people perceive that an innovation does not offer any substantial additional value with the alternatives they currently use, they are more inclined to develop resistance (Laukkanen et al., 2007). To be adopted, mobile banking must be perceived as having a higher value compared to other banking channels such as offline banking or automated teller machines (Venkatesh et al., 2012). In reality, however, it is hard to assess the exact value of mobile banking because its benchmark is unclear, uncertain, and even completely unknown for some people at the pre-adoption stage (Antioco and Kleijnen, 2010).

Drawing on previous studies (Hong et al., 2013; Sherman et al., 2001), we assume that cognitively old elders would be skeptical and pessimistic about technologies and suspicious of their potential value in relation to familiar products and services. Thus, they would not value mobile banking. Conversely, we assume that cognitively young elders would view technologies as providing additional value and flexibility and would demonstrate high levels of optimism and enthusiasm toward innovations, thus ascribing greater value to technology use. Therefore, we hypothesize that:

H2. *For elder consumers, the impact of the value barrier on mobile banking resistance would be a) significant and positive and b) moderated by the cognitive age, such that the effect would be stronger (weaker) for cognitively old (young) elders.*

As for the risk barrier, the third functional barrier, it refers to the degree of threat and danger inherent in an innovation (Laukkanen, 2016). Due to the perceptions of uncertainty and vulnerability surrounding mobile banking, risk is considered a critical factor that prevents individuals from adopting this new channel (Luo et al., 2010). Gerrard et al. (2006) reported that perceived risk is one of the most common barriers to adoption. It reflects individuals' doubts regarding the performance, financial, social, and security risks that may occur when using mobile banking (Laukkanen, 2016; Luo et al., 2010). Individuals fear that the system, the Internet connection, or the mobile device may fail to successfully complete the task (Laukkanen, 2016). Previous research has provided consistent empirical evidence that perception of risk is a major reason for not adopting mobile banking (Laukkanen, 2016).

We assume that cognitively old elders, who are more risk averse, are likely to be anxious to handle mobile banking without making errors (Laukkanen, 2016). In contrast, we expect cognitively young elders, who are likely to be self-confident and risk-takers, would feel comfortable (without fear) when using it. We therefore hypothesize that:

H3. *For elder consumers, the impact of the risk barrier on mobile banking resistance would be a) significant and positive and b) moderated by cognitive age, such that the effect would be stronger (weaker) for cognitively old (young) elders.*

2.2.2. The role of psychological barriers: the tradition and image barriers

According to Laukkanen et al., (2007, pp. 420–421), "the vast majority of consumers have no a priori desire to change" and "have a tendency to strive for consistency and status quo rather than continuously search for new behaviors." The tradition barrier emerges when the adoption of a new technology generates meaningful changes in a person's habitual behaviors (Laukkanen, 2016). This shift in behaviors is seen as a potential threat due to its incompatibility with the individual's existing values, practices, and prior experience (Laukkanen, 2016). In line with this view, Heidenreich and Handrich (2015) argue that many individuals are less open to innovations and find it hard to break away from routines or change their minds.

The status quo bias theory assumes that humans are motivated by innate conservatism and therefore develop a cognitive misperception of loss aversion according to which "losses loom larger than gains in value perception" (Kim and Kankanhalli, 2009, p. 569). This bias helps avoid or minimize post-decisional regret that could result from "unsatisfactory" choices (Wang et al., 2013). This desire for inertia affects people's inferential decision-making process "by putting forward a preference order that depends on the current reference level [here using their habitual bank channel], which is represented by an individual's status quo" (Falk et al., 2007, p. 147). As such, those who resist innovations tend to be insensitive (less receptive) to their real benefits or value and attribute poor expected performance to them (Montoya-Weiss et al., 2003). In other words, they underestimate (and even ignore) the advantages of the new channel while at the same time tending to overestimate the usefulness of the traditional channel (Falk et al., 2007). Since the perceived losses from giving up the status quo outweigh the perceived gains; the potential risks appear, in the eyes of resistors, to be much more severe and detrimental than they actually are (Falk et al., 2007). In keeping with this view and in the context of the banking sector, Curran and Meuter (2007) argue that a bank customer, who is "traditionally" accustomed to a familiar channel will attribute a high value to it rather than opt for an unfamiliar alternative such as mobile banking.

In addition to the impact of the tradition barrier on consumers' perceptions of usage, value and risk barriers, and considering the role of cognitive age in explaining consumers behaviors, this study argues that cognitive age moderates the impact of the tradition barrier on mobile banking resistance, such that the effect will be stronger (weaker) for those who are cognitively old (young) elders. We expect that the tradition barrier would have a more significant impact on elders who are cognitively old than on those who are cognitively young. The former are described generally as routine seekers who prefer face-to-face interaction and fear changes that may threaten their habits (Kohlbacher and Chéron, 2012). The latter are seen to be more curious and adventurous and more willing to break with traditions and search for novel experiences and interests (Sherman et al., 2001). Thus, we hypothesize that:

H4.1. *For elder consumers, the impact of the tradition barrier on a) mobile banking resistance, b) the usage barrier, c) the value barrier, and d) the risk barrier would be significant and positive.*

H4.2. *For elder consumers, the impact of the tradition barrier on a) mobile banking resistance, b) the usage barrier, c) the value barrier, and d) the risk barrier would be moderated by cognitive age, such that the effect would be stronger (weaker) for cognitively old (young) elders.*

The second form of psychological barrier is the image barrier. It refers to inferred negative attitudes and perceptions with respect to a product or service (Laukkanen, 2016). Generally, individuals develop their first impressions of a new technology by associating it to its specific classification, industry, and country of origin (Ram and Sheth, 1989). When these associations are unfavorably perceived, individuals are likely to form an overall negative image about that technology and/or its derivatives (Laukkanen, 2016). The image barrier derives thus from "a perceptual problem that arises out of stereotyped thinking" (Ram and Sheth, 1989, p. 9). When individuals hold an overall negative image about certain types of technology, they tend to systematically

ascribe the same stereotyped judgement to related products and services (e.g., mobile banking) (Laukkanen et al., 2007). And when they hold such negative views, they are likely to develop resistance (Laukkanen, 2016).

When non-users hold unfavorable impressions toward mobile banking, they fail to see its benefits or additional value in comparison with other familiar alternatives (Featherman and Pavlou, 2003). They are likely to view banks' claims about mobile banking as doubtful and even misleading. Consequently, non-users tend to perceive mobile banking (i.e., how using the system per se and applying the safety rules) as a complex task "plagued with performance problems and usage uncertainties" and as a fragile system vulnerable to attacks and data thefts (Featherman and Pavlou, 2003, p. 457). This stereotyped representation amplifies their sense of anxiety and information overload and nurtures uncertainty and perceptions of risk, making them believe they are likely to make errors and be subject to fraud and hacker attacks (Featherman et al., 2006).

Aside from examining the impact of the image barrier on the usage, value and risk barriers, we also assume that cognitively old elders would be affected by the image barrier more than cognitively young elders. The former are seen as being less likely to be involved with technological innovations and less likely to base their choice on inferential decision making. The latter are seen as being more technology savvy and continuously acquire and process information, motivated by a desire to seek novelty (Hong et al., 2013). For this reason, we hypothesize that cognitive age would moderate the impact of the image barrier on mobile banking resistance, such that the effect would be stronger (weaker) for those who are cognitively old (young) elders.

H5.1. *For elder consumers, the impact of the image barrier on a) mobile banking resistance, b) the usage barrier, c) the value barrier, and d) the risk barrier would be significant and positive.*

H5.2. *For elder consumers, the impact of the image barrier on a) mobile banking resistance, b) the usage barrier, c) the value barrier, and d) the risk barrier would be moderated by cognitive age, such that the effect would be stronger (weaker) for cognitively old (young) elders.*

Fig. 1 shows the study's conceptual model which suggests that cognitive age moderates the interrelationships between psychological and functional barriers as well as the effects of such barriers on mobile banking resistance. Presumably, the strength of such paths increases as cognitive age increases.

3. Methodology

Our study was conducted in a major French city. France constitutes an interesting environment in which to study mobile banking resistance among elders because the elderly population represents 23.7% of the country's total population (National Institute of Statistics and Economic Studies, 2017) and the majority of elderly people remain resistant to mobile banking (Atelier, 2017), despite France's position as one of the world's information and communications technology leaders.

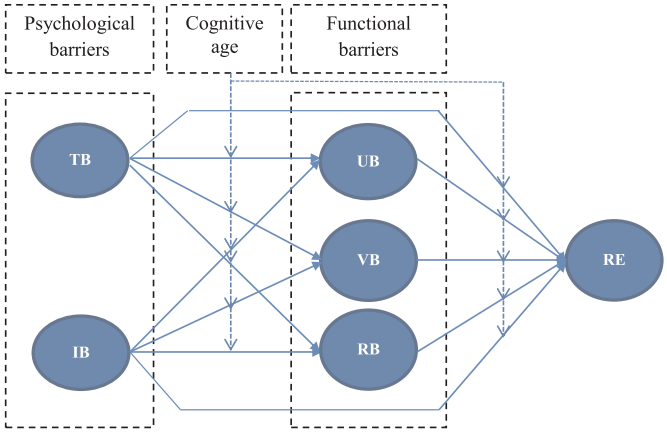

Fig. 1. Conceptual model of mobile banking resistance and the moderating role of cognitive age. ***Notes:*** TB = tradition barrier, IB = image barrier, UB = usage barrier, VB = value barrier, RB = risk barrier, RE = mobile banking resistance.

Participants were approached at the main entrance of three major French banks and asked to complete a paper-and-pencil survey. Participant had to be at least 55 years old, be non-users of mobile banking, and have at least one bank account. The final sample comprised 425 participants.

All constructs were assessed with multiple-item measures that have been empirically validated in past studies, as shown in Table 1. With the exception of cognitive age, participants were asked to rate their agreement with each statement on a seven-point Likert scale (end points: 1 = strongly disagree to 7 = strongly agree). All constructs were derived from past studies (see Table 1). This paper applies Barak and Schiffman's (1981) cognitive age scale. In addition to having been validated in different countries and contexts, this scale is superior and more functional than the single-item scale because it is "easy to administer, analyze and interpret" (Stephens, 1991, p. 37) and more accurate in assessing the complex phenomenon of self-perceived age as it thoroughly captures its four facets (feel-age, look-age, do-age, and interest-age) (Agogo et al., 2014, p. 387). First, respondents were asked to indicate the age-decade cohorts they felt they belonged to (20 s, 30 s, 40 s, 50 s, 60 s, 70 s, 80 s, or 90 s) for each item. Each item was coded as 1, 2, 3, 4, 5, 6, 7, or 8. To calculate the cognitive age, we followed the method adopted by Barak et al. (2011) and Sudbury and Simcock (2009). Hence, for each respondent, the cognitive age was calculated by averaging the midpoint scores for the four items as follows:

Composite measure of cognitive age = (((feel + look + do + interest)/4) +0.55) × 10.

Clusters were identified by computing the age difference between the cognitive age and biological age. Group 1 (hereafter G1) refers to those who are cognitively old, i.e., those whose the age difference (cognitive age - biological age) is greater than 0; group 2 (hereafter G2) refers to those who are cognitively young, i.e., those whose the age difference is less than 0. The results demonstrate the reliability of the cognitive age scale since Cronbach's alpha = 0.85 (Carmines and Zeller, 1979). The findings also corroborate previous research (Sudbury-Riley et al., 2015) regarding the discrepancies between self-perceived age and chronological age. In our sample, 54.82% of respondents (233 participants) were cognitively old; they reported feeling on average 9.41 years older than their actual chronological age (mean = 68.6 vs. 59.19, S.D. = 5.31 vs. 4.3). Another 45.17% (192 participants) were cognitively young; they reported feeling on average 10.77 years younger than their actual chronological age (mean = 52.86 vs. 63.64, S.D. = 10.09 vs. 10.2).

4. Data analyses and results

To test the study's conceptual model, structural equation modeling was performed using SmartPLS 3 (Ringle et al., 2015). First, we assessed the psychometric properties of the measurement models, and then we tested the hypotheses regardless of the moderation effect (H1a, H2a, H3a, H4.1a, H4.1b, H4.1c, H4.1d, H5.1a, H5.1b, H5.1c, and H5.1d). Next, we conducted multigroup analysis to explore the role of cognitive age as a moderator (H1b, H2b, H3b, H4.2a, H4.2b, H4.2c, H4.2d, H5.2a, H5.2b, H5.2c, and H5.2d).

4.1. Measurement model

We analyzed the measurement models for the pooled data and then for group 1(cognitively old) and group 2 (cognitively young). As shown in Table 2, all indicator loadings were significant and above the threshold of 0.7. In addition, Cronbach's alphas and composite

Table 1
Items.

Constructs	Items	Source
Cognitive age	**Please specify which of these age decades you THINK you really belong to:** **20 s 30 s 40 s 50 s 60 s 70 s 80 s 90 s** 1. I feel as though I am in my … 2. I look as though I am in my … 3. I do most things as though I were in my … 4. My interests are mostly those of a person in his/her …	Wei et al. (2013)
Tradition barrier	**TB1:** Patronizing in the banking office and chatting with the teller is a nice occasion on a weekday. **TB2:** I find MB less pleasant than those offered personally to customers. **TB3:** I prefer to carry out my financial transactions through traditional means rather than using MB. **TB4:** I am so used to traditional means to do my financial transactions that I find it difficult to move to MB.	Laukkanen and Cruz (2009) and Rammile and Nel (2012).
Image barrier	**IB1:** I have a very negative image of MB. **IB2:** In my opinion, MB is often too complicated to be useful. **IB3:** I have such a feeling that MB is difficult to use.	Laukkanen and Cruz (2009).
Usage barrier	**UB1:** To my knowledge, MB is not easy to use. **UB2:** I heard that the use of MB is not convenient. **UB3:** I think that MB is not fast to use **UB4:** In my opinion, progress in MB is not clear.	Laukkanen and Cruz (2009).
Value barrier	**VB1:** I am quite skeptical about the economic benefits of MB. **VB2:** In my opinion, MB does not offer any advantage compared to handling my financial matters in other ways (e.g., visiting the bank office and interacting with the bank's service encounters/office clerks). **VB3:** In my opinion, the use of MB will not increase my ability to control my financial matters by myself.	Laukkanen and Cruz (2009).
Risk barrier	**RB1:** I fear that while I am using MB, the connection will be lost. **RB2:** I fear that while I am using MB, I might tap out the information of the bills wrongly. **RB3:** I fear that the list of PIN codes may be lost and end up in the wrong hands.	Laukkanen (2016).
Mobile banking resistance	**RE1:** In sum, the adoption of MB would cause problems that I don't need. **RE2:** I would be making a mistake by adopting MB. **RE3:** In the near future, the adoption of MB would be connected with too many uncertainties.	Wiedmann et al. (2011).

Notes: MB = mobile banking.

reliabilities were higher than 0.7, showing indicator reliability (Hair et al., 2017). Since AVE values were above the suggested threshold of 0.5, convergent validity was verified (Hair et al., 2017). In addition, the heterotrait-monotrait criterion (HTMT) lent strong support to discriminant validity, as shown in Table 3. Indeed, all HTMT values were i) substantially lower than the conservative cut-off level of 0.85 and ii) significantly different from 1 (Hair et al., 2017). We also performed a multicollinearity test using the value inflation factor (VIF). All VIF values were considerably below the threshold of 5 (the highest values were 2.702 for pooled data, 2.506 for group 1, and 2.383 for group 2),

Table 2
Loadings, Cronbach's alphas (CA), composite reliability (CR), and average variance extracted (AVE).

	Pooled data				G1				G2			
Items	**Loadings**	**CA**	**CR**	**AVE**	**Loadings**	**CA**	**CR**	**AVE**	**Loadings**	**CA**	**CR**	**AVE**
TB		0.908	0.936	0.786		0.901	0.932	0.775		0.886	0.921	0.744
TB1	0.815				0.755				0.820			
TB2	0.920				0.923				0.873			
TB3	0.919				0.933				0.872			
TB4	0.888				0.900				0.884			
IB		0.925	0.952	0.870		0.889	0.931	0.818		0.903	0.937	0.832
IB1	0.923				0.873				0.950			
IB2	0.935				0.911				0.923			
IB3	0.939				0.928				0.861			
UB		0.927	0.948	0.820		0.926	0.948	0.820		0.911	0.937	0.789
UB1	0.872				0.850				0.878			
UB2	0.922				0.923				0.930			
UB3	0.925				0.938				0.880			
UB4	0.895				0.909				0.865			
VB		0.871	0.920	0.794		0.864	0.917	0.786		0.836	0.900	0.749
VB1	0.870				0.861				0.834			
VB2	0.918				0.915				0.887			
VB3	0.884				0.883				0.875			
RB		0.913	0.945	0.851		0.902	0.939	0.836		0.899	0.937	0.832
RB1	0.919				0.898				0.913			
RB2	0.922				0.902				0.928			
RB3	0.928				0.942				0.894			
RE		0.906	0.941	0.841		0.952	0.969	0.913		0.838	0.889	0.731
RE1	0.880				0.962				0.707			
RE2	0.932				0.946				0.907			
RE3	0.939				0.958				0.956			

Table 3
Discriminant validity.

The heterotrait-monotrait criterion						
		TB	**IB**	**UB**	**VB**	**RB**
Pooled data	**IB**	0.507 C_{85} [0.416; 0.600]				
	UB	0.639 C_{85} [0.561; 0.707]	0.539 C_{85} [0.450; 0.625]			
	VB	0.702 C_{85} [0.632; 0.763]	0.513 C_{85} [0.419; 0.605]	0.662 C_{85} [0.581; 0.742]		
	RB	0.763 C_{85} [0.703; 0.819]	0.488 C_{85} [0.400; 0.576]	0.763 C_{85} [0.704; 0.808]	0.691 C_{85} [0.615; 0.755]	
	RE	0.630 C_{85} [0.560; 0.699]	0.531 C_{85} [0.439; 0.610]	0.626 C_{85} [0.540; 0.696]	0.596 C_{85} [0.509; 0.681]	0.620 C_{85} [0.552; 0.689]
G1	**IB**	0.729 C_{85} [0.637; 0.806]				
	UB	0.636 C_{85} [0.529; 0.720]	0.715 C_{85} [0.610; 0.815]			
	VB	0.648 C_{85} [0.530; 0.747]	0.608 C_{85} [0.464; 0.736]	0.586 C_{85} [0.449; 0.700]		
	RB	0.697 C_{85} [0.592; 0.785]	0.664 C_{85} [0.558; 0.764]	0.786 C_{85} [0.718; 0.844]	0.611 C_{85} [0.483; 0.723]	
	RE	0.717 C_{85} [0.633; 0.787]	0769 C_{85} [0.688; 0.839]	0.795 C_{85} [0.731; 0.849]	0.677 C_{85} [0.561; 0.773]	0.812 C_{85} [0.743; 0.873]
G2	**IB**	0.123 C_{85} [0.061; 0.265]				
	UB	0.505 C_{85} [0.345; 0.668]	0.093 C_{85} [0.057; 0.235]			
	VB	0.635 C_{85} [0.508; 0.742]	0.097 C_{85} [0.052; 0.245]	0.651 C_{85} [0.520; 0.767]		
	RB	0.753 C_{85} [0.644; 0.847]	0.047 C_{85} [0.042; 0.186]	0.657 C_{85} [0.531; 0.762]	0.667 C_{85} [0.555; 0.774]	
	RE	0.399 C_{85} [0.250; 0.544]	0.059 C_{85} [0.052; 0.215]	0.297 C_{85} [0.156; 0.472]	0.366 C_{85} [0.264; 0.529]	0.314 C_{85} [0.231; 0.446]

Notes: Diagonal elements (bolded values) are the square root of AVEs. Off-diagonal values are the correlations between latent variables (absolute values).

demonstrating that multicollinearity is not a threat in the current research.

4.2. Structural model

Once acceptable psychometric properties in the three measurement models (pooled data; group 1: cognitively old; and group 2: cognitively young) were confirmed, we began by testing the model with the pooled data (not considering the moderating effect of cognitive age). The moderating effect of cognitive age was tested afterwards.

As shown in Table 5, mobile banking resistance achieved an R^2 value of 46.6% (pooled data), 72.7% (cognitively old), and 21% (cognitively young); the usage barrier 41.1% (pooled data), 46.6% (cognitively old), and 23.2% (cognitively young); the value barrier 43.3% (pooled data), 37.9% (cognitively old), and 35.5% (for cognitively young); and the risk barrier 50.9% (pooled data), 45.7% (cognitively old) and 47.6% (cognitively young).

Predictive relevance (Q^2) was measured using the blindfolding procedure (the cross-validated redundancy approach) which represents "a measure of how well the path model can predict the originally observed values" (Hair et al., 2017). All Q^2 values were substantially above zero providing strong support for the high predictive relevance of the three models.

As hypothesized, usage, value, and risk barriers had significant positive impacts on mobile banking resistance ($\beta = 0.20$, $p < 0.01$; $\beta = 0.13$, $p < 0.05$; $\beta = 0.13$, $p < 0.05$, respectively). Thus, H1a,

Table 4
MICOM results.

	Step 2: Compositional invariance			**Step 3a: Equality of composite mean values**			**Step 3b: Equality of variances**			**Measurement invariance?**
C.	**C. value (=1)**	**95% CI**	**Comp. Inv.?**	**Diff. C. M. Val. (=0)**	**95% CI**	**Eq. M. Val.?**	**Log. C. Var. Rat. (=0)**	**95% CI**	**Eq. Var.?**	
TB	0.99	[0.99; 1.00]	**Yes**	0.807	[− 0.181; 0.188]	**No**	0.105	[− 0.171; 0.176]	**Yes**	**Partial**
IB	0.99	[0.99; 1.00]	**Yes**	1.082	[− 0.193; 0.189]	**No**	0.099	[− 0.157; 0.159]	**Yes**	**Partial**
UB	1.00	[1.00; 1.00]	**Yes**	0.665	[− 0.197; 0.183]	**No**	0.156	[− 0.201; 0.195]	**Yes**	**Partial**
VB	1.00	[1.00; 1.00]	**Yes**	0.738	[− 0.181; 0.180]	**No**	0.111	[− 0.181; 0.153]	**Yes**	**Partial**
RB	1.00	[1.00; 1.00]	**Yes**	0.733	[− 0.186; 0.184]	**No**	− 0.157	[− 0.162; 0.180]	**Yes**	**Partial**
RE	1.00	[1.00; 1.00]	**Yes**	0.617	[− 0.185; 0.198]	**No**	− 0.091	[− 0.214; 0.197]	**Yes**	**Partial**

Notes: Comp. = composite, CI = confidence interval, Comp. Inv.? = compositional invariance, Diff. C. M. Val. = Difference in the composite's mean value, Eq. M. Val.? = Equal mean values, Log. C. Var. Rat. = Logarithm of the composite's variances ratio, Eq. Var.? = Equal variances.

Table 5
PLS-MGA results.

	Overall sample			G1			G2			|G1-G2|			Hyp
	Path	t value	p value	Path	t value	p value	Path	t value	p value	Diff paths	t value	p value	Sig?	S/NS
TB - > UB	0.45	10.379	0.000	0.270	3.906	0.000	0.478	6.418	0.000	0.208	2.052	0.041	Yes	NS
TB - > VB	0.53	12.970	0.000	0.391	4.912	0.000	0.595	11.580	0.000	0.205	2.051	0.041	Yes	NS
TB - > RB	0.62	15.954	0.000	0.414	7.250	0.000	0.694	14.577	0.000	0.279	3.661	0.000	Yes	NS
TB - > RE	0.20	3.039	0.002	0.103	2.267	0.024	0.248	1.988	0.047	0.145	1.161	0.246	No	NS
IB - > UB	0.29	6.499	0.000	0.473	6.171	0.000	0.130	1.699	0.090	0.343	3.171	0.002	Yes	S
IB - > VB	0.21	4.517	0.000	0.283	3.082	0.002	0.131	2.012	0.045	0.152	1.988	0.047	Yes	S
IB - > RB	0.16	4.196	0.000	0.327	5.269	0.000	0.079	1.377	0.169	0.247	3.004	0.003	Yes	S
IB - > RE	0.16	3.409	0.001	0.222	3.823	0.000	0.024	0.293	0.769	0.197	2.069	0.039	Yes	S
UB - > RE	0.20	2.987	0.003	0.252	4.621	0.000	0.030	0.288	0.774	0.222	2.079	0.038	Yes	S
VB - > RE	0.13	2.127	0.034	0.145	2.649	0.008	0.200	2.987	0.003	0.055	0.465	0.642	No	NS
RB - > RE	0.13	1.988	0.047	0.295	3.993	0.000	0.053	0.455	0.649	0.242	1.982	0.048	Yes	S
	R^2	Q^2		R^2	Q^2		R^2	Q^2						
UB	41.1%	0.335		46.6%	0.378		23.2%	0.173						
VB	43.3%	0.338		37.9%	0.290		35.5%	0.242						
RB	50.9%	0.484		45.7%	0.371		47.6%	0.385						
RE	46.6%	0.382		72.7%	0.657		21%	0.100						

Notes: S = significant, NS = non-significant.

H2a, and H3a were supported. In addition, the tradition barrier had a significant positive impact on mobile banking resistance and on the usage, value, and risk barriers ($\beta = 0.20$, $p < 0.01$; $\beta = 0.45$, $p < 0.001$; $\beta = 0.21$, $p < 0.001$; $\beta = 0.62$, $p < 0.001$, respectively). Thus, H4.1a, H4.1b, H4.1c, and H4.1d were supported. With respect to the image barrier, the analysis shows that it had significant positive impacts on mobile banking resistance and on the usage, value, and risk barriers ($\beta = 0.16$, $p < 0.001$; $\beta = 0.29$, $p < 0.001$; $\beta = 0.21$, $p < 0.001$; $\beta = 0.16$, $p < 0.01$, respectively). Therefore, H5.1a, H5.1b, H5.1c, and H5.1d were supported.

4.3. Multigroup analysis

Prior to running any multigroup analyses (MGA), we assessed the measurement invariance of composite models (MICOM) to ensure that differences in the structural relationships did not stem from distinctive content or meanings (Henseler et al., 2016). To do so, we used the three-step approach developed by Henseler et al. (2016), namely configural invariance (step 1), compositional invariance (step 2), and the equality of composite mean values and variances (step 3). With respect to step 1, configural invariance was automatically established in SmartPLS 3 "by using exactly the same set-up for each group-specific model estimation" (Schubring et al., 2016. p. 4606). As shown by the results of the MICOM analysis in Table 4, measurement invatriance was partially established (since compositional invariance (step 2) was fully established and the equality of composite mean values (step 3a) and variances (step 3b) were partially established). Given that "partial measurement invariance is sufficient to compare the estimated path coefficients across the groups" (Schubring et al., 2016. p. 4606), the next step was to run a multigroup analysis.

With respect to the multi-group analysis, the results revealed significant variations in the group-specific path coefficients between cognitively old and cognitively young elders. Indeed, there were significant differences between these two clusters for the effects of usage and risk barriers on mobile banking resistance. Such effects are stronger (weaker) for those who are cognitively old (young) ($|\Delta\beta| = 0.22$, $p < 0.05$, $|\Delta\beta| = 0.24$, $p < 0.05$, respectively). Therefore, H1b and H3b were supported. In addition, the impacts of the image barrier on mobile banking resistance and on usage, value, and risk barriers were moderated by cognitive age, such that the effects were stronger (weaker) for the cognitively old (young) ($|\Delta\beta| = 0.19$, $p < 0.05$, $|\Delta\beta| = 0.34$, $p < 0.01$, $|\Delta\beta| = 0.15$, $p < 0.05$, $|\Delta\beta| = 0.24$, $p < 0.01$, respectively). Hence, H5.2a, H5.2b, H5.2c, and H5.2d were supported. Furthermore, the results demonstrate that the effects of the tradition barrier on usage, value, and risk barriers were moderated by cognitive age ($|\Delta\beta| = 0.2$, $p < 0.05$, $|\Delta\beta| = 0.2$, $p < 0.05$, $|\Delta\beta| = 0.27$, $p < 0.001$, respectively). Nevertheless, such effects were unexpectedly stronger (weaker) for the cognitively young (old). Thus, H4.2b, H4.2c, and H4.2d were not supported. Additionally, no differences were found regarding the relationships between the value barrier and mobile banking resistance or the tradition barrier and mobile banking resistance. Accordingly, H2.b and H4.2a were not supported.

The results testify to the influence of tradition, image, usage, value, and risk barriers on consumer resistance as assumed in the innovation resistance literature. They also lend consistent support to previous findings on the effects of psychological barriers on functional barriers. Another interesting finding of this research lies in the moderating effect of cognitive age.

Figs. 2–4 show the results of the structural models of the pooled data, group 1 (cognitively old elders), and group 2 (cognitively young elders).

5. Theoretical and managerial implications

From a theoretical perspective, our study provides a deep comprehension of resistance among elders by shedding light on the interplay between psychological and functional barriers as well as their effects on mobile banking resistance. It also elucidates the moderating role of cognitive age in influencing those relationships. Most previous literature spuriously assumed that elders were non-attractive and even disadvantaged prospects (Sherman et al., 2001) because they were thought to homogeneously prefer the status quo, develop stress and anxiety toward novelty, and have high dispositional resistance to innovation (Oreg et al., 2009). These erroneous stereotypical portrayals are likely

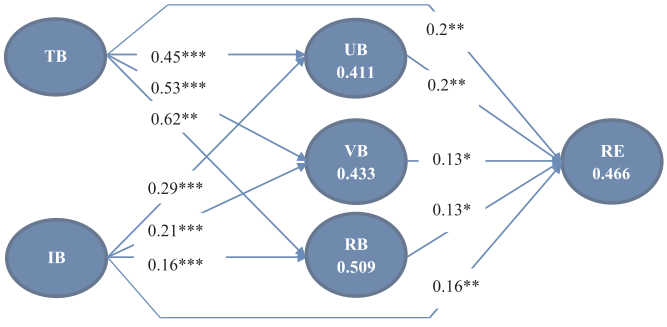

Fig. 2. The model's path coefficients and R^2s (pooled data).

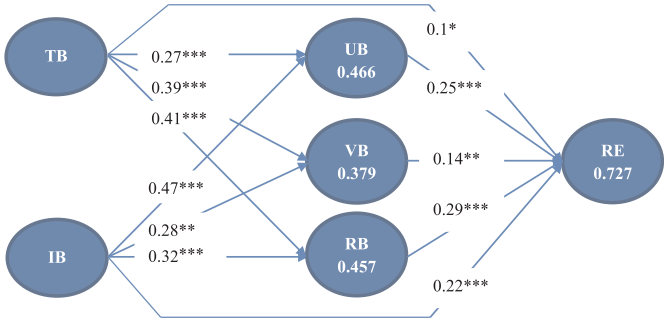

Fig. 3. The model's path coefficients and R^2s (cognitively old group).

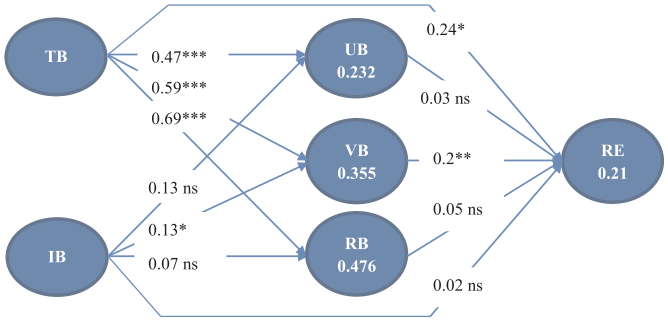

Fig. 4. The model's path coefficients and R^2s (cognitively young group).

to lead banks to miss the opportunities that would arise from targeting the elderly segment. Our study suggests that market segmentation practices should be overhauled to take into account cognitive rather than biological age as a meaningful segmentation criterion.

The results corroborate assumptions and empirical studies in the innovation resistance literature (Laukkanen, 2016) by providing strong additional evidence of the direct effects of all barriers on mobile banking resistance. Our study further augments the resistance literature by exploring the effects of psychological barriers on functional barriers. It shows the impact of the tradition barrier on usage, value, and risk barriers in keeping with status quo bias theory, which assumes that some people adopt a defensive strategy against innovation. Customers in this category are more likely to be conservative (desire for inertia) and tend to underestimate the advantages of mobile banking and form misperceptions of loss aversion (overestimation of risks).

In addition, we also found that the image barrier influences usage, value, and risk barriers. Consequently, an inferred negative image of mobile banking intensifies customer's insensitivity to its relevance and usefulness, corrupts perceptions of value, and increases perceptions of uncertainty and aversion to risk.

With respect to cognitive age, the effects of the image barrier on functional barriers and mobile banking resistance are stronger for persons who are cognitively old and weaker for those who are cognitively young. In addition, the effects of usage and risk barriers on mobile banking resistance are stronger for those who are cognitively old, while they are non-significant for those who are cognitively young. In contrast, there are no significant differences regarding the effects of the tradition barrier and the value barrier on mobile banking resistance. Although differences exist in the group-specific path coefficients between the two groups regarding the effects of the tradition barrier on functional barriers, the results show that those effects are unexpectedly weaker for persons who are cognitively old and stronger for those who are cognitively young. The latter findings are in line with Heidenreich et al. (2016) and consistent with entitativity research, which assumes that consumers with low innovation resistance (here cognitively young elders) prefer innovations with a high degree of newness. In their minds, mobile banking is not perceived as radically new compared to other self-service technologies such as internet banking. Given that cognitively young elders have high sensitivity to change, a penchant for stimulation seeking, and an eagerness to assign additional value to products and services with high degree of newness, they are much more critical; their resistance is thus a conscious response to their belief that mobile banking has not reached the high degree of novelty they expected (Heidenreich et al., 2016).

Understanding mobile banking resistance among elders is a critical step in helping banks develop or adjust their strategic actions. Indeed, the older cohorts represent a great business opportunity given size, wealth, and consumption patterns. Our study argues that banks should target tradition and image barriers as key priorities to gradually reduce functional barriers and mobile banking resistance, but suggests that measures to do so will be more meaningful and effective if the moderation effect is considered. We recommend that banks take into account the heterogeneity of older persons with respect to their consumption behaviors. Our study shows that barriers and resistance are reported differently among the elderly depending on their self-perceptions of their age. Cognitively old elders are more concerned with the image barrier (as first priority), while cognitively young elders are more concerned with the tradition barrier (as first priority). Banks could target cognitively old elders by launching intensive information campaigns and allowing customers to try their mobile banking applications. They could target cognitively young elders by conducting qualitative research to identify the modifications or additional features needed to give their mobile applications a high degree of newness in the eyes of this clientele.

6. Limitations and future directions

The findings of this study should be interpreted with caution given its limitations. The use of a convenience sample restricts generalizability, and a more representative sample is always recommended. The study is limited to French customers and a single sector (banking). It would be worth replicating in different industries and other countries since the “discrepancy between cognitive age and chronological age seems to be larger in certain cultures than in others” (Chang, 2008, p. 30). Comparative studies would enhance our comprehension of variations in consumer resistance across different countries and contexts. The use of a cross-sectional design is not without criticism as it ignores the changes that may occur in perceptions of barriers and resistance over long periods (Hsu et al., 2017; Londono et al., 2017). Consequently, further research should adopt a longitudinal approach. A future area of research could target a wider range of age cohorts, since recent age-based studies have found that discrepancies between self-perceived age and chronological age are reported among middle-aged and even young individuals (e.g., Hong et al., 2013).

References

Agogo, D., Milne, G.R., Schewe, C.D., 2014. Time benders: a model of subjective aging in aging adults. Health Mark. Q. 31 (4), 383–398.

Antioco, M., Kleijnen, M., 2010. Consumer adoption of technological innovations. Eur. J. Mark. 44 (11/12), 1700–1724.

Arning, K., Ziefle, M., 2010. Ask and you will receive: training novice adults to use a PDA in an active learning environment. Int. J. Mob. Hum. Comput. Interact. 2 (1), 21–47.

Atelier, 2017. L’adoption de la banque mobile prévaut chez les jeunes. Available at: ⟨http://www.atelier.net/trends/articles/adoption-de-banque-mobile-prevaut-chez-jeunes_418476⟩ (Accessed 23 December 2016).

Barak, B., Guiot, D.A., Mathur Zhang, Y., Lee, K., 2011. An empirical assessment of cross-cultural age self-construal measurement: evidence from three countries. Psychol. Mark. 28 (5), 479–495.

Barak, B., Schiffman, L.G., 1981. Cognitive age: a nonchronological age variable. In: Monroe, K.B. (Ed.), Advances in Consumer Research 8. Association for Consumer Research, Ann Arbor, MI, pp. 602–606.

Baker, E.W., Al-Gahtani, S.S., Hubona, G.S., 2007. The effects of gender and age on new technology implementation in a developing country: testing the theory of planned behavior (TPB). Inf. Technol. People 20 (4), 352–375.

Chang, C., 2008. Chronological age versus cognitive age for younger consumers: implications for advertising persuasion. J. Advert. 37 (3), 19–32.

Chen, K., Chan, A.H.S., 2014. Predictors of gerontechnology acceptance by older Hong Kong Chinese. Technovation 34 (2), 126–135.
Carmines, E.G., Zeller, R.A., 1979. Reliability and validity assessment, N. 07-017. Sage University Papers Series on Quantitative Applications in the Social Sciences, Sage, Beverly Hills, CA.
Casper, L.M., Florian, S.M., Brandon, P.D., 2015. Family demography: continuity and change in North American families. In: Kaakinen, J.R., Coehlo, D.P., Steele., R., Tabacco, A., Hanson, S.M.H. (Eds.), Family Health Care Nursing: Theory Practice and Research, 5th edition. F.A. Davis Company, Philadelphia, pp. 33–65.
Claudy, M.C., Garcia, R., O'Driscoll, A., 2015. Consumer resistance to innovation—a behavioral reasoning perspective. J. Acad. Mark. Sci. 43 (4), 528–544.
Curran, J.M., Meuter, M.L., 2007. Encouraging existing customers to switch to self-service technologies: put a little fun in their lives. J. Mark. Theory Pract. 15 (4), 283–298.
Falk, T., Schepers, J., Hammerschmidt, M., Bauer, H.H., 2007. Identifying cross-channel dissynergies for multichannel service providers. J. Serv. Res. 10 (2), 143–160.
Featherman, M.S., Pavlou, P.A., 2003. Predicting e-services adoption: a perceived risk facets perspective. Int. J. Hum.-Comput. Stud. 59 (4), 451–474.
Featherman, M.S., Valacich, J.S., Wells, J.D., 2006. Is that authentic or artificial? Understanding consumer perceptions of risk in e-service encounters. Inf. Syst. J. 16 (2), 107–134.
Gerrard, P., Cunningham, J.B., Devlin, J.F., 2006. Why consumers are not using internet banking: a qualitative study. J. Serv. Mark. 20 (3), 160–168.
Hair, J.F., Jr, Hult, G.T.M., Ringle, C., Sarstedt, M., 2017. A Primer on Partial Least Squares Structural Equation Modelling (PLS-SEM), 2nd ed. Sage Publications, Thousand Oaks, California, CA.
Heidenreich, S., Kraemer, T., Handrich, M., 2016. Satisfied and unwilling: exploring cognitive and situational resistance to innovations. J. Bus. Res. 69 (7), 2440–2447.
Heidenreich, S., Handrich, M., 2015. What about passive innovation resistance? Investigating adoption-related behavior from a resistance perspective. J. Product. Innov. Manag. 32 (6), 878–903.
Henseler, J., Ringle, C.M., Sarstedt, M., 2016. Testing measurement invariance of composites using partial least squares. Int. Mark. Rev. 33 (3), 405–431.
Hong, S.-J., Lui, C.S.M., Hahn Moon, J.J.Y., Kim, T.G., 2013. How old are you really? Cognitive age in technology acceptance. Decis. Support Syst. 56, 122–130.
Hsu, C.-L., Chang, C.-Y., Yansritakul, C., 2017. Exploring purchase intention of green skincare products using the theory of planned behavior: testing the moderating effects of country of origin and price sensitivity. J. Retail. Consum. Serv. 34, 145–152.
Kim, H.-W., Kankanhalli, A., 2009. Investigating user resistance to Information Systems implementation: a status quo bias perspective. MIS Q. 33 (3), 567–582.
Kleijnen, M., Lee, N., Wetzels, M., 2009. An exploration of consumer resistance to innovation and its antecedents. J. Econ. Psychol. 30, 344–357.
Kohlbacher, F., Chéron, E., 2012. Understanding 'silver' consumers through cognitive age, health condition, financial status, and personal values: empirical evidence from the world's most mature market Japan. J. Consum. Behav. 11 (3), 179–188.
Kohlbacher, F., Herstatt, C., Levsen, N., 2015. Golden opportunities for silver innovation: how demographic changes give rise to entrepreneurial opportunities to meet the needs of older people. Technovation 39–40, 73–82.
Laukkanen, T., 2016. Consumer adoption versus rejection decisions in seemingly similar service innovations: the case of the Internet and mobile banking. J. Bus. Res. 69 (7), 2432–2439.
Laukkanen, T., Sinkkonen, S., Kivijärvi, M., Laukkanen, P., 2007. Innovation resistance among mature consumers. J. Consum. Mark. 24 (7), 419–427.
Laukkanen, T., Cruz, P., 2009. Comparing consumer resistance to mobile banking in Finland and Portugal. In: Filipe, J., Obaidat, M.S. (Eds.), Communications in Computer and Information Science. Springer, New York, NY, pp. 89–98.
Lin, H.F., 2011. An empirical investigation of mobile banking adoption: the effect of innovation attributes and knowledge-based trust. Int. J. Inf. Manag. 31 (3), 252–260.
Londono, J.C., Davies, K., Elms, J., 2017. Extending the Theory of Planned Behavior to examine the role of anticipated negative emotions on channel intention: the case of an embarrassing product. J. Retail. Consum. Serv. 36, 8–20.
Luo, X., Li, H., Zhang, J., Shim, J.P., 2010. Examining multi-dimensional trust and multi-faceted risk in initial acceptance of emerging technologies: an empirical study of mobile banking services. Decis. Support Syst. 49 (2), 222–234.
Montoya-Weiss, M.M., Voss, G.B., Grewal, D., 2003. Determinants of online channel use and overall satisfaction with a relational, multichannel service provider. J. Acad. Mark. Sci. 31 (4), 448–458.
National Institute of Statistics and Economic Studies, 2017. Population par groupe d'âges. Available at: 〈https://www.insee.fr/fr/statistiques/1906664?Sommaire=1906743〉 (Accessed 23 December 2016).
Oreg, S., Nevo, O., Metzer, H., Leder, N., Castro, D., 2009. Dispositional resistance to change and occupational interests and choices. J. Career Assess. 17 (3), 312–323.
Ram, S., Sheth, J.N., 1989. Consumer resistance to innovations: the marketing problem and its solutions. J. Consum. Mark. 6 (2), 5–14.
Rammile, N., Nel, J., 2012. Understanding resistance to cell phone banking adoption through the application of the technology acceptance model (TAM). Afr. J. Bus. Manag. 6 (1), 86–97.
Ringle, C.M., Wende, S., Becker, J.-.M., 2015. SmartPLS 3.Bönningstedt: SmartPLS. Available at: 〈https://www.smartpls.com〉 (Accessed 25 December 2016).
Schiffman, L.G., Sherman, E., 1991. Value orientations of new-age elderly: the coming of an ageless market. J. Bus. Res. 22 (2), 187–194.
Schubring, S., Lorscheid, I., Meyer, M., Ringle, C.M., 2016. The PLS agent: predictive modeling with PLS-SEM and agent-based simulation. J. Bus. Res. 69 (10), 4604–4612.
Shaikh, A.A., Karjaluoto, H., 2015. Mobile Banking Adoption: A Literature Review. Telemat. Inform. 32, 129–142.
Sherman, E., Schiffman, L.G., Mathur, A., 2001. The influence of gender on the new-age elderly's consumption orientation. Psychol. Mark. 18 (10), 1073–1089.
Shukla, P., 2008. Conspicuous consumption among middle age consumers: psychological and brand antecedents. J. Product. Brand Manag. 17 (1), 25–36.
Souiden, N., Diagne, M., 2009. Canadian and French men's consumption of cosmetics: a comparison of their attitudes and motivations. J. Consum. Mark. 26 (2), 97–109.
Sudbury, L., Simcock, P., 2009. A multivariate segmentation model of senior consumers. J. Consum. Mark. 26 (4), 251–262.
Sudbury-Riley, L., Kohlbacher, F., Hofmeister, A., 2015. Baby Boomers of different nations: identifying horizontal international segments based on self-perceived age. Int. Mark. Rev. 32, 245–278 (Vol. 3/4).
Stephens, N., 1991. Cognitive age: a useful concept for advertising? J. Advert. 20 (4), 37–48.
United Nations, 2015. World Population Ageing. United Nations, New York. NY.
Van Auken, S., Barry, T.E., 1995. An assessment of the trait validity of cognitive age measures. J. Consum. Psychol. 4 (2), 107–132.
Venkatesh, V., Thong, J.Y.L., Xu, X., 2012. Consumer acceptance and use of information technology: extending the unified theory. MIS Q. 36 (1), 157–178.
Wang, Q., Song, P., Yang, X., 2013. Understanding the substitution effect between online and traditional channels: evidence from product attributes perspective. Electron. Mark. https://doi.org/10.1007/s12525-012-0114-2.
Wei, Y., Donthu, N., Bernhardt, K.L., 2013. Effects of cognitive age, dispositional time perceptions, and time view manipulations on product attribute evaluations. J. Bus. Res. 66 (11), 2171–2177.
Wiedmann, K.-P., Hennigs, N., Pankalla, L., Kassubek, M., Seegebarth, B., 2011. Adoption barriers and resistance to sustainable solutions in the automotive sector. J. Bus. Res. 64 (11), 1201–1206.
Wilkes, R.E., 1992. A structural modeling approach to the measurement and meaning of cognitive age. J. Consum. Res. 19 (2), 292–301.

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