THEORY/CONCEPTUAL

Older consumers and technology: A critical systematic literature review

Paolo Franco[1]

Abstract

Older consumers' adoption and consumption of technologies continues to be an important research area. However, marketing scholarship on this topic risks unintentionally smuggling age stereotypes into its constructed theories. Such assumptions include older consumers' adoption processes being complicated by health and social isolation issues and their low tech-skills. Although stereotypes hold a 'kernel-of-truth' and underpin meaningful research, they can transform from helpful heuristics to impediments to crafting reflexive scholarship. Therefore, this article reviews marketing literature on older consumers and technology. It develops a 2×3 typology to analyse 86 articles based on their portrayals of older consumers' capabilities (incapable/capable) and technology orientations (resisting/discerning/seeking). The typology's six emergent categories aim to turn age stereotypes into 'productive tensions' for researchers by encouraging critical reflexivity in ways that broaden future research possibilities. These possibilities include better accounting for older consumers who are skilled technology-seekers, and equally, non-adopters with non-technophobic reasons to resist adoption.

Keyword Consumer wellbeing · Critical reflexivity · Older consumers · Stereotypes · Systematic literature review · Technology adoption · Technology consumption

Older consumers' adoption and consumption of technologies continues to be an important area of research (Hwang & Nam, 2017; Nikou, 2015; Nunan & Di Domenico, 2019). Studies in this domain examine how best to integrate various technologies into older consumers' lives to improve their wellbeing outcomes (Hough & Kobylanski, 2009; Lee & Coughlin, 2015; Mostaghel, 2016). Technology adoption and consumption is thus envisioned to help address the particular health and social isolation issues that older consumers experience (Fowler et al., 2015; Holliday et al., 2015; Morozova & Gurova, 2021).

Marketing researchers are important voices in these discussions as published studies ideally inform practitioner strategies. To inform marketers, researchers theorise that successful older consumer tech-adoption may require methods ranging from overcoming resistance (Gilly et al., 2012; Holliday et al., 2015); offering education (Hwang & Nam, 2017; Iyer & Eastman, 2006); to the development of support systems involving family, peers, and communities (Bianchi,

2021; Lee & Coughlin, 2015). Such suggestions respond to routine findings that older consumers are different than other age groups as they lack technical skills and face declining physical/cognitive capabilities that impede tech-product use (Lee & Coughlin, 2015; Trocchia & Janda, 2000).

However, as this review article will emphasise, researchers must often question their assumptions regarding older consumers and technology to craft richer and more reflexive scholarship. For instance, studies reflect on how 'older consumer' and 'technology' are both nebulous terms that carry particular assumptions (Barnhart & Peñaloza, 2013; Kline, 1985; Salomon, 1984). Such reflections motivate this review's stipulative approach (Vennix, 2019, p. 128–129) to capture these terms' broad uses within marketing (see Ball & Curry, 1995). As discussed later, marketing scholarship roughly distinguishes older consumers as those around retirement age and beyond (e.g., 60+) who might adopt technologies as varied as smartphones, social media and self-service kiosks, to fall alarms. Nonetheless, definitional imprecisions like these signal that extant scholarship on older consumers and technology requires scrutiny.

Germane to this review, scrutinising marketing scholarship necessitates asking if "certain assumptions have been brought to the conduct of research" and whether these privilege the

✉ Paolo Franco
   paolo.franco@ru.nl

1 Institute for Management Research, Radboud University, 9018, 6500 HK Nijmegen, The Netherlands

development of certain understandings about older consumers and technology (Gordon & Gurrieri, 2014, p. 264). Prior work already notes that marketing dominantly studies older consumer tech-adoption in relation to health issues, assuming their resistance to new technologies (Niemelä-Nyrhinen, 2007; Nunan & Di Domenico, 2019). Remarks like these reflect historical trends in marketing which imply older consumers are "fragile, vulnerable, and slouching towards insignificance" (Schau et al., 2009, p. 256).

Such views on older consumers can be understood as stereotypes (Niemelä-Nyrhinen, 2007; Rosenthal et al., 2021). While stereotypes can be useful heuristics that motivate meaningful research, they can become demeaning to older consumers if not kept in check (Judd & Park, 1993; Schaie, 1988). This point is important as gerontology and marketing scholarship both theorise that research has potentials to contribute to the institutionalisation of age stereotypes that impact wellbeing (Barnhart & Peñaloza, 2013; Nelson, 2005).

Though we cannot be certain of academia's wellbeing effects, stereotypes' harms are observed in marketing contexts. For instance, families patronise older consumers when assuming their inability to cook or shop (Dean et al., 2014; Huff & Cotte, 2016). Special treatment can even foster discrimination when older consumers see these interactions as degrading (Tepper, 1994; Westberg et al., 2021). In tech-contexts, stereotypes manifest as self-inflicted inabilities to use technologies and hesitations to ask for help (Bae et al., 2021; Franco, 2020). Considering these impacts, researchers must reflect on whether our scholarship reproduces these understandings and their harms on older consumers.

Systematic critical scrutiny of marketing scholarship is needed. Not least because we as researchers want to avoid complicity in societal harms, but that reflecting on age stereotypes also offers productive ways to think about marketing theory and practice. To be clear, it is not inherently bad to theorise contexts in which older consumers adopt technologies for health and social isolation reasons or explain they can be unskilled with technology. On the contrary, such research is meaningful to older consumers who indeed experience these circumstances. Rather, the problem lies in scant theoretical attention on other older consumers who do not experience technologies in these manners. On this basis, this article differentiates itself from prior reviews on this topic that do not go far enough to critique marketing's dominant theorisation of older consumers as being incapable in various ways in relation to technology (Lee & Coughlin, 2015; Mostaghel, 2016; Nikou, 2015; Nunan & Di Domenico, 2019).

Although a couple prior reviews acknowledge age stereotypes (Lee & Coughlin, 2015; Nunan & Di Domenico, 2019), they do not critique how stereotypes can shape the construction of theories pertaining to older consumers and technology in marketing. They also fail to emphasise a fuller variety of older consumer life experiences that are not well represented

in current research. Indeed, recent studies indicate that many older consumers are not just open to technology but are enthusiastic and skilled, such as for identity construction and life passion purposes (e.g., Franco, 2020; LaBarge & Pyle, 2020). As this review will demonstrate, alternative old age assumptions like these need further exploration as they can open new possibilities for future marketing research on older consumers and technology (e.g. Fowler et al., 2015; Fregolente et al., 2019; Pera et al., 2020).

Therefore this article's purpose is to critically and systematically review marketing research in the domain of older consumers and technology. Specifically, it asks: *How have age stereotypes influenced the kinds of theories that marketing scholarship has constructed in the older consumers and technology domain?* As such, this review aims to contribute 'productive tensions' for researchers to work with. This term describes the transformation of the unease of critical self-reflection on age stereotype use into productive ways of expanding research possibilities. In so doing, the review seeks to reveal a 'big picture' emergent in this domain to serve as a platform for future marketing scholarship to build upon (Paul & Criado, 2020).

To these ends, this article first provides a theoretical background that explicates the intersections between the social construction of old age stereotypes, wellbeing impacts, and academic research. Next, the article explains its review approach, detailing its literature scoping and collection steps, and the critical reflexivity perspective that inspires its analysis procedures (Bettany & Woodruffe-Burton, 2009; Gordon & Gurrieri, 2014). The findings then outline and explain: (1) the article's emergent 2×3 typology of which reviewed articles are categorised; and (2) three established and three underdeveloped research categories based on the typology. For each of the six categories, its take on older consumers and technology is explained in terms of empirical themes and the kinds of theories it typically constructs, supplemented by suggested future research directions. Last, this article concludes by discussing its broader contributions and implications for future marketing scholarship on older consumers and technology.

Old age stereotypes, wellbeing, and academic research

Research in gerontology theorises that age is a category that is socially constructed, akin to race and gender (Nelson, 2005; Thane, 2003). Within this social category, old age is a subject position that demarcates assumed manners in which older people relate to others, their capabilities, and what it means to be 'old' (Hummert, 2010; Thane, 2003). Prior work theorises these kinds of age-related meanings are unique to the temporal and cultural contexts in which they emerge and become accepted (Philipson 1991; Ng, 2002; Thane, 2003).

While contemporary views generally hold older people in disregard, this has not always been the case (Thane, 2003; Townsend, 1981). In prehistorical and agrarian societies, older people were valued for their abilities to pass on culture, tradition, history, and knowledge to younger generations (Nelson, 2005). However, the advent of the printing press (Branco & Williamson, 1982) and the industrial revolution (Stearns, 1986) are argued to have disrupted this status quo. The former lessened older peoples' roles in diffusing culture, tradition, history, and knowledge, while the latter upended their assumed usefulness within systems of production (Nelson, 2005; Thane, 2003). Consequently, older people were growingly seen as burdens on society, especially as retirement was naturalised as a lifestage by the late twentieth century (Ng, 2002; Townsend, 1981). These views have been exacerbated by modern medical advances extending lifespans and enabling ever-larger populations of retired older people who require material and emotional support within societies (Nelson, 2005; Phillipson, 1991).

Contemporary views can be seen through the lens of age stereotypes. Stereotypes are implicit beliefs about the "characteristics, attributes, and behaviours of members of certain groups" that contain layperson logics as to how and why these associations make sense (Hilton & von Hippel, 1996, p. 240). Gerontology views old age stereotypes as prejudicial attitudes, practices, and social structures which reproduce certain beliefs about older people (Nelson, 2005). These include beliefs that ageing renders older people ill, incapable, and unsightly (Levy & Macdonald, 2016). For the purposes of this review, such beliefs likely underlie assumptions that tech-adoption benefits older people's wellbeing but they lack the skills to use tech-products successfully (Niemelä-Nyrhinen, 2007; Nunan & Di Domenico, 2019).

Stereotypes can equally feature discrimination in favour of older age groups (Tepper, 1994). Examples include beliefs that older people are kind and full of wisdom having plentiful lived experiences (Levy & Macdonald, 2016). Positive old age stereotypes, however, can still harbour reductive assumptions. For instance, Xu (2022, p. 735) observes that older people's activities are assumed to be limited to simple routines at home or care facilities. Such reductions distinguish activities that belong to the old versus young (see Schau et al., 2009). Similarly, Minichiello et al. (2000) explain that positive stereotypes set up expectations older people feel they cannot live up to. These expectations pressure older people (and others) to watch over their demeanour, as growing inabilities to share wisdom or do simple activities mark one's slippage into old age's unwanted associations (Huff & Cotte, 2016). In this manner, older people are seen to be vulnerable and teetering towards fragility (Schau et al., 2009).

Age stereotypes imply a social hierarchy that subjugates older people as inferior to younger people (Rozanova et al., 2006; Xu, 2022). This devaluation is internalised in ways that condition everyday interactions (Levy & Macdonald, 2016), ranging from younger people insisting on helping with tasks, using patronising elder baby-talk, to forms of elder abuse. Old age's devaluation moreover shapes how older people view themselves and what they believe they can and cannot do (Hummert, 2010). For instance, many older people believe they must retire and they should not engage in the latest pop-culture (North & Fiske, 2013). In these ways, stereotypes propagate normative lines that segregate identities and activities between young and old.

While age stereotypes are perpetuated by everyday social interactions, media, pop-culture, and consumption (Nelson, 2005), this review focuses on academic research. As established by the social sciences, research takes place within particular social, historical, and material contexts that shape its processes and outputs (Foucault, 1994; Latour & Woolgar, 1979). For instance, psychology has long reflected that age stereotypes can infiltrate research and reproduce stereotypes in published studies (Judd & Park, 1993; Schaie, 1988). Barnhart and Peñaloza (2013) reveal that marketing scholarship has similarly devalued older people. These authors highlight Wells and Gubar's (1966) Family Life Cycle model that naturalises the "Empty Nest" and "Solitary Survivor" lifestages which reify isolation and loneliness stereotypes, to studies that explain various ways old age shapes consumer behaviours (e.g., Lambert-Pandraud & Laurent 2010; Pettigrew et al., 2005).

If we as researchers believe that practitioners not only read, but draw upon, our scholarship, then the stereotypes our research may harbour have yet another route to impact older consumers. As age stereotypes and their harms manifest in market and consumption contexts (Barnhart & Peñaloza, 2013; Dean et al., 2014; Huff & Cotte, 2016; Westberg et al., 2021), it may be the case that we as researchers are complicit in enabling these effects through the practitioners we inform. Accordingly, the following review analyses the manner and extent to which marketing scholarship on older consumers and technology engages age stereotypes, particularly in theory development. The aim is to transform age stereotypes into productive tensions that enable researchers to broaden research possibilities in this domain.

Review approach

This review takes a domain-based approach that systematically extracts and analyses marketing articles on older consumers and technology (Paul et al., 2021; Sprong et al., 2021). In particular, the review utilises an interpretive narrative synthesis approach (Mays et al., 2005) that is moreover guided by critical reflexivity perspectives in marketing

(Bettany & Woodruffe-Burton, 2009; Gordon & Gurrieri, 2014). These approaches inspire how the articles are critically reviewed through analysis procedures. To explain these features, the following sections first detail the review's scope and article collection process. Following this, the critical reflexivity perspective and this review's interpretive analysis procedures are outlined.

Scope and systematic literature collection process

The review uses three scoping criteria to identify relevant articles. Namely, an article must study a technology context, discuss older consumers, and be published in marketing. Given numerous keywords that signal an article likely studies a technology context (e.g., a specific technology, or technology in general) and the wide variety of terms for older consumers (e.g., 'the elderly', 'seniors') (Fregolente et al., 2019; LaBarge & Pyle, 2020), the idea was to cast a wide net and filter down the search results to locate as many relevant articles as possible. The overall process of locating the final 86 articles reviewed is visualised in Fig. 1.

Scoping criteria were applied through keyword searches of journal articles written in English that are archived in the Social Science Citation Index in the Web of Science (WoS) between an open start date and December 2022 (Paul et al., 2021; Sprong et al., 2021). The WoS was chosen as this database is considered to have strong historical coverage and is the most reliable for indexing high-impact studies in reputable journals (Echchakoui, 2020). Keyword filters were applied to article metadata in stages (Paul & Criado, 2020), using the WoS web interface and Microsoft Excel. Metadata include title, abstract, keywords, and journal name fields.

First, an article must study a technology context. Keywords specifying technological contexts listed in Table 1 were applied to the title, abstract, and keyword metadata fields. These keywords represent consumer technologies with the highest penetration rates in the United States which serve as a benchmark consumer context (Consumer Technology Association, 2021). The inclusion of any of these keywords in any of the three fields satisfies this criterion. Keywords span 'technology' and 'innovation' to specific mentions of technologies such as 'smartphone', 'internet', 'wearable', to 'social media'. This query yielded 877,140 articles.

Second, an article must mention older consumers in its title, abstract or keywords. A second keyword array is also listed in Table 1 and includes: 'older-' and 'elderly-' prefixes variably paired with suffixes such as 'consumers' and 'people'. Lifestage terms like 'grandparent' and 'retirement', and generation names in the case of 'Baby Boomers' were

also included. After applying this criterion 70,343 articles continued to the next stage.

Third, an article must be published in marketing. Applying this criterion first involved filtering the search results to those categorised under the WoS' 'Business' or 'Management' discipline categories which yielded 1,515 results. These results and associated metadata were exported to an Excel spreadsheet to enable two manual screening procedures which were done simultaneously. Articles were manually screened based on journal name and abstract metadata to identify those that: (i) belonged to the marketing discipline; and (ii) were relevant to the review's topic of older consumers and technology. 1,163 articles were excluded as they were outside the marketing discipline. The vast majority were articles from other business and management disciplines (e.g., finance, accounting). Of the 352 marketing articles, 284 were scoped out. Explaining the nature of this high number of exclusions is thus important (Paul et al., 2021). Most exclusions were articles that mention 'technology' or 'innovation' in their title, abstract or keywords (e.g., smartphone, internet). However, in the same fields, these articles invoked the term 'older' in its general use and not referring to human age (e.g., 'older technologies'). After these exclusions, 68 articles advanced to the review stage.

Finally, for comprehensiveness, the WoS list was benchmarked against a comparative Scopus search that applied the same criteria and screening measures (Echchakoui, 2020). Only three articles were unique to the Scopus search and were added to the review. A final manual search was also conducted across competing indexes and publisher databases (e.g., EBSCO, Elsevier, Taylor & Francis). This search added 15 more articles. In sum, 86 articles were identified for review. Table 2 summarises the journals represented, and Table 3 lists all articles analysed which were published in marketing between 1985 and 2022.

Critical reflexivity and interpretive analysis

Analyses are guided by critical reflexivity perspectives in marketing (Bettany & Woodruffe-Burton, 2009; Gordon & Gurrieri, 2014). Critical reflexivity instils a mindfulness that knowledge production is conditioned by a time and place's dominant paradigms that normalise certain assumptions that researchers bring to their work (Foucault, 1994). It is these assumptions that may shape the kinds of theories researchers dominantly construct within a field (Nelson, 2005). While critical reflexivity is normally practiced at the individual or team level to uncover assumptions worthy of interrogation in one's own research projects, this review extends this mindset to think at a disciplinary level for systematic review purposes (cf. Bettany & Woodruffe-Burton, 2009; Gordon & Gurrieri, 2014).

Fig. 1 Literature collection process
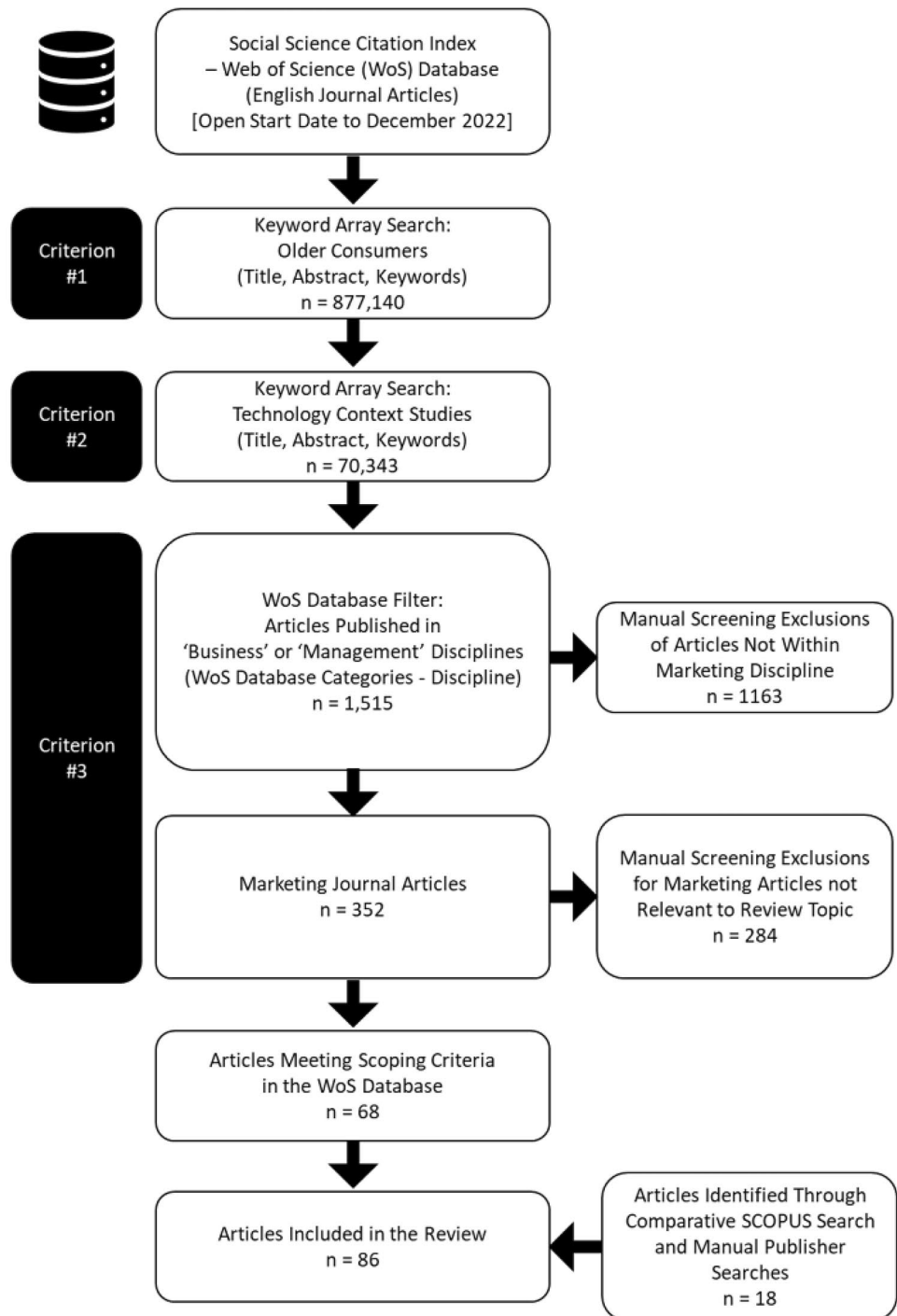
Consistent with critical reflexivity and the variety of methodologies across the reviewed articles (e.g., experiments, modelling, interviews, conceptual work), an interpretive qualitative analysis approach was utilised (Petticrew & Roberts, 2008). In particular, the review uses a *narrative synthesis* approach (Mays et al., 2005). This approach synthesises new insights by reinterpreting literature rather than only describing findings (Hulland, 2020; Jaakkola, 2020). This involves treating academic publications and the theories they construct as texts to be critically analysed akin to a discourse analysis (Thomas et al., 2013).

Narrative synthesis analyses unfolded in four rounds as summarised in Fig. 2. In the first round, patterns across the 86 articles were discerned through initial read-throughs in terms of older consumer portrayals in relation to technology. The review's 2×3 typology that features in the upcoming

Table 1 Keyword array construction

	General Terms	Specific Technologies	
Terms Specifying Technology Contexts	Innovation Technologies Technology	Camera Computer Device Digital Headphones Internet Laptop Mobile Online	Smart Assistant Smart Home Smart Television/TV Smartphone Smartwatch Social Media Tablet Wearable

	Prefixes and Variably Paired Suffixes				Lifestage Terms	Generational Terms
Terms Signifying 'Older Consumers'	Aging Ageing Elder Elderly Grey	Mature Older Senior Silver	Adult(s) Citizen(s) Consumer(s) Customer(s) Generation(s)	Individual(s) Market(s) People(s) Person(s) User(s)	Grandparent(s) Pensioner(s) Retiree(s) Retirement	Baby Boomer(s)

Table 2 List of journals with articles included in the review

Journal Name	Count
Journal of Consumer Marketing	15
Journal of Services Marketing	10
International Journal of Consumer Studies	7
Journal of Retailing and Consumer Services	6
Journal of Business Research	5
Psychology & Marketing	5
International Journal of Bank Marketing	4
Journal of Marketing Management	4
Marketing Intelligence & Planning	4
Journal of Consumer Affairs	3
Asia Pacific Journal of Marketing and Logistics	2
Journal of Fashion Marketing and Management	2
Journal of Research in Interactive Marketing	2
Journal of Service Management	2
The International Review of Retail, Distribution and Consumer Research	2
European Journal of Marketing	1
International Journal of Internet Marketing and Advertising	1
International Journal of Retail & Distribution Management	1
Journal of Consumer Research	1
Journal of Financial Services Marketing	1
Journal of Global Scholars of Marketing Science	1
Journal of Hospitality Marketing & Management	1
Journal of International Consumer Marketing	1
Journal of Macromarketing	1
Journal of Marketing Theory and Practice	1
Journal of Retailing	1
Journal of Travel & Tourism Marketing	1
Journal of Vacation Marketing	1

findings sections emerged during this stage. In the second round, articles were classified into the emerging typology's six categories. This involved analysing how each portrayed older consumers according to two dimensions: (i) their assumed capabilities (incapable/capable); and (ii) their orientations to technology (resisting/discerning/seeking).

Consider the review's classification of Bianchi (2021) to the 'Incapable/Resisting' category. As this study's introduction and literature review focuses on Internet technologies' benefits for addressing health and social isolation challenges, heightened attention is given to consumer *incapabilities* associated with ageing. At the same time, this study adopts a resistance theoretical framing to account for associated fears, anxieties, and physical and cognitive impairments that are argued to stifle Internet use. As this framing carries over to the findings and theoretical discussions, this article suits a *resisting* orientation categorisation.

Further, this review acknowledges that categorisation exercises are not objective but involve acts of interpretation (Bowker & Star, 2000). Articles that seemed to fit multiple categories were classified into the one most reflective of their portrayal of older consumers and technology, with the assistance of a colleague's feedback (Nikou, 2015). For instance, although Gilly et al. (2012) name older consumers as a '*resistant* group' and stress their discomfort towards technology, this article features many who make *discerning* choices indicating an openness to adoption. In this case, this article best fits the 'incapable/discerning' category.

In the third round, themes in empirical work within and across the categories were brought into focus. Differences in terminologies (e.g., 'older consumer' vs. 'elderly') and

Table 3 List of reviewed articles

Typology Category	Article	Journal	Technology Context(s) Mentioned or Studied	Particular Study of Older Consumers?	Term(s) for Older Consumers	Age Range (if Given)	Study Location(s)	Method(s) or Article Type	Enabling Theories / Conceptual Influences
Incapable, Resisting (n = 11)	Ben-Ami et al. (2014)	*European Journal of Marketing*	Internet, e-Learning	No – General Study, Sample of Undergraduates; but Discusses Elderly	Elderly	-	Israel	Experiment	Consumer Resistance; Self-Efficacy Beliefs
	Bianchi (2021)	*Journal of Services Marketing*	Internet Services	Yes	Elderly Consumers	75 +	Chile	Interviews	Technology Adoption Resistance; Service Ecosystem Perspective; Transformative Service Research (TSR)
	Chattaraman et al. (2014)	*Journal of Research in Interactive Marketing*	Virtual Agents on Websites	Yes	Older Consumers	65 +	United States	Experiment	Technology Anxiety; Consumer Perceptions
	Choudrie et al. (2018)	*Journal of Business Research*	Mobile Banking	Yes	Older Adults	50 +	United Kingdom	Conceptual Paper	Unified Theory of Acceptance and Use of Technology (UTAUT); Declining Physical, Sensory and Cognitive Capabilities
	East et al. (2014)	*Journal of Marketing Management*	Cameras, Computers, Mobile Phones, Facebook, Skype	Yes	Older Consumers	65 +	United Kingdom	Survey	Social Isolation/Influence; Consumer Decision-Making
	Holliday et al. (2015)	*International Journal of Consumer Studies*	Electronic Assisted Living Technologies, Smartphones	Yes	Older Consumers	50 +	United Kingdom	Focus Groups	Adoption Barriers; Consumer Decision-Making
	Lee et al. (2010)	*Marketing Intelligence & Planning*	Self-Service Technologies	No – All Ages Study	Older People	-	United States	Survey	Technology Anxiety; Need for Interaction; Tech-Use Intentions
	Lunsford and Burnett (1992)	*Journal of Consumer Marketing*	ATMs, Video Recorders, Cable TV, Electronic Pill Dispensers, Answering Machines	Yes	Elderly	65 +	n/a	Conceptual Paper	Barriers to Innovative Product Adoption; Consumer Resistance to Innovations; Self-Image Perceptions

Table 3 (continued)

Typology Category	Article	Journal	Technology Context(s) Mentioned or Studied	Particular Study of Older Consumers?	Term(s) for Older Consumers	Age Range (if Given)	Study Location(s)	Method(s) or Article Type	Enabling Theories / Conceptual Influences
	Pantano et al. (2022)	*Journal of Retailing and Consumer Services*	Retail Technologies (e.g., In-Store Displays, Self-Service Tills, Robots)	Yes	Old Consumers, Seniors, Elderly Consumers	75 +	Italy	Interviews	Social Inclusion/ Exclusion Theory; Information Overload Theory
	Perez et al. (2019)	*Journal of Consumer Marketing*	Social Media and Smartphones	No – Family Dynamics Study	Elderly	-	Mexico	Focus Groups	Inverse Consumer Socialisation; Intergenerational Family Dynamics; Resistance to Change
	Sancho-Esper et al. (2022)	*Journal of Vacation Marketing*	Virtual Reality, Virtual Tourism, Oculus Go	Yes	Older Adults	70 +	Spain	Mixed Methods – Survey, Structured Interview Questionnaire, and Focus Groups	Technology Acceptance Model (TAM); Technology Anxiety
Incapable, Discerning (n = 24)	Bavafa et al. (2019)	*Journal of Consumer Affairs*	Internet	Yes	Older People	65 +	United States	Survey	Financial and Health Literacy; Economic Vulnerability; Web Skills
	Čaić et al. (2018)	*Journal of Service Management*	Social Assistance Robots	Yes	Elderly	-	Europe	Interviews with Activity Materials	Value Co-Creation/ Co-Destruction, Value Networks, Service Design
	Čaić et al., (2019)	*Journal of Services Marketing*	Social Assistance Robots	Yes	Elderly	60 +	n/a	Conceptual Paper	Value Co-Creation; Social Cognition; Personal Values
	Chattaraman et al. (2011)	*Journal of Research in Interactive Marketing*	Virtual Agents on Websites	Yes	Older Consumers, Seniors	65 +	United States	Content Analysis and Focus Groups	Older Consumer Preferences; Declining Physical and Cognitive Abilities
	Eastman and Iyer (2004)	*Journal of Consumer Marketing*	Internet and Online Shopping	Yes	Elderly	65 +	United States	Survey	Demographic Differences; Reference Groups; Consumer Attitudes; Domain-Specific Innovativeness

Table 3 (continued)

Author (year)	Journal	Technology	Older focus	Population	Age	Country	Method	Theories/Concepts
Erjavec and Manfreda (2022)	Journal of Retailing and Consumer Services	Online Shopping	Yes	Older Adults	60 +	n/a	Survey	Unified Theory of Acceptance and Use of Technology (UTAUT); Social Isolation; Herd Behavior
Gilly et al. (2012)	Journal of Consumer Affairs	Computers and Internet	Yes	Older Consumers	65 +	United States	Interviews and Survey	Technology Optimism/Discomfort; Consumer Attitudes; Technology Resistance/Adoption
Hou and Eilliot (2021)	Journal of Retailing and Consumer Services	Mobile Shopping	No – All Ages Study	Older People	-	United States	Survey	Consumer Demographics; Technology Acceptance Model (TAM; Theory of Perceived Value; Theory of Innovation Diffusion
Hough and Kobylanski (2009)	Journal of Consumer Marketing	PCs and Internet	Yes	Elder Consumers	65 +	n/a	Conceptual Paper	Technology Acceptance Model (TAM), Consumer Perceptions; Physical Dexterity; Reference Group Affiliation; Technology Schema; Resistance to Change; Social Relations
Hwang and Nam (2017)	International Journal of Consumer Studies	PCs and Smartphones	Yes	Older People	60 +	South Korea	Survey	Digital Divide; Consumer Demographics
Khaksar et al. (2017)	Journal of Services Marketing	Social Assistance Technologies	Yes – Plus Perceptions of Caregivers and Specialists	Older People	-	Australia	Survey	Perceived Consumer Vulnerability; Dynamic Service Innovation Capabilities; Consumer-Directed Care

Table 3 (continued)

Leppel and McCloskey (2011)	*Journal of Consumer Marketing*	Online Shopping	No – Cross Generational Study	Older Individuals, Elderly	50 +	United States	Survey	Consumer Perceptions; Consumer Attitudes; Consumer Demographics; Technology Acceptance Model (TAM)
Naqvi et al. (2020)	*Asia Pacific Journal of Marketing and Logistics*	Social Media	No – General Study, Sample of Undergraduates; but Discusses Older People	Older People	-	Pakistan, UAE Malaysia	Survey	Technology Acceptance Model (TAM), Consumer Attitudes; Consumer Demographics
Nysveen et al. (2020)	*Journal of Business Research*	Assistive Technologies	Yes	Elderly	-	n/a	Conceptual Paper	Practice Theory, Ecosystem Adoption
Oderanti and Li (2018)	*Psychology & Marketing*	eHealth Technologies	Yes – Plus Perceptions of eHealth Entrepreneurs	Elderly People	55 +	United Kingdom	Focus Groups and Case Studies	Older Consumer Independence; Sustainable Business Models
Parida et al. (2016)	*Psychology & Marketing*	Social Media	Yes	Elderly Individuals	60 +	Sweden	Survey	Technology Acceptance Model (TAM); Consumer Sociodemographics; Technology Attitudes
Park et al. (2021)	*Journal of Services Marketing*	Online Grocery Shopping	Yes	Older Consumers	-	United States	Experiment	Socioemotional Selectivity Theory; Future Time Perspective; Chronological Age; Subjective Age
Porter and Donthu (2006)	*Journal of Business Research*	Internet	Yes	Older Individuals, Seniors	50 +	United States	Survey	Technology Acceptance Model (TAM), Consumer Attitudes, Consumer Perceptions

Table 3 (continued)

	Journal	Technology	Inclusion	Age group	Age	Country	Method	Theory / Constructs
Reisenwitz et al. (2007)	*Journal of Consumer Marketing*	Internet	Yes	Mature Consumers, Elderly	65 +	United States	Survey	Nostalgia Proneness; Consumer Innovativeness; Risk Aversion
Shen (2020)	*Journal of Consumer Marketing*	Email, Social Media, Online Video Calls, Instant Messaging, Smartphones	Yes	Older Adults	50 +	United States	Survey	Technology Acceptance Model (TAM); Physiological and Cognitive Decline
Thanasrivanitchai et al. (2017)	*International Journal of Internet Marketing and Advertising*	Internet	Yes	Older Consumers	45 +	Thailand	Surveys	Control Theory; "Losses" of Aging
Tipaldi and Natter (2022)	*Psychology & Marketing*	Smart Home Systems	Yes	Older Adults	65 +	Germany	Experiments	Consumer Decision-Making Heuristics; Choice Overload; Age-Framing/Age-Labelling
Trocchia and Janda (2000)	*Journal of Consumer Marketing*	Internet	Yes	Older Consumers	50 +	United States	Interviews	Consumer Attitudes, Consumer Perceptions; Resistance to Change; Reference Group Affiliation; Technology Schema; Physical Dexterity
Yap et al. (2021)	*International Journal of Consumer Studies*	Pandemic Coping Technologies (e.g., Social Media, Contactless Payment Systems)	No – All Ages Study	Elderly	-	n/a	Review / Conceptual Paper	Technology Paradoxes and Coping Strategies
Capable, Discerning (n = 34) Arenas-Gaitán et al. (2020)	*Marketing Intelligence & Planning*	Internet Banking	Yes	Older Adults	50 +	Spain	Survey	Unified Theory of Acceptance and Use of Technology (UTAUT)
Bae et al. (2021)	*Journal of Services Marketing*	Smartphones	Yes	Older Consumers	50 +	South Korea	Survey	Consumer Innovativeness; Stereotype Threat

Table 3 (continued)

Study	Journal	Cross generational	Product/Focus	Term	Age	Country	Method	Theory/Perspective
Beldona et al. (2009)	*Journal of Hospitality Marketing & Management*	No – Cross Generational Study	Online Travel Purchases	Baby Boomers	Born b/n 1946–64	United States	Survey	Generational Cohort Analysis; Technology Adoption Lifecycle
Beneke et al. (2011)	*Journal of Consumer Marketing*	Yes	Mobile Phones and Internet	Mature Market, Grey Market	55 +	South Africa	Survey	Consumer Demographics; Lifestyle Perspective
Berezan et al. (2018)	*Journal of Business Research*	No – Cross Generational Study	Social Media	Older People, Older Consumers, Baby Boomers	Born b/n 1946–64	n/a	Survey	Self-Determination Theory (SDT), Virtual Happiness
Berraies et al. (2017)	*International Journal of Bank Marketing*	No – Cross Generational Study	Mobile Banking Apps	Baby Boomers	Born b/n 1946–64	Tunisia	Survey	Consumer Demographics; Generational Perspective; Perceived Consumer Value
Bui (2021)	*International Journal of Consumer Studies*	Yes	Social Media	Older Consumers	55 +	United Kingdom	Interviews	Unified Theory of Acceptance and Use of Technology 2 (UTAUT2)
Castillo-Villar and Castillo-Villar (2022)	*Marketing Intelligence & Planning*	Yes	Mobile Banking Apps	Elderly, Older Adults	65 +	Mexico	Interviews	Affordance (and Constraints) Theory, Customer-Dominant Logic Perspective
Chéron and Kohlbacher (2018)	*Journal of International Consumer Marketing*	Yes	TVs, Digital Cameras, Rice Cookers, Video Games, Smartphones	Older Consumers	40 +	Japan	Survey	Innovative Product Adoption, Cognitive Age, Technological Anxiety, Global Consumer Innovativeness
Derbaix and Derbaix (2019)	*Journal of Marketing Management*	No – Cross Generational Study	Music Listening Devices	Older Generation	-	France	Interviews	Intergenerational Transmissions of Taste, Family Dynamics
Dorie and Loranger (2020)	*International Journal of Retail & Distribution Management*	No – Cross Generational Study	Online Shopping, Tablets, Smartphones, Social Media, Tablets	Baby Boomers	Born b/n 1943–160	United States	Survey	Generational Cohorts, Consumer Preferences
Eastman and Iyer (2005)	*International Journal of Consumer Studies*	Yes	Internet	Elderly Consumers, Senior Citizens	65 +	United States	Survey	Cognitive Age

Table 3 (continued)

Author (year)	Journal	Technology/Context	Older Adult Focus	Age Group	Age	Country	Method	Theory
Ge and Schleimer (2022)	*Journal of Services Marketing*	Paro (Companion Robot), Temi (Personal Assistant Robot), Roomba (Vacuum Cleaning Robot)	Yes	Older Adults	65 +	Australia	Home-Trials of Service Robots, Participant Diaries	Transformative Service Research (TSR)
Gilly and Zeithaml (1985)	*Journal of Consumer Research*	Grocery Scanners, Electronic Funds Transfer, ATMs	Yes	Elderly Consumers	65 +	United States	Survey	Consumer Socialization
Hansson et al. (2022)	*The International Review of Retail, Distribution and Consumer Research*	Online Grocery Shopping, Computers, Tablets, Smartphones	Yes	Elderly	69 +	Sweden	Interviews	Social Practice Theory, Shopping-as-Practice
Harris et al. (2016)	*International Journal of Bank Marketing*	Mobile and Online Banking	No – All Ages Study	Older Consumers, Elderly	46 +	United States	Survey	Generational Cohort Approach; Physical Age Characteristics; Unified Theory of Acceptance and Use of Technology (UTAUT)
Iyer and Eastman (2006)	*Journal of Marketing Theory and Practice*	Internet	Yes	Elderly, Seniors	65 +	United States	Survey	Consumer Attitudes; Reference Consumer Skills
Kim et al. (2015)	*Journal of Travel & Tourism Marketing*	Internet	No – Cross Generational Study	Baby Booms; Silent Generation	Born before 1964	United States	Survey	Generational Analysis; Travel Planning
Krishen et al. (2016)	*Journal of Business Research*	Social Media	No – Cross Generational Study	Baby Boomers	Born b/n 1946–64	n/a	Survey	Self-Determination Theory (SDT)
Kvalsvik (2022)	*Journal of Retailing and Consumer Services*	Online Grocery Shopping	Yes	Older Adults	62 + (Retirement Age in Norway)	Norway	Mixed Methods – Interviews and Experiment	Shopping Situational Characteristics; Individual Consumer Preferences
Kwon and Noh (2010)	*Journal of Fashion Marketing and Management*	Online Shopping	Yes	Mature Consumers	Born Before 1964	United States	Survey	Consumer Perceptions; Generational Cohort Approach
Law and Ng (2016)	*Journal of Global Scholars of Marketing Science*	Online Shopping	Yes	Older Users	50 +	Hong Kong	Survey	Consumer Attitudes; Online Purchase Intentions

Table 3 (continued)

Study	Journal	Technology	Age-Focused	Population	Age	Country	Method	Theories/Concepts
Lee and Lyu (2019)	The International Review of Retail, Distribution and Consumer Research	Self-Service Technologies	Yes	Older Consumers	55 +	United States	Survey	Diffusion Process Model; Technological Innovativeness; Technology Anxiety; Usage Intentions
Niemelä-Nyrhinen (2007)	Journal of Consumer Marketing	Internet and SMS	Yes	Baby Boomers	50 +	Finland	Survey	Technology Anxiety; Consumer Stereotypes; Generational Cohort Approach
Rahman and Yu (2019)	Journal of Fashion Marketing and Management	Online Shopping	Yes	Older Consumers	51 +	Canada	Interviews	Cognitive Age
Rajaobelina et al. (2021)	International Journal of Bank Marketing	Mobile Banking Apps	Yes	Elderly	55 +	North America	Survey	User/Service Experience; Perceived Age
Santosa et al. (2021)	Journal of Financial Services Marketing	Digital Payment Systems	No – Cross-Generational Study	Baby Boomers	Born b/n 1946–1964	Indonesia	Survey	Unified Theory of Acceptance and Use of Technology (UTAUT2) Continuance Intention
Vuori and Holmlund-Rytkönen (2005)	Marketing Intelligence & Planning	Internet	Yes	Older Adults	55 +	Finland	Survey	Life Stage Approach; Consumer Attitudes and Perceptions
Westberg et al. (2021)	Journal of Services Marketing	Self-Checkouts, Automated Call Centres, Online Chatbots	Yes	Older Consumers	55 +	Australia	Interviews	Age-Based Stereotype Threat Theory; Cognitive Age
Wilson-Nash and Tinson (2022)	Journal of Marketing Management	Tablets, Smartphones, Laptops, e-Readers	Yes	Older Consumers, Older Adults	65 +	United Kingdom	Self-Report Diaries	Technology Paradoxes, Coping Strategies, Self-Identity, Social Experiences
Wu et al. (2021)	Journal of Services Marketing	Self-Order Food Kiosks	No – All Ages Study	Older People	-	Online	Experiment	Socio-Emotional Selectivity Theory; Chronological Age
Yang and Jolly (2008)	Journal of Consumer Marketing	Mobile Data Services	No – Cross Generational Study	Baby Boomers	Born b/n 1946–64	United States	Survey	Technology Acceptance Model (TAM); Generational Approach

Table 3 (continued)

| Group	Author (year)	Journal	Technology	Comparison	Consumer Term	Age	Country	Method	Theory/Concepts
	Zeithaml and Gilly (1987)	*Journal of Retailing*	Grocery Scanners, Electronic Funds Transfer, ATMs	Yes – Comparison to Non-Elderly Consumers	Elderly Consumers	65 +	United States	Survey	Technology Adoption and Non-Adoption; Consumer Characteristics/Demographics
	Zhang et al. (2022)	*Journal of Retailing and Consumer Services*	e-Services (e.g., Websites, Info Kiosks, Mobile Apps)	Yes	Older Customers	65 +	China	Mixed Methods – Interviews and Survey	Customer Vulnerability; Transformative Service Research; Service-Dominant Logic; Customer Participation
Incapable, Seeking (n = 3)	Lim and Kim (2011)	*Psychology & Marketing*	TV Home Shopping	Yes	Older Consumers	60 +	United States	Survey	Loneliness; Parasocial Interactions
	Schneider-Kamp and Askegaard (2022)	*Journal of Marketing Management*	IoT Smart Alarm Systems (e.g., Fall and Motion Detectors)	Yes	Elderly Consumers	-	Denmark	Interviews and Observations	Assemblage Theory, Consumer Identity Negotiations
	Su and Tong (2021)	*Asia Pacific Journal of Marketing and Logistics*	Social Media	Yes	Silver Consumers, Older Adults	50 +	China	Survey	Unified Theory of Acceptance and Use of Technology (UTAUT2); Expectation-Confirmation Theory
Capable, Seeking (n = 5)	Fowler et al. (2015)	*International Journal of Consumer Studies*	Internet, Blogs, Social Media	Yes	Older People	65 +	China	Netnography	Sociocultural/Historical Perspective; Wellbeing/Quality of Life; Positive Ageing
	Fregolente et al. (2019)	*Journal of Consumer Marketing*	Tablets, Smartphones, Computers, Internet, Facebook and Whatsapp	Yes	Older Adults	65 +	Brazil	Interviews	Sociocultural Perspective; Consumer Identity Construction; Life Course Approach
	Morozova and Gurova (2021)	*International Journal of Consumer Studies*	Smartwatches and Fitness Trackers	Yes	Older Consumers	50 +	Finland, Russia	Interviews	Sociocultural Perspective; Practice Theory; Consumer Wellbeing
	Pera et al. (2020)	*Psychology & Marketing*	Facebook and Whatsapp	Yes	Older Consumers	60 +	Italy, Great Britain	Interviews and Focus Groups	Subjective Wellbeing; Consumer Identity Construction

Table 3 (continued)

	Journal	Technology	Cross Generational Study	Older consumer term	Age	Country	Method	Concepts
Reisenwitz and Iyer (2007)	Journal of Consumer Marketing	Internet	No – Cross Generational Study	Baby Boomers	50 +	United States	Survey	Cognitive Age; Generational Approach; Sociocultural Perspective
Capable, Resisting (n = 9) Areni (2021)	Journal of Macromarketing	Social Media and Smartphones	No – All Ages Study	Older Consumers	-	n/a	Automated Text Analysis	Sociocultural/ Historical Perspective; Autobiographical Obsolescence; Nostalgia; Disruptive Technologies
Cham et al. (2022)	International Journal of Bank Marketing	Mobile Payment Systems	Yes	Older Consumers, Elderlies	60 +	Malaysia	Survey	Innovation Resistance Theories
Chaouali and Souiden (2019)	Journal of Retailing and Consumer Services	Mobile Banking	Yes	Elderly People	55 +	France	Survey	Cognitive Age; Innovation Resistance; Adoption Barriers
Laukkanen et al. (2007)	Journal of Consumer Marketing	Internet and Mobile Banking	Yes	Mature Consumers	55 +	Finland	Survey	Innovation Resistance; Adoption Barriers
Mattila et al. (2003)	Journal of Services Marketing	Internet Banking	Yes	Mature Consumers	65 +	Finland	Survey	Diffusion Curve/ Late Adopters; Consumer Attitudes; Adoption Barriers
Obal and Kunz (2013)	Journal of Service Management	E-Services, E-Tailer Websites	No – Cross Generational Study	Baby Boomers	Born b/n 1946–64	n/a	Experiment	Online Trust; Digital Natives vs. Digital Immigrants
Pettinico and Milne (2017)	Journal of Consumer Marketing	Various Tracking Technologies (e.g., Fitness, Sleep, Home Energy Use)	No – All Ages Study	Older Consumers	50 +	United States	Blog Analysis and Experiments	Self-Quantification; Consumer Motivation; Consumer Goals
Rosen and Weil (1995)	Journal of Consumer Affairs	Cable TV Boxes, Satellite Dishes, Handheld Gaming	No – All Ages Study	Older People	51 +	United States	Survey	Technophobia; Consumer Demographics
Rosenbaum et al. (2022)	Journal of Services Marketing	Digital Technologies	No – Editorial Call for Future Research	Older Consumers, Senior Adults	60 +	n/a	Editorial and Conceptual Paper	Service Marketplaces
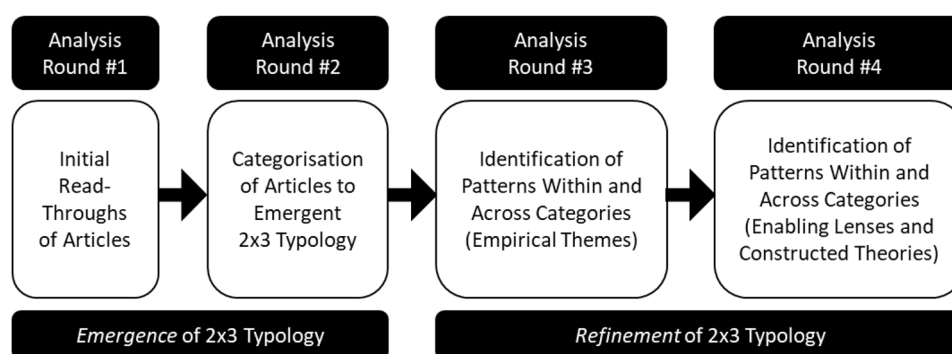
age-range construction (e.g., 50 + or 65 +) emerged during this round, as did some differences in the kinds of technologies studied (e.g., health vs. leisure). During this stage, clearer identities for the categories began to surface as the typology started to undergo refinement.

In the final round, patterns in the article's enabling lenses and the theories they tend to construct were distinguished across the categories (Dolbec et al., 2021). This procedure enabled meta-theoretical explorations of what each category uniquely offers (Huff & Barnhart, 2022; Vargo & Lusch, 2017). Although the review's analytical approach is qualitative, category counts were tabulated to help interpret which of the six research categories are relatively more established or underdeveloped than the others. This choice follows prior advice that suggests lower counts often signal immature streams of fragmented research that greatly benefit from increased awareness (Jaakkola, 2020).

The split between established and underdeveloped was first made by comparing the highest and lowest count categories. The two largest categories each tripled the counts of the smallest two combined. These large differences made for a natural split. The remaining two middle categories required more reasoning. 'Incapable/Resisting' was considered an established category as it had a higher count and features older consumers that reflect common age stereotypes. By contrast, 'Capable/ Resisting' was lower in count and features older consumers with atypical technology experiences and thus was considered underdeveloped. The typology and its six research categories now anchor the following findings sections.

Findings

Typological framework

An overview of the emergent 2 × 3 typology is in Table 4. This typology has two dimensions: (1) technology-related old age assumptions centred on capability (incapable/

capable); and (2) general consumer orientations to technology (resisting/discerning/seeking). As both emerged, relevant literature on stereotypes and consumer orientations to technology were consulted. In so doing, concepts from both literatures were integrated into the typology to refine its two dimensions. Through integration into the typology, these concepts serve as 'method theories' (Jaakkola, 2020). This means that these concepts when applied together as typology dimensions derive new insights into the reviewed domain. These two dimensions are now explained.

Dimension #1: Older consumer incapable/capable portrayals

While not exhaustive of all age stereotypes, what emerged in the review was a dominant focus on older consumer (in) capabilities. These relate to health, social isolation experiences, and technological skill-levels, which colour how and why various technologies are argued to fit into older consumers' lives. This dimension is split into incapable and capable portrayals to reflect this dominant research focus and to tease out articles that offer different views to incapability stereotypes.

The *incapable* subcategory captures articles that portray older people as being incapable in terms of health and sociability in ways that necessitate a technology's uses, and/or stresses they lack the skills to use technologies successfully. For instance, many articles spotlight declining physical/cognitive faculties as reasons for older consumers to adopt assisted living products (e.g., Holliday et al., 2015; Nikou, 2015). Likewise, social media is frequently pitched as a solution to social isolation (e.g., Bianchi, 2021; Su & Tong, 2021). In tandem, older consumers are often assumed to lack the skills required to successfully adopt and use new technologies (e.g., Bavafa et al., 2019; Perez et al., 2019). Articles that stress one or more of these incapabilities are grouped into this subcategory.

By contrast, the *capable* subcategory features articles that do not stress older consumers are incapable in relation to technology. These articles feature either a positive age stereotype

Table 4 Typological framework for reviewed articles

	Consumer Orientation to Technology				Older Consumer Portrayal (Assumed or Unassumed Physical & Cognitive Decline; Social Isolation; Low Tech-Skills)
	Resisting (n = 20)	**Discerning** (n = 58)	**Seeking** (n = 8)		
Category	**Incapable/Resisting** (n = 11) *[Established Research Category]*	**Incapable/Discerning** (n = 24) *[Established Research Category]*	**Incapable/Seeking** (n = 3) *[Underdeveloped Research Category]*	**Incapable** (n = 38)	
Age Ranges	Lowest: 50+ — Most Common: 65+ — Highest: 75+	Lowest: 45+ — Most Common: 65+ — Highest: 65+	50+ and 60+		
Main Age Descriptors	"Older-" (n=6) and "Elderly-" (n=5)	"Older-" (n=15) and "Elderly-" (n=10)	"Older-" (n=2), "Elderly-" (n=1), "Silver-" (n=1)		
Typical Tech Studied	No Clear Pattern – Various Technologies Studied (e.g., Everyday Technologies and Assisted Living Technologies)	No Clear Pattern – Various Technologies Studied (e.g., Everyday Technologies and Assisted Living Technologies)	No Clear Pattern – TV Home Shopping; Smart Alarm Systems; and Social Media		
Dominant Theoretical Perspectives	Technology/Innovation Resistance; Adoption Barriers; Technology Anxiety	Consumer Decision-Making Frameworks; Physical & Cognitive Decline Concepts	No Dominant Theoretical Perspective		
Summary Description	These studies tend to feature older consumers more advanced in age. Adoption and consumption of various technologies are framed as solutions to combat physical/cognitive decline and social isolation. Coupled with these challenges, a lack of tech-skills and anxieties of using these technologies frame these consumers' resistances to technology. These need to be overcome to encourage adoption and improved consumer wellbeing.	Studies in this category feature younger older consumers undertaking decision-making processes to adopt and consume technologies that have benefits for addressing health challenges and social isolation. Low tech-skills often discourage adoption choices. Education and training are commonly recommended to encourage technology adoption choices towards improved consumer wellbeing.	This sparse trio of studies highlight older consumers who are favourable towards adoption, despite the various ageing-related challenges they face. It is through adoption and consumption of new technologies that they seek improved wellbeing.		
Future Research Directions	(1) Marketing considerations that are non-patronising and avoid stigmatising older consumers in relation to their technology uses; and (2) Investigations into how age-related technology stereotypes are internalised by older consumers and others in society.	Studies of collective and multi-agential processes that contextualise older consumers' decision-making related to technology (e.g., social and material aspects of family and caregiver contexts).	(1) Explorations of what typifies contexts in which technologies that address older consumers' incapabilities are sought; (2) Studies of the 'dark sides' of adoption for older consumers.		
Category	**Capable/Resisting** (n = 9) *[Underdeveloped Research Category]*	**Capable/Discerning** (n = 34) *[Established Research Category]*	**Capable/Seeking** (n = 5) *[Underdeveloped Research Category]*	**Capable** (n = 48)	
Age Ranges	Lowest: 50+ — Most Common: 55+ — Highest: 65+	Lowest: 40+ — Most Common: 50+/55+ — Highest: 69+	50+, 60+ and 65+		
Main Age Descriptors	"Older-" (n=5) and "Mature-" (n=2)	"Older-" (n=18), and "Baby Boomers" (n=9)	"Older-" (n=4) and Baby Boomers" (n=1)		
Typical Tech Studied	Everyday Technologies (e.g., Smartphones, Social Media, Mobile Banking and Payment Systems, Wearables)	Everyday Technologies (e.g., Internet, Social Media, Smartphones, Laptops, Mobile Banking, Online Shopping)	Leisurely and Expressive Technologies (e.g., Smartphones, Tablets, Social Media, Wearables)		
Dominant Theoretical Perspectives	Technology/Innovation Resistance; Adoption Barriers	Consumer Decision-Making Frameworks; Cognitive Age; Cross-Generational Perspectives	Sociocultural Perspectives, Consumer Identity Construction		
Summary Description	Studies in this category showcase younger older consumers who view particular technologies as unnecessary to how they want to live their lives. These technologies span various benefits beyond addressing health and social isolation. The rationale for such views is not necessarily unique to older consumers but mirror concerns about technology that consumers of all ages share.	These studies feature younger older consumers undertaking decision-making processes to adopt and consume technologies for a variety of benefits (unrelated to addressing health issues and social isolation). Age tends to be treated in terms of "how old one feels" or acknowledges differences in generational familiarities with various kinds of everyday technologies that condition older consumers' technology choices.	Studies fitting this category lean into sociocultural perspectives which highlight that older consumers use technology as part of identity construction pursuits. These pursuits are often in the domain of leisure and socialising with their peers, family, and wider communities. Older consumers are portrayed as enthusiastic seekers of technology.		
Future Research Directions	Identification and investigation of further contexts in which older consumers resist adoption as they view these particular technologies' uses as unnecessary to how they want to live their lives. These studies likely will reflect contexts in which older consumers seek escapes from the ubiquity of digital devices much like their younger counterparts.	(1) Continued use studies that investigate to what extent older consumers actually benefit from adoption and for how long; (2) Macro-oriented studies that explore how notions of cognitive age and generations are societally constructed and contextualise older consumers' technology-related decision-making.	(1) The reinvigoration of lifelong identities (e.g., 'artist') through older consumers' tech-uses; (2) Tech-empowerment studies of older consumers who face (and may overcome) resource constraints that limit their accesses to technologies.		

or none at all. Examples include views that older consumers are wealthier on average and pursue leisure in retirement (Schau et al., 2009; Schiffman & Sherman, 1991). Indeed, tech-uses for travel, hobbies, and socialising feature in many articles in this subcategory (e.g., Fregolente et al., 2019; Pera et al., 2020). This subcategory also identifies articles that do not feature any age-related stereotypes. While drawing some attention to older age, these articles imply older consumers have the same tech-related capabilities as other groups.

Dimension #2: General consumer orientations to technology

Prior scholarship points out a common assumption that older consumers tend to be resistant to technology adoption due to not being able or comfortable to learn new things (Niemelä-Nyrhinen, 2007). However, many reviewed articles do not portray older consumers as resistant. For this reason, this second dimension invokes marketing research that theorises consumers as having various orientations to technology irrespective of age (Kozinets, 2008; Porter & Donthu, 2006). By extending this understanding to older consumers, the typology better foregrounds those who are discerning in their technology choices or are active technology seekers. As such, the typology is open to older consumers having resisting, discerning, and seeking orientations to technology.

The *resisting* orientation captures articles that treat older consumers as having something about them (e.g., health issues) or their contextual surroundings that makes them unwilling to adopt new technologies. Technology/innovation resistance theoretical framings are common in this category (e.g., Ram & Sheth, 1989). These articles frame successful adoption as needing to overcome tech-product/service-related barriers such as: concerns it is too complex, intrusive, or damaging to society; its uses being incompatible with age-related norms; to aversions to change (e.g., Laukkanen, 2016; Mani & Chouk, 2017). These barriers are viewed as a practitioner task to overcome so older consumers can benefit from adoption.

The *discerning* orientation instead features articles that see adoption as a reasoned choice by older consumers after careful evaluation of a technology's characteristics. Many articles that fit this framing are built upon decision-making models that theorise intentions to adopt, such as those informed by the Technology Acceptance Model (Davis, 1989) and the Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2012). Hence, perceptions over a technology's usefulness, ease-of-use, and social desirability (Kulviwat et al., 2009; Porter & Donthu, 2006) are common in this subcategory. Studies that fit this category therefore tend to treat older consumers as discerning decision-makers.

Finally, the *seeking* orientation captures articles that portray older consumers as newness and novelty seekers with intrinsic interests in tech-products (Bruner II & Kumar 2007; Kozinets, 2008). This view is consistent with nascent marketing studies that suggest older consumers can also be technology enthusiasts (Franco, 2020; Schau et al.,

2009). While few in number, by strongly diverging from tech-related age stereotypes, these articles especially hint at the potentials that a broadened view on older consumers and technology can offer.

Six article categories emerge from these two dimensions (Table 4). In what follows, each category's unique view on older consumers and technology is characterised in terms of dominant empirical themes, theories constructed, and offered marketing practitioner advice. On these bases, non-exhaustive future research directions for each category are suggested.

Established research categories

Incapable/Resisting

This category contains articles that study contexts in which adoption is intended to address older consumers' health and social isolation issues but is complicated by an assumed lack of tech-skills and their resistances to technology. These studies must balance crafting insights sensitive to age stereotypes while acknowledging many older consumers' serious realities in which various technologies offer wellbeing benefits. This category shows how stereotypes can be helpful heuristics that motivate meaningful research.

Incapability intertwines with resistance in two ways: (1) diminished physical/cognitive abilities and low technical skills foster tech-use fears and anxieties (e.g., Bianchi, 2021; Lunsford & Burnett, 1992); and/or (2) the technology under adoption is positioned to address health and social isolation issues but risks stigmatising older consumers when in use (e.g., Holliday et al., 2015). Articles in this category notice-ably study consumers of advanced ages, or the 'old-old' (Abdel-Ghany & Sharpe, 1997). This can be seen in the term 'elderly' invoked to a higher degree than other categories (see Table 3). As such, a focus on the elderly likely explains this category's heavy reflection of incapability stereotypes.

Due to focuses on physical/cognitive decline, social isolation, and low tech-skills, Incapable/Resisting studies dominantly utilise resistance, anxiety, and barrier concepts applied to adoption contexts (e.g., Meuter et al., 2003; Ram & Sheth, 1989). Collectively, these theoretical influences frame adoption as requiring older consumers (and others around them like family and service providers) to overcome age-induced challenges that stifle successful technology use (Bianchi, 2021; Chattaraman et al., 2014; Perez et al., 2019). Older consumers are consequently conceptualised as stuck between needing to adopt technologies to address their limitations, while these same limitations stifle their abilities to adopt successfully.

Researchers suggest various practitioner considerations to overcome this technology adoption conundrum. For instance, studies argue that many technologies are not designed with older people's limitations in mind and design choices like larger fonts and buttons to increase usage acces-sibility (Lunsford & Burnett, 1992). Likewise, studies also suggest that marketers get family members involved in adoption processes by offering tech-help to alleviate fears and anxieties (Bianchi, 2021; Perez et al., 2019). However, this advice still risks stigmatising older consumers by fore-grounding their limitations through designs that can come off as patronising, and priming others to assume they lack the capabilities to use technologies successfully. It is clear that tackling resistance in ways sensitive to age-related stig-matisation is a challenge that researchers and practitioners have yet to solve.

Hence, one future research direction is the exploration of marketing considerations that are non-patronising and do not stigmatise old age. Studies from elsewhere in the review bear fruitful starting points. Oderanti and Li (2018) find that older consumers feel empowered by wearables that are discreet, such as fall alarms that look like ordinary jewellery. Simi-larly, Murozova and Gurova (2021) show that older consum-ers feel freer to check health information on smartwatches than bulky blood pressure machines. These findings mirror Moschis (2003) who suggests that marketing strategies that remind older consumers of their age tend to turn them off product offerings. Future work can not only investigate prod-uct design choices but other marketing mix elements that are conducive to thoughtfully handling stigmatisation risks.

As studies in this category note, "many older people believe they are 'too old' to learn how to use technologies" (Lee et al., 2010, p.49), which reflects poor self-efficacy beliefs (Ben-Ami et al., 2014). Observations like these pro-voke questions such as: (i) Where do tech-related age ste-reotypes come from? And (ii) How and why are stereotypes perpetuated and internalised by older consumers and others in society? Marketing scholarship is best placed to answer these questions in light of consumption contexts' roles in fostering age stereotypes (e.g., Barnhart & Peñaloza, 2013). In particular, nascent work examines advertising, social media, and film representations of older people (Rosenthal et al. 2021; Xu, 2022). These studies offer informative start-ing points that can extend to critical examinations of these cultural forms' roles in aiding and abetting tech-related age stereotypes.

Future studies could also utilise perspectives that can help explain the mechanisms that may underlie stereotype internalisation. For instance, advertising, social media, and films might offer 'possible older selves' that steer how con-sumers come to understand themselves and their orienta-tions to technology as they age (Bennett & Gaines, 2010). Equally, these cultural forms may prescribe particular visions of consumer-technology relationships, perhaps those in which tech-products constrain the agency of older con-sumers (Hoffman & Novak, 2018; Novak & Hoffman, 2019; Schweitzer et al., 2019).

Incapable/Discerning

Although this category invokes incapability stereotypes related to health, social isolation, and tech-skills, adoption is framed as a decision carefully considered by older consumers than a situation that is outright resisted. Articles in this category dominantly study the 'young-old' as signalled by age ranges as low as 45 + and 50 + given to define older consumers (Tables 3 and 4) (e.g., Leppel & McClosky, 2011; Shen, 2020; Thanasrivanitchai et al., 2017). Given these studies frame adoption as a choice, this category helps reveal that the young-old tend to be granted more agency than the old-old when it comes to technology.

Individual consumer decision-making models premised on perception and attitude formation dominate this category. In particular, the Technology Acceptance Model (TAM) (Davis, 1989) is a common enabling lens utilised. Incapability is routinely mapped onto usefulness and ease-of-use concepts (e.g., Hough & Kobylanski, 2009; Porter & Donthu, 2006). For instance, reduced motor skills can make technologies harder to use, deterring older consumers from adoption (Shen, 2020; Trocchia & Janda, 2000). Equally, others suggest that declining health spurs adoption choices, such as the usefulness of online shopping to avoid the challenges of store visits (Leppel & McClosky, 2011; Park et al., 2021); online platforms to access information (Bavafa et al., 2019; Parida et al., 2016); to health technologies for their wellness benefits (Čaić et al., 2019; Oderanti & Li, 2018). Older consumers' extent of familiarity with a technology, how they feel its uses makes them look to others, and discomfort during use are further considerations (Eastman & Iyer, 2004; Gilly et al., 2012; Parida et al., 2016). According to this category, after pondering such considerations conditioned by their incapabilities, older consumers make adoption decisions.

Practitioner advice focuses on three things in this category: First, simpler designs are encouraged, such as tech-products that have less features and interfaces with fewer options (Chattaraman et al., 2011; Leppel & McClosky 2011). Like the Incapable/Resisting category, this category bears tensions in promoting simpler designs that concurrently avoid emphasising older consumers' limitations. Second, practitioners must shift attitudes towards a technology through persuasion. This requires changing use difficulty and usefulness perceptions through messages that avoid technical jargon (Trocchia & Janda, 2000). These messages should also show adoption helps older consumers cope with age-related challenges (Gilly et al., 2012; Thanasrivanitchai et al., 2017). Last, education initiatives to address skill gaps are recommended (e.g., Bavafa et al., 2019; Hwang & Nam, 2017). Beyond teaching tech-skills, classes must be convenient, affordable, and teach older consumers how to handle the difficulties of learning new technologies' uses (Eastman & Iyer, 2004; Gilly et al., 2012).

Given the dominance of individual decision-making perspectives, future research will benefit from examining collective processes, such as in family and caregiver contexts (e.g., Barnhart & Peñaloza, 2013; Epp & Price, 2008). At best, a couple of studies in this category showcase some potentials of this research direction. For instance, Čaić et al. (2018) find that successful adoption of service robots not only requires a willing older consumer but also agreeable caregivers. Similarly, Nysveen et al. (2020) argue that the material environment also shapes adoption possibilities. Through a practice perspective, these authors show that adoption can depend on how a technology complements the uses of other objects already in a context. For instance, video monitoring systems are augmented by motion sensors so they can detect irregular events that threaten older consumers' safety (e.g., falls). Studies pursuing this research direction can benefit from marketing scholarship that applies multi-agential perspectives to understand consumption, such as those that utilise practice and assemblage theories (e.g., Hoffman & Novak, 2018; Huff & Cotte, 2016; Schneider-Kamp & Askegaard, 2022).

Capable/Discerning

This category views older consumers as discerning and capable adopters who base choices on everyday needs and desires rather than assumed health and social isolation issues. Shaping this view are two differences in how older consumers are seen in relation to technology. As Table 4 shows, younger age ranges like 50 + and 55 +, even as low as 40 + feature in this category. Moreover, unlike the prior Incapable/Resisting and Incapable/Discerning categories that study various technologies inclusive of assisted living products, this category solely studies everyday technologies (e.g., smartphones, self-service, social media).

Although this category is premised on decision-making, there are three dominant theoretical approaches utilised that together stress older consumer technology adoption goes beyond utilitarian factors. These theories serve as a contrast to the prior Incapable/Discerning category, as this category starts to dissolve differences between older consumers and other ages. These approaches are either adaptations of the Unified Theory of Acceptance and Use of Technology (UTAUT), invocations of cognitive age, or uses of cross-generational perspectives.

UTAUT studies consider social and hedonic influences on adoption, contrasting with the Incapable/Discerning category's uses of TAM to emphasise practical factors like usefulness and ease-of-use (e.g., Bui, 2021; Santosa et al., 2021). Mindful of many everyday technologies' social uses and goals to offer enjoyable experiences, UTAUT's extended adoption factors make sense to apply to older consumers who are not assumed to face age-related challenges.

Cognitive age studies instead eschew chronological age. Rather than number of years lived indicating who is 'older', cognitive age makes this distinction based on how old one feels (e.g., Arenas-Gaitán et al., 2020; Eastman & Iyer, 2005; Rahman & Yu, 2019). This alternative leaves room for chronologically old consumers to see themselves in good physical, cognitive, and social health, and capable of using various technologies (e.g., Harris et al., 2016; Kwon & Noh, 2010; Law & Ng, 2016; Lee & Lyu, 2019). Finally, cross-generational studies contextualise differences in adoption preferences between old and young in terms of varying life-stages, accumulated wealth, and technological familiarity (e.g., Berezan et al., 2018; Dorie & Loranger, 2020). For instance, Baby Boomers with adult children are assumed to have more money and time to explore technologies related to travel like online trip booking and planning systems (Beldona et al., 2009; Kim et al., 2015).

These three theoretical approaches enable the same cautions and differing preferences all consumers have irrespective of age to be considered. For instance, privacy concerns that dissuade adoption (Walker, 2016) are found in this category (e.g., Berraies et al., 2017; Rajaobelina et al., 2021). Differing preferences also feature such as in online shopping studies. Non-adoption can reflect preferences to see products first-hand, doing things in-person, or wanting to go out (e.g., Rahman & Yu, 2019; Vuori & Holmlund-Rytkönen, 2005; Wu et al., 2021). These preferences suggest older consumers may simply seek non-digital forms of consumption like their younger counterparts (see Humayun & Belk, 2020).

Reasons more favourable to adoption more closely reflect general ways consumers are motivated to use new technologies. For example, this category emphasises that not all older consumers think they are too old to use technology, and many find their uses enjoyable (Arenas-Gaitán et al., 2020; Yang & Jolly, 2008). Commonly associated with enjoyment are positive age stereotypes like older consumers having wealth and free time to try new things. For instance, the internet sees increased adoption during retirement, and smartphones and tablets often become fixtures of retirees' leisure activities (Bae et al., 2021; Beneke et al., 2011). This category is thus more sensitive to portraying older consumers as unique individuals who make adoption choices in light of their particular personal circumstances and preferences.

Practitioner advice likewise stresses that older consumers should not be treated as a homogenous segment, acknowledging the variety of life experiences captured by this term (Rajaobelina et al., 2021; Westberg et al., 2021). This advice likely reflects this category bearing three dominant theories that each account for heterogeneity in its studied older consumer decision-making contexts. For instance, studies imply the younger-old have different adoption experiences than advanced ages such as 75+ (Bae et al., 2021; Vuori & Holmlund-Rytkönen, 2005). Beyond different degrees of

ageing, generational cohort effects also inform this observation (Niemelä-Nyrhinen, 2007). Consider Baby Boomers who are the bulk of the present younger-old (roughly ages 57–75). Boomers have more exposure to digital technologies than previous generations, having been in their 30s-40s during the diffusions of personal computers, internet, and email since the late 1980s. Longer exposures to digital technologies may explain their adoptions of devices that continue to facilitate web-browsing and email like smartphones. Implied is that older consumer heterogeneity extends to differing kinds of tech-experiences which must be considered by practitioners (Beneke et al., 2011; Niemelä-Nyrhinen, 2007).

Future research can address the weaknesses or extend the insights of the three theories in this category. First, UTAUT studies can also study post-adoption stages (Shih & Venkatesh, 2004). Indeed, continued use studies are rare in the review (e.g., Bae et al., 2021; Holliday et al., 2015). Such studies can gauge to what extent consumers actually benefit from adoption and for how long. In this vein, research can adopt temporal consumption perspectives, like recent studies that explain how tech-uses fluctuate with evolving life circumstances (Novak & Hoffman, 2019; Nysveen et al., 2020). If also integrated with generational pattern considerations, continued use studies may develop more nuanced insights on older consumers and technology.

Second, studies invoking cognitive age and generational perspectives may be extended by explorations over how such notions are socially constructed in relation to technology. Social science well establishes that the idea of generations itself is constructed (e.g., Mannheim, 1970). Unpacking how generational understandings are constructed and shape technology adoption processes may be a fruitful research area. For instance, Areni (2021) shows that current concerns of social media 'dumbing down society' are the latest in a pattern of successive generations critiquing new technologies. Historical precedents are seen in early reactions to print, radio, television, and the internet. Areni suggests structural patterns in how societies nostalgically see the relative simplicity of prior technologies when dealing with the challenges that newer technologies threaten. Macro-oriented studies of this kind are positioned to reveal important societal contextualisations of technology adoption decision-making processes.

Underdeveloped research categories

Incapable/Seeking

The three articles in this category portray older consumers as tech-seeking in their attempts to address their incapabilities. Su and Tong (2021) study older Chinese who seek out social media to address felt disconnections with loved ones, though growingly worried they now spend too much

time using these technologies. Lim and Kim (2011) study TV home shopping and its fervent adoption among those challenged by mobility and isolation issues. In particular, they observe that some older consumers not only find TV home shopping convenient, but they receive emotional benefits through parasocial relationships to program hosts. Last, Schneider-Kamp and Askegaard (2022) study those who seek smart alarm tech-products (e.g., fall alarms) to empower them to live independently. However, these uses are found to create stress for relatives who receive the notifications these devices generate. As these studies each apply different enabling lenses (i.e., UTAUT, parasociality, assemblage theory), it is too early to identify a dominant theoretical approach nor clear practitioner advice for this category.

Future research can use these studies' insights to explore what typifies contexts in which technologies that address older consumer incapabilities are sought. Compared with the Incapable/Resisting category, this category offers clues as to what may separate contexts featuring resisting and seeking older consumers. An idea is that two of the technologies studied (i.e., social media, TV home shopping) are not solely targeted to older consumers. Marketing strategies like these align with studies that advocate minimally differentiated product designs and messages between older consumers and other segments (Lunsford & Burnett, 1992; Moschis, 2003). Trialling a technology privately at home may also reduce fears of looking inept to others when learning its uses. However, the at-times stressful social nature of the smart alarm systems studied by Schneider-Kamp and Askegaard (2022) counters this thought and may capture a nuance that may later characterise this category if further developed.

Another direction is to unpack the dark sides of adoption hinted by this category. Su and Tong's (2021) study suggests that older consumers may also experience the wellbeing impacts of excessive use. Tech-addiction concepts applied to other ages may benefit through spotting similarities and differences to older consumer contexts (see Nevskaya & Albuquerque, 2019). Similarly, Lim and Kim's (2011) study of TV home shopping hints at the dangers of isolation. Like all consumers, wellbeing may be challenged when older consumers develop parasocial relationships through their tech-uses (Hartmann, 2016). Schneider-Kamp and Askegaard (2022) meanwhile show how family/caregiver relationships are complicated by a smart alarm's abilities to notify others of what it thinks are threatening events to their users. Each of these dark sides serve as provocative starting points for future research.

Paradox and vulnerability theories offer helpful handles to reveal and understand further dark sides to adoption for older consumers. For instance, Wilson-Nash and Tinson (2022) utilise paradox theory (Mick & Fournier, 1998) to show that older consumers also experience the double-edged nature of technology. In turn, these authors reveal

dark sides such as older consumers encountering persistent feelings of disorder (e.g., inboxes full of emails), discomfort when separated from their devices, and enslavement when technologies' charging needs routinely beckon (Robinson & Arnould, 2020). Similarly, Del Bucchia, Miltgen, Russell and Burlat (2021) extend paradox theories by theorising digital devices can make all consumers vulnerable in ways they may not immediately realise. Their insights imply that despite initial feelings of empowerment, older consumers may face revelatory moments in which they become aware of their dependence on technologies, especially when these devices fail (Robinson & Arnould, 2020). As the incapable/seeking category positions tech-products as solutions to wellbeing challenges, emergent technological vulnerabilities are important to study as they may complicate some older consumers' already tricky circumstances.

Capable/Seeking

This category features older consumers who seek out technologies to empower senses of identity. Studies of middle and upper-class older consumers pursuing leisure and reflecting well on their lives in retirement are abundant in this category (e.g., Fregolente et al., 2019; Reisenwitz & Iyer, 2007). Consistent with this positive stereotype are investigations of the adoption of smartphones, tablets, and smartwatches which are theorised to have benefits for identity expression (Morozova & Gurova, 2021; Pera et al., 2020). Several of these studies find that social media uses on these devices enable positive ageing where older consumers pursue happiness through sharing their life experiences and wisdom with loved ones (Fowler et al., 2015). Moreover, social media offers older consumers opportunities to connect with interest groups and can serve as an outlet for creative expression, such as photo-sharing groups that revolve around activities like cooking, gardening, and pets (Pera et al., 2020).

Sociocultural perspectives that focus on identity construction dominate this category and often draw from consumer culture scholarship in marketing (see Arnould & Thompson, 2005; Franco, 2022). These theories situate older consumers' identities as being extended through their tech-uses that deepen social connections (Epp & Price, 2008; Marchant & O'Donohoe 2014) and pursuals of leisure activities germane to retirement (Franco, 2020; Schau et al., 2009). Although this category only features five studies, their theoretical influences are already quite clear in how they commonly approach older consumers and technology.

Two early practitioner recommendations in this category are worth spotlighting. First, Pera et al. (2020) suggest that marketers focus on enhancing older consumers' confidence and creativity through their tech-product uses. These authors imply that marketing campaigns benefit from positioning

tech-products around their creative self-expression potentials for older consumers (see also Franco, 2020; Kozinets, 2008). Second, Morozova and Gurova (2021) suggest that successful adoptions of health wearables are encouraged by not positioning these devices as compensating 'losses' attributable to ageing. Rather, these devices enable identity-laden meanings of keeping fit akin to the health goals of consumers of all ages. This means practitioners should avoid accentuating negative old age associations when positioning health-related technologies (Moschis, 2003).

Future research can cast greater attention to how older consumers' tech-uses can not only extend their current identities but also reinvigorate lifelong identities that have been increasingly drowned out by old-age identity transitions. For instance, Franco (2020) finds that affluent older consumers adopt tech-products during retirement to update how they practice lifelong passions. Identities such as 'writer' and 'artist' can be reinvigorated in the ways that laptops, software, scanners, and digital cameras are introduced into creative processes by older consumers. In this manner, learning new technologies need not reify understandings that one is getting old, they may instead support evolving multi-faceted consumer identities.

A related research direction is to study if tech-seeking for empowerment is exclusive to affluent older consumers. This direction is important as many older consumers do not have stable finances (see Bavafa et al., 2019), which likely limits their access to technology. How then, can older consumers with limited resources empower themselves through adopting and using new technologies? Additionally, what types of support can marketers and other social actors provide to assist their efforts? Answers might be found in consumer research which illustrates how consumers can overcome resource and skill constraints through individual and community forms of resilience (Adkins & Ozanne, 2005; Ozanne & Ozanne, 2016). These studies thus may offer helpful lenses for understanding how older consumers can empower themselves by adopting new technologies despite the resource constraints they may face.

Capable/Resisting

This final category captures older consumers who do not see various technologies as necessary to how they want to live their lives. These articles do not assume technologies always benefit consumers. In so doing, they acknowledge that older consumers come from varied life experiences and that resistances to technology exist across all consumer age groups (e.g., Chaouali & Souiden, 2019; Mattila et al., 2003). Moreover, they stress that many older consumers have non-technophobic reasons to resist adoption. Although there are only nine Capable/Resisting studies, similar to the Incapable/Resisting category, technology resistance and adoption barrier theories dominate this category.

However, reasons unrelated to age-related incapabilities are given by this category to theorise why some older consumers resist technologies. In particular, studies emphasise that new does not always mean better and this may be a reason for outright resistance. Laukkanen et al. (2007), for example, explain that integrating new technologies into existing tasks like banking often means introducing inconveniences such as dealing with dying phone batteries and burdensome security measures. Similarly, Rosen and Weil (1995, p.79) point out that even if a technology is more convenient it may not enable tasks to be completed to a higher quality. For instance, does a computerised coffeemaker make tastier coffee? It is plausible that quality and hassle expectations do not make adoption an entertained thought for many older consumers. Last, Areni (2021) finds that some older consumers resist current technologies, like social media and smartphones, due to disdain for their societal effects. This cross-section of reasons attests to older consumers resisting adoption for reasons not attributable to ageing effects.

Future research thus can study a fuller range of contexts in which older consumers resist technologies they view as unnecessary. One context may be the resurgence of analogue objects like notebooks and vinyl records (Fernandez & Beverland, 2019; Humayun & Belk, 2020). Another may be 'digital detoxes' in which consumers wrestle over the necessity of their tech-uses by formulating and enacting temporary or permanent disconnections from their technologies (Nguyen et al., 2022; Radtke et al., 2021). Future work can study the prevalence of older consumers in these contexts, who like younger generations may seek to escape the current ubiquity of digital devices (Husemann & Eckhardt, 2018). Studying contexts like these may help future research suppress tendencies to view older consumer resistance as technophobia stemming from age-related incapabilities. Rather, older consumers may simply have similar reasons to resist adoption just like their younger counterparts.

Discussion

The influence of age stereotypes on marketing theory development

In response to this article's research question, age stereotypes indeed have steered much of the development of marketing theories on older consumers and technology. These stereotypes have largely operated as helpful heuristics that have motivated many meaningful studies that seek to enable older consumers to experience wellbeing benefits from various technologies. However, as a scholarly community, we must always be mindful of these stereotypes' potential influences on how we construct theories in our research domains (Judd & Park, 1993; Schaie, 1988).

Age stereotypes influence marketing theory development either through implicitly informing enabling lens choices (Dolbec et al., 2021; Vargo & Lusch, 2017) and/or how a lens is applied and adapted to an older consumers and technology context. These influences are clear in the typology's established categories. For instance, if a consumer is advanced in age and is assumed to face challenging health circumstances, resistance lenses appear as obvious theories to use (Incapable/Resisting category). Similarly, assumptions that younger-old consumers have unfavourable attitudes towards new technologies and low tech-skills lead to decision-making lenses being adapted to stress that adoption requires education and persuasion related to usefulness and ease-of-use (Incapable/Discerning). By contrast, if the assumption of incapabilities is then removed, decision-making lenses instead consider how old one feels and differing generational experiences when explaining adoption (Capable/Discerning).

The underdeveloped categories showcase alternative old age assumptions that can take theory development in novel directions by embracing older consumer heterogeneity. The Incapable/Seeking category loosens the assumption of older consumers being unfavourable towards adoption, despite the health and social isolation challenges they may face. In this sense, this nascent category hints at how technology enthusiasm can manifest through an older consumer's pursuits to improve their own wellbeing. At present there is no consistent theoretical perspective to emerge in this category, leaving much room for future research.

The Capable/Resisting category, however, lands on the complete opposite end of the typology to the Incapable/Seeking category. Instead, Capable/Resisting studies feature older consumers who resist pro-technology biases through making it clear that certain technologies just do not fit how they want to live their lives. Although these studies utilise resistance and adoption barrier frameworks, older consumers are theorised to resist for similar reasons to younger consumers. These resistances are not only in terms of personal grievances with the perceived nature of these technologies but also their adverse societal effects.

Meanwhile, the Capable/Seeking category leans into positive stereotypes that older consumers have the wealth and time in retirement to be leisure-seekers whose pursuits are empowered by their tech-uses (Franco, 2020; Schau et al., 2009). These studies tend to utilise sociocultural approaches (e.g., consumer culture theories) to frame adoption in terms of older consumers' identity construction projects, which is unique in the review. Overall, the underdeveloped categories foreground older consumer walks-of-life that are not well represented in current research. Most notably, these categories stress needs for marketing theories to better account for older consumers who diverge from age stereotypes, like skilled technology-seekers and non-adopters who have non-technophobic reasons to resist adoption.

Inconsistencies in age-range construction and terminology

Given the variety of age ranges used to signify older consumers (see Table 1), this review also observes these inconsistencies add unnecessary complexity for researchers working in this domain. In particular, the prefix 'older' loses all meaning when it becomes a catchall for anyone aged as low as 40+. What results is a rough average characterisation of older consumers in which articles mostly study those around retirement age (e.g., 60+) who may or may not adopt technologies as varied as smartphones, social media, self-service kiosks, to fall alarms.

With such a broad umbrella cast, these studies risk painting up to three generations with the same brush. This is especially concerning when noting that a selection of studies already point out the heterogeneity of those aged 60+ (e.g., Abdel-Ghany & Sharpe, 1997; Nikou, 2015), let alone the various walks-of-life of younger age ranges additionally bundled into the same 'older' groupings. At best, broad and imprecise age ranges stifle precision in theorising technology contexts in individual articles (see also Schneider-Kamp & Askegaard, 2022). At worst, they set the scene for confusion and contradictory results at a disciplinary level.

Future research will accordingly benefit from more attention to demarcating age ranges and associated terminology. This ideally would involve the avoidance of using open-ended age ranges when defining an 'older' group, particularly as more groups of younger people are included in a study (e.g., 40+ years). In lockstep, reflexive usage of age terminology would moreover be helpful. For instance, studies examining more advanced ages (e.g., 65+) that invoke the term 'elderly' or 'senior' more clearly signal what walks-of-life they have in mind when it comes to empirical findings and theory sections, stereotypes notwithstanding (e.g., Bianchi, 2021; Eastman & Iyer, 2005; Gilly & Zeithaml, 1985).

To pursue precision in theory development and avoid confusion at a disciplinary level, it is advantageous to lessen reliance on chronological age as the driving variable in how we characterise consumers. This review highlights a few options. One option is to use cognitive age as some reviewed articles suggest (e.g., Arenas-Gaitán et al., 2020; Eastman & Iyer, 2005). However, how old one feels may capture internalised social constructions of old age identity and what age-related terms signify in a culture (Barnhart & Peñaloza, 2013; Nelson, 2005). Another option is to focus on lifestages such as retirement (e.g., Schau et al., 2009), albeit noting these circumstances are also socially constructed (Philipson, 1991). Perhaps another option with its own advantages is to take a temporal-generational perspective as the next section explains.

Temporal-generational perspectives

This review observes that in technology contexts overarching theories tend to be time-resistant (e.g., resistance models, TAM), but empirical assumptions shift. These assumptions not only reflect age stereotypes but also historical changes in technological, social, cultural, and economic circumstances across the 30 + year review period. As an example, earlier studies tend to find that older consumers are hesitant about using the internet (e.g., Lunsford & Burnett, 1992) than contemporary studies (e.g., Fregolente et al., 2019). Another example are studies that barely met the review's 2022 cut-off that foreshadow COVID-19's emerging impacts on marketing scholarship (e.g., Erjavec & Manfreda, 2022; Hansson et al., 2022). These studies show how older consumers found themselves in tech-adoption processes when endeavouring to adapt to pandemic circumstances (Wilson-Nash et al., 2023). Such differences represent historical developments in which technologies progress through the diffusion curve and undergo changing social and cultural acceptances while amassing differing generational familiarities (Belk et al. 2021; Kulviwat et al., 2009; Niemelä-Nyrhinen, 2007; Rogers, 2003). These familiarities extend to an individual's pre-retirement and family experiences, and how long they have been without intensive technology socialisation opportunities since leaving the workforce (Franco, 2020). In short, consumer technologies are moving targets. This means today's technologies assumedly championed by younger generations are tomorrow's laggard technologies which are comfortable and familiar to older consumers.

Noticeable in the review is a paucity of studies that take macro-societal perspectives. Akin to meta-critiques of marketing scholarship, studying individuals' decision-making and immediate circumstances (e.g., family and caregiver contexts) misses societal and historical influences that are the 'context' of these contexts (Askegaard & Linnet, 2011). Nunan and Di Domenico (2019) come to a similar consideration through their outline of a broader set of marketing and public policy implications when considering older consumers and digital technologies. However, macro perspectives can go further. For instance, studies could critique the societal forces that construct notions of generations (Mannheim, 1970) and their assumed orientations to technology. These critiques may explain the temporal-generational patterns identified by this review. Areni's (2021) study that reveals repeated generational cycles of nostalgia for prior technologies and disdain for contemporary technologies is an exemplar. Similarly-spirited studies are positioned well to broaden marketing research possibilities on older consumers and technology.

Methodological implications

This article lastly offers methodological implications for researchers who wish to craft critical reviews. This article offers critical reflexivity as a perspective that can inform such reviews when applied to think at a disciplinary level (Bettany & Woodruffe-Burton, 2009; Gordon & Gurrieri, 2014). Reviews can thus aim to offer researchers what this article calls 'productive tensions'. This term refers to the unease of researcher reflection on their roles in the social construction of knowledge (and its societal effects) being transformed into productive ways of thinking about extant literature and future research possibilities. As an illustration, this review motivates its necessity and expands possibilities for marketing research on older consumers and technology by utilising interdisciplinary insights on the social construction of knowledge and age stereotypes (e.g., Barnhart & Peñaloza, 2013; Foucault, 1994; Nelson, 2005). It is the hope of this article that researchers who also find themselves critiquing dominant assumptions in a research domain can adapt features of this review in service of crafting their own.

Conclusion

This article critically and systematically reviews marketing scholarship on older consumers and technology. It joins like-minded studies that seek to develop insights that help incorporate technologies into older consumers' lives in ways that improve their wellbeing (Lee & Coughlin, 2015; Mostaghel, 2016; Nikou, 2015; Nunan & Di Domenico, 2019). However, this article departs from prior reviews through its critical reflexivity approach applied at a disciplinary level (cf. Bettany & Woodruffe-Burton, 2009; Gordon & Gurrieri, 2014); and its aim to interrogate how age stereotypes influence the development of older consumer and technology theories in marketing.

This review offers four contributions to marketing scholarship. First, it showcases how age stereotypes can influence enabling lens choices and how these are adapted to theorise older consumer technology contexts by way of its 2 × 3 typology of reviewed articles. Second, the review identifies inconsistencies in how older consumer age ranges and terms are deployed by scholarship, which invites theoretical imprecision and unnecessary complexity for researchers working in the reviewed domain. This critique is accompanied by suggestions on how to improve clarity in future studies. Third, this review outlines multiple needs for future research. These include: research directions for each of the typology's six research categories; deeper exploration of the three underdeveloped categories overall; and macro-level

studies that can contextualise current research that only studies individuals' decision-making and immediate sociocultural contexts. Last, the review offers a novel methodological approach for researchers who wish to craft critically reflexive reviews that interrogate a literature's taken-for-granted assumptions.

In closing, although prior reviews have acknowledged age stereotypes and explain that researchers should go beyond older consumer tech-adoptions for health and social isolation issues (e.g., Lee & Coughlin, 2015; Nunan & Di Domenico, 2019), these potentials in marketing have yet to be fully developed. This article develops these potentials by synthesising insights scattered across tech-adoption and consumption marketing literature through the lens of age stereotypes. It is thus the hope of this review that researchers and practitioners harness the productive tensions provoked by age stereotypes, both as helpful heuristics and lenses for critical reflexivity. In this way, these tensions can enable researchers and marketers to develop a fuller range of theories and practical actions that help technologies find meaningful roles in older consumers' lives. In particular, roles that both improve older consumers' wellbeing and are sensitive to their unique circumstances and preferences as individuals.

Declaration

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References

Abdel-Ghany, M., & Sharpe, D. L. (1997). Consumption Patterns Among the Young-Old and Old-Old. *Journal of Consumer Affairs, 31*(1), 90–112.

Adkins, N. R., & Ozanne, J. L. (2005). The Low Literate Consumer. *Journal of Consumer Research, 32*(1), 93–105.

Arenas-Gaitán, J., Ramos, A. F. V., & Peral-Peral, B. (2020). A Posteriori Segmentation of Elderly Internet Users: Apply PLS-POS. *Marketing Intelligence & Planning, 38*(3), 340–353.

Areni, C. (2021). Techno-Social Disruption, Autobiographical Obsolescence and Nostalgia: Why Parental Concerns about Smart Phones and Social Media Have Historical Precedents as Old as the Printed Word. *Journal of Macromarketing, 41*(2), 267–283.

Arnould, E. J., & Thompson, C. J. (2005). Consumer Culture Theory (CCT): Twenty Years of Research. *Journal of Consumer Research, 31*(4), 868–882.

Askegaard, S., & Linnet, J. T. (2011). Towards an Epistemology of Consumer Culture Theory: Phenomenology and the Context of Context. *Marketing Theory, 11*(4), 381–404.

Bae, H., Jo, S. H., & Lee, E. (2021). Why Do Older Consumers Avoid Innovative Products and Services? *Journal of Services Marketing, 35*(1), 41–53.

Ball, R. A., & Curry, G. D. (1995). The Logic of Definition in Criminology: Purposes and Methods for Defining "Gangs." *Criminology, 33*(2), 225–245.

Barnhart, M., & Peñaloza, L. (2013). Who Are You Calling Old? Negotiating Old Age Identity in the Elderly Consumption Ensemble. *Journal of Consumer Research, 39*(6), 1133–1153.

Bavafa, H., Liu, J., & Mukherjee, A. (2019). Building Financial and Health Literacy at Older Ages: The Role of Online Information. *Journal of Consumer Affairs, 53*(3), 877–916.

Beldona, S., Nusair, K., & Demicco, F. (2009). Online Travel Purchase Behavior of Generational Cohorts: A Longitudinal Study. *Journal of Hospitality Marketing & Management, 18*(4), 406–420.

Belk, R.W., Weijo, H., & Kozinets, R.V. (2021). Enchantment and perpetual desire: theorizing disenchanted enchantment and technology adoption. *Marketing Theory*, *21*(1), 25–51.

Ben-Ami, M., Hornik, J., Eden, D., & Kaplan, O. (2014). Boosting Consumers' Self-Efficacy by Repositioning the Self. *European Journal of Marketing, 48*(11–12), 1914–1938.

Beneke, J., Frey, N., Chapman, R., Mashaba, N., & Howie, T. (2011). The Grey Awakening: A South African Perspective. *Journal of Consumer Marketing, 28*(2), 114–124.

Bennett, T., & Gaines, J. (2010). Believing What You Hear: The Impact of Aging Stereotypes Upon the Old. *Educational Gerontology, 36*(5), 435–445.

Berezan, O., Krishen, A. S., Agarwal, S., & Kachroo, P. (2018). The Pursuit of Virtual Happiness: Exploring the Social Media Experience Across Generations. *Journal of Business Research, 89*, 455–461.

Berraies, S., Yahia, B., & Hannachi, M. (2017). Identifying the Effects of Perceived Values of Mobile Banking Applications on Customers: Comparative Study Between Baby Boomers, Generation X and Generation Y. *International Journal of Bank Marketing, 35*(6), 1018–1038.

Bettany, S., & Woodruffe-Burton, H. (2009). Working the Limits of Method: The Possibilities of Critical Reflexive Practice in Marketing and Consumer Research. *Journal of Marketing Management, 25*(7–8), 661–679.

Bianchi, C. (2021). Exploring How Internet Services Can Enhance Elderly Well-Being. *Journal of Services Marketing, 35*(5), 585–603.

Bowker, G. C., & Star, S. L. (2000). *Sorting Things Out: Classification and Its Consequences*. MIT Press.

Branco, K., & Williamson, J. (1982). Stereotyping and the Life Cycle: Views of Aging and the Aged. In A. Miller (Ed.), *In the Eye of the Beholder: Contemporary Issues in Stereotyping* (pp. 364–410). Praeger.

Bruner, G. C., II., & Kumar, A. (2007). Gadget Lovers. *Journal of the Academy of Marketing Science, 35*(3), 329–339.

Bui, H. T. (2021). Exploring and Explaining Older Consumers' Behaviour in the Boom of Social Media. *International Journal of Consumer Studies, 46*(2), 601–620.

Čaić, M., Mahr, D., & Oderkerken-Schröder, G. (2019). Value of Social Robots in Services: Social Cognition Perspective. *Journal of Services Marketing, 33*(4), 463–478.

Čaić, M., Oderkerken-Schröder, G., & Mahr, D. (2018). Service Robots: Value Co-Creation and Co-Destruction in Elderly Care Networks. *Journal of Service Management, 29*(2), 178–205.

Castillo-Villar, F. R., & Castillo-Villar, R. G. (2022). Mobile Banking Affordances and Constraints by The Elderly. *Marketing Intelligence & Planning, 41*(1), 124–137.

Cham, T., Cheah, J., Cheng, B., & Lim, X. (2022). I Am Too Old For This! Barriers Contributing to the Non-Adoption of Mobile Payment. *International Journal of Bank Marketing, 40*(5), 1017–1050.

Chaouali, W., & Souiden, N. (2019). The Role of Cognitive Age in Explaining Mobile Banking Resistance Among Elderly People. *Journal of Retailing and Consumer Services, 50*, 342–350.

Choudrie, J., Junior, C., McKenna, B., & Richter, S. (2018). Understanding and conceptualising the adoption, use and diffusion of mobile banking in older adults: a research agenda and conceptual framework. *Journal of Business Research, 88*, 449–465.

Consumer Technology Association. (2021). *Annual U.S. Consumer Technology Ownership and Market Potential Study*.

Chattaraman, V., Kwon, W., Gilbert, J. E., & Li, Y. (2014). Virtual Shopping Agents: Persona Effects for Older Users. *Journal of Research in Interactive Marketing, 8*(2), 144–162.

Chattaraman, V., Kwon, W., Gilbert, J. E., & Shim, S. I. (2011). Virtual Agents in E-Commerce: Representational Characteristics for Seniors. *Journal of Research in Interactive Marketing, 5*(4), 276–297.

Chéron, E., & Kohlbacher, F. (2018). Older Consumers' Adoption of Innovation in Japan: The Mediating Role of Cognitive Age. *Journal of International Consumer Marketing, 30*(4), 244–259.

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly, 13*(3), 319–340.

Dean, D., Kellie, J., & Mould, P. (2014). From Pushchairs to Wheelchairs: Understanding Tensions in Family Decision Making Through the Experiences of Adult Children Caring for Ageing Parents. *Journal of Marketing Management, 30*(15–16), 1703–1721.

Del Bucchia, C., Miltgen, C. L., Russell, C. A., & Burlat, C. (2021). Empowerment as Latent Vulnerability in Techno-Mediated Consumption Journeys. *Journal of Business Research, 124*, 629–651.

Derbaix, C., & Derbaix, M. (2019). Intergenerational Transmissions and Sharing of Musical Taste Practices. *Journal of Marketing Management, 35*(17–18), 1600–1623.

Dolbec, P. Y., Fischer, E., & Canniford, R. (2021). Something Old, Something New: Enabled Theory Building in Qualitative Marketing Research. *Marketing Theory, 21*(4), 443–461.

Dorie, A., & Loranger, D. (2020). The Multi-Generation: Generational Differences in Channel Activity. *International Journal of Retail & Distribution Management, 48*(4), 395–416.

East, R., Uncles, M. D., & Lomax, W. (2014). Hear Nothing, Do Nothing: The Role of Word of Mouth in the Decision-Making of Older Consumers. *Journal of Marketing Management, 30*(7–8), 786–801.

Eastman, J. K., & Iyer, R. (2004). The Elderly's Uses and Attitudes Towards the Internet. *Journal of Consumer Marketing, 21*(3), 208–220.

Eastman, J. K., & Iyer, R. (2005). The Impact of Cognitive Age on Internet Use of the Elderly: An Introduction to the Public Policy Implications. *International Journal of Consumer Studies, 29*(2), 125–136.

Echchakoui, S. (2020). Why and How to Merge Scopus and Web of Science During Bibliometric Analysis: The Case of Sales Force Literature from 1912 to 2019. *Journal of Marketing Analytics, 8*, 165–184.

Epp, A. M., & Price, L. L. (2008). Family Identity: A Framework of Identity Interplay in Consumption Practices. *Journal of Consumer Research, 35*(1), 50–70.

Erjavec, J., & Manfreda, A. (2022). Online Shopping Adoption During COVID-19 and Social Isolation: Extending the UTAUT Model with Herd Behavior. *Journal of Retailing and Consumer Services, 65*, 102867.

Fernandez, K. V., & Beverland, M. B. (2019). As the Record Spins: Materialising Connections. *European Journal of Marketing, 53*(6), 1152–1175.

Foucault, M. (1994). *The Order of Things*. Vintage.

Fowler, J. G., Gentry, J. W., & Reisenwitz, T. H. (2015). Analyzing Chinese Older People's Quality of Life Through Their Use of the Internet. *International Journal of Consumer Studies, 39*(4), 324–334.

Franco, P. (2020). Empowering the Independence of Older People with Everyday Technologies. In S. Churchill, L. Farrell, & S. Appau (Eds.), *Measuring, Understanding and Improving Wellbeing Among Older People* (pp. 15–39). Palgrave MacMillan.

Franco, P. (2022). The Consumer Culture Theory (CCT) Research Tradition and Digital Marketing. In A. Hanlon & T. Tuten (Eds.), *The SAGE Handbook of Digital Marketing* (pp. 118–135). Sage Publications Ltd.

Fregolente, A., Junqueira, I., & Medeiros, P. Y. (2019). Active and Wealthy Brazilian Older Adults: Identity and Consumption Motivations. *Journal of Consumer Marketing, 36*(5), 633–642.

Ge, G.L., & Schleimer, S.C. (2022). Robotic Technologies and Well-Being for Older Adults Living at Home. *Journal of Services Marketing*. Advanced Online Article. https://doi.org/10.1108/JSM-03-2022-0076

Gilly, M. C., Celsi, M. W., & Schau, H. J. (2012). It Don't Come Easy: Overcoming Obstacles to Technology Use Within a Resistant Consumer Group. *Journal of Consumer Affairs, 46*(1), 62–89.

Gilly, M. C., & Zeithaml, V. A. (1985). The Elderly Consumer and Adoption of Technologies. *Journal of Consumer Research, 12*(3), 353–357.

Gordon, R., & Gurrieri, L. (2014). Towards a Reflexive Turn: Social Marketing Assemblages. *Journal of Social Marketing, 4*(3), 261–278.

Hansson, L., Holmberg, U., & Post, A. (2022). Reorganising Grocery Shopping Practices - The Case of Elderly Consumers. *The International Review of Retail, Distribution and Consumer Research, 32*(4), 351–369.

Harris, M., Cox, K. C., Musgrove, C. F., & Ernstberger, K. W. (2016). Consumer Preferences for Banking Technologies by Age Groups. *International Journal of Bank Marketing, 34*(4), 587–602.

Hartmann, T. (2016). Parasocial Interaction, Parasocial Relationships, and Well-Being. In L. Reinecke & M. Oliver (Eds.), *The Routledge Handbook of Media Use and Well-Being* (pp. 131–144). Routledge.

Hilton, J. L., & von Hippel, W. (1996). Stereotypes. *Annual Review of Psychology, 47*, 237–271.

Hoffman, D. L., & Novak, T. P. (2018). Consumer and Object Experience in the Internet of Things: An Assemblage Theory Approach. *Journal of Consumer Research, 44*(6), 1178–1204.

Holliday, N., Ward, G., & Fielden, S. (2015). Understanding Younger Older Consumers' Needs in a Changing Healthcare Market - Supporting and Developing the Consumer Market for Electronic Assisted Living Technologies. *International Journal of Consumer Studies, 39*(4), 305–315.

Hou, J., & Elliot, K. (2021). Mobile Shopping Intensity: Consumer Demographics and Motivations. *Journal of Retailing and Consumer Services, 63*, 102741.

Hough, M., & Kobylanski, A. (2009). Increasing Elder Consumer Interactions with Information Technology. *Journal of Consumer Marketing, 26*(1), 39–48.

Huff, A. D., & Barnhart, M. (2022). UNRAVEL-ing Gnarly Knots: A Path for Researching Market-Entangled Wicked Social Problems. *Journal of Business Research, 144*, 717–727.

Huff, A. D., & Cotte, J. (2016). The Evolving Family Assemblage: How Senior Families "Do" Family. *European Journal of Marketing, 50*(5/6), 892–915.

Hulland, J. (2020). Conceptual Review Papers: Revisiting Existing Research to Develop and Refine Theory. *AMS Review, 10*, 27–35.

Humayun, M., & Belk, R. W. (2020). The Analogue Diaries of Postdigital Consumption. *Journal of Marketing Management, 36*(7–8), 633–659.

Hummert, M. L. (2010). Age Stereotypes and Aging. In K. W. Schaie & S. L. Willis (Eds.), *Handbook of the Psychology of Aging* (pp. 249–262). Academic Press.

Husemann, K. C., & Eckhardt, G. M. (2018). Consumer Deceleration. *Journal of Consumer Research, 45*(6), 1142–1163.

Hwang, H., & Nam, S. (2017). The Digital Divide Experienced by Older Consumers in Smart Environments. *International Journal of Consumer Studies, 41*(5), 501–508.

Iyer, R., & Eastman, J. K. (2006). The Elderly and Their Attitudes Toward the Internet: The Impact on Internet Use, Purchase, and Comparison Shopping. *Journal of Marketing Theory and Practice, 14*(1), 57–67.

Jaakkola, E. (2020). Designing Conceptual Articles: Four Approaches. *AMS Review, 10*, 18–26.

Judd, C. M., & Park, B. (1993). Definition and Assessment of Accuracy in Social Stereotypes. *Psychological Review, 100*(1), 109–128.

Khaksar, S. M. S., Shahmehr, F. S., Khosla, R., & Chu, M. T. (2017). Dynamic Capabilities in Aged Care Service Innovation: The Role of Social Assistive Technologies and Consumer-Directed Care Strategy. *Journal of Services Marketing, 31*(7), 745–759.

Kim, H., Xiang, Z., & Fesenmaier, D. R. (2015). Use of The Internet for Trip Planning: A Generational Analysis. *Journal of Travel & Tourism Marketing, 32*(3), 276–289.

Kline, S. J. (1985). What is Technology? *Bulletin of Science, Technology & Society, 1*, 215–218.

Kozinets, R. V. (2008). Technology/Ideology: How Ideological Fields Influence Consumers' Technology Narratives. *Journal of Consumer Research, 34*(6), 865–881.

Krishen, A. S., Berezan, O., Agarwal, S., & Kachroo, P. (2016). The Generation of Virtual Needs: Recipes for Satisfaction in Social Media Networking. *Journal of Business Research, 69*, 5248–5254.

Kulviwat, S., Bruner, G. C., II., & Al-Shuridah, O. (2009). The Role of Social Influence on Adoption of High Tech Innovations: The Moderating Effect of Public/Private Consumption. *Journal of Business Research, 62*(7), 706–712.

Kvalsvik, F. (2022). Understanding the Role of Situational Factors on Online Grocery Shopping Among Older Adults. *Journal of Retailing and Consumer Services, 68*, 103009.

Kwon, W., & Noh, M. (2010). The Influence of Prior Experience and Age on Mature Consumers' Perceptions and Intentions of Internet Apparel Shopping. *Journal of Fashion Marketing and Management, 14*(3), 335–349.

LaBarge, M. C., & Pyle, M. (2020). Staying in "The Works of Living": How Older Adults Employ Market Resources to Age Successfully. *Journal of Consumer Affairs, 54*(2), 742–774.

Lambert-Pandrad, R., & Laurent, G. (2010). Why Do Older Consumers Buy Older Brands? The Role of Attachment and Declining Innovativeness. *Journal of Marketing, 74*(5), 104–121.

Latour, B., & Woolgar, S. (1979). *Laboratory Life: The Construction of Scientific Facts*. Sage Publications Ltd.

Laukkanen, T. (2016). Consumer Adoption Versus Rejection Decisions in Seemingly Similar Service Innovations: The Case of the Internet and Mobile Banking. *Journal of Business Research, 69*(7), 2432–2439.

Laukkanen, T., Sinkkonen, S., Kivijärvi, M., & Laukkanen, P. (2007). Innovation Resistance Among Mature Consumers. *Journal of Consumer Marketing, 24*(7), 419–427.

Law, M., & Ng, M. (2016). Age and Gender Differences: Understanding Mature Online Users with the Online Purchase Intention Model. *Journal of Global Scholars of Marketing Science, 26*(3), 248–269.

Lee, C., & Coughlin, J. F. (2015). PERSPECTIVE: Older Adults' Adoption of Technology: An Integrated Approach to Identifying Determinants and Barriers. *Journal of Product Innovation Management, 32*(5), 747–759.

Lee, H., Cho, H., Xu, W., & Fairhurst, A. (2010). The Influence of Consumer Traits and Demographics on Intention to Use Retail Self-Service Checkouts. *Marketing Intelligence & Planning, 28*(1), 46–58.

Lee, H., & Lyu, J. (2019). Exploring Factors Which Motivate Older Consumers' Self-Service Technologies (SSTs) Adoption. *The International Review of Retail, Distribution and Consumer Research, 29*(2), 218–239.

Leppel, K., & McCloskey, D. W. (2011). A Cross-Generational Examination of Electronic Commerce Adoption. *Journal of Consumer Marketing, 28*(4), 261–268.

Levy, S. R., & Macdonald, J. L. (2016). Progress on Understanding Ageism. *Journal of Social Issues, 72*(1), 5–25.

Lim, C. M., & Kim, Y. (2011). Older Consumers' TV Home Shopping: Loneliness, Parasocial Interaction, and Perceived Convenience. *Psychology & Marketing, 28*(8), 763–780.

Lunsford, D. A., & Burnett, M. S. (1992). Marketing Product Innovations to the Elderly: Understanding the Barriers to Adoption. *Journal of Consumer Marketing, 9*(4), 53–62.

Mani, Z., & Chouk, I. (2017). Drivers of Consumers' Resistance to Smart Products. *Journal of Marketing Management, 33*(1–2), 76–97.

Mannheim, K. (1970). The Problem of Generations. *Psychoanalytic Review, 57*(3), 378–404.

Marchant, C., & O'Donohoe, S. (2014). Edging out of the Nest: Emerging Adults' Use of Smartphones in Maintaining and Transforming Family Relationships. *Journal of Marketing Management, 30*(15–16), 1554–1576.

Mattila, M., Karjaluoto, H., & Pento, T. (2003). Internet Banking Adoption Among Mature Customers: Early Majority or Laggards? *Journal of Services Marketing, 17*(5), 514–528.

Mays, N., Pope, C., & Popay, J. (2005). Systematically Reviewing Qualitative and Quantitative Evidence to Inform Management and Policy-Making in the Health Field. *Journal of Health Services Research & Policy, 10*(1), 6–20.

Meuter, M. L., Ostrom, A. L., Bitner, M. J., & Roundtree, T. (2003). The Influence of Technology Anxiety on Consumer Use and Experiences with Self-Service Technologies. *Journal of Business Research, 56*(11), 899–906.

Mick, D. G., & Fournier, S. (1998). Paradoxes of Technology: Consumer Cognizance, Emotions, and Coping Strategies. *Journal of Consumer Research, 25*(2), 123–143.

Minichello, V., Browne, J., & Kendig, H. (2000). Perceptions and Consequences of Ageism: Views of Older People. *Ageing & Society, 20*, 352–378.

Morozova, D., & Gurova, O. (2021). Being Like Others vs. Being Different: Wearable Technology and Daily Practices of 50+ Consumers in Russia and Finland. *International Journal of Consumer Studies, 45*(6), 1335–1356.

Moschis, G. P. (2003). Marketing to Older Adults: An Updated Overview of Present Knowledge and Practice. *Journal of Consumer Marketing, 20*(6), 516–525.

Mostaghel, R. (2016). Innovation and Technology for the Elderly: Systematic Literature Review. *Journal of Business Research, 69*(11), 4896–4900.

Naqvi, M., Li, S., Jiang, Y., & Naqvi, M. H. A. (2020). The Rise of Social Networking Sites: An Empirical Investigation Applying Demographic Differences and The Technology Acceptance Model. *Asia Pacific Journal of Marketing and Logistics, 32*(1), 232–252.

Nelson, T. D. (2005). Ageism: Prejudice Against Our Feared Future Self. *Journal of Social Issues, 61*(2), 207–221.

Nevskaya, Y., & Albuquerque, P. (2019). How Should Firms Manage Excessive Product Use? A Continuous-Time Demand Model to Test Reward Schedules, Notifications and Time Limits. *Journal of Marketing Research, 56*(3), 379–400.

Ng, S. H. (2002). Will Families Support Their Elders? Answers From Across Cultures. In T. Nelson (Ed.), *Ageism: Stereotyping and Prejudice Against Older Persons* (pp. 295–309). MIT Press.

Nguyen, M. H., Büchi, M., & Geber, S. (2022). Everyday Disconnection Experiences: Exploring People's Understanding of Digital Well-Being and Management of Digital Media Use. *New Media & Society, Advanced Online Article.* https://doi.org/10.1177/14614448221105428

Niemelä-Nyrhinen, J. (2007). Baby Boom Consumers and Technology: Shooting Down Stereotypes. *Journal of Consumer Marketing, 24*(5), 305–312.

Nikou, S. (2015). Mobile Technology and Forgotten Consumers: The Young-Elderly. *International Journal of Consumer Studies, 39*(4), 294–304.

North, M., & Fiske, S. (2013). Act Your (Old) Age: Prescriptive, Ageist Biases Over Succession, Consumption, and Identity. *Personality and Social Psychology Bulletin, 39*, 720–734.

Novak, T. P., & Hoffman, D. L. (2019). Relationship Journeys in the Internet of Things: A New Framework for Understanding Interactions Between Consumers and Smart Objects. *Journal of the Academy of Marketing Science, 47*(2), 216–237.

Nunan, D., & Di Domenico, M. (2019). Older Consumers, Digital Marketing, and Public Policy: A Review and Research Agenda. *Journal of Public Policy & Marketing, 38*(4), 469–483.

Nysveen, H., Pedersen, P. E., & Skard, S. (2020). Ecosystem Adoption of Practices Over Time (EAPT): Toward an Alternative View of Contemporary Technology Adoption. *Journal of Business Research, 116*, 542–551.

Obal, M., & Kunz, W. (2013). Trust Development in E-Services: A Cohort Analysis of Millennials and Baby Boomers. *Journal of Service Management, 24*(1), 45–63.

Oderanti, F. O., & Li, F. (2018). Commercialization of eHealth Innovations in the Market of the UK Healthcare Sector: A Framework for A Sustainable Business Model. *Psychology & Marketing, 35*(2), 120–137.

Ozanne, L. K., & Ozanne, J. L. (2016). How Alternative Consumer Markets Can Build Community Resiliency. *European Journal of Marketing, 50*(3/4), 330–357.

Pantano, E., Viassone, M., Boardman, R., & Dennis, C. (2022). Inclusive or Exclusive? Investigating How Retail Technology Can Reduce Old Consumers' Barriers to Shopping. *Journal of Retailing and Consumer Services, 68*, 1031074.

Parida, V., Mostaghel, R., & Oghazi, P. (2016). Factors for Elderly Use of Social Media for Health-Related Activities. *Psychology & Marketing, 33*(12), 1134–1141.

Park, J., Kim, D., & Hyun, H. (2021). Understanding Self-Service Technology Adoption by "Older" Consumers. *Journal of Services Marketing, 35*(1), 78–97.

Paul, J., & Criado, A. R. (2020). The Art of Writing Literature Review: What Do We Know and What Do We Need to Know? *International Business Review, 29*(4), 101717.

Paul, J., Lim, W. M., O'Cass, A., Hao, A. W., & Bresciani, S. (2021). Scientific Procedures and Rationales for Systematic Literature Reviews (SPAR-4-SLR). *International Journal of Consumer Studies, 45*(4), O1–O16.

Pera, R., Quinton, S., & Baima, G. (2020). I Am Who I Am: Sharing Photos on Social Media by Older Consumers and Its Influence on Subjective Well-Being. *Psychology & Marketing, 37*(6), 782–795.

Perez, M. E., Quintanilla, C., Castaño, R., & Peñaloza, L. (2019). Inverse Socialization with Technology: Understanding Intergenerational Family Dynamics. *Journal of Consumer Marketing, 36*(6), 818–826.

Petticrew, M., & Roberts, H. (2008). *Systematic Reviews in the Social Sciences: A Practical Guide*. Blackwell Publishing.

Pettigrew, S., Mizerski, K., & Donovan, R. (2005). The Three 'Big Issues' for Older Supermarket Shoppers. *Journal of Consumer Marketing, 22*(6), 306–312.

Pettinico, G., & Milne, G. R. (2017). Living By the Numbers: Understanding the "Quantification Effect." *Journal of Consumer Marketing, 34*(4), 281–291.

Phillipson, C. (1991). The Social Construction of Old Age: Perspectives From Political Economy. *Reviews in Clinical Gerontology, 1*(4), 403–410.

Porter, C. E., & Donthu, N. (2006). Using the Technology Acceptance Model to Explain How Attitudes Determine Internet Usage: The Role of Perceived Access Barriers and Demographics. *Journal of Business Research, 59*, 999–1007.

Radtke, T., Apel, T., Schenkel, K., Keller, J., & von Lindern, E. (2021). Digital Detox: An Effective Solution in the Smartphone Era? A Systematic Literature Review. *Mobile Media & Communication, 10*(2), 190–215.

Rahman, O., & Yu, H. (2019). Key Antecedents to the Shopping Behaviours and Preferences of Aging Consumers: A Qualitative Study. *Journal of Fashion Marketing and Management, 23*(2), 193–208.

Rajaobelina, L., Brun, I., Line, R., & Cloutier-Bilodeau, C. (2021). Not All Elderly are the Same: Fostering Trust Through Mobile Banking Service Experience. *International Journal of Bank Marketing, 39*(1), 85–106.

Ram, S., & Sheth, J. N. (1989). Consumer Resistance to Innovations: The Marketing Problem and Its Solutions. *The Journal of Consumer Marketing, 6*(2), 5–14.

Reisenwitz, T., & Iyer, R. (2007). A Comparison of Younger and Older Baby Boomers: Investigating the Viability of Cohort Segmentation. *Journal of Consumer Marketing, 24*(4), 202–213.

Reisenwitz, T., Iyer, R., Kuhlmeier, D. B., & Eastman, J. K. (2007). The Elderly's Internet Usage: An Updated Look. *Journal of Consumer Marketing, 24*(7), 406–418.

Robinson, T. D., & Arnould, E. J. (2020). Portable Technology and Multi-Domain Energy Practices. *Marketing Theory, 20*(1), 3–22.

Rogers, E. M. (2003). *Diffusion of Innovations* (5th ed.). Free Press.

Rosen, L. D., & Weil, M. M. (1995). Adult and Teenage Use of Consumer, Business, and Entertainment Technology: Potholes on the Information Superhighway? *Journal of Consumer Affairs, 29*(1), 55–84.

Rosenbaum, M. S., Russell-Bennett, R., & Contreras-Ramírez, G. (2022). Editorial: Research Priorities in the New Service Marketplace. *Journal of Services Marketing, 36*(8), 1009–1014.

Rosenthal, B., Cardoso, F., & Abdalla, C. (2021). (Mis)Representations of Older Consumers in Advertising: Stigma and Inadequacy in Ageing Societies. *Journal of Marketing Management, 37*(5–6), 569–593.

Rozanova, J., Northcott, H., & McDaniel, S. (2006). Seniors and Portrayals of Intra-Generational and Inter-Generational Inequality in the Globe and Mail. *Canadian Journal on Aging, 25*(4), 373–386.

Salomon, J. J. (1984). What is Technology? The Issue of Its Origins and Definitions. *History and Technology, 1*(2), 113–156.

Sancho-Esper, F., Ostrovskaya, L., Rodriguez-Sanchez, C., &Campayo, Sanchez, F. (2022). Virtual Reality in Retirement Communities: Technology Acceptance and Tourist Destination Recommendation. *Journal of Vacation Marketing*. Advanced Online Article. https://doi.org/10.1177/13567667221080567

Santosa, A. D., Taufik, N., Prabowo, F. H., & Rahmawati, M. (2021). Continuance Intention of Baby Boomer and X Generation As New Users of Digital Payment During COVID-19 Pandemic Using UTAUT2. *Journal of Financial Services Marketing, 26*, 259–273.

Schaie, K. W. (1988). Ageism in Psychological Research. *American Psychologist, 43*(3), 179–183.

Schau, H. J., Gilly, M. C., & Wolfinbarger, M. (2009). Consumer Identity Renaissance: The Resurgence of Identity-Inspired Consumption in Retirement. *Journal of Consumer Research, 36*(2), 255–276.

Schiffman, L. G., & Sherman, E. (1991). Value Orientations of New-Age Elderly: The Coming of an Ageless Market. *Journal of Business Research, 22*(2), 187–194.

Schneider-Kamp, A., & Askegaard, S. (2022). Reassembling the Elderly Consumption Ensemble: Retaining Independence Through Smart Assisted Living Technologies. *Journal of Marketing Management, 38*(17–18), 2011–2034.

Schweitzer, F., Belk, R. W., Jordan, W., & Ortner, M. (2019). Servant, Friend or Master? The Relationships Users Build with Voice-Controlled Smart Devices. *Journal of Marketing Management, 35*(7–8), 693–715.

Shen, A. (2020). Aging, PEOU, and Adoption of Communication Technology. *Journal of Consumer Marketing, 37*(2), 139–147.

Shih, C. F., & Venkatesh, A. (2004). Beyond Adoption: Development and Application of a Use-Diffusion Model. *Journal of Marketing, 68*(1), 59–72.

Sprong, N., Driessen, P. H., Hillebrand, B., & Molner, S. (2021). Market Innovation: A Literature Review and New Research Directions. *Journal of Business Research, 123*, 450–462.

Stearns, P. (1986). Old Age Family Conflict: The Perspective of the Past. In K. Pillemer & R. Wolf (Eds.), *Elder Abuse: Conflict in the Family* (pp. 3–24). Auburn House Publishing.

Su, J., & Tong, X. (2021). Catching Silver Consumers in China: An Integrated Model of Chinese Older Adults' Use of Social Networking Technology. *Asia Pacific Journal of Marketing and Logistics, 33*(9), 1903–1917.

Tepper, K. (1994). The Role of Labeling Processes in Elderly Consumers' Responses to Age Segmentation Cues. *Journal of Consumer Research, 20*(4), 503–519.

Thanasrivanitchai, J., Moschis, G. P., & Shannon, R. (2017). Explaining Older Consumers' Low Use of the Internet. *International Journal of Internet Marketing and Advertising, 11*(4), 355–375.

Thane, P. (2003). Social Histories of Old Age and Aging. *Journal of Social History, 37*(1), 93–111.

Thomas, P., Wilson, J., & Leeds, O. (2013). Constructing 'The History of Strategic Management': A Critical Analysis of the Academic Discourse. *Business History, 55*(7), 1119–1142.

Tipaldi, P., & Natter, M. (2022). Older Adults' Decisions on Smart Home Systems: Better Put an Age Tag On It! *Psychology & Marketing, 39*(9), 1747–1761.

Townsend, P. (1981). The Structured Dependency of the Elderly: A Creation of Social Policy in the Twentieth Century. *Ageing and Society, 1*(1), 5–28.

Trocchia, P. J., & Janda, S. (2000). A Phenomenological Investigation of Internet Usage Among Older Individuals. *Journal of Consumer Marketing, 17*(7), 605–616.

Vargo, S. L., & Lusch, R. F. (2017). Service-Dominant Logic 2025. *International Journal of Research in Marketing, 34*(1), 46–67.

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly, 36*(1), 157–178.

Vennix, J. (2019). *Research Methodology: An Introduction to Scientific Thinking and Practice.* Benelux: Pearson.

Vuori, S., & Holmlund-Rytkönen, M. (2005). 55+ People as Internet Users. *Marketing Intelligence & Planning, 23*(1), 58–76.

Walker, K. L. (2016). Surrendering Information through the Looking Glass: Transparency, Trust, and Protection. *Journal of Public Policy & Marketing, 35*(1), 144–158.

Wells, W., & Gubar, G. (1966). Life Cycle Concept in Marketing Research. *Journal of Marketing Research, 3*(4), 355–363.

Westberg, K., Reid, M., & Kopanidis, F. (2021). Age Identity, Stereotypes and Older Consumers' Service Experiences. *Journal of Services Marketing, 35*(1), 54–64.

Wilson-Nash, C., Pavlopoulou, I., & Wang, Z. (2023). Selecting, Optimizing, and Compensating During Lockdown: How Older Consumers Use Social Networking Services to Improve Social Well-Being. *Journal of Interactive Marketing, 58*(2–3), 301–320.

Wilson-Nash, C., & Tinson, J. (2022). "I Am the Master of My Fate": Digital Technology Paradoxes and the Coping Strategies of Older Consumers. *Journal of Marketing Management, 38*(3–4), 248–278.

Wu, R., Liu, M., & Kardes, F. (2021). Aging and the Preference for the Human Touch. *Journal of Services Marketing, 35*(1), 29–40.

Xu, W. (2022). (Non-)Stereotypical Representations of Older People in Swedish Authority-Managed Social Media. *Ageing & Society, 42*, 719–740.

Yang, K., & Jolly, L. D. (2008). Age Cohort Analysis in Adoption of Mobile Data Services: Gen Xers Versus Baby Boomers. *Journal of Consumer Marketing, 25*(5), 272–280.

Yap, S., Xu, Y., & Tan, L. (2021). Coping With Crisis: The Paradox of Technology and Consumer Vulnerability. *International Journal of Consumer Studies, 45*(6), 1239–1257.

Zeithaml, V. A., & Gilly, M. C. (1987). Characteristics Affecting the Acceptance of Retailing Technologies: A Comparison of Elderly and Nonelderly Consumers. *Journal of Retailing, 63*(1), 49–68.

Zhang, Y., Su, J., Guo, H., Lee, J. Y., Xiao, Y., & Fu, M. (2022). Transformative Value Co-Creation with Older Customers in E-Services: Exploring the Influence of Customer Participation on Appreciation of Digital Affordances and Well-Being. *Journal of Retailing and Consumer Services, 67*, 103022.