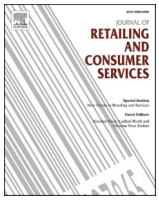
Journal of Retailing and Consumer Services 68 (2022) 103074

Contents lists available at ScienceDirect

Journal of Retailing and Consumer Services

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



Inclusive or exclusive? Investigating how retail technology can reduce old consumers' barriers to shopping

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ARTICLE INFO

Keywords:
Ageing consumers
Social exclusion
Retailing
Consumer behavior
Human-computer-interaction
Old consumers
Retail technology

ABSTRACT

This paper investigates older consumers in-store shopping experiences and the barriers that they face. The aim is to understand how new retail technologies (e.g., interactive in-store displays, self-service tills, robots etc.) can help seniors access satisfying, autonomous retail experiences, helping them to achieve a sense of inclusion in physical retail settings. Drawing upon the social inclusion/exclusion theory and information overload theory, the research employs a qualitative approach based on an inductive design, including face-to-face semi structured interviews with 36 consumers aged 75+. The findings highlight (i) old consumers have scarce interactions with in-store technologies (adding knowledge to motivations literature), (ii) the need to develop new technologies to support these consumers, and (iii) the extent to which these technologies are excluding rather than including old consumers (adding knowledge to the drivers of the field of exclusion). Results provide guidelines for retailers to enhance the sense of inclusion for old consumers through a better usage of new technologies.

1. Introduction

Retailers are increasingly implementing new retail technologies into their channels in order to enhance the experience throughout the customer journey, such as robots, interactive storefronts windows, interactive in-store displays, self-service tills; etc. (Pantano et al., 2022; Guha et al., 2021; Shankar et al., 2021). Literature demonstrates that the introduction of new retail technologies helps to provide satisfying shopping experiences which can contribute to an increase in quality of life for consumers (Roy et al., 2019; Yan et al., 2020; Adapa et al., 2020). However, these studies mainly refer to relatively young people's usage of these tools (less than 50 years old on average). Yet, with advances in healthcare and healthy lifestyles, the world's population is ageing with the proportion of people over 60 years set to almost double from 12% to 22% between 2015 and 2050 (World Health Organisation, 2021). This highlights the importance of older people as a consumer segment and one that must not be excluded by retailers when designing their stores. This may require considerable attention, as seniors might suffer from disability conditions that might impact on their mobility and access to external spaces, including retail settings, and lately their autonomous usage of these technologies. Thus, the characteristics of this segment, in terms of physical, statistical, psychological, social and behavioral characteristics, might influence retailing in terms of location, services and layout (Oeser et al., 2018; Seegebarth et al., 2019; Zhang and Mao, 2020).

Elderly consumers face many challenges when adopting new technologies, mainly due to age-related health issues (Pargaonkar et al., 2019). Although the importance of research in ageing consumers has been raised in marketing literature since 1974 (Klippel, 1974), and older people's interactions with technology are increasing (Hough and Kobylanski, 2009; Golant, 2017), research so far seems to be insufficient to overcome the barriers to shopping that ageing consumers might potentially encounter in physical retail settings. Indeed, several studies in the existing literature specifically advocate the need for research to include older age groups when investigating retail settings (e.g., Yu and Rahman, 2018; Boardman and McCormick, 2018; Phillips et al., 2021; Wu and Song, 2021; Guido et al., 2021).

A large reason for the paucity of research focusing on older consumers is due to practical reasons in the difficulties of collecting data (Friemel, 2014). In particular, mobility issues make the recruitment and interviewing of older people challenging (Melis et al., in press.). Researchers need to find a way of recruiting older participants by accessing

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https://doi.org/10.1016/j.jretconser.2022.103074
Received 10 March 2022; Received in revised form 23 June 2022; Accepted 5 July 2022
Available online 13 July 2022

their specific community, which again is not easy to do, especially if they are not ICT-savvy (Melis et al., in press.). However, with retail stores becoming increasingly revamped with new technologies, research must attempt to overcome these challenges by investigating whether an ageing population feels excluded in physical retail settings, and how technologies can be used to make them feel included.

This paper focuses on a particular segment of the population in retail settings, consumers aged 75+, defined as "old-old" and "very-old" by Yoon and Cole (2018). This segment includes those consumers who, on account of age, might suffer disabilities leading them to perceive barriers in traditional retail settings that might result in the feeling of exclusion. Preliminary research in this direction has highlighted the extent to which some new technologies like mobile devices can reduce the sense of exclusion of young people and those with mobility disabilities, but the impact that these technologies may have on older people is unknown (Dennis et al., 2017; Papagiannidis et al., 2017; Vinuales and Thomas, 2021; Hansson et al., 2022). For instance, older people may feel overwhelmed when introduced to new technologies, an aspect that warrants further investigation. Nevertheless, the number of older consumers ageing 66+ started using online shopping for food during COVID-19 pandemic (Hansson et al., 2022). However, no research to date has explored the barriers of old consumers in relation to in-store shopping through the theoretical lens of information overload and social exclusion. The present study intends to fill this gap in the literature.

Thus, this paper aims to understand older consumers' physical shopping experiences, including the barriers that they may face to shopping and how in-store retail technologies could be used to support their feeling of inclusion. Accordingly, the paper aims to contribute to the retail literature by answering the following research questions:

RQ1: How do old consumers currently experience shopping in stores and what are the challenges that they face?
RQ2: How can in-store retail technologies be designed to reduce older consumers' barriers to shopping?

The paper is organized as it follows: the next section is related to the theoretical background, focusing on consumers' interactions in retailing, emphasizing the increasing consumer-computer interaction in stores, and social inclusion/exclusion theories. The subsequent parts describe the methodology of the research and discuss the main results. The paper concludes with contributions to the literature, implications for practitioners, and suggestions for future studies.

2. Theoretical background

2.1. Technology in retailing

2.1.1. Consumers' interaction with the technology in retailing

The diffusion and evolution of retail technologies have changed the way that retailers collect and analyze consumer data, salespersons' tasks and duties, and they have supported the development of smart partnerships with consumers (Shankar et al., 2021; Xiao and Kumar, 2021). From the consumer's perspective, they have changed the access and consumption of goods, led to the development of highly personalized shopping experiences, and modified their interactions with both retailers and other consumers present in the store or reachable online (via social media) (Pantano et al., 2021; Silva and Bonetti, 2021). Specifically, the interactions between consumers and retailers are now largely mediated by new technology (Flavian et al., 2020; Pantano et al., 2022; Davenport et al., 2020; Grewal et al., 2020). As a result, physical stores can no longer just be places where products are distributed to consumers, as they can buy products from anywhere at any time, they must provide memorable experiences for consumers interwoven with technology and be places where communities can gather in order to eradicate the downturn of people going into stores and stay in business (Pantano et al., 2021).

These retail technologies can be classified as in-store technologies, such as robots, interactive displays/smart mirrors, and new systems for self-service check out (Bertacchini et al., 2017; Rese et al., 2019; Mende et al., 2019), out-store technologies such interactive storefront windows (Oh and Petrie, 2012), and pervasive/omnichannel technologies such as brand (store) mobile apps, which are not fixed in a certain location, and are "portable" to support consumers during their shopping experience as well as before and after physically approaching the physical store (McLean and Wilson, 2019; Li et al., 2020; Flavian et al., 2020; Fagerstrom et al., 2020). Studies have shown that each of these different types of technologies can enhance consumers' shopping experiences. For example, Blazquez et al. (2019) found that the use of in-store technologies, such as tablets, created a positive experience for consumers and encouraged purchase intention as they used these devices to find items that they wanted and read about key features. Grewal et al. (2020) found that out-store technologies such as 'smart windows' could heighten social presence felt in the shopping experience, whereas Iyer et al. (2018) found that omnichannel technologies, such as, effective integration of mobile apps can complement the in-store experience. However, consumers' willingness to use these retail technologies depends on their general attitude towards technology (Karimi and Liu, 2020). Furthermore, the introduction of some technologies into stores could have a negative effect on the shopper experience, as Reynolds-McIlnay and Morrin (2019) found that visual and auditory distractions caused by technology in the retail environment reduces trust.

The availability of this technology modifies the communication between consumers and employees in terms of the quantity and frequency of interpersonal contacts (Lee, 2015, 2017), as well as consumers and other consumers, whom which they might interact with through instant messaging systems (e.g., WhatsApp), reducing the need for a human shopping companion (Pantano and Gandini, 2017). Notably, Artificial Intelligence systems (AI) are changing the retail scenario (Guha et al., 2021). In particular, Davenport et al. (2020) pointed out some systems that would change how consumers (i) select the goods to purchase, by shifting the choice to the autonomous system (i.e., Birchbox), (ii) try clothes/makeup on, by adopting virtual try and fit (i.e., smart mirrors), and (iii) ask for assistance (chatbots are already available online for many brands); while Pantano and Pizzi (2020) investigated the evolution of automatic customer assistance led by chatbots, and the characteristics of such systems for replacing human employees that are more likely to be accepted by consumers.

As a consequence, the customer experience shifts from the traditional consumer-employee interactions to a new experience emerging from the interactions across different (digital) touchpoints (Lemon and Verhoef, 2016; Pantano et al., 2022). Yet, literature has primarily focused on the functional aspects of these retail technologies, such as chatbots, with investigations into the impact that they may have on the shopping experience with the value of them from consumers' perspectives lacking (Pantano and Pizzi, 2020). Retailers have to take into consideration that consumers seek interactive experiences and social engagement through platforms that contribute to their sense of connection, requiring new investigations on how to satisfy this need (Grewal et al., 2020). Furthermore, many studies focusing on retail and technology have used younger consumers, particularly student samples, thus, further research into newer technologies and their effect on older consumers is warranted.

2.1.2. Older consumers' interaction with the technology

It is important to differentiate consumers by age when it comes to technology because digital natives, those who have grown up with certain technologies such as the internet, may behave differently than digital nomads, who have witnessed these technological developments in their lifetime and so may need more time to learn how to use them (Boardman et al., 2022). This has created a natural 'digital divide' due to a lack of experience and training in these technologies for older people

(Pargaonkar et al., 2019).

As such, older peoples' adoption of technology is a complex and multifaceted issue, generally encompassing ten factors such as value, usability, affordability, accessibility, technical support, social support, emotion, independence, experience, and confidence (Lee and Coughlin, 2015). Indeed, Lee and Coughlin (2015) stress the importance of this complexity in older consumers' technology adoption, particularly emphasizing the individual and social characteristics that need to be considered to facilitate adoption and use that are not covered in frameworks such as the Technology Acceptance Model (TAM). This is further supported by Wu and Song (2021) who combine the Theory of Planned Behavior with TAM in order to investigate online shopping continuance amongst older adults due to the significance of subjective norms, such as peoples' opinions and perceived behavioural control, as well as mobility and perceived social isolation. Mostaghel (2016) too advocates the importance of family support in the adoption of technology by old people.

The literature suggests that the adoption of technology products, such as smartphones, laptops etc, should improve the level of independence felt by older consumers and thereby their quality of life (Mostaghel, 2016; Franco, 2020). Technology can even be empowering for older people as they use it to be more involved with their friends and families' lives via social networking and they can even benefit their health if they can carry out daily exercise regimes via tablet computers (Mostaghel, 2016). Yet, the reality is not that simple, as the process of having to learn how to use new technologies is not free from issues, often creating additional problems and frustrations which lead to feelings of a lack of independence when they perceive not being able to work the products themselves (Franco, 2020). Thus, despite the adoption of technology by older adults being a positive change, the rate of adoption is much slower than the rate of advancement of these technologies in the twenty-first century (Pargaonkar et al., 2019).

Yet, this gap will never lessen if research does not focus on older people when developing technologies. As it stands, old people have been overlooked during the development of products or services with the focus primarily being on younger consumers, thereby creating a gap in the literature and need to study the factors that affect the usage and adoption of technology by old consumers in order to help inform the design of technology and services for the elderly (Pargaonkar et al., 2019). In particular, an understanding of how technology usage influences old consumers' consumption experiences is still limited (Wilson-Nash and Tinson, 2022). Therefore, literature on consumer-computer interactions for old (including also "very old") consumers is still scarce.

2.2. Social ex/inclusion

Recent studies largely highlighted the importance of the access and usage of technologies, which can ultimately influence social inclusion, by emphasizing the disparities in physical access to technology and in resources and skills needed to use the technology (Liao et al., 2022; Khorshed and Sophia, 2015). Indeed, technologies (the access to) might generate new forms of exclusion among different groups of the population (Liao et al., 2022; Andrade and Doolin, 2016). However, the theory of social inclusion/exclusion is not new, it dates back to the late 1990s. Burchardt et al. (1999) defined social exclusion as occurring when an individual "(a) is geographically resident in a society, (b) cannot participate in the normal activities of citizens in that society, and (c) would like to participate but is prevented from doing so by factors beyond his or her control" (p. 229). In particular, social exclusion generates feelings of stress, anxiety, sadness, fear and social disconnection (Vinuales and Thomas, 2021). This highlights its importance for research and its societal impact on peoples' wellbeing.

Marketplace inclusion is defined as consumers access to and fair treatment within the market, whereas social exclusion prevents consumers from fully participating in a marketplace, for instance, they may feel excluded if they cannot keep up with contemporary consumption trends (Saatcioglu and Ozanne, 2013). Literature demonstrates that the circumstances of individuals' life play a key role in their shopping activities (Nakata et al., 2019; Dennis et al., 2016; Williamsand Hubbard, 2001), for example, the neighborhoods they live in (area of residence) (Nakata et al., 2019; Fields et al., 2019), the distance and support from family, relatives and friends (Nakata et al., 2019), age (Dennis et al., 2016; Jones et al., 2009), financial distress (Dennis et al., 2016; Prawitz et al., 2006), and disability conditions (i.e., blindness or limited mobility) (Dennis et al., 2016; Diener et al., 2006; Papagiannidis et al., 2017) influence consumers' sense of inclusion/exclusion, and approach to their shopping experience.

Specifically, issues regarding neighborhoods include access to transport and the availability of retail stores, while the distance and support from family, relatives and friends includes the possibility of a shopping companion who might help provide transport to the store and support whilst in the store (e.g., identifying the best product for a certain purpose). Thus, social ex/inclusion in shopping activities has become an important element to consider in retail planning policy, acquiring the attention of policy makers and academics (Papagiannidis et al., 2017; Camplone and Di Bucchianico, 2018). Indeed, social exclusion affects consumption behavior in terms of the favored channel for shopping (Dennis et al., 2016) and choice of products (Wang and Lalwani, 2019). There is a need for research to provide a better understanding of the challenges faced by excluded people in the marketplace in specific contexts (Saatcioglu and Ozanne, 2013). As such, research into retail needs to focus on the needs, wants and aspirations of all consumers, such as older consumers, marginalized minorities and people with disabilities, not just younger consumers, yet research on old consumers, in particular, is lacking (Yu and Rahman, 2018; Hansson et al., 2022). Therefore, the present study intends to fill a gap in the literature by investigating exclusion in terms of age within the context of autonomous shopping.

In past decades, the perception of social exclusion has acquired further relevance in the marketing literature. In this vein, studies demonstrated that socially excluded consumers are more likely to switch brands/products (Su et al., 2017, 2019), and prefer crowded retail spaces (Thomas and Saenger, 2020). Although an autonomous and satisfying shopping experience positively impacts on vulnerable people's sense of wellbeing (Rinaldi and Tosi, 2018), Fisk et al. (2018) further specified that consumers "may lack relevant knowledge, resources and social networks when they interact with service providers, exacerbating disadvantages and resulting in stereotyping and discrimination that can result in unproductive, stressful and harmful service encounters" (p. 841). Accordingly, some research indicates that the usage of technology might alleviate the sense of exclusion (Van Winden, 2001; Varghese and Jana, 2019), while improving urban regeneration (Fernback, 2005). Yet, technology can have dual effects on consumers, with positive and negative aspects (Roggeveen & Sethuraman, 2020). The positive side refers to the ability of technology to facilitate convenience and accessibility (Blazquez et al., 2019; Romano et al., 2021) whereas the negative aspects of technology could be that it makes consumers feel overwhelmed (Pitardi et al., 2022). Indeed, old consumers may feel socially isolated when they encounter issues with using technology as they are not able to actively participate in society (Mostaghel, 2016). Nevertheless, there is a paucity of research focusing on how consumers respond to different instances of exclusion in retail settings (Sinha and Lu, 2019) and no studies to date have focused on consumers over aged 75 in this context. As a result, studies call for future investigation into how to use new technologies to improve the sense of inclusion of people with disabilities (Dennis et al., 2016; Lin et al., 2018; Papagiannidis et al., 2017).

One important way in which people may feel excluded is due to their age, particularly in relation to technology. Indeed, Yu and Rahman (2018) state that research needs to focus on older consumers, recognizing their needs in relation to both product and market development

in order to improve elderly consumers' perceptions of inclusion in society and, ultimately, their quality of life as a result. Old consumers might show a limited willingness to adopt certain technologies (Dabholkar and Bagozzi, 2002; Duggan and Smith, 2013), despite the benefits that they could gain from technologies, such as helping them to buy autonomously when encountering difficulties (Camplone and Di Bucchianico, 2018); meaning that younger consumers are currently getting more value from technology-enriched shopping experiences (Pantano and Gandini, 2017). As well as cognitive processing, ageing is attributed to changes in consumers' affective responses and their motivations, which could influence what information older consumers pay attention to (Von Helversen et al., 2018). Thus, elderly people may be more likely to miss certain technologies or cues to help them with their shopping experience in stores.

Nevertheless, Boardman and McCormick (2018) found that the over-60s preferred to shop in physical stores due to convenience and avoided mobile commerce due to perceived restrictions such as the screen size being too small. This highlights the potential that physical stores have in engaging older consumers with new technologies and the opportunities that they could provide for the ageing population. Yet, no research to date has explored old consumers and their attitude to shopping in contemporary technology-filled stores, highlighting their exclusion from academic research. The present study will fill this gap in the literature by exploring whether old consumers feel excluded when shopping in physical stores, and how technologies can be used to make them feel included.

2.3. Information overload theory

Information overload was used as a theoretical lens for this research in order to investigate whether ageing consumers feel excluded in the actual physical retail settings and how technology can reduce ageing consumers' barriers to shopping. This theory has often been linked with technology studies because of the large amount of information that people are now exposed to as the result of the interaction with the technology, due to the potential for the technology to over stimulate consumers (Romano et al., 2022). Indeed, beyond a certain threshold, more information leads to a worse subjective state towards the shopping decision, with novice consumers facing particularly severe information overload issues (Chen et al., 2009).

Studies have researched information overload in relation to smartphone use (Li and Chan, 2020), product choice quality (Korhonen et al., 2018), online product reviews (Hu and Krishen, 2019), and augmented reality enriched shopping environments (Romano et al., 2022). Bettis-Outland (2012) defines information overload as a multidimensional construct which occurs as a result of the following three components: (1) equivocality, which refers to the existence of multiple valid interpretations of information (2) quantity, which refers to the volume and availability of information, and (3) variety, which refers to the different sources of information (p.818). In other words, information overload refers to a person's perception of being overwhelmed by incoming information that exceeds their cognitive capacity (Li and Chan, 2022.).

To the authors' knowledge, no studies to date have explored information overload in relation to social exclusion, nor focused on older consumers in particular. Applying information overload theory to older age groups is particularly pertinent as studies show that ageing can diminish cognitive processing and what aspects consumers pay attention to (Wagner et al., 2014; Von Helversen et al., 2018). The ability to understand marketing communications declines as people get older because of the taxing mental effort required for the elderly to engage in cognitive processes of interpretation (Guido et al., 2021). This suggests that information overload may have a lower threshold for older consumers than younger consumers, and may be occurring in physical stores unbeknownst to the retailers themselves. Indeed, the context that the consumer is in may overwhelm their decision-making abilities (Li, 2016). Thus, the present study will consider old consumers' information overload in retail store shopping environments, exploring its relationship with social exclusion in order to provide a contribution to knowledge.

3. Methodology

3.1. The Italian context

The research explores the Italian context as Italy is the European Country with the highest life expectancy, with more than 7 million people over 75 years old, comprising of 11.7% of the Italian population, with 4 out of 7 being more than 80 years old (Istat, 2022). The population of Italy is ageing faster than the European average, due to the increase in life expectancy and decrease in the birth rate (Istat, 2019). Indeed, there was an increase of 1.5% of people aged 65–79 years old, 4.3% of people aged 80–89 years old, and 7.4% of people aged 90–99 years old in Italy between 2019 and 2022 (Istat, 2022). Italy also counts a huge number of older people living alone. Only 29% of females aged 75+ live with a companion and 68% of males aged 75+ live with a companion (Istat, 2022). In 2018, 1,000,229 people over 65 years old had no social networks outside their family (Istat, 2022). The percentage of isolated people increases with their age, reaching a peak among 84 years-old (18.2%) (Istat, 2019). However, only 41.4% of 75+ men and 31.2% of 75+ women have no disabilities or other forms of limitations to day-to-day activities (Istat, 2022).

Older people's main goals in using the Internet are messages (70.7%), e-mails (64.7%), reading online journals and looking for health information (47.7%) (Istat, 2019). Video-sharing and social networks are used by 41.1% and 33.7% of older people respectively, and online purchasing has also increased (Istat, 2019). Since online communication and social networking services play an important function in interpersonal contact (Istat, 2019), frequent usage could limit the relational and social solitude felt by older people. Thus, digital competences could be an important asset for their social, economic, cultural and relational inclusion.

3.2. Data collection and participants

The current study is exploratory in nature as it aimed to investigate the extent to which new technologies might specifically improve older consumers' access to retail shopping experiences through the lens of social inclusion/exclusion. To this end, the research employed a qualitative data analysis approach, aiming at enhancing existing theory from data (Tuerner, 1981), following the grounded theory approach (Glaser and Strauss, 1967). This approach involves the development of theories and framework based on constant comparison and theoretical sampling. Accordingly, this approach seeks precise coding, consisting of an iterative and inductive process, where data are organized to create themes, topics and theories (Glaser and Strauss, 1967). As the aim of the research relied on the interpretation and understanding of a certain behavior, the researchers conducted face-to-face semi-structured interviews with 36 old consumers aged 75+, recruited in the urban area of a large city in Northern Italy between October and November 2019, which lasted approximately 50 min each. All data collection was conducted over a two month period (October and November 2019), not in stages. Each participant was interviewed alone, with no companion attending, and in-person. The face-to-face interviews allowed the researcher to observe both the verbal and nonverbal data (Hiller and Di Luzio, 2004). To this end, the researcher has further access to facial expressions, gesture and any other paraverbal communication able to enrich the meaning of the words (Carr and Worth, 2001).

Following Marshall's sampling strategies for qualitative research (1996), this research involved a non-probability convenience sample, where members of the target population met the criteria of easy accessibility, geographical proximity, availability at a given time, willingness to participate (Dörnyei, 2007), and being aged 75+. Thus, the sample 36

Italian consumers is considered to be sufficient in providing enough insights to answer the research questions, since it is not expected that the random sample of the population used in this qualitative study is likely to produce a representative sample based on characteristics normally distributed within the population, as in quantitative research (Marshall, 1996). To reduce the response bias (before the interview), data were collected through a common interview guide (interview protocol) (Table 1), serving as a guide for the semi-structured interviews (Flick, 2002). After the transcription, a copy of the data was forwarded to interviewees to further confirm their reliability, authenticity and for replicability purposes (Moustakas, 1994).

Each interview was recorded with the authorization of the interviewee, and was subsequently transcribed by researchers to facilitate data analysis. The names of the interviewees were omitted for anonymization purposes. The data was analyzed through thematic analysis (Braun and Clarke, 2006). Following Braun and Clarke (2006), the study used the research questions to manually code, and associated the themes with the codes based on the space within each interview and across the interviews. To reduce response bias (after the interviews), an independent researcher checked the themes and codes extracted. Subsequently, the software *WordStat* was employed to identify the codes manually extracted from the research questions within the texts through a word frequency analysis. Accordingly, the system automatically identified the codes, and the results were compared with the manual ones. Thus, the most representative codes were (i) shopping experience, (ii) companion, (iii) technology, and (iv) exclusion/excluded. *WordStat* further allowed the analysis of themes by conducting a factor analysis based on Varimax rotation, enabling the exploration of underlying thematic structure in the text of the interviews by combining statistical analysis and language processing. During this process, all the factor loadings with values higher than a certain value (in this case five, meaning that a factor must be included in at least five different interviews in the data set) were retrieved as part of the extracted topic. Nevertheless, topic modelling using factor analysis might result in some words being associated with more than one factor, thus the researchers manually screened the emerging factors and synthesized the results into three main categories.

In total, the sample consisted of 20 females and 16 males, between 76 and 84 years old. Concerning their preferred place for shopping, the large majority (22 out of 36) indicated that they preferred small local stores, usually managed by a person they know, only eight preferred large grocery stores, four preferred open-air markets, and two preferred shopping centers, while their purchases are almost exclusively related to food, with an average frequency of purchase of once per week. Half of the participants (18 out of 36) went alone to the shopping location, while the other half (18) needed a companion (e.g., daughter/son or nephew) since s/he has some disabilities reducing the ability to go alone. Participants' profiles are included in Appendix 1.

Table 1
Interview guide.

Topic area	Question/s
Opening question	Can you tell me about your familiarity with the store of your village/city?
Shopping journey	Do you usually go alone to buy stuff? Why? How far is the store form your place? How do you reach the place? Are you happy with this experience? Why?
Sense of inclusion/ exclusion	Do you think that the actual points of sale meet your needs as a shopper? Why? Do you feel comfortable/ uncomfortable in the actual points of sale? Why? What would you change to make you feel more comfortable?
Others' influence	What influence do your friends have when you buy a product? What influence has the salesperson when you buy a product? Why? What kind of products do you usually ask for suggestions for? Who do you ask?
Interaction with new technologies	What kind of new technologies (i.e. smartphones) do you like using in your daily life? Why? Do you usually use any technology when shopping? Why?
Experience with digital technologies	Do you usually use the technologies available in the store (i.e. self-service cash desk)? When/How do you use them? Are you happy with this kind of service? Why?
	How do the in-store technologies make you feel? Why?
Wrap up	Do you have any other comments about your shopping experience that you would like to share with me?

4. Findings and discussion

The analysis of the older consumers' responses yields several meaningful insights for retailing, human-computer interaction, and social sciences. Accordingly, three main standpoints emerge: (i) challenging offer of products, (ii) limited technological support for monetary transactions, and (iii) perception of exclusion prompted by the retail technologies.

4.1. Challenging offer of products and related information

The first theme to emerge during the interviews was the challenges that old consumers faced as the result of large product offerings in retail stores. Participants found it hard to understand the best product to buy among the bewildering variety, with very similar prices, requiring an extended knowledge of the brands and related characteristics. Therefore, the actual offer of products required participants to process a large amount of information that they are not able to (or do not feel comfortable doing). Inevitably, participants compared the current situation with past times when, for instance, they could find only two or three brands of pasta and the choice was easier. Now, for the same product, they might find more than 10 different brands, often with little variation between products of the same brand (e.g., oat milk, almond milk, soya milk, milk enriched with vitamins, and so on rather than just the skimmed, semi-skimmed and whole they remember from their youth). This is in line with research by Lambert-Pandraud et al. (2017) who found that as consumers age they tend to forget information learned about more recent brands and only retain awareness of long-established brands, thereby making them reluctant to engage in brand-switching. The present study found that the large variety of products on offer made the purchase decision more complex, causing information overload, which resulted a sense of frustration for old people:

> "*Now in the supermarket there is too much on offer of everything. I feel uncomfortable, because any time I need something I spend a lot of time trying to find it.*" (female, 76 years old).

To reduce this uncomfortable feeling, they preferred going shopping with a companion (usually a relative), or alternatively, accessed the assistance of store employees. The reliance on a family member as their first port of call for help with technologies concurs with Franco (2020). However, for those that did not have a companion, their experiences in receiving assistance from store employees varied. In some cases, participants received good service, in others the (lack of) support from an employee increased their frustration. One participant said:

> "*I usually ask the employees for suggestions. I think that their opinion is more relevant than my friends' one, because they always know the news, and all the brands. I like when they say that they already tried the same product and it was perfect, so they recommend it to me.*" (female, 75 years old).

This experience was even more relevant when shopping in small local stores. One participant declared:

> "*They know me. That is my favorite grocery store. They call me when they have special promotions that could interest me. I like this environment. I like going there alone and being able to find the products I need alone.*" (female, 75 years old).

This highlights the importance of personalized service to old consumers and the positive emotions that it evokes. Having a relationship with the store's owner/employees was important to them and it resulted

in re-patronage of that store. The quote also shows the feeling of pride that occurs when old consumers are able to be independent and feel confident in going to the store alone. The familiar environment of the smaller local store with employees who were helpful and greeted them by name boosted consumers' confidence in being able to undertake the shopping trip successfully, thereby heightening their perception of inclusion through their sense of independence.

On the other hand, in the case of large stores, participants felt too shy to ask for suggestions. Thus, the actual physical retail settings provide an information-rich environment leading to information overload that only the support of a shopping companion or shopping assistant could reduce. For instance, one participant said:

> "*Sometimes, I ask for a suggestion, but I'm afraid the salesperson thinks that I'm stupid because I'm not able to choose the product by myself. Sometimes I also don't feel s/he pays much attention to my issue. Once, I even had the feeling he was playing me*." (female, 80 years old).

In the cases of both positive and negative employee assistance, participants demonstrated the need for specific support in choosing the product and locating it in the store in the case of larger stores. The larger the choice of goods the more it reduced their individual capability to make a choice entirely autonomously. They appeared to place a great deal of trust on the opinions of the store employees in terms of their recommendations in order to help making their decisions, highlighting the importance of support for old consumers when shopping. This contrasts to Yu and Rahman (2018) who found that Chinese consumers aged 55+ placed more importance on product attributes and utilitarian values than customer service and aspects related to the retail environment. However, the average age in Yu and Rahman (2018)'s study was 61.9 years old which suggests that the issues found in the present study may become more prominent with age.

Although only few of the participants in the present study had physical disabilities, requiring a companion to physically access the store, others needed support to process the huge amount of information related to products (leading to information overload), which has increased dramatically due to the size and format of contemporary stores when compared to their shopping experiences in the past. Thus, the findings suggest that information overload is contributing to feelings of exclusion for old consumers as it is hindering their ability to feel independent. This supports literature by Franco (2020) who discusses the importance of independence for older people and their ability to carry out everyday tasks in their quality of life. Therefore, the greater the range of products on offer, an aspect that is considered a benefit for other (younger) consumers, the more challenging the shopping experience becomes for older consumers. The findings suggest that this is because old consumers think that they lack the capabilities to distinguish amongst the products, thus requiring additional support to receive the same advantages from the shopping experience as younger consumers. Although technologies to support the product location and comparison exist (i.e., IKEA terminals in the stores, store groceries apps), the data revealed that these are not accessed by old consumers. Therefore, the technology is not perceived as a supportive tool to autonomously access the information needed. This outcome contrasts to previous literature that has focused on younger consumers and found that in-store tablets were useful and convenient (Blazquez et al., 2019), highlighting an age divide in the perceptions of technologies in stores and the need to consider older consumers in both academic and market research.

4.2. Limited technological support of the monetary transactions

An important issue that emerged throughout the interviews relates to the understanding of price, discounts and payment processes. Although participants did not mention specific disabilities related to vision, the majority affirmed that they encountered many difficulties in understanding the correct prices of products. For example, one participant said:

> "*I often have issues in understanding the products on offer and how they are labelled. I think that the labels are not always very clear. For instance, there is the price and the percentage of discount off it but not the calculated final price, or sometimes the products on promotions are not located close to the related offer. Probably, the store could do something more to make everything more clear!*". (male, 78 years old).

Moreover, participants noticed some incongruencies related to the labelled price and the actual price paid, as a consequence of unclear labels or discounts. Indeed, a few of them felt that they often paid the wrong amount, as they did not have control of the payment process. One participant said:

> "*When I went home, I noticed on the bill more items than the ones that I had purchased. Since then, I always pay attention and check each item at the cash desk. I'm old but not stupid. However, I imagine that it happens very often to many*" (female, 78 years old).

Similarly, another said:

> "*Sometimes the cashier makes us pay twice. For instance, I frequently notice a price on the shelf and then another on the bill. Probably no one notices it and pays more. I have always been good with mathematics, so I immediately notice, but it is not fair, especially for us old people!*" (male, 82 years old).

This is important as Guido et al. (2021) found that elderly consumers faced specific limitations in processing, comprehending and learning stimuli, disadvantaging them in retail settings and that they should therefore, be protected from misleading communications. An example of this is Tesco, whereby the price for Clubcard holders is displayed in large bold font, but only made clear at close inspection that it is a higher price for those who do not have a Clubcard. Yet, this could also be reflective of the fact that as consumers age, their ability to recall the price of food products diminished (Guido et al., 2021). Nevertheless, what was telling in the present study was that participants considered these payment discrepancies as a human responsibility, without attributing any fault to the technologies (i.e., cash desk, including the self-service ones when they were rarely adopted). Indeed, participants thought that the products were not correctly labelled by employees, or that employees did not properly apply the expected discount. This highlights old consumers' lack of awareness of the role that technologies play in stores and resulted in them feeling like the store, and its employees, were trying to unfairly trick them into paying more, or providing false discounts, indicating a sense of inadequacy in line with feelings of social exclusion.

These considerations emphasize (i) the importance of price when shopping for old consumers, and (ii) the fear of being subjected to unfair retail price practices. The first aspect might be justified by the welfare practice that a large proportion of old Italians have towards sustaining younger generations, reflected in their need to save money to support relatives. The latter might be justified by the limited capability of easily identifying the actual price and resulting in suspicion of retailers. In this sense, the actual technologies, including the ones displaying the prices and evaluating the discounts, are not intuitive and supportive of old consumers' experience. Although the large presence of technologies available to support monetary transactions (e.g., mobile apps., contactless payment systems, RFID readers etc.) and past studies demonstrating the extent to which these improve the customer journey, interviewees did not adopt any technology to support their understanding of price or payments. Thus, such technologies are not providing benefits for older consumers. This outcome contrasts to Pargaonkar et al. (2019) who found that 72% of elderly consumers showed a willingness to learn new technologies. The present study findings suggests that old consumers are only willing to learn these new technologies in comfortable settings, and in the supportive family environment discussed by Pargaonkar et al. (2019), not when confronted with them during their retail shopping experience.

4.3. Perception of exclusion prompted by the retail technologies

Although participants were aware of the main benefits emerging from the use of retail technologies, many of them expressed their unwillingness to use these technologies as they believed that they were not able to use them. For instance, they were aware that some of these technologies (like apps for mobile or in-store interactive displays) support the product location and comparison, but they did not feel comfortable using these technologies themselves. For example, one participant said:

> *"I don't use any technology in the store. However, my husband usually repeats [in local dialect]* we should learn how to use it*! Because we realize that we don't use it enough, especially when we have just a few items, we should use the automatic cash-desks. But I prefer the traditional cashier, I feel more comfortable with them … all these technologies and products make me feel uncomfortable … my nephew says that I have to learn, but I replied that I'm not able to. Probably if they teach me slowly, I might learn … probably the technology would be very useful for me, I would feel more autonomous, but someone should teach me …"* (female, 78 years old).

One of the participants had tried to use some technologies like the self-service cash desks, which is considered the most rewarding in terms of time (speed of checkout), but only with the help of a relative, in order to avoid mistakes. This participant affirmed that:

> "*I use the automatic cash desk, but only when my daughter helps me. I like this service because I can get out fast if I have just a few products. If I have many goods I prefer going to the cashier. I have to confess that this technology makes me feel bad rather than good, because if someone is not 50 years old anymore, s/he might make mistakes*" (female, 81 years old).

Thus, most participants felt that their lack of training or ability to use the technology was causing a barrier to use for them. For instance, one participant declared:

> "*I don't use the technologies available in the store since I feel uncomfortable. They seem to be hard for me!" (male, 76 years old).*

This concurs with Franco (2020) that older consumers feel like they are not able to work new technologies which has a knock-on effect on their feelings of independence. For example, another participant said:

> *"I'm able to use only my mobile (honestly with many difficulties and just to send and receive messages). How can I use an automatic cash desk?!? These technologies are not for me. I'm from a different age" (female, 77 years old).*

This outcome highlights old consumers' feelings of exclusion in stores through their perception of not being able to use technology. However, a participant affirmed that even if she did not access these technologies, she was happy that they are available for more "expert consumers", in order to save them time. This, again, highlights old consumers' perception that they are not as skilled as other consumers at using the facilities or services in retail stores, resulting in them feeling excluded from the mainstream consumer group. The interviews revealed that old consumers' reluctance to use in-store technology lies in their fear of making mistakes, especially in a space where the other customers in the store are strangers. This fear encompasses the inner feeling of being negatively judged by others (other consumers or employees) due to their inadequateness. In other words, this feeling excludes them on account of the technology-enriched retail context, which they cannot fully explore to get the value from them. This feeling of exclusion in the retail context further results in a more general sense of social exclusion. To illustrate, a participant declared:

> *"I have the fear of being out of the world. If you don't follow the progress in the technology, you cannot do anything and you are forced to ask someone to do for you […] I tried to learn something, but the fear stops you. I know that many people at my age refuse to even learn because they are afraid" (male, 76 years old).*

Nevertheless, participants did not propose the possibility of being trained by an employee on the usage of existing technologies, nor did they suggest any additional possible technologies with more intuitive or even more user-friendly interfaces (e.g., with larger characters/font, etc.). Furthermore, unlike in Franco's (2020) ethnographic study, old consumers did not actively seek help with the technologies in-store, showing a level of embarrassment at not being able to work them or simply avoiding them all together due to this. This may be because in Franco's (2020) study, the researcher posed as a 'tech-helper' in a village community, thereby positioning himself as an obvious supportive role. However, retail employees were not perceived to play a supportive role by old consumers and they deliberately did not make their perceived incompetence known in order to 'save face' and not appear socially excluded.

In summary, even though old consumers were aware of the potential benefits emerging from technologies for shopping, they felt excluded as those technologies required a level of competency and skill to conduct proper usage. This inadequateness resulted in a more general feeling of exclusion from both retailing and social settings. Therefore, the introduction of more intuitive and useable technologies for this age group would improve their sense of wellbeing and autonomy in daily activities like shopping.

5. Conclusion

The aim of this paper was to understand the barriers to shopping for older consumers, in order to explore the extent that new technologies might be able to help seniors to access value-added retail experiences. Results emerging from 36 in-depth interviews with old (also including old-old) consumers (aged 75+) revealed that the main barriers to in-person shopping in large shopping environments as: (i) the large number of products on offer in grocery stores is challenging for them and causes information overload, (ii) the limited technological and employee support for their shopping, and (iii) a feeling of social exclusion due to their perceived inadequate skills in using the technological systems and shopping autonomously.

5.1. Theoretical contributions

This paper contributes to knowledge by exploring the relationship between social exclusion and information overload with respect to technology and old people shopping in stores. First, our results provide insights into consumers' perceptions of new technologies as a potential supportive tool for shopping, building on extant literature (Pantano and Gandini, 2017; Lemon and Verhoef, 2016; Rese et al., 2019), by showing the extent to which the benefits of technologies perceived by other age groups is not yet effective for old consumers. In this way, our research also replies to the need to include older age groups when investigating retail settings (e.g., Yu and Rahman, 2018; Boardman and McCormick, 2018; Phillips et al., 2021; Wu and Song, 2021; Guido et al., 2021). In particular, our results provide new evidence on the extent to which retail technology is excluding that part of population composing of old (and old-old) consumers. Although literature shows that the adoption of technology would improve the level of independence felt by old consumers (Mostaghel, 2016; Franco, 2020), our participants mainly show a feeling of a lack of independence in using retail technology, being very reluctant to adopt it autonomously. This outcome extends Pargaonkar et al. (2019) work with new evidence on the very limited adoption of retail technology, as well as the limited advancements of this technology for old consumers' usage. Moreover, despite the specific limitations of old consumers in processing, comprehending and learning stimuli (Guido et al., 2021), the present study demonstrates that actual retail

technology is not protecting old consumers from misleading communications.

Second, in line with Franco (2020), the findings demonstrate old consumers' reliance on family members as the first port of call for help with technology. The present study shows the extent to which a retail setting might become a place of social exclusion for old consumers, by adding further evidence to the literature on the circumstances of an individual's life that play a key role in their shopping activities (Nakata et al., 2019; Dennis et al., 2016; Williams and Hubbard, 2001), with emphasis on age (Dennis et al., 2016; Jones et al., 2009). Specifically, our results show that old age, along with its related issues, strongly limits the autonomy of in-person shopping, as old consumers often need to rely on a companion to conduct this successfully. The existing technologies in retail stores are not yet able to limit this barrier. Accordingly, our findings extend Vinuales's and Thomas's (2021) work, by showing how the exclusion from independent (in-person) shopping generates a feeling of frustration, which ultimately impacts the wellbeing (Rinaldi and Tosi, 2018; Hansson et al., 2022) of older consumers. In particular, those old consumers without a companion to rely on face this barrier, and consequently need to rely on a store employee for assistance, whereby they display a level of embarrassment at not being able to use the technologies properly, or avoid them altogether, thereby reinforcing their perception of exclusion from society.

Third, the larger the product range on offer, the more challenging it is for old consumers, who think that they lack the capabilities to distinguish among the products, thus requiring additional support to take the same advantages from the experience. Although technologies to support the product location and comparison exist, these are not accessed by old consumers. In line with the risk that more information leads to a worse subjective state towards the shopping decision (Chen et al., 2009), our results demonstrate that old consumers are currently exposed to information overload in large shopping environments, thereby adding new evidence to the Bettis-Outland (2012) definition of information overload by showing that it is the quantity of information in particular (as the volume of information emerging from the huge offer of similar product) enhances the sense of inadequateness and social exclusion felt in old consumers, which the actual technologies are not able to reduce. Accordingly, our results further corroborate the "digital divide" concept (Pargaonkar et al., 2019) in the specific retail sector, showing the extent to which the lack of experience and training in certain retail technologies lead to old consumers' reluctance to use them for improving their shopping experience, exacerbating their feelings of social exclusion. As social exclusion generates feelings of stress, anxiety, sadness, fear and social disconnection (Vinuales and Thomas, 2021), the present study makes an important societal contribution showing the impact that the nature of modern physical stores, and the many different technologies that are incorporated into them, are having on elderly peoples' wellbeing. Therefore, our study finally replies to the call of Wilson-Nash and Tinson (2022) to provide a better understanding of how technology usage influences old consumers' consumption experiences.

5.2. Practical implications

From a practical point of view, our findings expose retailers' lack of attention to older shoppers when introducing a new technology in store. Our research highlights the critical importance of providing retail technology better designed for old consumers' usage and needs, which is not very effective in the present form. In this way, elderly consumers might be able to access the benefits of in-store socializing with other consumers or store personnel with the support of new technologies. The technologies are more oriented to a younger segment of population, who are able to benefit from their access to stores without the support of others (Lee, 2015, 2017; Pantano and Gandini, 2017; Davenport et al., 2020; Hansson et al., 2022). Yet, the potential of the 'grey market' is enormous for retailers and so focusing on this segment of consumers would also be profitable in the long-run for businesses (Yu and Rahman, 2018; Hansson et al., 2022). The actual technology that exists in retail stores is not intuitive enough or easy enough to use to support old consumers when carrying out their shopping. To address this issue, retailers should provide technologies that are more intuitive for old consumers, not requiring past knowledge and practice with technological systems. For instance, our results show that many participants struggled to comprehend the prices of products, and felt misled by prices, showing a reducing ability to recall and clearly identify the price of the product at the purchase and post-purchase stages. Thus, a new technology should take into account the possible vision impairments/disabilities and the importance of price evaluation, comparison and recall through an intuitive interface that would be much more supportive for old consumers, especially if associated with an easy to use calculator. This could be made clearer by increasing the font size, having clearer graphics and particular colours, and making the terms of promotions and discounts more obvious. This function would further support older consumers to better understand the price and price strategy in place and manage their purchases. Similarly, technology for old consumers should be more tolerant of users' errors. In other words, these systems would allow consumers to try several times without increasing expenditure or generating a sense of frustration or inadequateness.

Furthermore, the present study shows that personalized service is important to old consumers and so any new technologies could try to replicate the sales assistant role as closely as possible and provide ad hoc recommendations, for instance as done with digital shopping assistants in fashion industry for younger generations (Silva and Bonetti, 2021). These recommendations would be able to reduce the information overload perceived in a shopping environment that provides a large offer of un/familiar products. In this way, new technology would provide an effective robotic companion for old consumers, replacing the physical companion/support who is not always available, while enhancing the sense of an autonomous experience. Retailers should have a clear 'tech helper' to support old consumers using the new technology, showing them how to use it, providing a safe space for them to learn and not feel embarrassed. As a consequence, old consumers may embrace a set of automated retail technologies, which would result in high quality interactions, risk reduction, and human control over the technology and the shopping journey in general. Thus, the design of a new technology with these characteristics, coupled with clear help and support, would result in more inclusive shopping experiences for old consumers.

5.3. Limitations and suggestion for future studies

Notwithstanding the theoretical, practical and social impact, the present study encounters some limitations. The first is the focus on old consumers in just one part of Europe (Italy). This country was chosen due to it having the highest number of old people in the population. However, studies in other countries, with differing attitudes towards technology (i.e., South Korea and Japan) might find different results. Similarly, the participants in this study showed reluctance to use new technologies, emerging from their perception of inadequate skills and fear of making mistakes. Other cultural backgrounds might achieve different results. For example, Badowska (2019) found that there were differences in the innovativeness of the elderly in different countries, with Poland being the most innovative, followed by Slovenians and Czechs. Therefore, new cross-country and cross-cultural studies are encouraged to provide more generalizable results.

Second, the present study focused mainly on the grocery retailing sector, meaning that results may not be generalizable to other retail sectors such as fashion or technology products. Future research could be conducted with old consumers in these specific market contexts to compare if the results differ. This may be particularly interesting for clothing as an experience product that can carry higher social risk (Boardman and McCormick, in press), but also shopping for technology products themselves as that indicates a desire to be included with the

rapid advancements being made in this area. Also, this study did not focus on a specific retail technology or interface, thus studies focusing on particular types of technology and their usefulness in facilitating inclusion for old consumers when shopping are strongly encouraged. Accordingly, future research into intuitiveness and elderly-friendly technology is particularly recommended. The authors acknowledge that it can be challenging to recruit old consumers for research studies (hence the current lack of studies on this consumer group), but strongly encourage more studies on this group to help create a more inclusive society. We recruited participants on the base of convenience. However, working with associations for elderly for extending the sample of future studies in this direction would extend the quality of our results.

Third, our research involved old consumers when they were at home, thus the interviews were based on their ability to recall their experiences in a large shopping environment, not during the actual experience itself. Thus, new studies might approach a retailer to observe actual old consumers' shopping experiences, and interview them when experiencing the issues. Similarly, new quantitative studies could be conducted; distinguishing between male and female consumers' behavior when accompanied and when shopping alone would further enhance the generalizability of the results. This new approach would increase the reliability of the results, enhancing their ecological validity (Andrade, 2018; Araujo et al., 2007), and allowing for the potential discovery of additional factors that may have not emerged in the present research.

Appendix 1

	Age	Gender	Most visited place for shopping	Frequency of purchases (in person)	Companion
#1	76	F	Large grocery store	Once per week	
#2	76	F	Shoppping center	Once every two months	Yes
#3	76	F	Local (small) store	Once per fortnigh	
#4	77	F	Local (small) store	Once per fortnigh	
#5	84	M	Shopping center	Once every ten days	Yes
#6	76	M	Local (small) store	Once every three months	Yes
#7	84	M	Local (small) store	Once per week	Yes
#8	78	F	Local open-air markets	Once per week	
#9	76	F	Local (small) store	Once every three months	
#10	80	F	Local (small) store	Every day	Yes
#11	77	M	Local (small) store	Twice per week	
#12	77	M	Large grocery store	Once every two months	Yes
#13	80	M	Local (small) store	Twice per week	Yes
#14	76	F	Local open-air markets	Once per week	
#15	77	M	Local open-air markets	Once per week	
#16	76	F	Large grocery store	Once per week	
#17	76	F	Local open-air markets	Once per week	
#18	80	M	Local (small) store	Once per week	Yes
#19	76	F	Local (small) store	Every day	
#20	82	F	Local open-air markets	Once per week	Yes
#21	84	M	Local (small) store	Once per week	Yes
#22	76	F	Local (small) store	Every day	
#23	76	F	Local (small) store	Once per week	
#24	76	M	Local (small) store	Twice per week	
#25	84	F	Local (small) store	Once per week	Yes
#26	78	F	Local (small) store	Once per week	Yes
#27	81	F	Local (small) store	Once per week	Yes
#28	79	F	Local (small) store	Twice per week	Yes
#29	77	M	Large grocery store	Once per week	
#30	76	M	Local (small) store	Once per week	
#31	76	M	Local (small) store	Once per week	
#32	82	M	Local (small) store	Once per week	Yes
#33	76	F	Large grocery store	Once per month	
#34	76	M	Large grocery store	Once per month	Yes
#35	76	M	Large grocery store	Once per month	
#36	76	F	Large grocery store	Once per month	Yes

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