Proposal of a Measurement Instrument for the Adoption of Electronic Commerce in the Elderly: An Elicitation Study Based on the Theory of Planned Behavior.

Propuesta de un instrumento de medición para la adopción del comercio electrónico en personas mayores: un estudio de elicitación basado en la teoría del comportamiento planificado.

Nadia Soto-Hernández
MBA student
Universidad del Bío-Bío
Concepción, Chile
nadiasotohernandez@gmail.com

Elizabeth E. Grandón
Full professor
Universidad del Bío-Bío
Concepción, Chile
egrandon@ubiobio.cl

Patricio Ramírez-Correa
Associate professor and head of the School of Engineering
Universidad Católica del Norte, Coquimbo, Chile
patricio.ramirez@ucn.cl

Trabajo empírico – investigación

Reconocimiento: Esta investigación fue financiada por ANID-Chile, a través del programa FONDECYT, beca nro. 1210130

Abstract

The adoption of electronic commerce has been widely studied through various theories. However, the elderly segment has been relatively excluded from these studies. Focusing on older people is relevant due to the significant increase in the aging of the world population and the digital divide that marginalizes them from the benefits of technological advances. In this context, and based on the Theory of Planned Behavior, this study aims to build an instrument that measures older people's behavioral, normative, and control beliefs about electronic commerce. The instrument is developed through an elicitation study following a qualitative methodology. Thirty-four Chilean older people were interviewed based on a questionnaire of open questions associated with consequences, social referents, and obstacles to the use of electronic commerce. The 443 responses were examined through content analysis, which led to the determination of measures of behavioral beliefs, evaluation, normative beliefs, motivation to comply, control beliefs, and perceived facilitation. The measures determined are the basis for the proposal of a novel instrument that contains 66 items personalized to this age group. The findings of new variables obtained from the elicitation process highlight the importance of considering ad-hoc measurement scales in the development of public policies to promote the use of electronic commerce in older people. Future research could validate this instrument through a quantitative study in a sample of older people. The methodology followed can be replicated in this population to understand the use of other information technologies such as smartphones, and social network sites, among others.

Keywords: Elicitation study, TPB, older people, Chile

Resumen

La adopción del comercio electrónico ha sido ampliamente estudiada a través de diversas teorías. Sin embargo, el segmento de personas mayores ha quedado relativamente excluido de estos estudios. Enfocarse en personas mayores resulta relevante por el significativo aumento del envejecimiento de la población mundial y la brecha digital que los margina de los beneficios de los avances tecnológicos. En este contexto, y en base a la Teoría del Comportamiento Planeado, el objetivo de este estudio es construir un instrumento que mida las creencias de comportamiento, normativas y de control de las personas mayores en relación al comercio electrónico. El instrumento se desarrolla a través de un estudio de elicitación siguiendo una metodología cualitativa. Se entrevistaron a 34 personas mayores chilenas en base a un cuestionario de preguntas abiertas asociadas a consecuencias, referencias sociales y obstáculos del uso de comercio electrónico. Las 443 respuestas fueron examinadas a través de un análisis de contenido, cuyos resultados dieron paso a la determinación de medidas de creencias conductuales, evaluaciones, creencias normativas, motivación para cumplir, creencias de control y facilitación percibida. Las medidas determinadas son la base de la propuesta de un nuevo instrumento que contiene 66 ítems personalizados a este grupo etario. Los hallazgos de nuevas variables obtenidas del proceso de elicitación permiten relevar la importancia de considerar escalas de medida ad-hoc en el desarrollo de políticas públicas, con el fin de promover el uso del comercio electrónico en personas mayores. Futuras investigaciones podrían validar este instrumento a través de un estudio cuantitativo en una muestra de personas mayores. La metodología seguida puede ser replicada en esta población con el objetivo de entender el uso de otras tecnologías de información tales como smartphones, redes sociales, entre otras.

Palabras Clave: Estudio de elicitación, TPB, personas mayores, Chile

INTRODUCTION

The world is experiencing significant demographic change related to the rapid aging of the population. In 2019, there were 703 million people aged 65 and over in the world population, and by 2050, it is projected to reach 1500 million. On the other hand, between 1990 and 2019, the number of people aged 80 or over increased from 54 million to 143 million, and it is expected that between 2019 and 2050, this figure will reach 426 million (UN, 2019). Chile is not an exception to this growing phenomenon. The 2017 Chilean census showed that the number of older people totaled 2.9 million, positioning the country as one of the three most senior in Latin-America. Similarly, projections indicate that the population over 60 will reach 31.2% at the national level in 2050 (6.9 million older people), and a structural modification is expected since the number of people aged 80 and over will increase (CASEN, 2017).

In the recent worldwide context, information technology (IT) has provided innovative and efficient solutions to deal with the COVID-19 pandemic and ease confinement and social distancing measures. Unfortunately, however, the pandemic has also exposed the consequences and cost of the digital divide for older adults. Many people have not been able to take advantage of the benefits of digital technologies and, consequently, have been excluded from e-learning solutions and teleworking (OCDE et al., 2020). Furthermore, the available statistics regarding Information and Communication Technologies (ICTs) in Latin-America show that the age group of older people is the most isolated from digital technologies, exposing a significant digital divide (Sunkel & Ullmann, 2019).

ITs, and particularly the use of the Internet, generate multiple benefits, such as knowledge and access to government services, access to health programs, new educational opportunities, and access to social or entertainment programs, among numerous other benefits that have meant changes in the

social and economic development of countries (León et al., 2020). In particular, e-commerce has become an important economic sector and has consistently contributed to the economy of many developed and developing countries worldwide (Soh et al., 2020). However, in Chile, older people still show low participation in online transactions, whether in purchases or payments. This situation is worrying, given that online procedures are an advantage, especially for older people with mobility problems (Pinto-Fernández et al., 2018). On the other hand, the standardized instruments used in the literature to study the phenomenon of e-commerce adoption globally do not seem to be the best for analyzing a segment with very different characteristics from the general population. As Grandon & Mykytyn (2004) indicate, the development of sound theory-based instruments is crucial for developing the information systems area. Along these lines, the Theory of Planned Behavior (TPB) (Ajzen, 1991) proposes a procedure to elicit individuals' beliefs and thereby generate a basis for the generation of measurement instruments according to the population studied. The TPB suggests that people's expectations and values regarding executing a behavior form their behavioral, normative, and control beliefs. Such beliefs influence people's attitudes, subjective norms, and perceived behavioral control toward their intention, impacting their behavior (Downs & Hausenblas, 2005). This theory inspired Grandon & Mykytyn (2004) to use the TPB to determine the attitude beliefs, subjective norms, and perceived behavioral control towards electronic commerce by managers of small and medium-sized companies in Chile.

The relevance of elicitation studies is based on the valuable information about the thoughts and feelings people express regarding a behavior (Downs & Hausenblas, 2005). Since not all people share the same thoughts and feelings concerning a specific behavior, it is important to identify the most prominent beliefs related to adopting electronic commerce by a group of older people. Through the elicitation study, it is possible to achieve a revealing understanding of the reasons why older people adopt the behavior under analysis. In this context, elicitation studies have been carried out on numerous

topics. For example, Middlestadt (2012) developed an elicitation study to identify beliefs underlying specific eating and physical activity behaviors. Also, Lee et al. (2021) designed an elicitation study to obtain the most outstanding beliefs regarding sports participation among university students in South Korea. For their part, Dwyer et al. (2020) conducted an elicitation study, within the Theory of Planned Behavior framework to identify the underlying beliefs in the participation in the exercise of adults with cystic fibrosis. On the other hand, Etika et al. (2021) identified salient beliefs underlying speeding behavior among Nigerian commercial drivers.

Based on the Theory of Planned Behavior, this study aims to build an instrument that measures older people's behavioral, normative, and control beliefs about electronic commerce. In this way, it is intended to contribute to the making of appropriate decisions by the institutions that work with electronic commerce and to contribute to the design of public policies that seek to mitigate digital exclusion and help the integration and well-being of this group.

LITERATURE REVIEW

Electronic commerce

Electronic commerce is defined as "the process of buying and selling products or services through the electronic transmission of data through the Internet and www" (Turban et al., 2011). Electronic commerce is a concept that is linked to the use of ICT in a company's transactions, that is, with the help of technology, to offer and sell a company's products online.

Electronic commerce provides multiple advantages in terms of time and money since it allows a greater search for information and comparison before purchase, achieving a better price when

making the transaction, thus completing a purchase adapted to the needs and requirements of the client (Avilés et al., 2011). Zhao (2020) also indicates that the Internet and information communication technology generates a drastic reduction in transaction costs by bring sellers and buyers closer to each other.

In addition, relevant international evidence indicates the importance of focusing on this technology linked to older people. For example, Sukson (2018) indicates that older people are mostly retired, have a high purchasing power, and have credit cards. However, they are not users of electronic commerce, despite using the Internet frequently. This fact configures them as a potential group of clients prepared for online shopping platforms (Sukson, 2018).

On the other hand, Peral et al. (2013) state that the elderly correspond to a demographic group with the highest growth in developed countries. They enjoy more free time and may have greater income availability than other segments of the population; therefore, it represents an exciting market for ICTs. In fact, in Spain, the average annual expenditure on online purchases among those over 65 years of age in 2019, observed an increase of 32.2% compared to 2018 (ONTSI, 2020).

Theory of Planned Behavior

The Theory of Planned Behavior (TPB) was developed by Ajzen in 1985 and it is based on the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), which proposes the hypothesis that the intention of an individual to carry out a particular behavior is a determining factor of said behavior. According to Ajzen, "intentions are assumed to capture the motivational factors that influence behavior." Therefore, the intention to perform a behavior is determined by the individual's attitude toward the behavior and the subjective norm (Ajzen, 1991). The behavioral intention is the most direct and closest element to the behavior. It corresponds to the positive or negative appreciation that the

individual makes of the behavior and it is defined by the subject's beliefs about the results of the behavior and their appreciation of these results (Duarte, 2014). On the other hand, the subjective norm accounts for the perceived social pressure to execute or not a specific behavior.

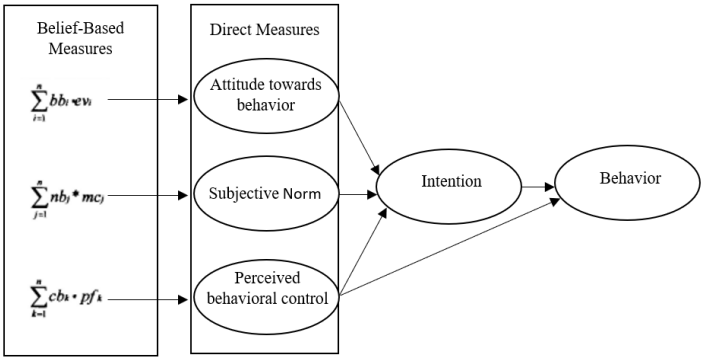
In 1991, Ajzen added the construct of perceived behavioral control (PBC) to TRA. This construct aims to meditate on an individual's perceptions regarding the existence of personal or situational impediments to the execution of a specific behavior. Thus, the TPB posits that perceived behavioral control indirectly influences behavior through intentions and directly when the person does not have complete control over that behavior.

Attitude, subjective norm, and perceived behavioral control are determined either by belief-based or direct measures. The majority of the studies carried out to date have used direct measures. However, belief-based measures have the advantage of providing insight into the cognitive basis underlying behavioral perceptions (Grandon & Mykytyn, 2004).

Belief-based measures are calculated by the cross-product of belief structures and other factors. For example, attitude is measured by the sum of behavioral beliefs that performing a behavior will lead to a particular outcome, weighted by an evaluation of the desirability of that outcome. For example, in the context of the adoption of electronic commerce by older people, an older person may believe that the use of electronic commerce can decrease the possibility of contagion from COVID and may consider this result highly desirable. On the other hand, the subjective norm is measured by the sum of normative beliefs relative to a particular referent, weighted by the motivation to comply with that referent. For example, an older person may believe their neighbors think he or she should use e-commerce, but complying with a neighbor's wishes may be relatively unimportant. Finally, perceived behavioral control is measured by the sum of the control beliefs, weighted by the perceived facilitation of the

control belief in inhibiting or facilitating the behavior. For instance, an older person may think that they do not have the knowledge to use electronic commerce and that knowledge is fundamental in determining the intention to use it. Figure 1 shows the TPB model, including belief-based and direct measures of attitude, subjective norm, and behavioral control.

Figure 1: TPB Model



Fuente; Ajzen 1991

TPB has been studied in Latin-America. For example, Ramírez-Correa et al. (2020) analyzed a sample of 489 consumers of specialty coffee from Brazil. They found a significant and positive relationship between the attitude towards specialty coffee and the intention to purchase this type of coffee. In addition, perceived behavioral control presented a positive and significant relationship with buying specialty coffees. However, the relationship between subjective norms and purchase intention was found to be non-significant. Also, Altobello et al. (2008) analyzed the adoption of electronic commerce by managers/owners of SMEs in Chile based on the Theory of Planned Behavior. Later, Grandón et al. (2011) compared the TPB and the TRA to determine which is a more parsimonious model to predict the intentions to adopt electronic commerce by managers/owners of SMEs in Chile.

TPB has been widely used in topics related to prediction and behavior changes, including the use of technology (Ajzen, 2020). However, to the best of our knowledge, no studies analyzed the adoption of electronic commerce by older people through the TPB. Some research have studied the adoption of electronic commerce by older people but through other theories, such as those by Aguilar-Flores & Chiang-Vega (2020) and Soh et al. (2020). However, such studies have not used belief-based measures. As an exception, Jung et al. (2017), through an elicitation study based on the TPB, obtained an in-depth understanding of the behavioral, normative, and control beliefs of low-income older adults associated with consuming fruits and vegetables.

METHOD

According to Ajzen's guidelines (Ajzen, 1991), the first steps in developing the Theory of Planned Behavior instrument consist of identifying the population of interest; determining the behavior of interest, and running an elicitation study to identify the specific elements of the questionnaire. This way, the measures of attitude beliefs, subjective norms, and perceived behavioral control are generated. The following table shows the methodological summary for obtaining the instrument, indicating the people involved in each step, as suggested by Ajzen.

Table 1: Steps to generate the instrument.

Step	Description	People involved
1	Determination of the population of interest. In this case, older people in Chile.	Researcher
2	Determination of the behavior of interest. In this case, the intention to adopt electronic commerce by older people in Chile.	Researcher
3	Elicitation of the perceived consequences of adopting electronic commerce, the social referents associated with it, and the possible obstacles and barriers to its adoption from an adequate subsample (between 20-30 people, according to (Ajzen, 1991).	Older people
4	Content analysis to identify the most frequent responses.	Researcher

5	Building measures of behavioral beliefs, evaluations, normative beliefs, motivation to comply, control beliefs, and perceived facilitation on the most cited responses.	Researcher
6	Development of TPB questions of intention, attitude, subjective norm, and perceived behavioral control.	Researcher

Fuente; Ajzen 1991

For the elicitation process (step 3), five open questions are included in the survey, which are presented in the following table:

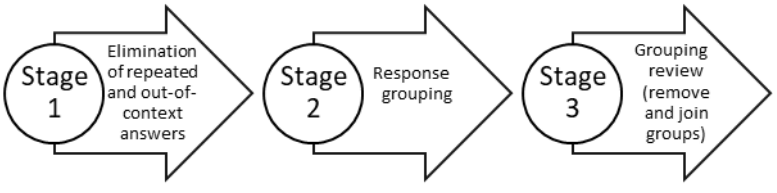
Table 2: Questions included in the survey.

No.	Question
1	What are some advantages of incorporating e-commerce into your day-to-day activities over the next year?
2	What are some disadvantages of incorporating e-commerce into your day-to-day activities over the next year?
3	Who are the people or groups that would approve of you incorporating e-commerce into your daily activities over the next year?
4	Who are the people or groups that would disapprove of you incorporating e-commerce into your daily activities in the next year?
5	What are some obstacles related to incorporating electronic commerce into your daily activities during the next year?

Fuente; Ajzen 1991

Based on the answers given to each question, content analysis is carried out in three stages, as shown in Figure 2:

Figure 2: Analysis stages



Fuente; Own Elaboration

The results of the application of the methodology are presented in the next section along with a discussion.

RESULTS AND DISCUSSION

For the purposes of this research, the older adult population is considered as people 60 years of age or older, a definition decreed in the Inter-American Convention on the Protection of the Human Rights of Older Persons (OAS, 2015). The data collection process was developed through a convenience sample through a printed survey that was answered by 34 older people. The surveys were distributed to the participants' homes, where the definition of electronic commerce and the questions were explained. Then, the completed surveys were withdrawn after an average of four days.

Most of the participants were women (59%), with secondary education (86%), from urban areas (85%), and aged between 65 to 84 years (56%). Table 3 shows a summary of the demographic information of the participants.

Table 3: Demographic information of the sample.

Gender	
Male	41%
Female	59%
Area of residence	
Urban	85%
Rural	15%
Age	
60-64	41%
65-74	38%
75-84	18%
>85	3%
School level	**Porcentaje**
Complete elementary school	15%
Incomplete elementary school	24%
Complete high school	29%
Incomplete high school	18%
Complete college	9%
Incomplete college	6%

Fuente; Own Elaboration

The behavioral, normative, and control beliefs are presented in detail, which were analyzed individually and then jointly by the researchers to agree on the results. Tables 5, 6, and 7 show the

summary of results of each step defined in Figure 2.

Behavioral Beliefs

Based on the question, what are some advantages of incorporating e-commerce into your daily activities over the next year? The study initially found 103 advantages. In the first stage, those advantages were refined, removing duplicates and out-of-context answers, yielding 72 advantages. In the second stage, they were grouped according to their type, obtaining 7 groups. In the third stage, no modifications were made, so the 7 groups now make up the 7 items associated with the questionnaire. These are: time savings, comfort and efficiency in delivery, comfort and quality in the purchase process, avoiding COVID contagion, cost reduction, safety by not walking around with cash, and a variety of products.

The most cited advantage (22.2% of the total) is saving time. This saving is perceived through not having to stand in line at stores to complete transactions, avoiding trips to stores, and the freedom to make purchases from one's home. The second most cited advantage (20.8% of the total) corresponds to the comfort and quality of the purchase process, highlighting the ease of making the purchase and ease of making collections and payments. The variety of products is located as the third most cited advantage (15.3% of the total). At this point, some participants stood out who mentioned the feasibility of "buying outside of Chile" and "greater access to commercial pages" with a wide variety of products. The fourth advantage is safety, seen as not carrying cash (11.1% of the total) and convenience and efficiency in delivery (11.1% of the total). Regarding safety, most participants alluded to avoiding theft of cash and concerning convenience, participants mentioned the comfort in obtaining the product since it arrives at home and the waiting periods for the arrival of the product. In fifth place is the reduction of costs (9.7% of the total) and the avoidance of COVID-19 (9.7% of the total). The decrease in costs is

manifested through not having to incur expenses in transportation and by accessing exclusive offers online. Regarding avoiding COVID contagion, the participants stated "not leaving home," "safety of buying without being exposed to the pandemic," "avoiding crowds," and "no exposure to the pandemic."

From the question, what are some of the disadvantages of incorporating electronic commerce into your daily activities during the next year? The study initially yielded 96 disadvantages. In the first stage, these disadvantages were refined, eliminating the duplicates and out-of-context answers, obtaining 76 disadvantages. In the second stage, they were grouped according to their type, obtaining ten groups. Finally, in the third stage, the researchers validated a content analysis, obtaining seven negative consequences of adopting electronic commerce. These are impulsive purchases, distrust due to system security issues, shipping errors or wrong product selection, lack of training in the use of technology, sedentary lifestyle, inefficiency in post-sale service, and impersonal service.

The most cited negative consequence (34.9% of the total) corresponds to mistrust due to system security issues. This mistrust is related to situations such as card cloning, fraud, products purchased not arriving, data theft, and scams, among others. The second most cited negative consequence corresponds to the lack of training in the use of technologies (26.9% of the total). In this aspect the participants mention "lack of knowledge," "lack of training," "not having the ability to technology," "little handling of cards," and "dependence on third parties." The third most cited disadvantage corresponds to errors in the shipping or wrong selection of products (17.5% of the total). At this point, the participants mention factors such as "loss of the product," "another product may arrive," and "sizes arrive different," among others. The fourth most cited disadvantage corresponds to the inefficiency in the post-sale service (11.1% of the total). It refers to the problems related to the exchange and return of products and the delay in the reimbursement after purchase cancellation. On the other hand, as less cited negative consequences, impulsive buying stands out (4.8% of the total), impersonal service (3.2% of the total),

alluding to not being able to see the person from whom you are buying. Finally, only one person mentioned the increase in sedentary lifestyle as a negative consequence (1.6% of the total).

Normative Beliefs

Based on the question, who are the people or groups that would approve of incorporating electronic commerce into their daily activities during the next year? The elicitation study yielded 89 positive referents.

In the first stage, these referents were refined, eliminating duplicates and those that did not proceed, obtaining 44 referents. In the second and third stages, they were grouped according to their type. Then, the groups were eliminated and/or joined through a content analysis, obtaining nine groups or items for the questionnaire. These are social groups, friends, family, neighbors, people who work in SMEs or large companies that use e-commerce, younger generational groups, people with physical limitations, people who appreciate the practicality of e-commerce, and co-workers.

The most cited positive social reference corresponds to people who work in SMEs or large companies that use electronic commerce (32.6% of the total). As for SMEs, the participants mention people who work in "spare stores," "paint shops," "fairs," "entrepreneurs," and as for large companies, the participants mention people who work in "retail," "banks," "commercial houses," and "supermarkets." The second most cited positive social reference corresponds to the family (27.9% of the total), where children, grandchildren, and siblings, among others, stand out. In third place are people who appreciate the pragmatism of electronic commerce (9.3% of the total) and co-workers (9.3% of the total). Regarding the first, the participants mention as a positive social reference "those who like comfort," "those who do not want to waste time," "people who do not have time," and "people

who avoid crowds." As for co-workers, the participants mention "bosses," "secretaries," "purchasing department," and "customers and suppliers" as positive social referents. The fourth most cited social reference corresponds to social groups (7.0% of the total). In this item, the participants mention "elderly adult club," "neighborhood association," and "elderly adult headquarters." Finally, sharing fourth place, the youngest generational groups are positioned (7.0% of the total). Likewise, only one person mentioned neighbors as a positive social reference (2.3% of the total), friends (2.3% of the total), and people with physical limitations (2.3% of the total).

Based on the question, who are the people or groups that would disapprove of incorporating electronic commerce into their daily activities during the next year, the elicitation study yielded 62 negative referents. In the first stage, these referents were refined, eliminating duplicates and those out-of-context, obtaining 37 referents. In the second and third stages, they were grouped according to their type through a content analysis validated by the researchers, obtaining six groups or items for the questionnaire. These are social groups, friends, family, neighbors, people with previous bad experiences in electronic commerce, and people without knowledge or access to technological tools.

The most cited negative social reference corresponds to the family (33.3% of the total). The second most mentioned negative social reference corresponds to people with previous bad experiences with electronic commerce (30.0% of the total). This item refers to those people who have lost their jobs due to the widespread use of electronic commerce, for example, cashiers, vendors, and stockers. The third most cited negative social reference is related to people without knowledge or access to technological tools (20.0% of the total). In particular, the respondents refer to people who do not dominate the PC, do not handle technology, illiterate people, or people with less education. Friends are in fourth place (10.0% of the total). In fifth place are the social groups (3.3%) and the neighbors (3.3%).

It is worth noting that some social referents, such as social groups, friends, family, and neighbors, were mentioned as both positive and negative social referents. This situation could be explained through human cognition, understood as to how each person perceives and interprets himself and his external environment (Chiavenato, 2009). Therefore, the foregoing could cause each of the entities mentioned above to express a positive or negative perception regarding adopting electronic commerce and influence others subject to their conception regarding the behavior studied.

Control Beliefs

From the question, what are some obstacles related to the incorporation of electronic commerce in your daily activities during the next year, the elicitation study yielded 93 answers. In the first stage, these obstacles were refined, eliminating duplicates and those that do not proceed, obtaining 71 obstacles. In the second and third stages, they were grouped according to their type through a content analysis validated by the researchers, obtaining five groups or items for the questionnaire. These are low motivation to learn, lack of training in the use of technologies, not having the technical resources that allow purchasing, insecure and unreliable system, and health problems.

The most cited obstacle corresponds to the lack of training in using technologies (43.5% of the total). At this point, the following comments from the participants stand out "little electronic or technological preparation," "little knowledge of technology," "little use of technological means," "lack of learning," and "little use of digital platforms." The second most cited obstacle corresponds to not having the technical resources that allow the purchase to be completed (30.4% of the total), highlighting comments such as: "not having Internet," "not having a credit card," not having a smart cell phone," "not having a computer," "the poor quality of the Internet signal" and "the malfunction

due to frequent drops in the Internet signal." In third place, the obstacle corresponding to the insecure and unreliable system appeared (15.9% of the total). In this item, the following comments were maid "fear of being scammed," "misleading offers," and "data risk," among others. In fourth place, health problems are positioned as an obstacle (5.8% of the total), highlighting those of an ophthalmological type (vision). Finally, the low motivation to learn stands out (4.3% of the total).

Table 5: Summary stage 1 - Elimination of repeated responses

	Number of responses				
	Positive consequences (advantages)	Negative consequences (disadventages)	Positive referents	Negative referents	Obstacles
Initial number of responses	103	96	89	62	93
Number of deleted answers	31	20	45	25	22
Final number of responses	72	76	44	37	71

Fuente; Own Elaboration

Table 6: Summary stage 2 – Grouping

	N° of answers per item				
Initial Ítems	Positive consequences (advantages)	Negative consequences (disadventages)	Positive referents	Negative referents	Obstacles
1	16	1	3	1	3
2	8	3	1	3	30
3	15	22	12	10	11
4	7	11	4	4	3
5	7	1	3	5	13
6	8	17	1	6	8
7	11	1	1	7	3
8		7	4	1	
9		11	10		
10		2	4		
11			1		
Total	72	76	44	37	71

Fuente; Own Elaboration

Table 7: Summary stage 3 - Review of the grouping

Item	Positive consequences (advantages)	Negative consequences	Positive referents	Negative referents	Obstacles
1	16	3	3	1	3
2	8	22	1	3	30
3	15	11	12	10	11
4	7	17	1	9	21
5	7	1	14	6	4

6	8	7	3	1	
7	11	2	1		
8			4		
9			4		
Total	72	63	43	30	69

Fuente; Own Elaboration

The following table summarizes outstanding final items associated with behavioral, normative, and control beliefs.

Table 8: Outstanding consequences, social referents, and obstacles in adopting electronic commerce.

	Consequences
1	Time saving
2	Comfort and efficiency in delivery
3	Comfort and quality in the purchase process
4	Avoid COVID contagion
5	Costs reduction
6	Safety by not carrying cash
7	Variety of products
8	Impulsive purchase
9	Mistrust due to system security issues
10	Errors in shipping or wrong selection of products
11	Lack of training in the use of technologies
12	Encourages a sedentary lifestyle
13	Inefficiency in the post-sale service
14	Impersonal service
	Social References
1	Social groupings
2	Friends
3	Family
4	Neighbours
5	People with previous bad experiences in the use of electronic commerce
6	People without knowledge or access to technological tools
7	People who work in SMEs or large companies that use e-commerce
8	Younger generation groups
9	People with physical limitations
10	People who appreciate the convenience of e-commerce
11	Co-workers
	Obstacles
1	Low motivation to learn
2	Lack of training in the use of technologies
3	Not having the technical resources to make the purchase
4	Insecure and unreliable system
5	Health problems

Fuente; Own Elaboration

Finally, we proceeded to create measures of behavioral beliefs, evaluations, normative beliefs, motivation to comply, control beliefs, and perceived facilitation of the most cited answers (step 5 in Table 1) and the development of TPB questions of intention, attitude, subjective norm, and perceived behavioral control (step 6 in Table 1). Both steps' results are presented in the proposed instrument shown in Appendix A.

Based on the information available in the literature, this study represents the first to qualitatively explore older people's perceptions of adopting e-commerce using the TPB. This study allowed the identification of relevant and unique factors of behavioral, normative, and control beliefs related to the adoption of electronic commerce by this segment in Chile.

CONCLUSION

The current study developed an instrument to study older people's adoption of electronic commerce following the methodological bases proposed by (Ajzen, 1991). The instrument was developed from an elicitation study applied through a survey of 34 Chilean participants. The elicitation study allowed the discovery of older people's behavioral, normative, and control beliefs regarding de adoption of electronic commerce.

The study revealed that the most prominent control belief corresponds to the lack of older people training in using technologies. Therefore, addressing this type of need is a recommendation for developing effective training programs that contribute to the well-being, independence, and autonomy of the elderly. In addition, saving time was found to be one of the most highly valued behavioral beliefs of older people. In other words, older people value optimizing their time; therefore, electronic commerce would represent a means to achieve this objective.

These results have important implications for the business sector, specifically for those companies that already work with electronic commerce. Companies that plan to implement electronic commerce in the short term can also be interested in these results since they can create commercial strategies that focus on the specific beliefs that may influence e-commerce adoption by older people.

Even though this study followed a well-defined procedure, it is not without limitations. In the sample under analysis, older people residing in urban areas predominated. Therefore, the results may not be generalized to older people living in rural areas. In addition, the highest percentage of respondents is between 60-74 years old with secondary education or less.

Based on the above, it is suggested that future research incorporate people over 74 years and with higher education. Likewise, although it cannot be considered a limitation, it is recommended that future research analyze an equal number of men and women to determine if there are differences in their perceptions according to gender. Finally, future research could focus on validating the instrument generated in this research through a quantitative study applied to a sample of older people. In addition, the methodology followed can be replicated in this population in order to understand the use of other information technologies such as smartphones, health monitors, and social networking sites, among others.

REFERENCES

Aguilar-Flores, S. M., & Chiang-Vega, M. M. (2020). Factores que determinan el uso de las TIC en adultos mayores de Chile. *Revista Científica*, *39*(3), 296–308. https://doi.org/10.14483/23448350.16054

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, *50*, 179–211.

Ajzen, I. (2020). The theory of planned behavior: Frequently asked questions. *Human Behavior and Emerging Technologies*, *2*(4), 314–324. https://doi.org/10.1002/hbe2.195

Altobello, S., Grandón, E., & Mykytyn, P. P. (2008). Predicting electronic commerce adoption in Chilean SMEs. *Journal of Business Research*, *61*, 697–705. https://doi.org/10.1016/j.jbusres.2007.06.047

Avilés, D., Cáceres, M. F., & Leiva, N. (2011). *El uso de e-commerce en las nuevas generaciones. Modelo de adopción de tecnología desde la perspectiva del cliente* [Universidad de Chile]. https://repositorio.uchile.cl/handle/2250/108033

CASEN. (2017). *Encuesta de Caracterización Socioeconómica Nacional. Personas mayores, envejecimiento y cuidados.* http://observatorio.ministeriodesarrollosocial.gob.cl/storage/docs/grupos-poblacion/Documento_de_resultados_Personas_mayores_envejecimiento_y_cuidados_31.07.2020.pdf

Chiavenato, I. (2009). *Administración de recursos humanos. El capital humano de las organizaciones. Novena edición*.

Downs, D. S., & Hausenblas, H. A. (2005). Elicitation studies and the theory of planned behavior: A systematic review of exercise beliefs. *Psychology of Sport and Exercise*, *6*(1), 1–31. https://doi.org/10.1016/j.psychsport.2003.08.001

Duarte, A. (2014). *El poder explicativo de la teoría de la acción planificada para la elección del uso de diferentes medios de transporte*. 1–72.

Dwyer, T. J., Griffin, B. N., Bye, P. T. P., & Alison, J. A. (2020). Elicitation interview study to identify salient beliefs about exercise participation in adults with cystic fibrosis. *Physiotherapy (United Kingdom)*.

Etika, A., Merat, N., & Carsten, O. (2021). Identifying salient beliefs underlying speeding behaviour: An elicitation study of nigerian drivers. *Transportation Research Interdisciplinary Perspectives*.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behaviour: An introduction to theory and research*.

Grandon, E. E., & Mykytyn, P. P. (2004). Theory-based instrumentation to measure the intention to use electronic commerce in small and medium sized businesses. *Journal of Computer Information Systems*, *44*(3), 44–57. https://doi.org/10.1080/08874417.2004.11647581

Grandón, E. E., Nasco, S. A., & Mykytyn, P. P. (2011). Comparing theories to explain e-commerce adoption. *Journal of Business Research*, *64*(3), 292–298. https://doi.org/10.1016/j.jbusres.2009.11.015

Jung, S. E., Shin, Y. H., Kim, S., Hermann, J., & Bice, C. (2017). Identifying Underlying Beliefs About Fruit and Vegetable Consumption Among Low-Income Older Adults: An Elicitation Study Based on the Theory of Planned Behavior. *Journal of Nutrition Education and Behavior*, *49*, 717-723.e1. https://doi.org/10.1016/j.jneb.2017.05.343

Lee, C. G., Kwon, J., Ahn, C., Park, S., Yang, Y. K., & Park, S.-U. (2021). Identification and evaluation of beliefs about sport participation among South Korean university students. *Journal of American College Health*.

León, R., Meza, S., Araneda, T., & Villaroel, M. (2020). *Brecha en el uso de internet: Desigualdad digital en el 2020. Fundación País Digital*. 28. https://paisdigital.org/download/estudio-brecha-en-el-uso-de-internet-2020/?wpdmdl=20151

Middlestadt, S. (2012). Beliefs Underlying Eating Better and Moving More: Lessons Learned from Comparative Salient Belief Elicitations with Adults and Youths. *The ANNALS of the American Academy of Political and Social Science. 2012;640(1):81-100.* https://doi.org/10.1177/0002716211425015

OAS. (2015). *Inter-American Convention on Protecting the Human Rights of Olders Pearsons. Organization of American States*. https://www.oas.org/en/sla/dil/docs/inter_american_treaties_A-70_human_rights_older_persons.pdf

OCDE, CAF, CEPAL, & C. EUROPEA. (2020). *Perspectivas económicas de América Latina 2020. Transformación digital para una mejor reconstrucción*.

ONTSI, 2019. (2020). *Observatorio Nacional de las Telecomunicaciones y de la Sociedad de la Información, ONTSI (2019).* https://doi.org/10.30923/2695-5830-2020

Peral, B., Arenas, J., & Ramón, M. Á. (2013). El papel de las variables sociodemográficas en el uso de las aplicaciones basadas en Internet por los mayores. *Innovar*, *23*(48), 55–66.

Pinto-Fernández, S., Muñoz-Sepúlveda, M., & Leiva-Caro, J. A. (2018). Uso de tecnologías y comunicación en adultos mayores chilenos. *CTS: Revista Iberoamericana de Ciencia, Tecnología y Sociedad*, *13*(39), 143–160.

Ramírez-Correa, P., Rondán-Cataluña, F. J., Moulaz, M. T., & Arenas-Gaitán, J. (2020). Purchase intention of specialty coffee. *Sustainability (Switzerland)*, *12*(4), 1–13. https://doi.org/10.3390/su12041329

Soh, P. Y., Heng, H. B., Selvachandran, G., Anh, L. Q., Chau, H. T. M., Son, L. H., Abdel-Baset, M., Manogaran, G., & Varatharajan, R. (2020). Perception, acceptance and willingness of older adults in Malaysia towards online shopping: a study using the UTAUT and IRT models. *Journal of Ambient Intelligence and Humanized Computing*, *0123456789*. https://doi.org/10.1007/s12652-020-01718-4

Sukson, C. (2018). *Relative Valuation of Diageo Public Limited Company a Thematic Paper Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Management College of Management Relative Valuation of*.

Sunkel, G., & Ullmann, H. (2019). Las personas mayores de América Latina en la era digital: superación de la brecha digital. *Revista de La CEPAL*, *2019*(127), 243–268. https://doi.org/10.18356/db143bd3-es

Turban, E., Lang, J., & King, D. (2011). *Introduction to Electronic Commerce*.

UN. (2019). *United Nations. Department of Economic and Social Affairs.Population Division (2020). World Population Ageing*. https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/files/documents/2020/Jan/un_2019_worldpopulationageing_report.pdf

Zhao, R. (2020). Technology and economic behavior: A theoretical framework. *Human Behavior and Emerging Technologies*, *2*(4), 336–342. https://doi.org/10.1002/hbe2.211

Appendix A. Proposed instrument to measure older people's incorporation of electronic commerce.

Adoption of electronic commerce by older people

Electronic commerce is defined as "the process of buying and selling products or services through the electronic transmission of data through the Internet and www." Payment for the products or services you purchase is also deemed to be made electronically.

Instructions

Please put an "X" in the place of the scale that best describes your opinion.

Social factors

How strongly would each of the following people or groups of people approve or disapprove of incorporating electronic commerce into their daily activities this year?

	Strongly disapprove	**Slightly disapprove**	**Neutral**	**Slightly approve**	**Strongly approve**
Social groups to which I belong					
Friends					
Relatives					
Neighbors					
People with previous bad experiences in the use of electronic commerce					
People without knowledge or access to technological tools					
People who work in SMEs or large companies that use e-commerce					
Younger generation groups					
People with physical limitations					
People who appreciate the convenience of e-commerce					
Co-workers					

In general, how important is it for you to comply with what the following people or groups of people think?

	Very unimportant	**Slightly unimportant**	**Neutral**	**Slightly important**	**Very important**
Social groups to which I belong					
Friends					
Relatives					
Neighbors					

People with previous bad experiences in the use of electronic commerce					
People without knowledge or access to technological tools					
People who work in SMEs or large companies that use e-commerce					
Younger generation groups					
People with physical limitations					
People who appreciate the convenience of e-commerce					
Co-workers					

Possible obstacles and barriers

How likely are you to have the following items to incorporate e-commerce into your daily activities this year?

	Very unlikely	**Slightly unlikely**	**Neutral**	**Slightly likely**	**Very likely**
Motivation to learn					
Training in the use of technologies					
Technical resources that allow the purchase to be completed					
Reliable and secure system					
Good health					

How relevant is each of the following elements to incorporating e-commerce into your daily activities this year?

	Very irrelevant	**Slightly Irrelevant**	**Neutral**	**Slightly relevant**	**Very relevant**
Motivation to learn					
Training in the use of technologies					
Technical resources that allow the purchase to be completed					
Reliable and secure system					
Good health					

Opinion

For you, incorporating electronic commerce into your daily activities this year would be:

	Extremely	**Slightly**	**Neutral**	**Slightly**	**Extremely**	
Bad						Good
Harmful						Useful
Negative						Positive
Ineffective						Effective
Fool						Wise

For you, incorporating e-commerce this year would be:

	Extremely	**Slightly**	**Neutral**	**Slightly**	**Extremely**	
Difficult						Easy
Out of my control						Under my control
Complicated to carry out						Simple to carry out

Future consequences

How likely are the following consequences of incorporating e-commerce into your daily activities?

Consequences	**Very unlikely**	**Slightly unlikely**	**Neutral**	**Slightly likely**	**Very likely**
Time-saving					
Increased convenience and efficiency of delivery					
Increased convenience and quality of the purchasing process					
Reduction of COVID contagion					
Costs reduction					
Increased security by not walking around with cash					
More variety of products					
Increase in impulse buying					
Increased mistrust due to system security issues					
Greater number of shipping errors or wrong product selection					
Increased training in the use of technology					
Increased sedentary lifestyle					
Post-sale service worsens					
Increases the impersonality of the service					

Attributes

In general, how good or bad are the consequences associated with using electronic commerce indicated below for you?

	Extremely bad	**Slightly bad**	**Neutral**	**Slightly good**	**Extremely good**
Time-saving					
Increased convenience and efficiency of delivery					
Increased convenience and quality of the purchasing process					
Reduction of COVID contagion					
Costs reduction					

Increased security by not walking around with cash					
More variety of products					
Increase in impulse buying					
Increased mistrust due to system security issues					
Greater number of shipping errors or wrong products selection					
Increased training in the use of technology					
Increased sedentary lifestyle					
Post-sale service worsens					
Increases the impersonality of the service					

Please answer the following questions according to the scale that best expresses your opinion:

	Strongly disagree	**Slightly disagree**	**Neutral**	**Slightly agree**	**Strongly agree**
Incorporating electronic commerce into my daily activities this year would be good					
Incorporating electronic commerce into my daily activities this year would be positive					
Incorporating electronic commerce into my daily activities this year would be effective					
Incorporating e-commerce into my daily activities this year would be detrimental					
Incorporating electronic commerce into my daily activities this year would be silly					
Most of the people who are important to me think that I should incorporate e-commerce this year					
Most of the people who influence my behavior think that I should incorporate e-commerce this year					
People whose opinions I value would prefer that I introduce e-commerce this year					
Incorporating e-commerce this year would be easy					
Incorporating e-commerce this year would be under my control					
Incorporating electronic commerce this year would be simple to carry out					
I will try to incorporate e-commerce this year					
I have some plans to incorporate e-commerce this year					
I have a strong commitment to incorporate e-commerce this year					
I use e-commerce frequently					
I have purchased a significant number of products or services through e-commerce in the last year					