

The adoption of online grocery shopping: the case of Dutch seniors

Master Thesis Business Administration – Innovation & Entrepreneurship

Radboud University Nijmegen | 2018 - 2019



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Abstract

Online grocery shopping is an upcoming trend in the Netherlands. However, older consumers are lagging behind in this adoption process. Therefore, this study aims to determine which factors contribute to the adoption of online grocery shopping among Dutch older consumers. In line with the Technology Readiness Index, factors that function either as drivers or as inhibitors have been studied. A survey is conducted among Dutch older consumers (N = 442). Results of a multiple regression analysis show that eight factors, a) convenience orientation (+), b) perceived risk (-), c) innovativeness (+), d) household size (+), e) gender, f) grocery-specific perceived risk (-), g) health issues (+) and h) delivery fee (-), account for 32.3% of the explained variance in the intention to adopt online grocery shopping among older consumers in the Netherlands. The first three predictors, account for 25.6% of the explained variance and are described as selective innovativeness. Findings suggest that 21.5% of older consumers has the intention to use online grocery shopping in the coming year. This implies that there are possibilities to increase traffic of older consumers in online grocery shopping. In order to do so, retailers should implement a marketing strategy that highlights how convenient and safe it is to order groceries online.

Keywords: *Online grocery shopping, technology readiness, adoption model, older consumers.*

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1. Introduction

In the Netherlands, the society is greying (De Kruijf & Langenberg, 2017). This development will lead to an increased proportion of older consumers. Therefore, the older consumer will become a more important target group for retailers. One thing every consumer needs is groceries. In grocery shopping a lot of money is involved. In 2017 the total revenue of supermarkets in the Netherlands was above 35 billion Euros (GFK, 2017) and in 2018 this increased with 3.8% (CBS, 2019a). A recent innovation in the grocery shopping industry is online grocery shopping. While in 2006 hardly anyone bought groceries online, in 2017 29% of the Dutch households had at least once bought their groceries online in the past 12 months (Eurostat, 2018). Clearly, online grocery shopping is an upcoming trend. However, statistics show differences in the adoption of online grocery shopping among different age groups. The peak of the adoption rate of online grocery shopping is between 20 and 44 years old (Eurostat, 2018). After that, there is a negative relationship between age and online grocery shopping (Eurostat, 2018). Thus, the older the consumer, the less he or she uses online grocery shopping. Interestingly, health issues are one of the triggers to start online grocery shopping (Hand, Dall'Omo Riley, Harris, Singh, & Rettie, 2009; Morganosky & Cude, 2000), and older consumers experience more health issues (CBS, 2018). So, even though health issues might trigger the older consumer to start online grocery shopping, the older consumer is less likely to actually start doing groceries online. This contradiction leads to the question why only a small amount of the older consumers is adopting online grocery shopping?

Answering this question is difficult, since it is hard to estimate how the combination of factors that trigger or prevent older consumers from doing online grocery shopping add up in determining whether the older consumer adopts this innovation or not. An example of this is that on the one hand one of the factors that might influence the lower adoption rate among older consumers is the loneliness older consumers experience (Van Beuningen & De Witt, 2016). Going to a local shop to buy groceries is a possibility to have social contacts and thus overcome this loneliness. This reasoning suggests that it is less likely for older consumers to start doing their grocery shopping online. On the other hand, most of the loneliness is due to health issues, and health issues are a trigger to adopt online grocery shopping, because that can result in less mobility (Hand et al., 2009). So, people might overcome loneliness by going to the supermarket, while the loneliness might be caused by health issues, which makes it more likely to adopt online grocery shopping. Both lines of reasoning sound convincing, however, what drives the older consumer more in determining whether to adopt online grocery shopping?

Technology Readiness Index (TRI), an index that measures readiness to embrace new technologies, offers a framework to deal with both factors that have a positive and a negative impact on the adoption

of online grocery shopping (Parasuraman, 2000). The TRI consists of two scales that measure the drivers of technology readiness and two scales that measure the inhibitors of technology readiness (Parasuraman, 2000). Since it has not been researched whether older consumers value some of these factors that do or do not lead to adoption more than other factors, this research uses TRI as a framework to focus on both the factors that have a negative impact and a positive impact on the adoption of online grocery shopping amongst older consumers. This leads to the following problem statement:

Which factors prevent and trigger older consumers towards adopting online grocery shopping in the Netherlands and to what extent do these factors determine older consumers' intention to adopt online grocery shopping?

1.1. Relevance

This research is relevant in several ways. Academically it adds to the current literature on adoption of online grocery shopping in general and for older consumers specifically. Secondly, it has practical relevance for both consumers and retailers. The following sections discuss this relevance in more depth.

1.1.1. Academic relevance

There has been only little research on the adoption of online grocery shopping specifically. There has been some research in the field, but that is mainly about online shopping in general. Even though online grocery shopping is part of online shopping, the factors that lead to adoption of online shopping are not necessarily the same factors that do lead to adoption of online grocery shopping. This is because online shopping and online grocery shopping show some differences. Firstly, the products in grocery shopping are perishable, which is not the case in online shopping, that especially focusses on products as books, electronics and clothes for example (Mortimer, Fazal e Hasan, Andrews & Martin, 2016). Secondly, there is a higher shopping frequency in grocery shopping compared to other shopping activities for books, electronics and clothes for instance (Mortimer et al., 2016). Therefore, this research specifically focusses on the adoption of online grocery shopping. Secondly, most triggers for adoption are general factors that lead to adoption and are not age specific. Lee and Coughlin (2015) found that the older consumer values different factors in adopting innovations than younger consumers. Therefore, this research focusses especially on the older consumer, which will give new insights in the current academic literature.

1.1.2. Practical relevance

This study focusses on determining which factors trigger or inhibit older consumers from adopting online grocery shopping. Understanding the triggers for adoption that are specific for this group can be of added value for the retailers. This is because the older consumer will become a more important age-group for the retailers, because of the greying society in the Netherlands (De Kruijf & Langenberg, 2017). Besides that, retailers should be aware of the inhibitors for adoption among this group, in order to deduct the influence of these inhibitors, for instance by the marketing strategy. To determine which ways the retailer should use to reach out to this increasing group of older consumers, it is important to know whether or when the innovation of online grocery shopping will be beneficial for older consumers. The results give retailers important insights in what ways they can add value for the older consumer and in what ways they can add their business' value by offering appropriate offerings to the older consumer.

1.2. Research outline

This research proposal consists of four chapters. Chapter 1 has introduced the problem statement. Chapter 2 clarifies the concepts, discusses relevant literature and presents the conceptual model, including the hypotheses. Chapter 3 discusses the methodology that will be used for conducting this research. Chapter 4 presents the results of the conducted study and chapter 5 will draw conclusions based on these results. Furthermore, chapter 5 will discuss implications, limitations and closes with directions for future research.

2. Literature review, research model and hypotheses

This chapter aims to find factors in the literature that are likely to relate to the adoption of online grocery shopping among older consumers. These factors serve as input for the conceptual model that will be tested later in this research. Paragraph 2.1 starts by discussing key characteristics of the older consumer. Paragraph 2.2 discusses the TRI and paragraph 2.3 examines the factors influencing adoption of online grocery shopping among older consumers. Since not all questions will be answered satisfactorily, empirical research is needed. Therefore paragraph 2.4 combines all the information into a conceptual model.

2.1. The older consumer

In the Netherlands people used to retire at the age of 65. However, currently this age is slightly increasing every year till it is at 67 in 2021 (Rijksoverheid, n.d.). Some studies have taken this age of 65 as definition of the older consumer, however when the retirement age is increasing, should the definition of the older consumer be adapted too? I personally do not think so, defining the older consumer has to do with a lot more than only the retirement age, for instance with biological changes. That is why several studies have used different ages to determine the older consumer. Ages that are common in studies differ between 50 and 80 years old. In order to determine what is suited for this research, a closer look is taken on the characteristics of the older consumer.

Aging influences people in several ways (Broeshart, Heidendal & De Jager, 2000). Firstly physiological, already from the age of 30 people are experiencing obsolescence in biological changes (Broeshart et al., 2000). However, most of this happens when they are unaware of it. Only from the age of 40 or 50 people are starting to notice these biological signs of obsolescence. Some of these changes are a decrease of strength in the muscles, osteoporosis, a decrease in the lung capacity and a decrease of sight and hearing (Kasper, 2018). Secondly obsolescence does influence the psychological functioning (Broeshart et al., 2000). Cognitively it is more difficult to transfer information from the short-term memory to the long-term memory. Because of that, it is more difficult to efficiently store the information. Also, because of some physiological changes, it gets more difficult for the elderly to process much information at the same time (Broeshart et al., 2000). So, based on the physiological and psychological changes the first signs of obsolescence already start in an early stage, around 30. However, people are starting to be aware of this around the age of 40 or 50 (Broeshart et al., 2000).

Besides the physiological and psychological aspects, there are changes in social aspects as well. A study conducted in the USA by Stone, Schwartz, Broderick & Deaton (2010) on age and self-reported well-

being shows that well-being is a U-curve during the lifetime. Well-being is reported as high during the youth and decreases when time evolves. Around the age of 50, it is on the lowest point. After that, the self-reported well-being increases as age increases. To a lesser extent, the same U-curve is found in a European study (Veenhoven, 2006). Also, in a study in the Netherlands among people of 45 years and older it is shown that age is positively related to life satisfaction (Kasper, Webers, Moschis & Mathur, 2017).

Based on the information about aging, it can be stated that people are influenced by the biological changes already way before they are retiring (Broeshart et al., 2000). This is the reason to define the older consumer around the age that they are starting to be aware of these changes. Besides that, the mentioned studies on well-being showed that people from 50 years and onwards, even though they start being aware of getting older, show an increase in well-being (e.g. Stone et al., 2010). Based on this information on biological changes and well-being, this study defines the older consumer as a consumer of 50 years and older.

2.2. Technology Readiness Index (TRI)

The TRI is a multi-item scale that measures readiness to embrace new technologies (Parasuraman, 2000). Parasuraman developed this scale because of the growing number and the increasing role of technology-based products and services. These developments did benefit customers, however there was also evidence of frustration among customers dealing with technology-based systems. Therefore, the developed multi-item scale measures both the benefits and the frustrations (Parasuraman, 2000).

The TRI consists of four scales, 1) optimism: A positive view of technology and a belief that it offers people increased control, flexibility, and efficiency in their lives. 2) Innovativeness: A tendency to be a technology pioneer and thought leader. 3) Discomfort: A perceived lack of control over technology and a feeling of being overwhelmed by it. 4) Insecurity: Distrust of technology and skepticism about its ability to work properly. The scales optimism and innovativeness are drivers of technology readiness and the other two scales, discomfort and insecurity, are inhibitors of technology readiness (Parasuraman, 2000). The original TRI has been revised to the TRI 2.0, this scale contains less items, only 16 in total, but still consists of the same four scales and is tested on validity and reliability (Parasuraman & Colby, 2015). The TRI 2.0 included new items, because of the fast-changing pace technology comes with (Parasuraman & Colby, 2015). In table 1, Cronbach's α of the scales of TRI 2.0 are given. This table shows that the TRI 2.0 is a reliable instrument to measure the scales optimism, innovativeness, discomfort and insecurity. However, this reliability derives from a study in the USA,

which is not the target group for this study. Since the technological developments in the USA are practically on the same level as in the Netherlands, it is expected that the scale will also be reliable among Dutch consumers.

Table 1.

Reliability of TRI 2.0 (Parasuraman & Colby, 2015).

	Items	A
Optimism	4	.80
Innovativeness	4	.83
Discomfort	4	.70
Insecurity	4	.71

In the validation of TRI 2.0 Parasuraman and Colby (2015) distinguished several segments, one of them is the segment avoiders. The avoiders score high on the inhibitors and low on the drivers of technology readiness, this means they show a lot of resistance towards new technologies and very little motivation to adopt and use new technologies, therefore the avoiders can be seen as late adopters (Parasuraman & Colby, 2015). Another segment they distinguished are the hesitators, the hesitators show a low degree of innovativeness and are therefore less likely to be ready to adopt new technologies (Parasuraman & Colby, 2015). Interestingly, these two segments are populated by a majority of people that are 50 years and older, respectively for 79 and 69 percent (Parasuraman & Colby, 2015). Therefore, it is expected that older consumers will score higher on the inhibitors than on the drivers.

H1: Older consumers score significantly higher on the inhibitors than on the drivers of the TRI.

2.3. Factors influencing adoption

The factors of the TRI provide a framework in order to understand whether someone is ready to adopt new technological products or services. Therefore, TRI can be a useful framework in understanding the adoption of online grocery shopping among older consumers. However, it is expected that more factors are involved in this adoption process. This section discusses literature that provides factors, that might have an influence on the adoption of online grocery shopping among older consumers besides the factors found in the TRI. First, an overview will be given of the literature on adoption in general by the older consumer. After that factors that influence the adoption of online grocery shopping will be linked to the literature on the older consumer in order to come up with hypotheses about the adoption of online grocery shopping among older consumers.

2.3.1. Factors influencing adoption by the older consumer

By reviewing many articles related to technological adoption and the older consumer, Lee and Coughlin (2015) were able to distinguish ten different factors that influence the adoption of technological-enabled products and services among older consumers. These factors can be found in table 2.

Table 2.

Factors of older consumers' technology adoption.

Factor	Description
Value	Perception of usefulness and potential benefit.
Usability	Perception of user friendliness and ease of learning.
Affordability	Perception of potential cost savings.
Accessibility	Knowledge of existence and availability in the market.
Technical support	Availability and quality of professional assistance throughout use.
Social support	Support from family, peers and community.
Emotion	Perception of emotional and psychological benefits.
Independence	Perception of social visibility or how a technology makes them look to others.
Experience	Relevance with their prior experiences and interactions.
Confidence	Empowerment without anxiety or intimidation.

Based on these factors, it can be concluded that older consumers not only focus on the technical aspects of a new product or service, but also on the social and emotional aspects, like social support and emotion, in order to determine whether they adopt the innovation or not (Lee & Coughlin, 2015). This is also found in a research on the adoption of mobile banking in Finland, the main barriers for adopting amongst mature consumers were difficulty using computers and lack of personal service (Mattila, Karjaluoto & Pento, 2003). This also highlights a social aspect, namely personal service. This importance of social aspects is specifically found in the adoption amongst older consumers (Lee & Coughlin, 2015). General adoption models, like the Technology Acceptance Model (TAM; Davis, 1989) and the extended Technology Readiness and Acceptance Model (TRAM; Lin, Shih & Sher, 2007) do not include social aspects. Therefore, it is important to consider these social and emotional aspects in adoption research involving older consumers. The following paragraphs provide more details on the factors that do influence adoption of online grocery shopping among older consumers. The social and emotional aspects will be included in the discussion as well.

2.3.2. Factors influencing adoption of online grocery shopping among older consumers

There is little research to factors that influence the adoption of online grocery shopping. Therefore, research on the adoption of online shopping in general will be used to determine which factors are likely to influence online grocery shopping, because the innovation of online grocery shopping is similar to the innovation of online shopping to a large extent. However, online grocery shopping does differ from general online shopping, because of the perishability and variability of the products and the higher frequency of the shopping activity (Mortimer et al., 2016). Besides the little research on online grocery shopping, there is hardly any research on the adoption of online grocery shopping among older consumers. Therefore, this paragraph adds drivers and inhibitors found in the literature to the drivers and inhibitors from the TRI 2.0 (Parasuraman & Colby, 2015). Combining this with information about the older consumer will lead to the next set of hypotheses.

2.3.2.1. Drivers

In the TRI 2.0 two drivers have been distinguished, namely optimism and innovativeness (Parasuraman & Colby, 2015). It is expected that these are positively related to the intention to shop groceries online, because online grocery shopping makes use of a new technology. Optimism shows similarities with the factors value and usability as found in the study of Lee and Coughlin (2015). Therefore, it is likely that this relationship between optimism and intention to shop groceries online will be present among older consumers. Innovativeness is found to be positively related to the frequency of purchasing online among older consumers (Reisenwitz, Iyer, Kuhlmeier & Eastman, 2007). Therefore, innovativeness is also expected to be relevant for determining the adoption of online grocery shopping among older consumers.

H2A: Optimism and intention to adopt online grocery shopping among older consumers are positively related.

H2B: Innovativeness and intention to adopt online grocery shopping among older consumers are positively related.

Besides these drivers, the adoption literature on online shopping and online grocery shopping reveals some other factors that are possible drivers for intention to shop groceries online among older consumers. These factors will be discussed now, and hypotheses will be presented.

Convenience orientation. Consumers tend to have different shopping orientations (Solomon, Bamossy, Askegaard & Hogg, 2006; Stone, 1954). One of these shopping orientations is being convenience-oriented (Girard, Korgaonkar & Silverblatt, 2003). Convenience-oriented consumers

value convenience in choosing where, how and what they shop. One of their key characteristics is their time-saving orientation (Girard et al., 2003; Handa & Gupta, 2014). Also, energy-saving has proven to be an important characteristic of convenience orientation (Candel, 2001).

Several studies have shown that convenience is an important driver of online shopping in general (Delafronz, Paim & Khatibi, 2009; Girard et al., 2003; Handa & Gupta, 2014; Lim & Cham, 2015; Rohm & Swaminathan, 2004). It is expected that this will also be found in online grocery shopping, because online grocery shopping is also proven to be timesaving (Anesbury, Nenycz-Thiel, Dawes & Kennedy, 2016), which is important for people that are convenience-oriented. Also, a recent Thai study found a positive relationship between being convenience-oriented and intention to adopt online grocery shopping (Loketkrawee & Bhatiasavi, 2018). This implies that this relationship also exists among online grocery shopping in the Netherlands, however this should still be tested, because of the other culture and age-group in the current research. Since older consumers also highly value convenience (Grougiou & Pettigrew, 2011), it is expected that this positive relationship is also present among Dutch older consumers.

H2C: Convenience orientation is positively related to intention to adopt online grocery shopping among older consumers.

Health issues. Another driver of starting to shop groceries online is the experience of health issues (Hand et al., 2009; Morganosky & Cude, 2000). Since older consumers experience more health issues (CBS, 2018), it is expected that they are triggered to start doing groceries online when they experience these health issues. However, this hypothesis is only based on two researches. Also, the two researches that show this relationship are dated, so a lot has changed in the meantime. Therefore, this research examines this possible relationship in order to check whether this has changed over the last decade or can still be found.

H2D: There is a positive relationship between having health issues and intention to adopt online grocery shopping among older consumers.

2.3.2.2. Inhibitors

In the TRI 2.0 two inhibitors have been distinguished, namely discomfort and insecurity (Parasuraman & Colby, 2015). It is expected that these are negatively related to the intention to shop groceries online among older consumers, because online grocery shopping makes use of a new technology.

H3A: Discomfort and intention to adopt online grocery shopping among older consumers are negatively related.

H3B: Insecurity and intention to adopt online grocery shopping among older consumers are negatively related.

Besides these inhibitors, the adoption literature on online shopping and online grocery shopping reveals some other factors that are possible inhibitors for the intention to shop groceries online among older consumers. These factors will be discussed now, and hypotheses will be presented.

Perceived risk. With respect to the topic of online shopping, perceived risk has to do with two types of risk, firstly, making payments over the web and sharing personal information and secondly with the product bought (Chaparro-Peláez, Agudo-Peregrina & Pascal-Miguel, 2016). In online grocery shopping the perceived risk on the product itself is associated with buying perishable food while the consumer does not have the chance to check this product beforehand (Mortimer et al., 2016). Perceived risk is found to be a barrier in e-commerce adoption (Chaparro-Peláez et al., 2016). Since online grocery shopping is part of e-commerce, it is expected that the negative relationship between perceived risk and adoption will also be present in online grocery shopping.

H3C: The perceived risk on online grocery shopping is negatively related with the intention to adopt online grocery shopping among older consumers.

Loneliness and social interaction. Since there is only little research towards online grocery shopping and especially towards the older consumer, it has not been researched yet how social interaction when going to a supermarket influences the adoption of online grocery shopping. However, it seems logical that the older consumer prefers the social contacts in the local supermarket, because older consumers value social aspects more in the adoption of new technologies (Lee & Coughlin, 2015). This negative relationship between valuing social interaction and the intention to adopt online grocery shopping is also found in a study on the adoption of online shopping in general (Swaminathan, Lepkowska-White & Rao, 1999). It is found that older consumers might perceive technology as a thing that decreases social contact (Kang et al., 2010). Based on this Lee and Coughlin (2015) conclude that the potential threat to a decrease in social and emotional contact is a barrier for technology adoption. This reasoning can be applied to grocery shopping as well. When adopting online grocery shopping, the consumer will miss the trips to the supermarket which are a source of social and emotional contact. Thus, consumers who value social interaction more than others are less likely to adopt online grocery shopping, because it involves less social interaction. Therefore, we hypothesize:

H3D: There is a negative relationship between the need for social interaction and intention to adopt online grocery shopping among older consumers.

Another reason to suggest this relationship is because of the loneliness older consumers experience (Routasalo, Savikko, Tilvis, Strandberg & Pitkala, 2006; Van Beuningen & De Witt, 2016). A higher age is often associated with loneliness (Rodrigues, De Jong Gierveld & Buz, 2014), which suggests that older consumers experience more loneliness. Also, there is a negative relationship between the frequency of social contacts and the extent to which somebody experiences loneliness (Van Beuningen & De Witt, 2016). So, the more social interaction, the less loneliness somebody will experience. This is likely to result in a decrease of the intention to adopt online grocery shopping, because when the older consumer adopts online grocery shopping, they will experience more loneliness, because of missing out some of their social contacts. Therefore, we hypothesize:

H3E: There is a negative relationship between loneliness and the intention to adopt online grocery shopping among older consumers.

2.3.2.3. Control variables

Besides the expected direct drivers and inhibitors, there are three variables that will be controlled for in this study, since they are likely to influence both the dependent variable as some independent variables in the model.

Gender. Since men are more convenience-oriented than women (Swaminathan et al., 1999), it can be suggested that men are more likely to have the intention to start online grocery shopping. Therefore, gender is expected to impact the intention to adopt online grocery shopping. In order to prevent bias, gender is included as a control variable.

Age. Statistics show that the peak of the adoption rate of online grocery shopping in the Netherlands is between 20 and 44 years old and after that the higher the age, the more the adoption rate decreases (Eurostat, 2018). Therefore, within the target group of this study, 50+ Dutch' consumers, it is expected that age negatively relates to the intention to adopt online grocery shopping. Since age also is expected to positively influence the independent variables health issues (CBS, 2018) and loneliness (Rodrigues et al., 2014), it is included as a control variable in the model.

Internet experience. In order to adopt online grocery shopping, using the internet is necessary. Also, previous internet experience and online shopping in general are positively related (Naseri & Elliott, 2011). It is likely that previous experience also impacts the intention to adopt online grocery shopping among older consumers, since older consumers are especially driven by previous experiences (Lee & Coughlin, 2015). Besides that, older Dutch' consumers show a relatively low adoption rate on internet usage compared to the younger Dutch' consumers (CBS, 2019b). So, in order to prevent bias among adopters and non-adopters of the internet, there will be controlled for internet experience as well.

2.4. Conceptual model

The above hypotheses will be tested in order to get a better understanding of the factors that influence the intention to adopt online grocery shopping among older consumers. Even though intention is the best predictor of actual behavior according to the Theory of Reasoned Action and the Theory of Planned Behavior (Montano & Kasprzyk, 2015), the relationship between intention to adopt online grocery shopping and actual adoption of online grocery shopping will be tested too. A positive relationship between these constructs shows whether intention is measured accurately. So, this relationship is expected to be positive:

H4: The intention to adopt online grocery shopping is positively related to the actual adoption of online grocery shopping among older consumers.

In order to test all these hypotheses a conceptual model is drawn. In figure 1 the basic model with the basic concepts can be found. The more detailed model in which the basic concepts are further elaborated can be found in figure 2.



Figure 1. Basic conceptual model – towards a model that determines the adoption of online grocery shopping among Dutch’ seniors.

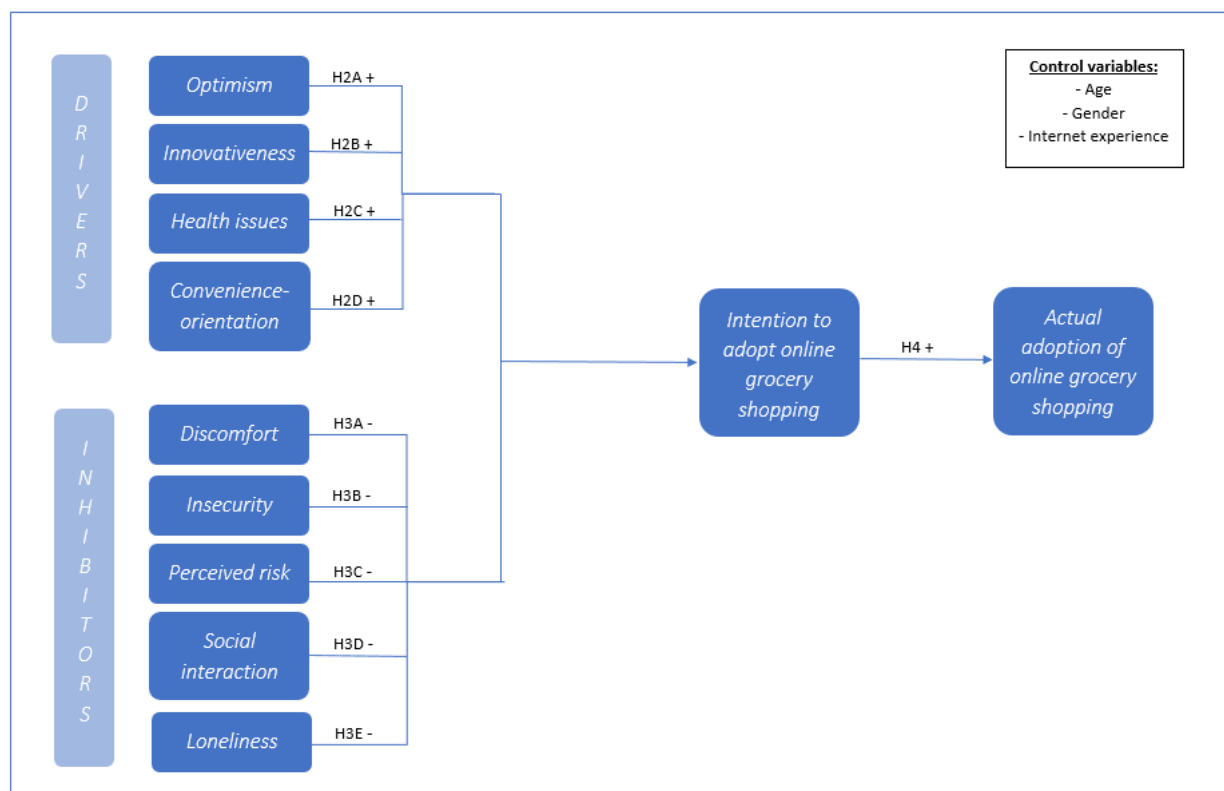


Figure 2. Detailed conceptual model - towards a model that determines the adoption of online grocery shopping among Dutch’ seniors.

3. Methodology

3.1. Pretest

Since the literature on the adoption of online grocery shopping among older consumers is scarce, three semi-structured interviews are conducted to check whether the factors found in the literature are also important drivers and inhibitors for people in the target group. Secondly, these interviews function as a check if there are no other important factors that have not been mentioned in the literature yet. Three respondents were gathered by a convenience sample. All three differed in their way of doing online grocery shopping. The three are a 73-year-old male and a 63- and 64-year-old female. One of them did not use online grocery shopping, while the other two did. From those two, one got her groceries delivered at home and the other one picked the ordered groceries up at a pick-up point. The guidelines of the interviews can be found in appendix A. Before starting the interview, the respondents were asked for permission to record the interview. All three respondents gave permission. After conducting the interviews, the recordings were used to transcribe the interviews. To guarantee respondents anonymity, fictitious names are used in the transcriptions.

The main barriers that were named during the interviews were the minimum amount to order and the delivery fee. One respondent said: *"You need to have a minimum of €25,00, otherwise they will not come, and with only two persons in the household you do not have that much groceries."* In the Netherlands most suppliers charge a delivery fee, however, there is one delivery service that has no delivery fee. Therefore, one respondent told that was the reason she used it, she also said that if there would be a delivery fee everywhere, she was not sure if she would have adopted online grocery shopping as well. Other barriers that were emphasized during the interview with the respondent that was not using online grocery shopping, were social contact and having a moment to be among people and out of the house. About this he said the following: *"For your social contacts it is of importance to go to an actual supermarket, cause then you run into people. (...) So, it helps to be among other people."* This is in line with the expected influence of social interaction. A final reason that was named to keep going to the supermarket, combined with online grocery shopping or solely, was about the perishability of especially fresh produce. This is part of perceived risk, however directly aimed at the produce specific for grocery shopping.

In all three interviews health issues were named as a driver. One adopter of online grocery shopping told: *"That is actually because of my back, yes I have some problems with my back. That is why my children told me to start ordering the groceries online."* Adopting online grocery shopping because of health issues is in line with the proposed model. Another driver that was named during the interviews

was that online shopping is less time consuming. This supports the hypothesis that convenience orientation is positively related to intention to adopt online grocery shopping.

Besides these drivers and barriers, a few other factors were named, namely service and assortment. Inadequate service is named as a reason to stop, namely *“when the service is not good anymore, or they deliver wrong products, things like that and that would happen all the time, or if they are hours late, that will be a reason to stop”*. Thus, the service-level of online grocery shopping versus traditional grocery shopping is not directly the reason to adopt online grocery shopping. However, it might influence how and where consumers shop for groceries. If the service in a traditional market is inadequate, that does not necessarily make someone adopt online grocery shopping, that consumer might also try another traditional supermarket. Therefore, the service level is likely to influence consumers choice in how and where to do the grocery shopping, but this cannot be directly linked as a driver or inhibitor for online grocery shopping specific. Assortment was named as both a driver and a barrier, while one respondent told that there was a more extensive assortment online, another respondent told me they do not have everything online. This might differ per online retailer and is also determined by the assortment of the supermarket someone used to shop at. Therefore, assortment might play a role as either a driver or a barrier. Since, this can be both a driver and a barrier this will not be included in the current model for practical reasons.

In conclusion it can be stated that many of the factors in the model have been named in the interviews, for instance health issues, convenience orientation, perceived risk and social interaction. This supports the proposed model. Besides that, some extra factors seem to be important based on the interviews. Specifically, the delivery fee, the minimum amount of order, service and being able to check the produce. Even though, checking the produce can be part of perceived risk, in the interviews this specific part of perceived risk got more attention than the other parts of perceived risk, therefore this is named separately. The extra mentioned factors will be measured in the survey as well. Service will only be measured for interpretational reasons and will not be included in the model, since service can be both an inhibitor and a driver. Therefore, it cannot be linked directly to intention to adopt online grocery shopping. However, questions about the minimum amount of order and delivery fee will be added to the model as inhibitors. Finally, checking the produce on freshness is part of perceived risk and is therefore already included in the model. Because of these changes, the final conceptual model has slightly changed and can be found in figure 3.

The two added variables, delivery fee and minimum amount of order, result in the following hypotheses:

H3F: Not willing to pay a delivery fee is negatively related to intention to adopt online grocery shopping among older consumers in the Netherlands.

If the above hypothesis is supported, this suggests that a delivery fee might function as an inhibitor to adopt online grocery shopping. Therefore, the delivery fee in the model is included as an inhibitor.

H3G: Not being able or willing to order a certain minimum amount is negatively related to intention to adopt online grocery shopping among older consumers in the Netherlands.

If this hypothesis is supported, this suggests that the minimum amount of order might function as an inhibitor to adopt online grocery shopping. Therefore, the minimum amount of orders is also included as an inhibitor in the model.

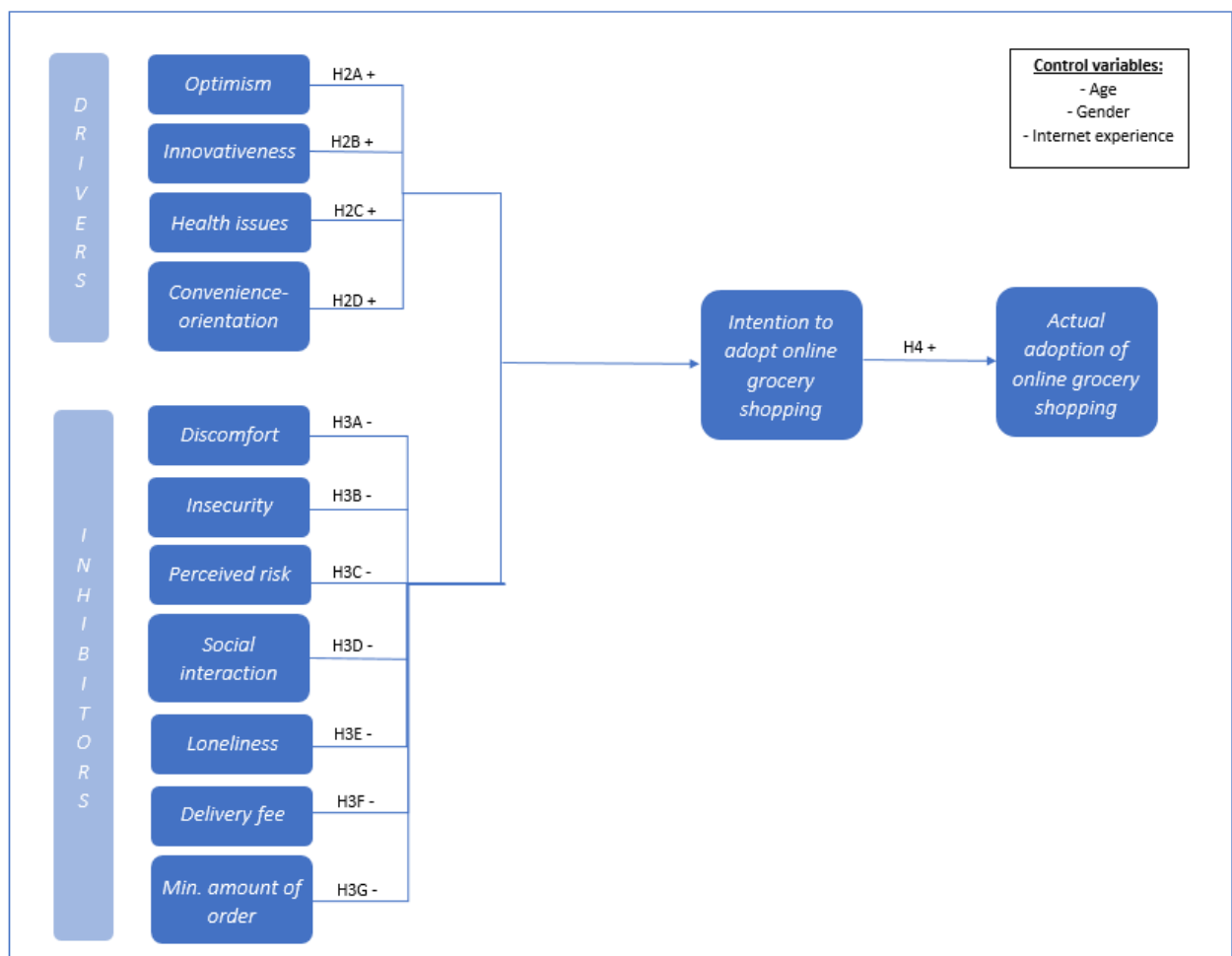


Figure 3. Final conceptual model: factors that determines the adoption of online grocery shopping among Dutch' seniors.

3.2. Sample and procedure

A survey was used to gather data from older consumers in the Netherlands. The survey was in Dutch, because that is the native language of the target group.

3.2.1. Pretest survey

Before conducting the survey, a few people from the target group have filled out the survey in order to check if all questions were clear. One respondent, a 50-year-old male, told that he did have the intention to start using online grocery shopping. However, since he is not in charge of the grocery shopping in his household, he filled in that he did not have the intention to use it in the coming year, because he never does the grocery shopping. In order to prevent for errors like this in the results, the following extra information was added to that question: *If you are not responsible for the grocery shopping in your household, imagine you are while answering this question.*

Other feedback, from a 63-year-old female, was that some of the questions about technology are broadly interpretable, and that they were difficult to answer sometimes. Since these are translated versions of the TRI 2.0, no changes have been made. However, this should be considered when interpreting the results. For the rest, no other points of feedback were named during this testing.

3.2.2. Procedure

Respondents were gathered by convenience sampling, both online and offline. Online respondents were mainly gathered via social media and they were asked to send the invitation forwards to their contacts of 50 years and older (snowball technique). Offline respondents were mainly gathered by spreading the survey among an apartment specific for seniors and by spreading it in a village where the society is clearly greying. This resulted in 91.0% of the respondents that filled out the survey online and 9.0% that filled it out offline. Respondents were asked to fill in the survey which took approximately 10 minutes. After they filled out the survey, they were thanked for their participation. For an overview of the full survey, see appendix B.

3.2.3. Research ethics

Before participating, respondents were informed about the fact that the results are used for scholarly reasons and results are analyzed anonymously. The online respondents were able to quit the survey any time they wanted. The offline respondents had the same opportunity and were able to skip a question, however it was recommended to fill out all the questions. At the end of the survey the possibility was given to send the researcher an e-mail if the respondent wanted to be informed about

the results. Eight people asked for this, after finalizing this study, they have been send a Dutch summary.

3.3. Measurements

This section discusses how the constructs were measured. Also, the control variables are introduced in this section. An overview of the measurements and the scales can be found in appendix C.

3.3.1. Dependent variables

Actual adoption. Actual adoption is measured with the question: *Have you ever made use of online grocery shopping?* The answer possibilities are *yes* and *no*.

Intention to adopt. Intention to adopt will be measured by the following question: *'After reading the information on online grocery shopping, to what extent do you intent to use this in the coming year?'* This can be answered on a 5-point scale, with answer categories differing from no intention to a lot intention. For the actual adopters the question will be asked slightly different, namely *'With your experience in online grocery shopping, do you intend to keep using this the coming year?'* This question can be answered on the same 5-point scale.

3.3.2. Independent variables

Optimism, innovativeness, insecurity and discomfort. These are the scales from the TRI and will be measured by the 16 questions retrieved from the TRI 2.0¹ (Parasuraman & Colby, 2015). A translation of these scales is made by following the procedure in appendix D.

Health issues. To measure health issues, a general question used by the CBS, the Dutch agency for statistics, is used (Botterweck et al., 2003). In their health-survey they ask the following question *'Hoe is in het algemeen uw gezondheid?'* [Dutch], which means *'How do you score your health in general?'*. This question can be scored on a 5-point scale, which consists of the following answer possibilities: *very bad, bad, it is okay, well* and *very well*. Since this question measures how good the health of the respondent is, this item will be reversed before analyzing in order to measure health issues.

Convenience orientation. Convenience orientation is measured by an adaptation of the CONVOR scale which consists of six items measured on a 7-point Likert scale (Candel, 2001). This scale is developed

¹ These questions comprise the Technology Readiness Index 2.0 which is copyrighted by A. Parasuraman and Rockbridge Associates, Inc., 2014. This scale may be duplicated only with written permission from the authors.

to measure convenience orientation in meal preparation. Three of the six items have been adapted to the grocery shopping context in order to measure convenience orientation in this specific context. For instance, the proposition *'It's a waste of time to spend a long time in the kitchen preparing a meal.'* is adapted to: *'It's a waste of time to spend a long time in the supermarket doing groceries.'* The items have been translated to Dutch. Information on the translation process can be found in appendix D. Since the TRI, which is the main body of the survey, is measured on a 5-point Likert scale, convenience orientation will also be measured on a 5-point Likert scale in order to be consistent. Therefore, this measurement differs from the 7-point Likert scale that is used in the original study of Candel (2001).

Perceived risk. In line with Bianchi & Andrews (2012), 4 items are used to measure perceived risk. These items originate from Andrews, Kiel, Drennan, Boyle and Werawardeena (2007), who adopted the measurement tool of Jarvenpaa, Tractinsky and Vitale (2000). This adapted version measures perceived risk in an internet context, which is suitable for this study, because online grocery shopping needs to be done on the internet. In order to measure the perceived risk on online grocery shopping specifically, the items will be adapted to online grocery shopping. These items will also be measured on a 5-point Likert scale in order to be consistent with the measurement of the other concepts and their scales. Based on these scores an average score will be calculated, where a higher score represents a higher perceived risk. The adapted items are:

1. There is too much uncertainty associated with using the internet to buy groceries.
2. Compared with other ways of buying groceries, I think that using the internet is more risky.
3. I feel safe giving my personal details to a supermarket's website if requested.
4. I feel safe buying groceries on the internet using my credit card.

Item 3 and 4 will be scored inversely, because they measure trust, the opposite of perceived risk. These questions about perceived risk show some similarities with the measurements of insecurity in the TRI. However, perceived risk is specifically aimed at measuring perceived risk in the context of online grocery shopping, while insecurity measures a distrust of technology and skepticism about its ability to work properly (Parasuraman, 2000). This also involves perceived risk to some extent, but the main difference is that insecurity is measured about new technologies and technological services in general. Therefore, both perceived risk and insecurity are measured independently. In appendix B the questionnaire can be found, including the Dutch translation of the items on perceived risk. Information on the translation process can be found in appendix D.

Based on the interviews, one extra question is added to the measurement of perceived risk, namely: *For me the reason to buy (certain) groceries in the supermarket instead of online, is that I want to check*

the produce on freshness, quality and expiry date. Before interpreting this in the light of perceived risk, factor analysis will be conducted to check whether this measures the same concept.

Loneliness. A scale commonly used to measure loneliness, is the scale of De Jong Gierveld. This scale consists of 11 items that measure both social (5 items) and emotional loneliness (6 items) (De Jong Gierveld & Kamphuis, 1985). All items can be answered on a 3-point scale that consists of the following answer possibilities: *yes*, *kind of*, and *no*. The authors also developed a short version of the scale, that consists of six items, which is also able to distinguish between social and emotional loneliness (De Jong Gierveld & Van Tilburg, 2006). This scale is originally Dutch and tested on validity and reliability in a Dutch population. The items and the scoring of this 6-item scale can be found in table 3. This scoring results in a total loneliness-score between 0 and 6.

Table 3.

Scoring of the 6-item loneliness scale De Jong Gierveld.

Item [between brackets in Dutch]	Answer: 'yes'	Answer: 'kind of'	Answer: 'no'
There are plenty of people I can rely on when I have problems. [Er zijn genoeg mensen op wie ik in geval van narigheid kan terugvallen.]	0	1	1
There are many people I can trust completely. [Ik heb veel mensen op wie ik volledig kan vertrouwen.]	0	1	1
There are enough people I feel close to. [Er zijn voldoende mensen met wie ik me nauw verbonden voel.]	0	1	1
I experience a general sense of emptiness. [Ik ervaar leegte om mij heen.]	1	1	0
I miss having people around. [Ik mis mensen om mij heen.]	1	1	0
I often feel rejected. [Vaak voel ik me in de steek gelaten.]	1	1	0

The 6-item scale is considered reliable, the α differed between .70 and .76 (De Jong Gierveld & Van Tilburg, 2006). The α coefficients for the subscales are slightly lower than the α coefficients of the 6-item scale, between .67 and .74 for emotional loneliness and between .70 and .73 for social loneliness (De Jong Gierveld & Van Tilburg, 2006). For the current study only the total score on loneliness will be

used, since the context of online grocery shopping does not give any motive to expect different outcomes of the two subscales. Since the original items are in Dutch, the questions can be used directly in the questionnaire.

Social interaction. Swaminathan and colleagues (1999) posed a question whether the respondent preferred to deal with people or not in order to determine whether the respondent was driven by social interaction or not. Therefore, this study will also pose questions to what extent people like to deal with other people, in line with Swaminathan and colleagues (1999). Two questions will be used to measure this, one in general and one specific for the grocery shopping context. These questions are developed based on the measurement of Swaminathan and colleagues (1999), but are new developed questions. The questions are phrased in Dutch and are measured on a 5-point Likert scale, which will result in a total score on need for social interaction. The questions can be found in the questionnaire in appendix B.

3.3.3. Control variables

The control variables will also be measured in the questionnaire. First, a simple question about gender is included. Secondly age is measured with an open-ended question. Finally, internet experience will be measured with the question, *how often do you use the internet?* There will be 5 answer possibilities: *(almost) never, monthly, weekly, daily and multiple times a day.*

3.3.4. Additional questions

Based on the results of the interviews in the pretest, some additional questions have been included for interpretational reasons:

- The minimum amount of order keeps me from ordering my groceries online.
- I am willing to pay a delivery fee for the service I get when buying my groceries online.
- Service is important to me when deciding where and how I get my groceries.

These questions are answered on a 5-point Likert scale and will be used to interpret the results and give directions for future research, since this is one of the first studies that tries to establish a model that explains the adoption of online grocery shopping among older consumers. Since, delivery fee is measured as willingness to pay a delivery fee this item will be reversed before analyzing. By reversing this item, the results will show that the higher the score on this item the less people are willing to pay a delivery fee.

Also, a multiple-choice question is added about the height of the delivery fee. This question is to interpret the results on the willingness to pay a delivery fee better. This also serves as input and valuable information for the retailers.

Finally, two extra questions have been added myself. These additional questions are about household size and distance to the closest supermarket. Household size is likely to influence to what extent the minimum amount of order is problematic or not, since a 1-person household needs less groceries than a 4-persons household. Therefore, this construct will be measured too. Besides that, distance to closest supermarket will be measured, since it might impact how time-saving online grocery shopping can be. Since, these two factors are not found in the literature or the interviews, they are not included in any of the hypotheses, but are mainly measured as a check.

4. Results

The survey was conducted among 442 Dutch consumers between 50 and 95 years old ($M = 59.7$; $SD = 8.2$). This included 135 male ($M = 61.3$; $SD = 8.8$) and 307 female ($M = 59.0$; $SD = 7.8$) respondents.

This age-difference between male and female participants is significant ($p = .11$).

4.1. Exploration of the data

After collecting the data, some variables have been transformed to other variables. The three questions on social loneliness have been transformed to a total score on social loneliness, the same has been done for emotional loneliness. Also, the sum of these two factors has been calculated, the overall loneliness score. Scoring is based on table 3. When conducting a reliability analysis on these variables, both social and emotional loneliness as well as total loneliness are considered to be measured adequately since they meet the threshold of .70, see table 4.

Table 4.

Reliability loneliness.

	Number of items	Cronbach's α
Social loneliness	3	.709
Emotional loneliness	3	.701
Total loneliness	6	.738

Since the TRI questions have been translated, it was necessary to first check whether this translated scale is also reliable for this population. Therefore, a reliability analysis is conducted for the four separate dimensions. Cronbach's α for these four dimensions can be found in table 5.

Table 5.

Reliability axes TRI 2.0.

	Number of items	Cronbach's α
Innovativeness	4	.770
Optimism	4	.774
Insecurity	4	.518
Discomfort	4	.679

For discomfort if one item (*"When I get technical support from a provider of a high-tech product or service, I sometimes feel as if I am being taken advantage of by someone who knows more than I do."*)

would be deleted, Cronbach's α would slightly improve from .679 to .682. Since this hardly makes any difference and the TRI is tested extensively in other countries, this item will not be deleted from the sample. For the other scales, there will be no improvement when deleting an item.

The reliability of innovativeness and optimism are good, $\alpha > .7$. However, the reliability of discomfort and insecurity is lower, but still acceptable for this empirical research, since only 4 items are used to measure the subscales. In order to calculate the reliability of the total TRI-score, all items on inhibitors of technology have been reversed. The reliability of the total scale is considered good, $\alpha = .852$. The overall TRI-score is calculated by the following formula:

$$\text{TRI 2.0} = (\text{innovativeness} + \text{optimism} + (6 - \text{insecurity}) + (6 - \text{discomfort})) / 4.$$

Reliability of the three items that measure convenience orientation is considered good ($\alpha = .893$). Therefore, an average score on convenience orientation is computed. Also, the reliability of the two items that measure social interaction is considered acceptable ($\alpha = .754$), therefore also an average score for social interaction is computed. Finally, the reliability for perceived risk is determined. Perceived risk was measured originally with four items, and one item has been added based on the interviews. Two items of perceived risk have first been inversed. The reliability for the scale that consists of all five questions is considered acceptable ($\alpha = .725$). However, when deleting the added item about checking the freshness of the produce, Cronbach's α would increase to .753. Therefore, it is decided that this new question does not measure perceived risk accurately and the average score on perceived risk will only be determined by the original four questions. Since this freshness-item is not part of perceived risk, it might measure something else. This item was named in the interviews and will still be used in further analysis. However, it will be analyzed on his own. This item will be named grocery-specific perceived risk. This item is also expected to be an inhibitor and therefore results in the following hypothesis.

H3H: Grocery-specific perceived risk is negatively related with the intention to adopt online grocery shopping among older consumers.

Including this hypothesis results in a slightly different conceptual model. This model is shown in figure 4.

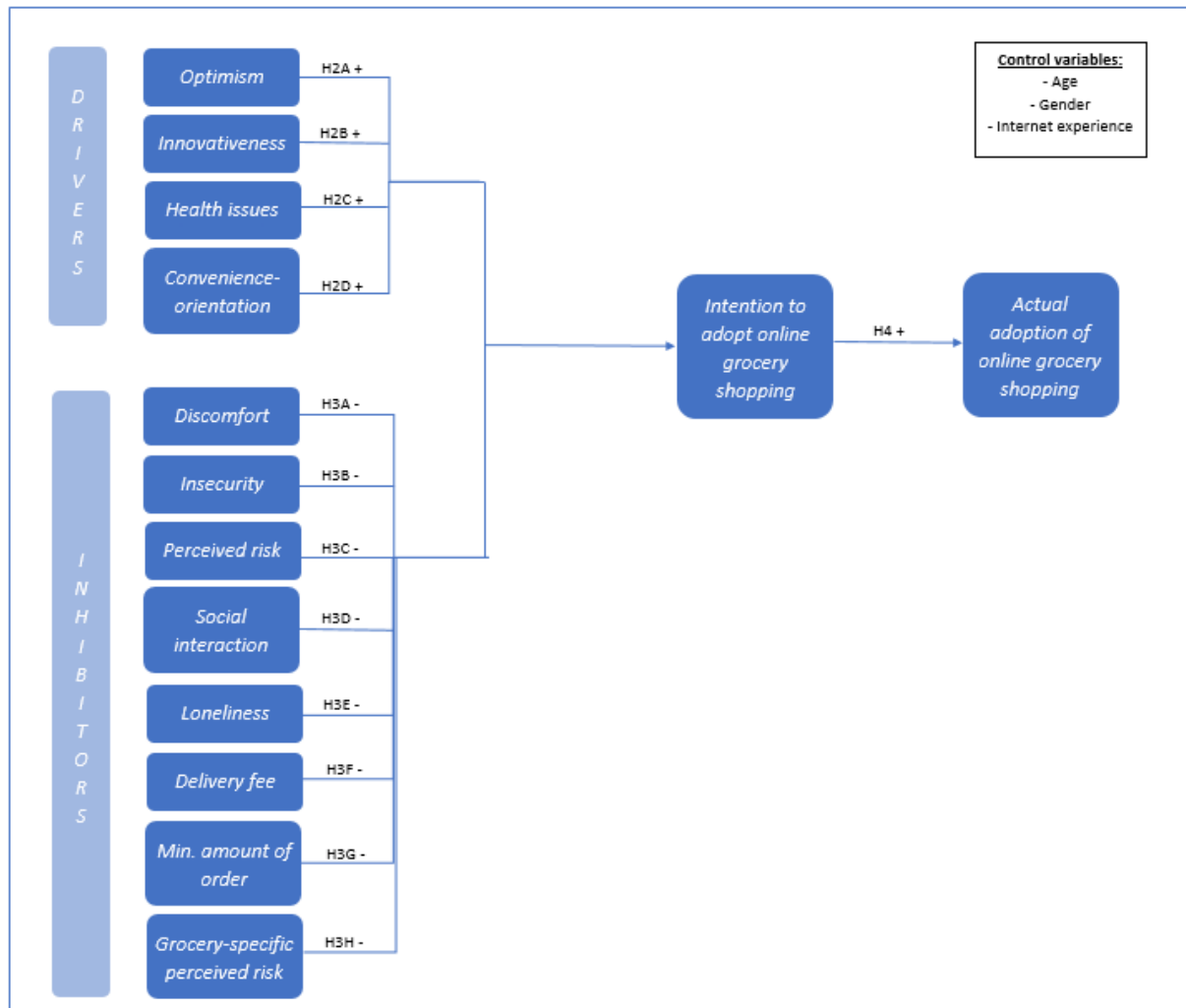


Figure 4. Adapted conceptual model.

Finally, the questions about health and delivery have been reversed for interpretational reasons. Also, the two different measures of intention to adopt have been combined to one variable that measures the intention to use online grocery shopping the coming year: 21.5% does have the intention to use online grocery shopping the coming year, 68.8% will probably not use online grocery shopping the coming year and 9.7% was neutral in their answer.

After computing several average scores, the following statistics are derived from the dataset. From the total sample ($n=442$), 8.8% has adopted online grocery shopping. When only looking at the female respondents, the percentage of adopters was 10.1%, while for the male respondents this was 5.9%. The average score on intention to use online grocery shopping in the coming year was 2.21 ($SD = 1.286$), measured on a 5-point scale, where 1 represents no intention at all and 5 represents that it is very likely the respondent would use this in the coming year. This intention differs slightly between

male ($M = 2.10$; $SD = 1.312$) and female respondents ($M = 2.26$; $SD = 1.274$), however this difference is not significant ($p = .248$). The average scores on the independent variables can be found in table 6.

The respondents do value social interaction a lot ($M = 3.69$; $SD = .817$) and are not that much convenience oriented in the grocery shopping context ($M = 2.71$; $SD = .991$). The minimum amount of order is not a big problem to adopt online grocery shopping, according to the majority of respondents. Also, 51.4% is willing to pay a delivery fee when using online grocery shopping. How much they are willing to pay as a delivery fee can be found in figure 5. It appears that most respondents consider an amount below €5,00 as appropriate.

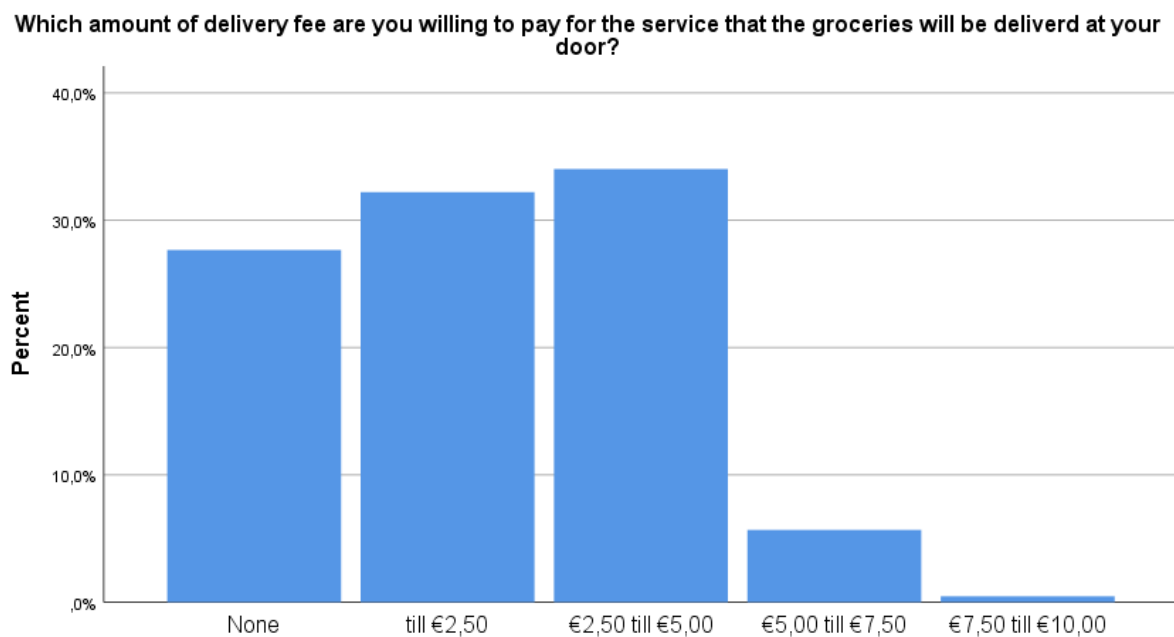


Figure 5. Amount of money people are willing to pay as a delivery fee.

Respondents consider service as an important reason in determining where and how they do their groceries: 71.3% agrees or fully agrees that *'service is very important in determining where and how I do my groceries.'*

People in the sample ($N = 442$) mainly consider their health as good, 82.1% considers their health as good or very good. Besides that, the majority does not feel lonely, 54.5% does not feel lonely at all with a score of zero on the loneliness scale. 14.5% experiences loneliness however, since they score 3 points or more on the loneliness scale. 2.0% scores 6 points and can be considered very lonely. Graphs on the distribution of the scores on health and loneliness can be found in figure 6 and 7: most of the respondents are healthy and not lonely.

Table 6.

Mean scores for the independent variables.

	Mean score	SD	Range of measurement	Interpretation of the score
TRI – innovativeness	2.86	.752	1 – 5	The higher the score, the more innovative.
TRI – optimism	3.36	.673	1 – 5	The higher the score, the more optimistic.
TRI – discomfort	2.87	.637	1 – 5	The higher the score, the more discomfort experienced.
TRI – insecurity	3.26	.608	1 – 5	The higher the score, the more insecurity experienced.
Total score TRI	3.02	.515	1 – 5	The higher the score, the more technology ready.
Perceived risk	2.87	.726	1 – 5	The higher the score, the more perceived risk.
Convenience orientation	2.71	.991	1 – 5	The higher the score, the more convenience oriented.
Social interaction	3.69	.817	1 – 5	The higher the score, the more the respondent enjoys having social interaction.
Health issues	1.99	.651	1 – 5	The higher the score, the more health issues are experienced.
Loneliness	.99	1.433	0 – 6	The higher the score, the more loneliness is experienced.
Minimum amount of order	2.41	1.093	1 – 5	The higher the score, the more a minimum amount keeps the respondent from adopting online grocery shopping.
Delivery fee	2.82	1.070	1 – 5	The higher the score, the less the respondent is willing to pay a delivery fee.
Grocery-specific perceived risk	3.96	1.012	1 – 5	The higher the score, the more grocery-specific perceived risk is experienced.

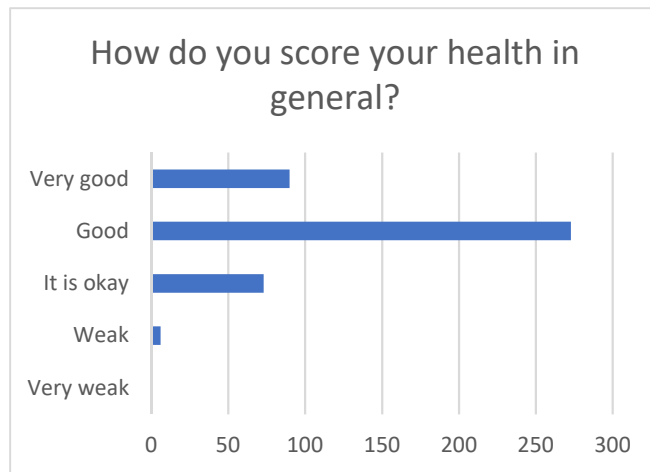


Figure 6. Health of the respondents.

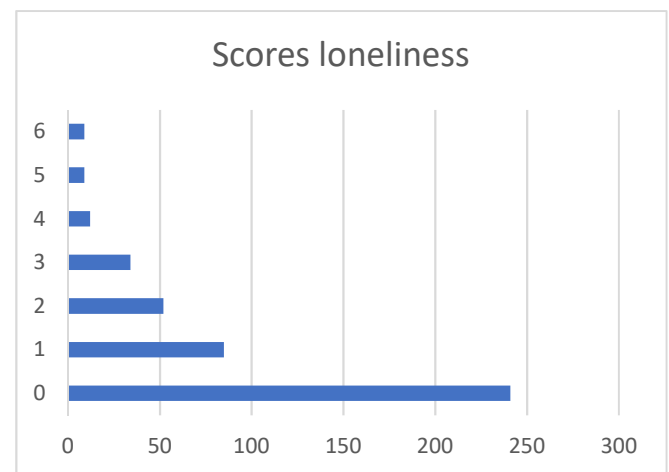


Figure 7. Experienced loneliness of the respondents

Since the group of respondents is relatively healthy and not very lonely, it might be interesting to take a closer look at the means of the respondents that are not so healthy and sometimes experience loneliness. These are the respondents that scored their health as 'it is okay' or 'weak' and simultaneously had a score of 3 or more on loneliness. This group, group A, consisted of only 19 respondents. This group is compared to group B, with respondents that considered either their health as good or considered themselves as not lonely or a combination of both ($N = 423$). These groups differed significantly in terms of health and loneliness but did not differ significantly on the intention to adopt online grocery shopping ($p = .467$). However, significant differences were found in delivery fee, perceived risk, innovativeness, insecurity and total TRI score. Table A in appendix E shows the full results of this comparison. Results suggest that outcomes of the study might differ slightly when having a more representative sample of the Dutch population of 50 years and older in terms of health and loneliness.

Since the combined group of lonely and not healthy respondents only consists of 19 respondents, there has also been taken a closer look to the differences between lonely versus not lonely and healthy versus not healthy. Being lonely is considered every respondent that has a loneliness-score of three or higher. Being healthy is considered every respondent that answered 'good' or 'very good' on the question about health. Also, for this comparison no significant differences were found between the groups on the dependent variable. Full results of these comparisons can be found in table B and C in appendix E. Since the separate groups are relatively small and no significant differences are found for the dependent variable, further analysis will be conducted by including the total sample.

In order to test H1, which stated that older consumers would score higher on the inhibitors than on the drivers of the TRI, a mean score for the inhibitors and a mean score for the drivers was computed. By looking at the mean scores, it appears that the inhibitors ($M = 3.06$; $SD = .54$) show a slightly lower average score than the drivers ($M = 3.11$; $SD = .63$). Based on a paired t-test there is no significant mean difference found between the inhibitors and the drivers in this group. Therefore, H1 is not supported. However, there are found to be significant differences between the four dimensions. These differences are made visual in table 7. It appears that the scores between the four dimensions do differ significantly, except for the difference between discomfort and innovativeness.

Table 7.

P-values of a paired t-test between the dimensions of TRI 2.0

	Innovativeness	Optimism	Insecurity	Discomfort
Innovativeness	-	-	-	-
Optimism	<.001*	-	-	-
Insecurity	<.001*	.049*	-	-
Discomfort	.927	<.001*	<.001*	-

* = significant mean-difference ($p < .05$).

When dividing the group in subgroups based on age, some interesting differences are found. The group of 50 till 55 years scores significantly higher on the drivers than on the inhibitors of the TRI ($p = .005$), while the oldest group scores significantly higher on the inhibitors than on the drivers of the TRI ($p = .009$). The mean scores per subgroup and the p-value for significance of the mean difference can be found in table 8.

Table 8.

Mean scores on the TRI per age group.

Age group	N	Mean drivers	Mean inhibitors	p-value (difference between M_{drivers} and $M_{\text{inhibitors}}$)
50 – 55	143	3.20	2.97	.005*
55 – 60	113	3.12	3.08	.724
60 – 65	77	3.05	3.10	.721
65 – 70	44	3.18	3.01	.273
70+	65	2.93	3.24	.009*

* = significant mean-difference ($p < .05$).

More detailed results on the means of the four dimensions per age group and the differences between the dimensions per subgroup can be found in appendix E, from table D onwards.

4.2. Correlations

The other hypotheses suggest correlations between the dependent variable (the intention to adopt online grocery shopping) and various independent variables. Therefore, the correlation between intention to adopt online grocery shopping and all the variables in the model is determined separately per variable. Before conducting the correlation, the assumptions of normality, linearity and homoscedasticity were assessed. The assumptions were violated, mainly because the variables are all ordinal. Therefore, the correlation will be measured with Spearman's rho (see table 9).

Table 9.

Correlation between independent variables and intention to adopt online grocery shopping.

Independent variables	Spearman's rho	Significance level
Drivers		
Convenience orientation	.338	<.001*
TRI innovativeness	.286	<.001*
TRI optimism	.286	<.001*
Health issues	-.003	.956
Inhibitors		
Perceived risk	-.330	<.001*
Delivery fee	-.247	<.001*
Grocery-specific perceived risk	-.245	<.001*
Social interaction	-.209	<.001*
TRI discomfort	-.194	<.001*
TRI insecurity	-.160	.001*
Loneliness	-.074	.120
Minimum amount of order	.114	.017*

* = significant ($p < 0.05$).

Table 10 shows that from the expected drivers, convenience orientation, innovativeness and optimism are positively correlated with intention to adopt online grocery shopping. Other than expected health issues do not show any relationship with intention to adopt online grocery shopping. Therefore H2A, H2B and H2C are supported and H2D is not supported.

When taking a closer look on the inhibitors, perceived risk, delivery fee, grocery-specific perceived risk, social interaction, discomfort and insecurity show the expected negative correlation with intention to adopt online grocery shopping. Based on that, H3A, H3B, H3C, H3D, H3F and H3H are supported.

Other than expected loneliness does not show a significant negative correlation with intention to adopt online grocery shopping, therefore H3E is not supported. Since loneliness is measured by two subscales, emotional and social loneliness, also a correlation between the subscales and intention to adopt online grocery shopping is conducted. Spearman's rho indicated the absence of a correlation between social loneliness and intention to adopt online grocery shopping, $r_s = -.061$, $p = .202$, two-tailed, $N = 442$. Spearman's rho also indicated the absence of a correlation between emotional loneliness and intention to adopt online grocery shopping, $r_s = -.063$, $p = .184$, two-tailed, $N = 442$.

Minimum amount of order shows a surprising result, since there is found to be a positive correlation between the minimum amount of order and intention to adopt online grocery shopping. This is surprising, since a negative relationship was expected, therefore H3G is not supported. In order to interpret this finding carefully, a closer look was taken on the item. The posed question was: *The minimum amount of order keeps me from ordering my groceries online*. Thus, a positive relation suggests that the more the minimum amount of order is functioning as a barrier, the more intention someone has to adopt online grocery shopping. Since, this does not appear to be logical this item will not be used in further analysis.

A Pearson's chi-square test of contingencies (with $\alpha = .05$) was used to evaluate whether intention to adopt online grocery shopping is related to the actual adoption of online grocery shopping. The chi-square test was statistically significant, $\chi^2(4, N = 442) = 188.74$, $p < .001$. The association can be described as large, Cramer's $V = .653$. These findings suggest that intention to adopt and actual adoption are correlated, this makes it likely that intention is measured accurately.

The control variable internet experience is also measured ordinal and violates the assumptions of normality, linearity and homoscedasticity. Therefore, the correlation between internet experience and the intention to adopt online grocery shopping is assessed by using Spearman's rho. Internet experience does not correlate with intention to adopt online grocery shopping, $r_s = .083$, $p = .083$, two-tailed, $N = 442$. The correlation between age and intention to adopt online grocery shopping is also assessed using Spearman's rho, since intention to adopt online grocery shopping is measured ordinally. As expected, age does negatively correlate with intention to adopt online grocery shopping, $r_s = -.213$, $p < .001$, two-tailed, $N = 442$.

Since gender is a dichotomous variable, the correlation between gender and intention to adopt online grocery shopping is measured with a Pearson's chi-square test of contingencies. The chi-square test was not significant, $\chi^2(4, N = 442) = 4.678, p = .322$. Therefore, it is not likely that gender and intention to adopt online grocery are correlated. Thus, from the control variables, only age shows the expected correlation with intention to adopt online grocery shopping.

Interestingly, distance to supermarket positively correlates with intention to adopt online grocery shopping, $r_s = .122, p = .010$, two-tailed, $N = 442$. Also, household size correlates positively with the intention to adopt online grocery shopping, $r_s = .221, p < .001$, two-tailed, $N = 441$. Table 10 presents an overview of the Spearman correlations that have been discussed above.

Table 10.

Spearman correlations of age, internet experience, distance to closest supermarket and household size with intention to adopt online grocery shopping.

Variable	Spearman's rho	Significance level
Age	-.213	<.001*
Internet experience	.083	.083
Distance to closest supermarket	.122	.010*
Household size	.221	<.001*

* = significant ($p < .05$)

Since, there are variables that show correlations with several other variables, for instance age is negatively correlated with internet experience and health issues correlate positively with age. An overview of all the correlations can be found in the correlation matrix in table 11. Since, there are a lot of variables that show correlations with other variables it might be possible that not all the variables that correlate directly with the intention to adopt online grocery shopping are actual predictors for this dependent variable. Therefore, a regression analysis is conducted. The following paragraph describes the results of this regression analysis.

Table 11.

Correlation matrix of all the variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Intention to adopt	-																		
2. Innovativeness	.286*	-																	
3. Optimism	.286*	.544*	-																
4. Discomfort	-.194*	-.400*	-.415*	-															
5. Insecurity	-.160*	-.347*	-.408*	.510*	-														
6. TRI – total	.307*	.769*	.776*	-.741*	-.722*	-													
7. Perceived risk	-.330*	-.277*	-.362*	.486*	.421*	-.501*	-												
8. Convenience-orientation	.338*	.120*	.147*	-.033	-.124*	.138*	-.106*	-											
9. Social interaction	-.209*	-.145*	-.157*	.145*	.245*	-.218*	.222*	-.285*	-										
10. Health issues	-.003	-.188*	-.139*	.214*	.203*	-.238*	.166*	.056	.097*	-									
11. Loneliness	-.074	-.105*	-.098*	.125*	.124*	-.158*	.085	.035	-.058	.156*	-								
12. Min. amount of order	.114*	-.008	-.060	.138*	.127*	-.097*	.165*	.084	.016	.160*	.142*	-							
13. Delivery fee	-.247*	-.159*	-.252*	.297*	.253*	-.307*	.300*	-.159*	.130*	.139*	.021	.054	-						
14. Groc. spec. PCR	-.245*	-.067	-.048	.203*	.276*	-.184*	.264*	-.214*	.186*	.100*	-.013	.078	.166*	-					
15. Age	-.213*	-.115*	-.107*	.215*	.004	-.150*	.234*	-.079	.114*	.161*	.056	.017	.087	.069	-				
16. Gender	.103 ^a	.341 ^a	.238 ^a	.173 ^a	.143 ^a	.338 ^a	.138 ^a	.204 ^a	.143 ^a	.081 ^a	.118 ^a	.108 ^a	.118 ^a	.144 ^a	.362 ^a	-			
17. Internet experience	.083	.205*	.250*	-.200*	-.170*	.271*	-.217*	.018	-.143*	-.098*	-.111*	-.040	-.081	.002	-.190*	.180 ^a	-		
18. Household size	.221*	.037	.060	-.117*	.031	.064	-.150*	.109*	-.053	.133*	-.173*	-.068	-.025	-.060	-.454 ^a	.125 ^a	.070	-	
19. Distance supermarket	.122*	-.007	.069	-.002	-.022	.031	-.063	.160*	.040	.101*	-.001	.023	-.007	.045	.036	.034 ^a	.002	.037	-

Note: all shown correlations are spearman correlations, except for:

a) Cramer's V.

b) Pearson correlation.

* = significant (p < .05).

4.3. Regression analysis

Multiple regression analysis is a statistical technique that is used to examine the relationship between a single dependent variable and multiple dependent variables (Hair Jr., Black, Babin & Anderson, 2014). In this study multiple regression is used to check whether the independent variables from the conceptual model predict the intention to adopt online grocery shopping². The results of the regression analysis will reveal which combination of factors can predict the intention to adopt online grocery shopping and how much variance in the dependent variable will be explained by those factors deemed significant.

First a multiple regression is conducted. All variables that are included in the conceptual model are also included in the regression analysis, except for the minimum amount of order, since that item correlated in the opposite direction as expected with the dependent variable and no logical explanation could be found. Besides that, household size and distance to closest supermarket will be included as well, since these two variables correlated positively with intention to adopt online grocery shopping.

This resulted in a regression model with 16 predictors. This model accounted for a significant 34.0% of the variance in intention to adopt online grocery shopping, $R^2 = .340$, adjusted $R^2 = .315$, $F(16, 424) = 13.65$, $p < .001$. This model can be found in table 12.

² Since most collected data is measured ordinally, several assumptions for multiple regression have been violated. However several items are added to a sum-score, these sum-scores tend toward a normal distribution. Also, multiple regression is pretty robust and the sample ($N = 442$) is of an appropriate size, thus the multiple regression is conducted even though assumptions are violated.

Table 12.

Regression model, including all 16 predictors.

	Unstandardized		Standardized		Sig.
	B	SE	β	t	
Constant	1.792	1.085		1.651	.100
Convenience orientation	.296	.057	.227	5.163	<.001
Perceived risk	-.386	.090	-.218	-4.282	<.001
Innovativeness	.344	.089	.201	3.876	<.001
Gender	.395	.117	.142	3.363	.001
Household size	.165	.052	.146	3.158	.002
Grocery-specific perceived risk	-.171	.056	-.135	-3.059	.002
Health issues	.209	.083	.106	2.509	.012
Delivery fee	-.115	.052	-.096	-2.206	.028
Optimism	.163	.103	.085	1.591	.112
Social interaction	-.117	.068	-.074	-1.713	.087
Insecurity	.150	.111	.071	1.353	.177
Discomfort	.142	.107	.070	1.332	.184
Distance to closest supermarket	.083	.064	.053	1.293	.197
Loneliness	-.038	.037	-.042	-1.020	.308
Internet experience	-.045	.084	-.024	-.543	.587
Age	.000	.008	-.002	-.048	.962

When including total TRI score instead of the four subscales of the TRI, the full model including all the predictors accounted for 30.9% of the variance in intention to adopt online grocery shopping. Since, this is lower than when including the separate subscales, the regression will be executed with the subscales included and not with the total TRI score included. Also, inclusion of the separate dimensions will give more detailed information on the influences per dimension, especially since in this regression model only one of the four dimensions, innovativeness, contributes significantly to the model.

Some striking finding from the regression analysis, is that insecurity and discomfort show a positive relation with the intention to adopt online grocery shopping, while that was expected to be negative. Since these factors do not contribute significantly to the model, no extensive explanation for this remarkable finding will be given. However, it is likely that this finding is due to the other factors in the regression model that probably not only impact the dependent variable but also several independent

variables, like discomfort and insecurity. Chapter 5 will try to give a more extensive explanation on this remarkable finding.

In the model presented in table 12, half of the predictors does not contribute significantly to the model. Therefore, a stepwise regression is conducted as well. Forward selection was applied, which resulted in a model including eight variables, that accounted for 32.3% of the variance in intention to adopt online grocery shopping. This stepwise regression, including the order in which the variables are added can be found in table 13.

Table 13.

Stepwise regression with backwards selection. Dependent variable is intention to adopt online grocery shopping.

	R²	Adj. R²	Significance of the model	Variable that is added to the model	Significant F change
Model 1	.136	.134	< .001	Convenience orientation	<.001
Model 2	.232	.229	< .001	Perceived risk	<.001
Model 3	.256	.251	< .001	Innovativeness	<.001
Model 4	.275	.269	< .001	Household size	.001
Model 5	.294	.286	< .001	Gender	.001
Model 6	.305	.295	< .001	Grocery-specific perceived risk	.009
Model 7	.316	.305	< .001	Health issues	.010
Model 8	.323	.310	< .001	Delivery fee	.033

In order to present a compact model which includes variables that contribute significantly as a predictor, the final model is the model that resulted from the stepwise regression. This model accounted for a significant 32.3% of the variance in intention to adopt online grocery shopping. All predictors in this model contributed significantly to the model. The predictors that were included are, convenience orientation, perceived risk, innovativeness, household size, gender, grocery-specific perceived risk, health issues and delivery fee. Specifications on this model can be found in table 14.

Table 14.

Final regression model, predicting intention to adopt online grocery shopping.

	Unstandardized coefficients		Standardized coefficients		Sig.
	B	SE	B	t	
Constant	1.028	.479		2.145	.032
Convenience orientation	.341	.054	.261	6.269	<.001
Perceived risk	-.359	.080	-.203	-4.497	<.001
Innovativeness	.356	.074	.208	4.822	<.001
Household size	.178	.046	.157	3.869	<.001
Gender	.378	.114	.136	3.315	.001
Grocery-specific perceived risk	-.141	.054	-.111	-2.608	.009
Health issues	.225	.081	.114	2.773	.006
Delivery fee	-.109	.051	-.091	-2.133	.033

In combination, the eight variables in the final model explained 32.3% of the variance in intention to adopt online grocery shopping, $R^2 = .323$, adjusted $R^2 = .310$, $F(8, 432) = 29.37$, $p < .001$. According to Cohen's (1988) conventions, this combined effect can be considered large ($f^2 = .48$).

Based on the regression analysis, other hypotheses are supported than was suggested based on the correlations. The similarities and differences are made visual in table 15.

Based on the presented results in this chapter, the following chapter will elaborate on these results, by drawing conclusions and interpreting the results.

Table 15.

Results on the hypotheses H2 and H3.

	Hypothesis	Expected correlation	Significant in regression
H2A	Optimism and intention to adopt online grocery shopping among older consumers are positively related.	Yes	No
H2B	Innovativeness and intention to adopt online grocery shopping among older consumers are positively related.	Yes	Yes
H2C	Convenience orientation is positively related to intention to adopt online grocery shopping among older consumers.	Yes	Yes
H2D	There is a positive relationship between having health issues and intention to adopt online grocery shopping among older consumers.	No	Yes
H3A	Discomfort and intention to adopt online grocery shopping among older consumers are negatively related.	Yes	No
H3B	Insecurity and intention to adopt online grocery shopping among older consumers are negatively related.	Yes	No
H3C	The perceived risk on online grocery shopping is negatively related with the intention to adopt online grocery shopping among older consumers.	Yes	Yes
H3D	There is a negative relationship between the need for social interaction and intention to adopt online grocery shopping among older consumers.	Yes	No
H3E	There is a negative relationship between loneliness and the intention to adopt online grocery shopping among older consumers.	No	No
H3F	Not willing to pay a delivery fee is negatively related to intention to adopt online grocery shopping among older consumers in the Netherlands.	Yes	Yes
H3G	Not being able or willing to order a certain minimum amount is negatively related to intention to adopt online grocery shopping among older consumers in the Netherlands.	No	-
H3H	Grocery-specific perceived risk is negatively related with the intention to adopt online grocery shopping among older consumers.	Yes	Yes
-	Additional (control) variables:		
	• Gender	No	Yes
	• Age	Yes	No
	• Internet experience	No	No
	• Household size	Yes	Yes
	• Distance to closest supermarket	Yes	No

5. Conclusion and discussion

This chapter starts by providing conclusions on the above presented results. Secondly, some unexpected outcomes will be discussed in more detail. Thirdly there will be elaborated on the theoretical contributions and managerial implications. Finally, limitations of this study are discussed and directions for future research are given.

5.1 Conclusion

This study started with the question *‘which factors prevent and trigger older consumers towards adopting online grocery shopping in the Netherlands and to what extent do these factors determine older consumers’ intention to adopt online grocery shopping?’*. In order to determine this, a survey was conducted among 442 older Dutch consumers.

Firstly, correlations between independent variables and the dependent variable were calculated. The results showed that optimism, innovativeness, convenience orientation, household size and distance to closest supermarket are positively correlated with older consumers’ intention to adopt online grocery shopping. Also, several factors are negatively correlated with older consumers’ intention to adopt online grocery shopping; these are discomfort, insecurity, perceived risk, grocery-specific perceived risk, social interaction, delivery fee and age.

Secondly, the independent variables were combined into a regression, in order to determine whether a combined model could explain the variance in the intention to adopt online grocery shopping. Not all the factors determine older consumers’ intention to adopt online grocery shopping. The factors that do, are convenience orientation, perceived risk, innovativeness, household size, gender, grocery-specific perceived risk, health issues and delivery fee. From these factors, convenience orientation, innovativeness and health issues trigger the intention to adopt online grocery shopping. Perceived risk, grocery-specific perceived risk and delivery fee prevent older consumers’ from adopting online grocery shopping. Household size and gender are socio-demographic factors that do have an influence in this regression. Both show a positive relation in the regression model. For gender this means that women are more likely than men to have the intention to adopt online grocery shopping. Together, these factors explain 32.3% of the variance in older consumers’ intention to adopt online grocery shopping.

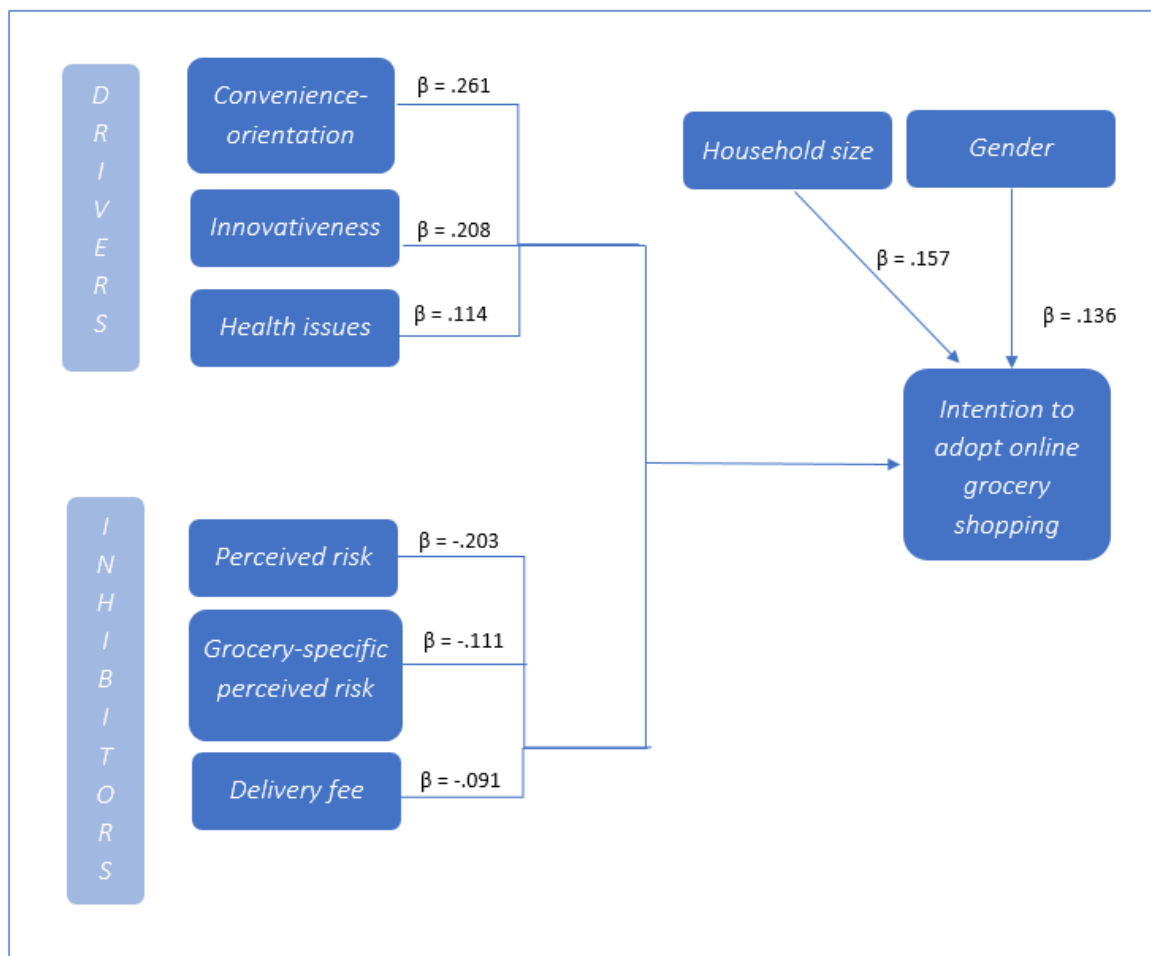


Figure 8. Results of the final model that explains 32.3% of the variance in intention to adopt online grocery shopping among Dutch older consumers. *Interpretation of gender: male = 0; female = 1.

Based on this model the answer on the research question is that innovativeness, convenience orientation, health issues, gender, perceived risk, grocery-specific perceived risk, delivery fee and household size are factors that prevent and trigger older consumers towards adopting online grocery shopping. Figure 8 shows exactly which of these factors are the drivers and the inhibitors and to what extent they determine the intention to adopt online grocery shopping.

From these factors, convenience orientation, perceived risk and innovativeness are the most important predictors. These two factors together account for 25.6% of the explained variance in the intention to adopt online grocery shopping. This founded relation with convenience orientation is in line with other research on online grocery shopping and online shopping in general, conducted among different age groups (e.g. Girard et al., 2003; Handa & Gupta, 2014; Loketkrawee & Bhatiasevi, 2018). Therefore, it can be concluded that convenience orientation is the most important predictor for the intention to buy groceries online for older Dutch consumers, which is the same relationship as can be

found among other age groups and cultures. The founded negative relation between perceived risk and intention to adopt online grocery shopping is also in line with the expectations from earlier studies (Chaparro-Peláez et al., 2016; Mortimer et al., 2016). Therefore, this study confirms that perceived risk is, despite the fast developments of the internet, still an inhibitor for older Dutch consumers to adopt innovations that use the internet, in this case online grocery shopping. Finally, innovativeness shows how innovative older consumers are. Since online grocery shopping is an innovation, it is in line with the expectations that innovativeness is found to be positively related to the intention to adopt online grocery shopping.

Two possible solutions to the research question have been discussed. First of all by studying correlations and secondly by developing a regression model. Since, the adoption of online grocery shopping is a complex phenomenon and multiple factors can be involved, it is recommended to see the adoption of online grocery shopping as a complex phenomenon. Therefore, the solution derived from the multiple regression is suggested to be the answer to the research question, since regression takes into account this complexity by taking into account the combination of factors, instead of one correlation at a time.

Thus, in conclusion it can be stated that the eight factors, presented in figure 8, are the factors that prevent and trigger older consumers towards adopting online grocery shopping in the Netherlands. From these factors convenience-orientation, perceived risk and innovativeness are the most important predictors. These three factors can be named selective innovativeness, in line with Schiffman and Sherman (1991). Selective innovativeness describes the phenomenon that older consumers accept and adopt new innovations and technologies selectively. Thus older consumers only adopt when they see the benefits of the innovation (Schiffman & Sherman, 1991). In this case when they see that it is convenient and there is less risk and they have an innovative mindset, this all determines their selective innovativeness. Therefore, it can be concluded that selective innovativeness is of importance in understanding the adoption of online grocery shopping among Dutch older consumers. Thus, when older consumers are selective innovative towards the innovation of online grocery shopping, it is more likely that they will adopt this innovation.

5.2 Discussion

Hypothesis 1 suggested that older consumers would score higher on the inhibitors than on the drivers of the TRI 2.0. However, results did not show a significant difference. A possible explanation for not supporting H1 might be that older consumers are using the internet more and more and are therefore

more familiar with new technologies and thus more innovative and optimistic and at the same time experience less discomfort and insecurity. The hypothesis was based on the study Parasuraman & Colby (2015) conducted in the USA. It was expected that the technological developments in the Netherlands and the USA were comparable. However, it seems that there are some small differences, where the Netherlands has a slightly advantage in terms of technological developments. For instance, in the Netherlands 90% of the adults above 37 use the internet, while in the USA that is 84% (Pew Research Center, 2018). That is why it is explainable that Dutch older consumers are more technology ready, than was expected based on the study in the USA (Parasuraman & Colby, 2015). Besides that, internet technology develops at a fast pace. Since the study of Parasuraman & Colby (2015) is conducted in 2014, which is already 5 years ago, the rapid development of the internet technology and its usage might also explain this unexpected result. Interestingly, when dividing the group into subgroups, the expected mean difference in internet usage is found among Dutch consumers of 70 years and older compared to the younger ones. This might be due to the fact that they have stopped working in the past years and have not had to use a lot of new technologies. The older consumers that are still working are to a great extent forced to use new technologies during their work, which makes them more familiar with new technologies. For the consumers of 70 years and older, this is probably not the case, since many of them are already retired. Overall, it is likely that, with the current technological developments, this picture on technology readiness is changing. In this study it is already found that while consumers of 50-55 years old score higher on the drivers than on the inhibitors, the consumers of 70 years and older score higher on the inhibitors than the drivers. This shift is expected to continue the coming years, so it will be likely that consumers are becoming more technology ready in the future.

Another unexpected finding is that loneliness and internet experience do not correlate with intention to adopt online grocery shopping, neither do they have any predictive power in predicting the intention to adopt online grocery shopping. In the sample, many people do not experience loneliness and many people use the internet daily. This might cause that no relation is found because there is barely variation in these variables. Considering internet experience, more and more people are adopting the internet, also older consumers. In 2012 43% of the people between 65 and 75-year-old never used internet. In 2018 this has decreased to 10% (CBS, 2019b). Among adults of 75 years and older, this percentage has decreased from 66 to 32 percent (CBS, 2019b). This suggests that the internet adoption is developing on a fast pace. When everyone, or almost everyone is using the internet, it is likely that there is no correlation found between internet experience and intention to adopt online grocery shopping. For loneliness, some separate tests have been conducted, since the majority of respondents did not experience loneliness. 64 respondents had a high loneliness-score (three or higher). When

comparing this group to the group with respondents that had a loneliness-score of two or lower, it is found that those two groups only differed significantly on innovativeness, insecurity, overall technology readiness and health issues. No significant mean difference was found in intention to adopt online grocery shopping. This suggests that the fact that there is no correlation between loneliness and intention to adopt online grocery shopping is not due to the fact that there was a little amount of lonely people in the sample, but that loneliness probably does not have the expected effect. Thus, findings suggest that despite the expectations, loneliness is not related to the intention to adopt online grocery shopping. Since the relation between loneliness and intention to shop online never has been studied before, this study gives the interesting insight that loneliness is not related to the intention to adopt online grocery shopping.

As pointed out in the results section, the correlation between minimum amount of order and the intention to adopt online grocery shopping was positively significant, while the expected relationship was negative. Because of the unexpected relationship, this variable was not included in any further analysis. However, this discussion tries to find possible explanations for this unexpected correlation. One option is that the question was not clear to the respondents, which results in unexplainable outcomes. However, this is not very likely, since during the pre-test none of the respondents marked that question as difficult. Another option is that there are many people that do not have the intention to adopt online grocery shopping, but that they do not care about the minimum amount of order. The other way around is also an option, it might be that people do have the intention to adopt online grocery shopping, but the minimum amount of order is problematic for them, thus they do not actually adopt, even though they have the intention. Finally, in line with the previous argument, consumers might want to have the convenience of ordering anything, anytime they want, however the minimum amount of order makes it less convenient and easy, since they have to order a minimum. Overall, several speculative explanations are possible, but none of them can be proven. The option that is most likely in my opinion is that people do have the intention to adopt online grocery shopping, but do not actually adopt, because the minimum amount of order is problematic or the minimum amount of order makes it less convenient.

As expected, some of the variables that do correlate with the intention to adopt online grocery shopping are not significant predictors in the regression analysis with intention to adopt online grocery shopping as the dependent variable. This makes sense cause regression analysis also takes into account the correlations with other independent variables, which might result in a very small predictive power for one of the correlated independent variables, because one predictive variable might overpower another one. However, there were also two variables that did not show a correlation with the intention

to adopt online grocery shopping, but were predictive in the regression analysis. This was the case for health issues and gender. This is possible since there are multiple predictors added to the regression model and collinearity is low. Low collinearity between predictors can result in a higher predictive power for the regression model. In this study, this resulted in the addition of health issues and gender as significant predictors, while they did not correlate with the dependent variable.

Another remarkable finding when comparing the results of the correlations and the results of the regression, is that, even though not significant, discomfort and insecurity were negatively correlated with the intention to adopt online grocery shopping, but were positive predictors in the regression analysis. Even though the VIF-values did not suggest multicollinearity, this is probably due to the fact that these factors correlated to other independent variables as well. It is found that both discomfort and insecurity positively correlate with the variable health issues. The variable health issues positively predicts the intention to adopt online grocery shopping and has more predictive power in the regression analysis than discomfort and insecurity. This might have resulted in the fact that discomfort and insecurity suddenly turned into positive predictors, instead of the expected negative ones. This might have happened because, people with health issues also score higher on discomfort and insecurity. Thus, since health issues positively predicts the intention to adopt online grocery shopping, it is explainable that discomfort and insecurity also turned out to be positive predictors, because those two factors positively correlate with health issues.

Finally, gender was included as a control variable, since it was expected that men are more convenience-oriented and are therefore more likely to have a higher intention to adopt online grocery shopping (Swaminathan et al., 1999). However, the study revealed that women are more likely to adopt online grocery shopping. No relationship is found between gender and convenience orientation. There are a few possible explanations for this unexpected finding. Firstly, the hypothesis was based on an aged study, which was conducted two decades ago. In the meantime, many things have changed. Therefore, it is possible that the whole society is more convenience-oriented which makes that there are no differences found between male and female in convenience orientation. Another reason might be that convenience orientation of men and women differs when they are getting older. The original study of Swaminathan and colleagues (1999) included only 18.4% of people that were 50 years and older. The rest of the respondents in that study were below 50. Therefore, convenience orientation might be different per age group. But, if there is no difference in convenience orientation, why do females have a higher intention to adopt online grocery shopping? A possible explanation might be that, even though this is slowly shifting, traditionally women are responsible for the groceries (Mortimer & Clarke, 2011). It seems logical that when someone is responsible for something it is more

likely that that person will use innovations in that area. This might be why females are more likely to adopt online grocery shopping.

5.3 Implications

This paragraph discusses the implications of the conducted study and their results. This will be discussed in two ways. First, the theoretical contribution will be discussed. Secondly, managerial implications will be explained, so retailers have recommendations on how to translate the results to the entrepreneurial practice.

5.3.1. Theoretical contribution

This study contributes to the academic literature on online grocery shopping in several ways. First, this study is the first contribution that specifically focusses on the older consumer. This has revealed that older consumers are mainly led by selective innovation in their intention to adopt online grocery shopping. This is in line with several reasons for online shopping in general as discussed in the meta-analysis of Zhou, Dai and Zhang (2007). Therefore, this study shows that the adoption of online shopping in general and online grocery shopping are similar to some extent. Secondly, this study confirmed the link between health issues and intention to adopt online grocery shopping. The studies that have showed this link before have been conducted more than a decade ago (Hand et al., 2009; Morganosky & Cude, 2000). Therefore, this study tried to understand whether this link was still present and especially whether this relationship is present among older consumers. This study showed that this is still the case. However, this was not a direct link. Health issues only seem to play a role if innovativeness, perceived risk and convenience orientation are included in the model as well. The fact that health issues do not play a direct role is a whole new insight on the relationship between health issues and the adoption of online grocery shopping. Finally, this study proves that technology readiness can be an important framework to determine adoption of new services that require technology.

5.3.2. Managerial implications

21.5% of the respondents has the intention to use online grocery shopping in the coming year, which is more than double of the actual adopters in the Netherlands in 2018 (Eurostat, 2018). This suggests that there is market potential, since there are non-adopters that do have the intention to adopt. Therefore, the adoption rate among older consumers can be increased, when implementing the right strategy.

However, as a retailer the first step should be to determine where the retailer wants the focus to be on. It makes sense that bigger households, spend more money on groceries. Older consumers mostly do have a household of 1 or 2 persons, which is small. Therefore, they probably spend less on their groceries. A retailer should consider its priorities in marketing. However, if a retailer wants to increase the traffic of older consumers, especially now the society is greying, in online grocery shopping some recommendations are listed.

Findings suggest that the main driver for older consumers to start doing their groceries online, is selective innovativeness. Part of this is convenience. Since convenience is a personal characteristic, retailers can not change this. However, when a retailer wants more older consumers to adopt online grocery shopping, it might be valuable to focus on the convenience of online grocery shopping in the marketing strategy. Therefore, marketing materials should highlight the convenience and advantages of online grocery shopping. Another thing that impacts the selective innovation, is a barrier for older consumers to start online grocery shopping, namely perceived risk. This is also difficult to change as a retailer, however marketing can be used to lower the perceived risk of the older consumer. For instance, the marketing materials can be aimed at explaining how easy and safe it is to use the app or the internet for ordering the groceries. Another option is to organize short training sessions, locally, when there are seniors who are interested, but do not think they are capable of doing it themselves. Thus, if a retailer wants to increase traffic of older consumers in online grocery shopping, it should mainly be done by using marketing materials to highlight the main reason for adopting and by removing the risks older consumers perceive. When developing marketing materials that focus on the above-mentioned points, the target group of older consumers should be taken into account. Considering marketing, there are several studies written on how to adequately do marketing for older consumers (e.g. Moschis, 2003; Yoon & Cole, 2017). One thing that for instance should be considered is keeping it simple. Many older consumers are not used to making choices as much as you need to do nowadays in society. Therefore, marketing should help older consumers make decisions, by making it easy and simple for them to make decisions by avoiding too much choice (van der Zwan, 2017).

In order to keep the older consumers that already do their groceries online, service should be at a good level. Older consumers think service is very important, 71.3% stated that service is important for them in determining where and how to shop their groceries. This implies that if the service is bad, they would consider doing their groceries somewhere else. As one of the interviewees said: *“when the service is not good anymore, or they deliver wrong products, things like that and that would happen all the time, or if they are hours late, that will be a reason to stop”*.

Finally, there are still many (68.8%) older consumers that do want to go to the supermarket themselves. Therefore, online grocery shopping can be a great addition for some older consumers, but it will probably not replace the traditional supermarket. During one of the interviews a respondent named something interesting about this. He could imagine that when getting older it would be more difficult to carry all the groceries, and that it would be interesting to have an option where the groceries would be brought at home. However, he also stated that grocery shopping can be a way of interaction and getting in touch with other people, especially when you're living by yourself. Based on this reasoning he did a suggestion. Namely make it possible that the older consumer who cannot carry his own groceries, is still able to go to the supermarket himself. The proposed idea to do this, is by giving the older consumer the possibility to scan the products he needs in the supermarket, without actually grabbing them. After scanning everything he needs, he can pay at the cashier, including an additional fee. A few hours later the groceries that he scanned will be delivered at his home. By implementing this, the older consumer is still able to go to the supermarket on his own and has the possibility to be among other people. Basically, the older consumer will still be able to make his shopping trip including the social interaction, without having to carry all the groceries when that is getting difficult.

However, another respondent in the interviews stated she valued the social interaction with the deliverer more than the social interaction in the supermarket. This might differ strongly between different people. Therefore, it is recommended to not generalize the results, but take the results into account while developing a strategy for each specific supermarket and customer segments.

5.4 Limitations and future research

This study also has some limitations, mainly methodological. These limitations will be discussed and points for improvement are suggested for future research. Finally, this paragraph will add some more suggestions for future research on the adoption of online grocery shopping.

The first limitation of this study is that there have been numerous possibilities of factors to include in the study. Based on other studies, some of them have been chosen to be incorporated. However, theoretically many more factors could have been included. For instance, one of the variables has been convenience orientation, which is one of several possible shopping orientations. It could be very interesting to study whether other shopping orientations might also influence the intention to adopt online grocery shopping. Since, including all the shopping orientations would make the survey way too extensive, this study only incorporated the shopping orientation that was most likely to be related to the adoption of online grocery shopping. Therefore, this study was not able to check for all kinds of

factors. However, the factors that were likely to influence the adoption of online grocery shopping the most were included.

This also accounts for perceived risk. According to Chaparro-Peláez and colleagues (2016) perceived risk involves two kinds of perceived risk, namely the risk involved by making payments over the web and safety and besides that the perceived risk that has to do with the product. This study considered perceived risk as a whole, however results indicate that there are differences in types of perceived risk. That resulted in naming part of perceived risk grocery-specific perceived risk. Future research should include different types of perceived risk and measure them all with multiple items in order to draw conclusions on what types of perceived risk exactly prevent older consumers from online grocery shopping.

Besides that, future research could include other factors as well, for instance assortment and service might explain more of the variance, since both have been mentioned in the interviews. A good way to include these factors is by conducting a conjoint analysis or by studying this by means of a case study in the reality by studying actual shoppers in different supermarkets and online retailers. Besides that, additional demographic factors, like income and education, could be included to measure whether that might explain more of the variance. Also, more circumstantial factors could be included in future research, for example the weather. It might be that people consider adopting more when it is raining or extremely hot or cold outside. Also, other circumstances might play a role, for instance inflation.

Also, personal circumstances, for instance if someone works part-time, fulltime or is retired, can possibly make a difference in the intention to adopt online grocery shopping. Besides that, this study showed that health issues are predictors in the regression analysis. However, future research could elaborate on that by including specific health issues. For instance, physical health issues, which decreases mobility versus mental health issues like depression. It can be very interesting to study whether both types of health issues have an effect or whether this effect is mainly due to one type of health issues. Since, this was an explorative study in the context of older consumers, future research can elaborate on this study and improve the proposed model from this study by studying the suggested factors.

Secondly, some of the measurements could have been even more accurate than at present. First, health issues are only measured with one question, while there are scales to measure health that are more elaborated. The main reason to include only one question was because of the duration of the survey. By including multiple items, the questionnaire would have been very long and the chances for

quitting during the survey would have been increased. However, it could be interesting for future research to study whether the results on health are the same when using a scale to measure health, for instance by using dimensions of positive health (Huber et al., 2011). Besides, health, some other variables have been measured with one question as well, for instance internet experience and the questions that have been added based on the interviews. One of the questions that has been added based on the interviews was about the delivery fee and the willingness to pay a delivery fee. This question suggested that delivery fee was an inhibitor. Since people who are not willing to pay the delivery fee, showed a lower intention to adopt online grocery shopping. However, since this is an assumption based on that single question, it would have been better to study the influence of a delivery fee with a conjoint analysis. This would have been too extensive for this study, however future research might execute a conjoint analysis in order to better understand what the influences are from the delivery fee. Conducting a conjoint analysis might also be useful in order to study the exact influence of the minimum amount of order and the quality of the service.

Another limitation in the used measurements are the translated questions of the TRI 2.0. During the pretest one respondent noticed that these questions were difficult to understand and thus to answer. Since, these questions were tested elaborately in the USA and were carefully translated this is not changed before sending out the survey. However, some respondents that filled out the survey offline thought the same thing, the questions were difficult. For example, one respondent did not fill out any of the questions of the TRI 2.0 and wrote a big question mark next to the questions. Also a few respondents gave me personal feedback that they thought these questions were difficult. The respondents who mentioned this were all female. This feedback suggests that some of the questions might have been difficult to understand for some respondents, this might have influenced the outcomes a little. However, during the pretest, none of the other respondents thought that the questions of the TRI 2.0 were difficult. Thus, it is likely that only a small number of respondents had some difficulties answering these questions and this does not have a main impact on the results. Nevertheless, when including more 'simple' questions, it would have been more likely that more people that started participating online in completing the questionnaire, would also finish the survey. This could have resulted in more respondents, but also in slightly different outcomes, since it might be possible that the people that quitted the survey because of difficult questions have another opinion than the people who thought the questions were easy to answer.

Thirdly, the sample was not completely representative. First of all, the total sample size was adequate. However, 69.5% of the sample included female respondents, which resulted in a relatively small sample of male respondents. Secondly, gender and age were correlated to each other. This was due

to the sample which exists on average of older men and younger women. This also makes the sample not completely representative. This might have been due to the topic, since the topic is likely to attract more female respondents than male respondents. Since, there were not so many male respondents included in the study, this also might have caused the remarkable correlation between age and gender. Obviously, this correlation was due to the sample and is not applicable to the whole population. Future research should try to include more male respondents and some respondents that are less healthy to get a more representative sample. Also, the respondents experienced less health issues than the whole population. This can be explained by the fact that the whole population also includes people in nursing homes and on average they experience more health issues than older consumers who live independently. This study focused on the older consumers that live independently and therefore probably did not include as many people with health issues as was expected based on the total population.

Finally, this study resulted in a model (figure 8) that accounts for more than 32% of the explained variance in the intention to adopt online grocery shopping among Dutch older consumers. Future research could focus on a few topics in order to extend this research. Firstly, future research could extend the current knowledge about the adoption of online grocery shopping among older consumers by studying this topic in several countries with different cultures, to determine whether this might also be culture specific. Secondly, future research could elaborate on this study by conducting a comparative study between older consumers and consumers below 50 years of age. Thirdly, as discussed future research could also study other possible factors that might influence the intention to adopt online grocery shopping, in order to be able to extend the current model so that there will be more predictive power. As discussed before, this could be by studying the influence of other shopping orientations as well or by including other additional factors.

All in all, it can be stated that online grocery shopping is a new area with lots of possibilities for the retailers, where unfortunately academic studies are scarce. Despite the above-mentioned limitations, this study has shown that whether older consumers adopt online grocery shopping or not mainly depends on their selective innovation, which consists of their convenience orientation, perceived risk and innovativeness. These outcomes give valuable information to the retailers on how to roll out a marketing-strategy that also targets older consumers. Besides that, the study gives new insights in the factors that determine the adoption of online grocery shopping, especially for older consumers. Future research can elaborate on this study by trying to explain more of the variance or by comparing this to other age-groups. In conclusion, this study has explored the field of older consumers and online grocery shopping and there is still much more to learn about the adoption of online grocery shopping.

Therefore, it is recommended to continue studying this field, to get more detailed knowledge about the adoption of this innovation, online grocery shopping.

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Appendix A – Interview guidelines

Since the respondents and the researcher are all Dutch, this outline is in Dutch.

Respondent A – has adopted online grocery shopping and uses it regularly.

1. Kunt u uzelf kort introduceren? Leeftijd, dagelijkse bezigheden etc.
2. Ik heb begrepen dat u uw boodschappen online doet.
 - Sinds wanneer doet u dit?
 - Wat is de reden dat u hiermee bent gestart?
 - Doet u uw boodschappen altijd online of gaat u soms nog naar de supermarkt?
 - Indien nog naar supermarkt: wat is de reden dat u hier zo nu en dan heengaat?
 - Wat zijn voor u de grootste voordelen van online boodschappen doen?
 - Kleven er ook nadelen aan het doen van online boodschappen?
 - Doorvraag: maar dit weegt niet op tegen de voordelen?
 - Wat zou voor u een reden zijn om weer te stoppen met online boodschappen doen?
(Dit kan service gerelateerd zijn, maar ook persoonlijk)
 - Zou u het aan anderen aanraden? Zo ja, hoe zou u hen overtuigen?

Respondent B – uses online grocery shopping once in a while.

1. Kunt u uzelf kort introduceren? Leeftijd, dagelijkse bezigheden etc.
2. Ik heb begrepen dat u zo nu en dan uw boodschappen online doet.
 - Sinds wanneer bent u hiermee begonnen?
 - Wat is de reden dat u hiermee bent gestart?
 - Hoe is de verdeling tussen naar de supermarkt gaan en online boodschappen doen?
 - Wat is de reden dat u soms voor de supermarkt kiest en soms voor online?
 - Wat zijn voor u de voordelen van online boodschappen doen?
 - Wat zijn voor u de nadelen van online boodschappen doen?
 - Wat zou voor u een reden zijn om weer te stoppen met online boodschappen doen?
(Dit kan service gerelateerd zijn, maar ook persoonlijk)
 - Zou u het aan anderen aanraden? Zo ja, hoe zou u hen overtuigen?

Respondent C – has never tried online grocery shopping.

1. Kunt u uzelf kort introduceren? Leeftijd, dagelijkse bezigheden etc.
2. Ik heb begrepen dat u uw boodschappen altijd in de supermarkt zelf haalt. Tegenwoordig zijn er ook veel mogelijkheden om online boodschappen te bestellen. Heeft u wel eens overwogen hier gebruik van te maken?
 - Zou u het wel eens willen proberen? Waarom wel/niet?
 - Wat is voor u de reden om de boodschappen in de supermarkt te blijven halen?
 - Kunt u een reden bedenken waardoor het waarschijnlijk wordt dat u gebruik gaat maken van online boodschappen doen?

Appendix B – Survey

Because the respondents are Dutch older consumers, the survey will be in Dutch.

Beste deelnemer,

Fijn dat u deze vragenlijst wil invullen. Deze vragenlijst is bedoeld voor iedereen van 50 jaar en ouder. Bent u nog geen 50 jaar, dan wil ik u vragen de enquête **NIET** in te vullen.

Momenteel ben ik bijna klaar met mijn studie Bedrijfskunde aan de Radboud Universiteit te Nijmegen. Voor mijn afstudeerscriptie, onder begeleiding van prof. dr. H. Kasper, doe ik onderzoek naar het doen van online boodschappen door consumenten van 50+. Voor het invullen van de vragenlijst maakt het niet uit of u wel of geen gebruik maakt van online boodschappen. Ook als u uw boodschappen zelf bij de supermarkt haalt, ben ik erg benieuwd naar uw mening.

In het eerste gedeelte van de vragenlijst staan een aantal algemene vragen die belangrijk zijn om de resultaten van mijn onderzoek goed te kunnen interpreteren. Het laatste gedeelte van de vragenlijst gaat over (online) boodschappen doen.

Het invullen van de vragenlijst kost ongeveer 10 tot 15 minuten. Alle gegevens zullen anoniem worden verwerkt; de huidige privacy regels worden toegepast.

Mocht u vragen hebben, dan kunt u mij altijd bereiken via manja.dieterman@live.nl of 

Alvast heel erg bedankt voor uw medewerking!

Manja van Munster-Dieterman.

1. Wat is uw geslacht?

- ☐ Man
☐ Vrouw

2. Wat is uw leeftijd? jaar

3. Uit hoeveel personen bestaat uw huishouden? perso(o)n(en)

4. Op welke afstand bevindt zich de dichtstbijzijnde supermarkt?

- ☐ < 500 meter
☐ 500 meter – 1.5 km
☐ 1.5 km – 2.5 km
☐ > 2.5 km

De volgende vragen hebben te maken met uw gezondheid.

5. Hoe is in het algemeen uw gezondheid?

- ☐ Zeer slecht
☐ Slecht
☐ Gaat wel
☐ Goed
☐ Zeer goed

6. Wilt u van elk van de volgende uitspraken aangeven in hoeverre die op u, zoals u de laatste tijd bent, van toepassing is?

	Ja	Min of meer	Nee
Er zijn genoeg mensen op wie ik in geval van narigheid kan terugvallen.	O	O	O
Ik ervaar leegte om mij heen.	O	O	O
Vaak voel ik mij in de steek gelaten.	O	O	O
Ik heb veel mensen op wie ik volledig kan vertrouwen.	O	O	O
Ik mis mensen om mij heen.	O	O	O
Er zijn voldoende mensen met wie ik me nauw verbonden voel.	O	O	O

7. Internetgebruik.

Hoe vaak maakt u gebruik van het internet? (hieronder valt websites bezoeken, maar ook social media gebruik, bijv. e-mail, Facebook en Whatsapp)

(Bijna) nooit	Maandelijks	Wekelijks	Dagelijks	Meerdere keren per dag
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. De volgende vragen gaan over hoe technologie uw leven beïnvloedt. Wilt u bij de volgende stellingen aangeven in hoeverre u het er eens of oneens mee bent.

	Helemaal oneens	Oneens	Neutraal	Eens	Helemaal eens
Nieuwe technologieën dragen bij aan een betere levenskwaliteit.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Normaal gesproken kan ik zelf achterhalen hoe nieuwe technologische producten en services werken, zonder hulp van anderen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Op het moment dat ik technische ondersteuning krijg van een bedrijf heb ik soms het gevoel alsof ze van mijn onwetendheid profiteren.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Technologie geeft mij meer bewegingsvrijheid.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Te veel technologie leidt mensen af tot een punt waarop het schadelijk is.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Soms denk ik dat technologische systemen niet ontworpen zijn om gebruikt te worden door normale mensen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Andere mensen komen naar mij toe voor advies over nieuwe technologieën.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Helemaal oneens	Oneens	Neutraal	Eens	Helemaal eens
Mensen zijn te afhankelijk van technologie om dingen voor ze te doen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik blijf op de hoogte van de laatste technologische ontwikkelingen binnen mijn interessegebied.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Technologie geeft mensen meer controle over hun dagelijkse leven.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Over het algemeen ben ik de eerste binnen mijn vriendenkring die een nieuwe technologie aanschaft wanneer het verschijnt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Het voelt niet vertrouwd voor mij zaken te doen met een bedrijf dat alleen maar online te bereiken is.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
De technische helpdesk is niet behulpzaam, omdat ze het niet uitleggen in begrijpelijke termen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Er bestaat geen gebruiksaanwijzing in begrijpelijke taal voor nieuwe technologische producten of diensten.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Technologie vermindert de kwaliteit van mijn persoonlijke relaties, omdat de persoonlijke interactie afneemt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Technologie maakt mij productiever in mijn dagelijks leven.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Ik wil u vragen het volgende informatieblok eerst door te lezen voordat u verder gaat met de rest van de vragen.

Online boodschappen doen betekent dat u uw boodschappen online, via internet, bestelt. Deze boodschappen kunnen dan bij u thuis worden afgeleverd tussen bepaalde tijden of later worden afgehaald bij de supermarkt. Wanneer u de boodschappen op deze manier bestelt, hoeft u niet meer zelf naar de winkel toe om de boodschappen te halen. U kunt deze dan gewoon vanachter uw computer, laptop, tablet of mobiele telefoon bestellen.

**Deze kosten kunnen ondertussen gewijzigd zijn. Tevens is er bij een aantal van deze supermarkten de optie om de boodschappen zelf af te halen, de bezorgkosten liggen dan beduidend lager. Vaak zijn er ook actieproducten, wanneer u die aanschaft vervallen de bezorgkosten.*

Aanbieder	Minimum bestelbedrag	Bezorgkosten
Albert Heijn	€70,-	€3,95 - €12,95
Jumbo	€50,-	€6,00
PicNic	€25,-	Gratis
Coop	€40,-	€4,99
Spar	Nvt	€4,95 (gratis vanaf €50,00)
Plus	€25,-	€6,00

☐ Nee (beantwoord alleen vraag 9A en ga daarna verder met vraag 10)

☐ Ja (beantwoord alleen vraag 9B en ga daarna verder met vraag 10)

9A) Met uw huidige kennis over en/of ervaring met online boodschappen doen, in hoeverre bent u van plan om hier het komende jaar gebruik van te gaan maken? (Indien u niet verantwoordelijk bent voor de boodschappen in uw huishouden, stelt u zich dan voor dat u dit wel zou zijn bij het beantwoorden van deze vraag.)

$$0 \qquad 0 \qquad 0 \qquad 0 \qquad 0$$
$$0 \qquad 0 \qquad 0 \qquad 0 \qquad 0$$

10. Naar aanleiding van de antwoorden die u bij vraag 9 hebt gegeven, wilt u bij de volgende stellingen aangeven in hoeverre u het eens of oneens bent met de stelling?

	Helemaal oneens	Oneens	Neutraal	Eens	Helemaal eens
a) Het minimumbestelbedrag weerhoudt mij ervan om online boodschappen te gaan doen.	O	O	O	O	O
b) Ik ben bereid om bezorgkosten te betalen voor de service die geleverd wordt bij het doen van online boodschappen.	O	O	O	O	O
c) Service is voor mij erg belangrijk bij het bepalen op welke manier en waar ik mijn boodschappen haal.	O	O	O	O	O
d) Een reden voor mij om (bepaalde) boodschappen in de supermarkt te halen en niet online is het feit dat ik zelf op versheid, kwaliteit en houdbaarheid wil controleren.	O	O	O	O	O

11. Bezorgkosten: Welk bedrag aan bezorgkosten bent u bereid te betalen voor de service dat de boodschappen bij u thuis worden bezorgd? (Deze bezorgkosten zijn per bestelling.)

- ☐ Geen
- ☐ tot €2,50
- ☐ €2,50 tot €5,00
- ☐ €5,00 tot €7,50
- ☐ €7,50 tot €10,00
- ☐ €10,00 tot €15,00

12. Wilt u bij de volgende stellingen aangeven in hoeverre u het eens of oneens bent met de stelling?

Het eerste gedeelte gaat over online boodschappen doen.	Helemaal oneens	Oneens	Neutraal	Eens	Helemaal eens
a) Er is teveel onzekerheid verbonden aan het doen van boodschappen op het internet.	O	O	O	O	O
b) Ik vind het veilig om mijn persoonlijke gegevens af te geven op een website van een supermarkt wanneer er om gevraagd wordt.	O	O	O	O	O

	Helemaal oneens	Oneens	Neutraal	Eens	Helemaal eens
c) Ik vind het veilig om mijn pinpas te gebruiken voor het betalen van mijn online gekochte boodschappen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) Vergeleken met andere manieren van boodschappen doen, denk ik dat het boodschappen doen via internet risicovoller is.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Het tweede gedeelte gaat over boodschappen doen in het algemeen

	Helemaal oneens	Oneens	Neutraal	Eens	Helemaal eens
e) Hoe minder energie het mij kost om boodschappen te doen des te beter het is.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) Ik spendeer zo min mogelijk tijd aan het doen van boodschappen, omdat ik dat prefereer.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g) Het is zonde van de tijd om lang in de supermarkt te zijn voor het doen van boodschappen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. De laatste vragen zijn stellingen over sociale interactie. Wil u aangeven in hoeverre u het eens of oneens bent met de stelling?

	Helemaal oneens	Oneens	Neutraal	Eens	Helemaal eens
a) Tijdens het boodschappen doen in de supermarkt vind ik het leuk om met andere mensen een praatje te maken.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Ik vind het leuk om met andere mensen te praten.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Bedankt dat u de tijd wilde nemen om deze vragenlijst in te vullen!

Bent u geïnteresseerd naar de resultaten? U kunt dit aangeven door contact met mij op te nemen via: manja.dieterman@live.nl of [REDACTED]

Manja van Munster-Dieterman.

Appendix C – Measurements

Question	Variable	Question (Dutch)	Answer scale (Dutch)	Hypotheses
1	Sex	Wat is uw geslacht?	0 = Man 1 = Vrouw	* controlvariable
2	Age	Wat is uw leeftijd?	50-100	* controlvariable
3	Household size	Uit hoeveel personen bestaat uw huishouden?	0-8	none
4	Distance to supermarket	Op welke afstand bevindt zich de dichtstbijzijnde supermarkt?	1 = <500m 2 = 500m – 1.5 km 3 = 1.5 km – 2.5 km 4 = > 2.5 km	none
5	Health	Hoe is in het algemeen uw gezondheid?	1 = Zeer slecht 2 = Slecht 3 = Gaat wel 4 = Goed 5 = Zeer goed	H2D
6	Loneliness (emotional) Loneliness (social)	a) Ik ervaar leegte om mij heen b) Vaak voel ik mij in de steek gelaten c) Ik mis mensen om mij heen d) Er zijn genoeg mensen op wie ik in geval van narigheid kan terugvallen e) Ik heb veel mensen op wie ik volledig kan vertrouwen f) Er zijn voldoende mensen met wie ik me nauw verbonden voel	Yes / kind of = 1 No = 0 Yes = 0 Kind of / No = 1	H3D
7	Internet experience	Hoe vaak maakt u gebruik van het internet?	1 = (bijna) nooit 2 = Maandelijks 3 = Wekelijks 4 = Dagelijks 5 = Meerdere keren per dag	* Controlvariable
8	TRI – Optimism	a) Nieuwe technologieën dragen bij aan een betere levenskwaliteit b) Technologie geeft mij meer bewegingsvrijheid c) Technologie geeft mensen meer controle over hun dagelijks leven	1 = Helemaal oneens 2 = Oneens 3 = Neutraal	H1, H2A

	TRI – Innovativeness	d) Technologie maakt mij productiever in mijn dagelijks leven	4 = Eens	H1, H2B
	TRI – Discomfort	e) Normaal gesproken kan ik zelf achterhalen hoe nieuwe technologische producten en services werken, zonder hulp van anderen	5 = Helemaal eens	H1, H3A
	TRI - Insecurity	f) Andere mensen komen naar mij toe voor advies over nieuwe technologieën		H1, H3B
		g) Ik blijf op de hoogte van de laatste technologische ontwikkelingen binnen mijn interessegebied		
		h) Over het algemeen ben ik de eerste binnen mijn vriendenkring die een nieuwe technologie aanschaft wanneer het verschijnt		
		i) Op het moment dat ik technische ondersteuning krijg van een bedrijf, heb ik soms het gevoel alsof ze van mijn onwetendheid profiteren		
		j) Soms denk ik dat technologische systemen niet ontworpen zijn om gebruikt te worden door normale mensen		
		k) De technische helpdesk is niet behulpzaam, omdat ze het niet uitleggen in begrijpelijke termen		
		l) Er bestaat geen gebruiksaanwijzing in begrijpelijke taal voor nieuwe producten of diensten		
		m) Te veel technologie leidt mensen af tot een punt waarop het schadelijk is		
		n) Mensen zijn te afhankelijk van technologie om dingen voor hen te doen		
		o) Het voelt niet vertrouwd voor mij zaken te doen met een bedrijf dat alleen maar online te bereiken is		
		p) Technologie vermindert de kwaliteit van persoonlijke relaties, omdat de persoonlijke interactie afneemt		
9	Actual adoption	Maakt u momenteel gebruik van online boodschappen?	0 = Nee 1 = Ja	H4
9 a+b	Intention to adopt	a) Met uw huidige kennis over en/of ervaring met online boodschappen doen, in hoeverre bent u van plan om hier het komende jaar gebruik van te gaan maken?	1 = Helemaal niet van plan 2 = Waarschijnlijk niet van plan	H2, H3, H4

		b) Met uw huidige ervaring met online boodschappen doen, in hoeverre bent u van plan dit te blijven gebruiken het komende jaar?	3 = Neutraal 4 = Waarschijnlijk wel van plan 5 = Zeer zeker wel van plan	
10	Reasons adoption Grocery-specific perceived risk	a) Het minimumbestelbedrag weerhoudt mij ervan om online boodschappen te gaan doen. b) Ik ben bereid om bezorgkosten te betalen voor de service die geleverd wordt bij het doen van online boodschappen. c) Service is voor mij erg belangrijk bij het bepalen op welke manier en waar ik mijn boodschappen haal. d) Een reden voor mij om (bepaalde) boodschappen in de supermarkt te halen en niet online, is het feit dat ik zelf op versheid, kwaliteit en houdbaarheid wil controleren.	1 = Helemaal oneens 2 = Oneens 3 = Neutraal 4 = Eens 5 = Helemaal eens	H3F H3G * Interpretation H3H
11	Delivery fee	Welk bedrag aan bezorgkosten bent u bereid te betalen voor de service dat de boodschappen bij u thuis worden bezorgd? (Deze bezorgkosten zijn per bestelling.)	1 = Geen 2 = tot €2,50 3 = €2,50 - €5,00 4 = €5,00 - €7,50 5 = €7,50 - €10,00 6 = €10,00 - €15,00	- * Mainly for interpretation of the results.
12	Perceived risk Convenience orientation	a) Er is teveel onzekerheid verbonden aan het doen van boodschappen op het internet. b) Ik vind het veilig om mijn persoonlijke gegevens af te geven op een website van een supermarkt wanneer er om gevraagd wordt. c) Ik vind het veilig om mijn pinpas te gebruiken voor het betalen van mijn online gekochte boodschappen. d) Vergeleken met andere manieren van boodschappen doen, denk ik dat het boodschappen doen via internet risicovoller is. e) Hoe minder energie het mij kost om boodschappen te doen des te beter het is. f) Ik spendeer zo min mogelijk tijd aan het doen van boodschappen, omdat ik dat prefereer.	1 = Helemaal oneens 2 = Oneens 3 = Neutraal 4 = Eens 5 = Helemaal eens	H3C H2C

		g) Het is zonde van de tijd om lang in de supermarkt te zijn voor het doen van boodschappen.		
13	Social interaction	a) Tijdens het boodschappen doen in de supermarkt vind ik het leuk om met andere mensen een praatje te maken. b) Ik vind het leuk om met andere mensen te praten.	1 = Helemaal oneens 2 = Oneens 3 = Neutraal 4 = Eens 5 = Helemaal eens	H3E

Appendix D – Translation process

In table XX the translation process can be found. The translation from the original question to Dutch is done by a female whose mother language is Dutch and already lives for six years in the USA. The translation from Dutch to English is made by a Dutch female who has finished her university study English language and culture in the Netherlands. After the independent translations, the original question was compared to the final English translation, by the researcher and a man who has been raised in England and has now been living for 20 years in the Netherlands. Together they deliberated on the translations and if the meaning was the same, the final translation they came up with can be found in the fourth column. If nothing is in the fourth column, the first translation is used.

Table XX

Translation process

Original question	Translation to Dutch	Translation back to English	Final Dutch translation
We are interested in your views on how technology influences your life. Please indicate how much you agree with the following statements.	Wij zijn geïnteresseerd in uw mening over hoe technologie uw leven beïnvloedt. Geef bij de volgende stellingen aan in hoeverre u het eens of oneens bent.	We are interested in your opinion on how technology influences your life. Please indicate the measure of your agreement or disagreement with the following statements.	De volgende vragen gaan over hoe technologie uw leven beïnvloedt. Geef bij de volgende stellingen aan in hoeverre u het eens of oneens bent.
New technologies contribute to a better quality of life.	Nieuwe technologieën helpen de levenskwaliteit te verbeteren.	New technologies help improve the quality of life.	Nieuwe technologieën dragen bij aan een betere levenskwaliteit.
I can usually figure out new high-tech products and services without help from others.	Normaal gesproken heb ik geen hulp nodig van anderen bij het toepassen van nieuwe technologieën.	I usually don't need any help from others with applying new technologies.	Normaal gesproken kan ik zelf achterhalen hoe nieuwe technologische producten en services werken, zonder hulp van anderen.

When I get technical support from a provider of a high-tech product or service, I sometimes feel as if I am being taken advantage of by someone who knows more than I do.	Op het moment dat ik technische ondersteuning krijg van een bedrijf lijkt het alsof ze van mijn onwetendheid profiteren.	When I receive technical support from a company it seems as if they are profiting from my ignorance.	Op het moment dat ik technische ondersteuning krijg van een bedrijf heb ik soms het gevoel alsof ze van mijn onwetendheid profiteren
Technology gives me more freedom of mobility.	Technologie geeft mij meer vrijheid in mobiliteit.	Technology gives me more freedom and mobility.	Technologie geeft mij meer bewegingsvrijheid.
Too much technology distracts people to a point that is harmful.	Teveel technologie leidt mensen af en kan schadelijk zijn.	Too much technology distracts people and can be harmful.	Te veel technologie leidt mensen af tot een punt waarop het schadelijk is.
Sometimes, I think that technology systems are not designed for use by ordinary people.	Soms denk ik dat technologische systemen niet gemaakt zijn om te gebruiken door normale mensen.	Sometimes I think that technological systems aren't made to be used by ordinary people.	Soms denk ik dat technologische systemen niet ontworpen zijn om gebruikt te worden door normale mensen.
Other people come to me for advice on new technologies.	Andere mensen komen naar mij toe voor advies over nieuwe technologieën.	Other people come to me for advise on new technologies.	
People are too dependent on technology to do things for them.	Mensen zijn te afhankelijk van technologie.	People are too dependent of technology.	Mensen zijn te afhankelijk van technologie om dingen voor ze te doen.
I keep up with the latest technological developments in my areas of interest.	Ik ben op de hoogte van de laatst technologische ontwikkelingen.	I am up to date with te latest technological developments.	Ik blijf op de hoogte van de laatste technologische ontwikkelingen binnen mijn interessegebied.

Technology gives people more control over their daily lives.	Technologie geeft mensen meer controle over het dagelijks leven.	Technology has given people more control over their daily lives.	Technologie geeft mensen meer controle over hun dagelijkse leven.
In general, I am among the first in my circle of friends to acquire new technology when it appears.	Over het algemeen ben ik de eerste binnen mijn vriendenkring die een nieuwe technologie aanschaft.	I am usually the first one within my circle of friends who purchases a new technology.	Over het algemeen ben ik de eerste binnen mijn vriendenkring die een nieuwe technologie aanschaft wanneer het verschijnt.
I do not feel confident doing business with a place that can only be reached online.	Het voelt niet prettig om zaken te doen met een bedrijf dat alleen maar te bereiken is via het internet.	It doesn't feel comfortable to do business with a company that can only be reached through the internet.	Het voelt niet vertrouwd voor mij zaken te doen met een bedrijf dat alleen maar online te bereiken is.
Technical support lines are not helpful because they don't explain things in terms I understand.	De technische klantenservice is niet behulpzaam omdat het uitlegt wordt in een taal die ik niet begrijp.	The technological support isn't helpful, because it is explained in a language I don't understand.	De technische klantenservice is niet behulpzaam, omdat ze het niet uitleggen in begrijpelijke terminologie.
There is no such thing as a manual for a high-tech product or service that's written in plain language.	Er bestaat geen gebruiksaanwijzing in begrijpelijke taal voor nieuwe technologische producten of diensten.	There is no manual in comprehensible language for new technological products or services.	

Technology lowers the quality of relationships by reducing personal interaction.	Technologie vermindert de kwaliteit van mijn persoonlijke relaties omdat de persoonlijke communicatie afneemt.	Technology decreases the quality of my personal relationships, because the personal communication decreases.	Technologie vermindert de kwaliteit van persoonlijke relaties, omdat de persoonlijke interactie afneemt.
Technology makes me more productive in my personal life.	Technologie maakt mij productiever in mijn dagelijks leven.	Technology makes me more productive in my daily life.	
There is too much uncertainty associated with using the internet to buy groceries.	Er is teveel onzekerheid verbonden aan het doen van boodschappen op het internet.	There is too much uncertainty attached to online shopping.	
Compared with other ways of buying groceries, I think that using the internet is more risky.	Vergeleken met de ouderwetse manier van boodschappen doen, denk ik dat boodschappen doen via het internet risicovoller is.	Compared to the old-fashioned way of shopping I think that online shopping is more risky.	Vergeleken met andere manieren van boodschappen doen, denk ik dat het boodschappen doen via internet risicovoller is.
I feel safe giving my personal details to a supermarket's website if requested.	Ik vind het veilig om mijn persoonlijke gegevens af te geven op een website van een supermarkt.	I think it is safe to hand over my personal information on the website of a supermarket.	Ik vind het veilig om mijn persoonlijke gegevens af te geven op een website van een supermarkt wanneer er om gevraagd wordt.

I feel safe buying groceries on the internet using my credit card.	Ik vind het veilig om mijn pinpas te gebruiken voor het betalen van mijn online gekochte boodschappen.	I think it's safe to use my debit card to pay for my online shopping.	
The less physical energy I need to do my groceries, the better.	Hoe minder energie het mij kost om boodschappen te doen des te beter het is.	The less energy it takes me to shop the better.	
Preferably, I spend as little time as possible on grocery shopping.	Het is mijn voorkeur om zo min mogelijk tijd te spenderen aan de boodschappen.	I prefer to spend as little time as possible on shopping .	Ik spendeer zo min mogelijk tijd aan de boodschappen, omdat ik dat prefereer.
It's a waste of time to spend a long time in the supermarket doing groceries.	Het is zonde van mijn tijd om lang in de supermarkt te zijn voor het doen van de boodschappen.	It is a waste of my time to be in the supermarket for a long time to do my shopping.	Het is zonde van de tijd om lang in de supermarkt te zijn voor het doen van de boodschappen.

Appendix E – Additional results

Table A.

Mean differences between group A (lonely and not healthy) and group B (the others).

	M _A ; N = 19	M _B ; N = 423	p-value
Intention to adopt online grocery shopping	2.00	2.22	.467
TRI – innovativeness	2.38	2.89	.004*
TRI – optimism	3.16	3.37	.182
TRI – discomfort	2.99	2.86	.211
TRI – insecurity	3.68	3.24	.002*
Total score TRI	2.72	3.04	.008*
Perceived risk	3.24	2.86	.025*
Convenience orientation	2.81	2.71	.673
Social interaction	3.95	3.68	.167
Health issues	3.11	1.94	<.001*
Loneliness	3.89	.86	<.001*
Minimum amount of order	2.53	2.40	.628
Delivery fee	3.32	2.80	.039*
Grocery-specific perceived risk	3.89	3.96	.777

* = significant (p < .05).

Table B.

Mean differences between respondents that experience loneliness and respondents that do not.

	M _{LON} ; N = 64	M _{NOTLON} ; N = 378	p-value
Intention to adopt online grocery shopping	2.05	2.24	.272
TRI – innovativeness	2.68	2.89	.034*
TRI – optimism	3.28	3.37	.290
TRI – discomfort	2.95	2.86	.299
TRI – insecurity	3.45	3.23	.007*
Total score TRI	2.89	3.05	.025*
Perceived risk	2.98	2.85	.211
Convenience orientation	2.77	2.70	.613
Social interaction	3.73	3.69	.726
Health issues	2.22	1.95	.004*
Loneliness	3.89	.50	<.001*
Minimum amount of order	2.61	2.37	.110
Delivery fee	2.83	2.82	.956
Grocery-specific perceived risk	3.92	3.97	.749

* = significant ($p < .05$).

Table C.

Mean differences between respondents that do feel healthy and respondents that do not.

	M _{HEA} ; N = 79	M _{NOTHEA} ; N = 363	p-value
Intention to adopt online grocery shopping	2.16	2.22	.727
TRI – innovativeness	2.59	2.92	<.001*
TRI – optimism	3.22	3.39	.054
TRI – discomfort	3.03	2.83	.003*
TRI – insecurity	3.41	3.23	.018*
Total score TRI	2.85	3.06	.001*
Perceived risk	3.00	2.84	.075
Convenience orientation	2.69	2.72	.857
Social interaction	3.89	3.65	.021*
Health issues	3.08	1.75	<.001*
Loneliness	1.32	.92	.053
Minimum amount of order	2.58	2.37	.116
Delivery fee	3.05	2.77	.027*
Grocery-specific perceived risk	4.00	3.95	.693

* = significant (p < .05).

Table D.

Mean scores on the TRI dimensions per age group.

Age group	N	Mean innovativeness	Mean optimism	Mean insecurity	Mean discomfort
50 – 55	143	2.97	3.44	3.25	2.69
55 – 60	113	2.88	3.35	3.26	2.90
60 – 65	77	2.75	3.35	3.29	2.91
65 – 70	44	3.05	3.32	3.16	2.86
70+	65	2.62	3.25	3.31	3.17

Table E.

P-values of a paired t-test between the dimensions of TRI 2.0 among 50-55-year-olds.

	Innovativeness	Optimism	Insecurity	Discomfort
Innovativeness	-	-	-	-
Optimism	<.001*	-	-	-
Insecurity	.002*	.028*	-	-
Discomfort	.003*	<.001*	<.001*	-

* = significant mean-difference ($p < .05$).

Table F.

P-values of a paired t-test between the dimensions of TRI 2.0 among 55-60-year-olds.

	Innovativeness	Optimism	Insecurity	Discomfort
Innovativeness	-	-	-	-
Optimism	<.001*	-	-	-
Insecurity	.001*	.406	-	-
Discomfort	.862	<.001*	<.001*	-

* = significant mean-difference ($p < .05$).

Table G.

P-values of a paired t-test between the dimensions of TRI 2.0 among 60-65-year-olds.

	Innovativeness	Optimism	Insecurity	Discomfort
Innovativeness	-	-	-	-
Optimism	<.001*	-	-	-
Insecurity	<.001*	.608	-	-
Discomfort	.312	<.001*	<.001*	-

* = significant mean-difference ($p < .05$).

Table H.

P-values of a paired t-test between the dimensions of TRI 2.0 among 65-70-year-olds.

	Innovativeness	Optimism	Insecurity	Discomfort
Innovativeness	-	-	-	-
Optimism	.007*	-	-	-
Insecurity	.471	.406	-	-
Discomfort	.209	.012*	.002*	-

* = significant mean-difference ($p < .05$).

Table I.

P-values of a paired t-test between the dimensions of TRI 2.0 among consumers of 70 year and older.

	Innovativeness	Optimism	Insecurity	Discomfort
Innovativeness	-	-	-	-
Optimism	<.001*	-	-	-
Insecurity	<.001*	.630	-	-
Discomfort	<.001*	.543	.088	-

* = significant mean-difference ($p < .05$).