

The effect of COVID-19 on consumer adoption of the online purchase channel for grocery shopping

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ABSTRACT

In the year 2020 the world was struck by the coronavirus pandemic. The illness spread to all continents, influencing not only businesses, governments and infrastructure, but also the everyday life of the consumer. The population is advised, and sometimes forced by rules, to keep their distance from another in order to avoid the further spreading of the illness. Up until the point of the pandemic, the percentage of consumers adopting online grocery shopping was growing steadily each year. This thesis researches if the coronavirus pandemic either fuels the adoption or discontinuation of online grocery shopping by the consumer. Consumer traits and motivational concepts from the Technology Acceptance Model are used to understand said adoption of online grocery shopping and a comparison is made between the situation before and since the coronavirus pandemic. In this research, self-efficacy is the only consumer trait proven to have a significant influence on the adoption of online grocery shopping. Almost all motivational concepts show no significant influence on the adoption of online grocery shopping, either before or since the coronavirus pandemic. However, the coronavirus pandemic has found to have a positive influence on the percentage of groceries being bought online by consumers.

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Keywords

Online grocery shopping, Coronavirus pandemic, COVID-19, Technology Acceptance Model, Consumer traits, Adoption

1. INTRODUCTION

In the last decade, online grocery shopping has become increasingly adopted each year by consumers in Europe. In the year 2019, the Netherlands even proved to be the leading country in the adoption of the online grocery shopping method by consumers (Eurostat, 2020). The share percentage of consumers in the Netherlands who purchased food/groceries online between 2006 and 2019 is shown in figure 1. To serve as comparison, Belgium, Germany and the United Kingdom are also added in the graph.

The figure shows a steady yearly increase of consumer share that purchases groceries via the online channel. However, the cause for this increase remains unexplained. To create a deeper understanding of the factors why consumers are triggered to buying groceries online a framework will be utilized.

The base of this model is provided by the Technology Acceptance Model (TAM) by Davis (1989). Researchers have created this framework in order to understand how computer technologies are accepted and used in a working environment, but it has proved to be helpful in understanding consumer adoption of electronic commerce (Chen et al., 2002; Moon and Kim, 2001; Lederer et al., 2000). In TAM it is explained that the intention to utilize a technology is affected by an individual's attitude towards this technology. The attitude towards this technology is influenced by two independent determinants, which are called "perceived usefulness" and "perceived ease of use" (Davis, F. D., Bagozzi, R. P., & Warshaw, P. R., 1989). Perceived usefulness can be defined as the extent to which an individual believes that making use of a particular technology causes their performance or productivity to be increased. Perceived ease of use can be defined as the extent to which an individual feels that usage of this technology is effortless. A couple years later, "perceived enjoyment" was added as an extra independent determinant. This can be defined as the extent to which an individual believes usage of the technology is enjoyable, without taking possible performance consequences

into account (Davis, F.D., Bagozzi, R.P. and Warshaw, P.R., 1992). In the TAM framework it is argued that "utilitarian and hedonic aspects influence the consumers' attitude towards using a new technology and that this attitude has a strong, direct and positive effect on the consumer's actual intentions of using the new technology" (Bobbitt, L. M., & Dabholkar, P. A., 2001; Davis, F. D., 1993).

In addition, two exogenous factors will be taken into account, "consumer traits" and "the coronavirus pandemic". Consumer traits will be the only consumer difference taken into account, as psychographic profiles and demographic factors are both not of critical interest to understand why consumers use a technology based self-service (Dabholkar, P. A., & Bagozzi, R. P., 2002). There are four consumer traits that are directly relevant and they include self-efficacy, inherent novelty seeking, need for interaction with a service employee and self-consciousness.

This paper researches the influence of the coronavirus pandemic on the consumer adoption (or discontinuation) of online grocery shopping. In simple wording, this thesis researches if the coronavirus pandemic triggers consumers to buy their groceries online or not. During the current coronavirus pandemic there are multiple rules and regulations setup by the Dutch government in order to combat and regulate the further spreading of the virus. These measures are aimed at individuals and organisations. The most noteworthy rules include staying at home as much as possible and keeping 1,5 meter distance to other individuals (RIVM, 2020). The general population is advised to only go outside whenever absolutely necessary. Possible examples could be when one's profession cannot be carried out from their home, when groceries have to be obtained, when fresh air is needed or when help is needed by other individuals. Businesses are also severely affected by additional rules arranged by the Dutch government. On March 15, 2020 the hospitality industry was forced to close.

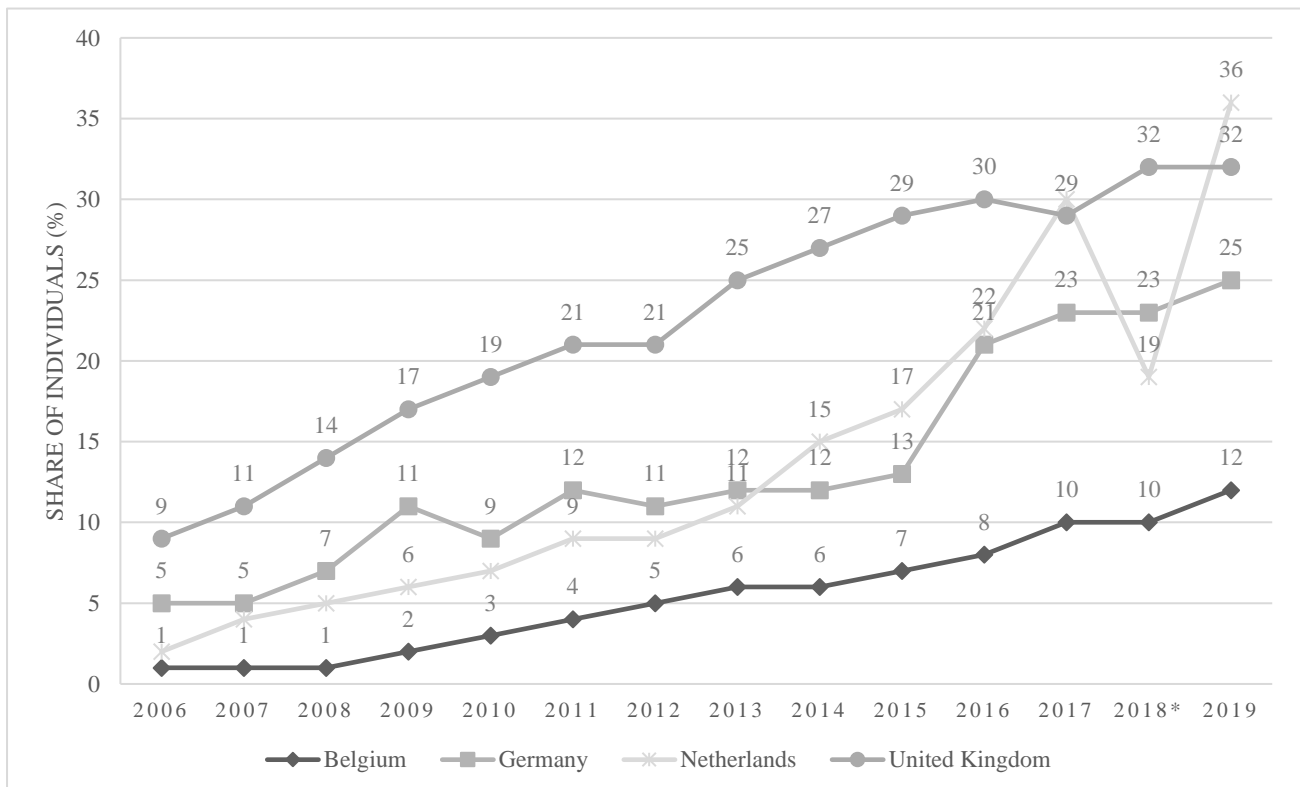


Figure 1 - Online food/groceries shopping consumer share percentage per country yearly

On March 23, 2020 more professions that require direct contact were forced to close their doors. These included hairdressers, makeup artists, beauty salons and nail salons. Then on March 24, 2020 casinos, sport and fitness clubs, saunas, arcade halls and sex establishments were forced to close. This also included remaining contact professions not specifically listed such as driving schools. All of these businesses remained closed until May 15, 2020 (Rijksoverheid, 2020).

As grocery shops are a main source of food and necessities for society, they cannot be closed but must try to obey the government's rules regarding the corona virus as well as possible. In the first few weeks of the coronavirus, consumers started panic-buying. It seems that consumers are increasingly purchasing their groceries online in order to be able to stockpile. The CEO of Picnic, one of the main Dutch online grocery stores, reports that currently (April 2020) they receive three times as many orders as they can handle and will employ at least 700 new employees (RTL Nieuws, 2020).

Taking into account the mentioned situation, this thesis answers the following research question:

What effect does the corona virus have on consumer adoption (or discontinuation) of online grocery shopping?

The thesis is structured as follows. First, previous literature is reviewed regarding consumer adoption of new technologies and services. The Technology Acceptance Model and the exogenous factors will be explained. Then, the explained concepts will be used to form the theoretical framework that will be used in this research and the hypotheses will be given. After this, in the methodology section, the research design, sample and measures will be discussed. Then, the results of the research will be given. This will be followed by a discussion, the limitations & recommendations and conclusion. Lastly, acknowledgements will be made.

2. LITERATURE REVIEW

2.1 Technology Acceptance Model (TAM)

In order to develop a deep understanding of the consumers' thoughts, attitude and intentions of online grocery shopping a framework that explains acceptance and usage of new technologies and services by consumers is reviewed. The cornerstone is provided by the Technology Acceptance Model (TAM) by Davis (1989). In TAM it is explained that an individual's behavioral intention to utilize a technology is affected by the individual's attitude towards this technology and that in turn, the attitude towards the technology affects actual system usage. Two concepts are originally introduced, *perceived usefulness* and *perceived ease of use*. These two determinants are seen as the main factors that affect computer acceptance behavior. In TAM, perceived usefulness can be defined as the extent to which an individual believes that making use of a particular technology causes their performance or productivity to be increased and perceived ease of use can be defined as the extent to which an individual feels that usage of this technology is effortless (Davis, F. D., Bagozzi, R. P., & Warshaw, P. R., 1989). This original model sketched the role of extrinsic motivation, motivation driven by external rewards such as money or praise. To also model the role of intrinsic motivation, the concept of *perceived enjoyment* was introduced to the TAM model in 1992. This determinant can be defined as the extent to which an individual believes usage of the technology is enjoyable, without taking possible performance consequences into account (Davis, F.D., Bagozzi, R.P., & Warshaw, P.R., 1992). This meant that now three determinant factors, perceived usefulness, perceived ease of use and perceived enjoyment, are seen as responsible for affecting the attitude towards using a

technology and ultimately the adoption (or discontinuation) of the technology.

2.2 Consumer traits

In addition to the mentioned model, two exogenous factors will be taken into account; *consumer traits* and *the coronavirus pandemic*. Consumer traits are specifically taken into account as they are found to be very important factors in consumer attitude and intention (Dabholkar, P. A., & Bagozzi, R. P., 2002). Four consumer traits that are proven to be directly relevant to the adoption of new technologies are included; *inherent novelty seeking*, *need for interaction with a service employee*, *self-efficacy*, and *self-consciousness*.

Inherent novelty seeking can be defined as the degree to which an individual has the wish to find new incentives (Hirschman, 1980). Consumers that see inherent novelty seeking as important tend to have a positive attitude towards using technology-based products and tend to enjoy finding new ways to tackle challenges (Hirschman, 1980; Midgley & Dowling, 1978). Need for interaction with a service employee can be defined as the degree of importance an individual sees in human contact when provided a product or service (Dabholkar, 1996). The study by Dabholkar (1996) showed that consumers having a high interaction need are inclined to stay away from technology-based self-services, while consumers having a low interaction need are inclined to lean towards using these options. Self-efficacy can be defined as the degree to which an individual is confident in his/her ability to perform a certain act (Bandura, 1977). Some individuals might be more comfortable and familiar with using technologies and will therefore be more likely to make use of the technology. Self-efficacy has proven to be a major factor that underlies intrinsic motivation (Davis, F. D., Bagozzi, R. P., & Warshaw, P. R., 1989). Self-consciousness can be defined as the degree to which an individual is concerned about a person's view of him- or herself (Fenigstein, A., Scheier, M. F., & Buss, A. H., 1975). It is believed that consumers that have the intention to use a system might still not make actual use of the system because of social risk (Dabholkar, P. A., & Bagozzi, R. P., 2002).

2.3 The coronavirus pandemic

Aside from consumer traits, situational factors are also of great importance in understanding the adoption of a technology by an individual. These external factors are caused by the environment and are not from the individual within. Previous research concluded that situational factors might even prevent an individual from accepting and using a technology as a whole, even if the individual's consumer traits would otherwise lead to believe they would (Dabholkar, P. A., & Bagozzi, R. P., 2002). Coming from this, it is therefore logical to believe such a situational factor might also steer the consumer in the direction of adopting a technology. In this research, one particular situational factor will be taken into account; the corona virus (COVID-19) pandemic. However, this is not an ordinary situational factor. Normally, some individuals might suffer from a situational factor and some might not. In this case all respondents, and even the whole society for that matter, are suffering from the same situational factor as this is a world-wide pandemic.

3. THEORETICAL FRAMEWORK

3.1 Online Grocery Shopping Adoption Framework

The theoretical framework created and used in this research is a combination of the information reviewed in the literature review and is created specifically for understanding the influence of the coronavirus on the adoption of online grocery shopping by the consumer. Concepts of the Technology Acceptance Model

(TAM), consumer traits and the coronavirus pandemic are used to create this framework (Figure 2). The model takes four consumer traits into account that affect the adoption of online grocery shopping by consumers; *inherent novelty seeking*, *need for interaction with a service employee*, *self-efficacy* and *self-consciousness*. Three concepts originating from TAM are also implemented in the model; *perceived usefulness*, *perceived ease of use* and *perceived enjoyment*. These three concepts are seen as an additional three determinant factors that affect the adoption of online grocery shopping by the consumer. The coronavirus pandemic is implemented in the core of this model, as the society as a whole is affected. In this framework, ‘online grocery shopping’ can be defined as the usage of online grocery stores by consumers, up until the point that the consumer makes the actual purchase and the products are scheduled for delivery.

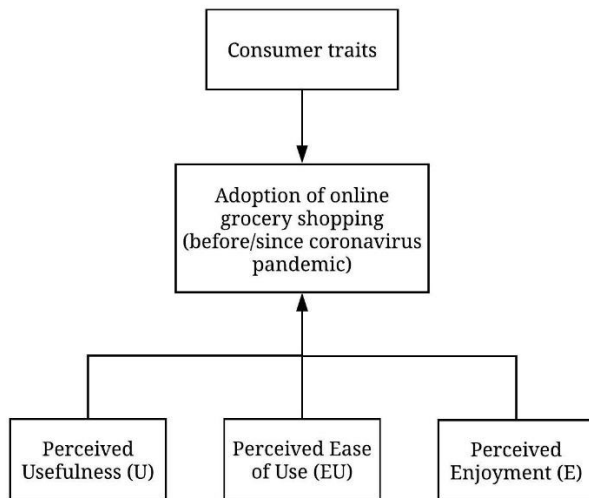


Figure 2 - Online grocery shopping adoption framework

3.2 Hypotheses

Consumer traits

Inherent novelty seeking is defined as the degree to which an individual has the wish to find new incentives. It is believed to have a positive influence on the adoption of new technology and finding new ways to tackle challenges. The hypothesis for this trait therefore includes:

H1: Increased inherent novelty seeking positively influences the adoption of online grocery shopping

Self-efficacy is defined as the degree to which an individual is confident in his/her ability to perform a certain act. When consumers are increasingly comfortable and confident of their ability to buy their groceries online, it is believed that they will be more likely to buy their groceries online. Therefore the hypothesis for the trait includes:

H2: Increased self-efficacy positively influences the adoption of online grocery shopping

Need for interaction with a service employee is defined as the degree of importance an individual sees in human contact when provided a product/service. When consumers have a high need for interaction with service employees, it is believed they will be less likely to buy their groceries online, as they will prefer to buy their groceries in-store. Therefore the hypothesis for the trait includes:

H3: Increased need for interaction with a service employee negatively influences the adoption of online grocery shopping

Self-consciousness is defined as the degree to which an individual is concerned about a person's view of him- or herself.

When consumers are increasingly socially conscious, they are believed to avoid social risks and less likely to adopt new technologies. They will therefore be less likely to buy their groceries online, and the hypothesis for the trait includes:

H4: Increased self-consciousness negatively influences the adoption of online grocery shopping

Motivational concepts

Perceived usefulness (U) is defined as the extent to which an individual believes that making use of a particular technology causes their performance or productivity to be increased. Increased perceived usefulness is believed to have a positive effect on the adoption of online grocery shopping, the hypothesis for this variable therefore includes:

H5: Perceived usefulness positively influences the adoption of online grocery shopping

Perceived ease of use (EU) is defined as the extent to which an individual feels that usage of this technology is effortless. Increased perceived ease of use is believed to have a positive influence towards the adoption of online grocery shopping. Therefore the hypotheses for this variable include:

H6: Perceived ease of use positively influences the adoption of online grocery shopping

Perceived enjoyment (E) is defined as the extent to which an individual believes usage of the technology is enjoyable, without taking possible performance consequences into account. Increased perceived enjoyment is believed to have a positive effect on the adoption of online grocery shopping. Therefore the hypothesis for this variable includes:

H7: Perceived enjoyment positively influences the adoption of online grocery shopping

Coronavirus pandemic

The coronavirus pandemic is believed to have a positive effect on online grocery shopping, as by this physical contact and further spreading of the virus is minimized. People that purchase their groceries online, are believed to have increased the amount of products they buy online after the introduction of the coronavirus pandemic. Therefore the hypothesis for this variable includes:

H8: The coronavirus pandemic will have a positive influence on the percentage of groceries bought online per consumer

4. METHODOLOGY

4.1 Research Design

To test the hypotheses provided in the previous chapter, the selected data collection method was an online questionnaire. A primary benefit of conducting online questionnaires is that it enables reaching a large amount of participants more easily, regardless of geographical or direct contact barriers. Participants were asked questions to measure their geographics, consumer traits, the three independent variables (perceived usefulness, perceived enjoyment, perceived ease of use) and their experiences with buying groceries online before and since the introduction of the coronavirus pandemic. The questionnaire consisted of 38 items. The first 5 items were created to gather the demographics of the participants and consisted of questions about gender, age, educational level, annual income and country of origin. The next 8 items were given to measure the consumer traits. After this, two questions were asked about the frequency of buying groceries and if the participant had ever bought groceries online. If the participant answered ‘no’ to the last question, the questionnaire would be ended. If ‘yes’ was answered, another 23 contingency questions would be presented.

The participants to this questionnaire participated voluntarily and were able to withdraw at any given time. Next to this, no personal information was gathered and confidentiality was promised. The complete questionnaire can be found in Appendix F.

4.2 Sampling

A total of 117 respondents participated in the experiment. After the questions about demographics, 8 more questions were asked about consumer traits. After these questions were answered, two more questions were asked about the frequency of buying groceries and if the participant had ever bought groceries online. If the participant answered “no” to the last question, the questionnaire would be ended. If “yes” was answered, another 23 contingency questions would be presented. The inclusion of this decision question was based on the fact that the 23 questions after this question would only be relevant to the participant if he had purchased groceries online at some point in his life. This question was deliberately placed after the consumer traits questions, to measure if consumer traits affect whether or not the participants have ever bought groceries online. The questionnaire was estimated to take around five minutes when the full 38 questions were to be answered. In order to reach a large amount of participants easily, the non-probability sampling method of reliance of available subjects (also known as convenience sampling) was chosen. The questionnaire was shared on social media platforms such as LinkedIn, Facebook, Instagram and Snapchat and was also re-shared by other individuals on these platforms. The questionnaire was posted on April 18, 2020, was available globally and was accepting responses for a two week period. The questionnaire could be filled in by respondents using any device with an internet connection such as mobile phones, laptops or desktop computers.

4.3 Measurement

The items in the questionnaire regarding consumer traits, perceived usefulness, perceived ease of use and perceived enjoyment were recorded on a five point Likert scale anchored by 1 (strongly disagree) and 5 (strongly agree). The items regarding the coronavirus pandemic and the effect on online grocery shopping behavior were recorded by a mix of agree/disagree statements, multiple choice answers (of percentages) and open questions. The measures for each of these variables will now be detailed further. The complete list of variable measures can also be found in Appendix A.

For the variables that consist of more than two items, a Cronbach's α (alpha) statistic is carried out to measure the reliability of the scale. Values lower than .50 show low reliability, values between .50-.70 show moderate reliability, values between .70-.90 show high reliability and values above .90 show excellent reliability (Hinton, P. R., McMurray, I., & Brownlow, C., 2014, p. 359). Other literature suggests that values higher than .70 are suitable to indicate a reliable scale (Field, 2009, p. 675).

For the variables that consist of only two items, a Spearman-Brown statistic is carried out to measure the reliability of the scale. This statistic measurement is chosen as it has proven to be the more appropriate reliability coefficient for a two-item scale (Eisinga, R., Grotenhuis, M. Te, & Pelzer, B., 2013). Just as when Cronbach's α is used, values higher than .70 are an indication of a reliable scale.

After data collection, exploratory factor analysis was conducted by carrying out a principal component analysis (PCA). The results for this analysis can be found in Table 2 and 3 in the results chapter. This analysis makes use of varimax orthogonal rotation to reduce correlated variables into fewer variables of strongly correlated variables. To interpret these loadings, the general rule was followed that values greater than .40 represent

substantive values (Field, 2009, p. 666). Values between .40-.50 will be called “weak”, values between .50-.75 will be called “moderate” and values greater than .75 will be called “strong” values.

4.3.1 Measurement of consumer traits

The variable “inherent novelty seeking” was measured by two items: “When things get boring, I like to find some new and unfamiliar experience” and “I like to continually change my activities”. These items were evaluated using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The items scored moderate for reliability with a Spearman-Brown coefficient of .511. This is substantially lower than the rule of thumb by Nunnally (1978) which suggests the minimum value indicating reliability is 0,70. However for this research, a minimum of 0,50 will be accepted to show reliability.

The variable “self-efficacy” was measured by two items: “I am highly confident I can use online websites to make purchases” and “Making purchases has typically been easy for me in the past”. These items were evaluated using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The items scored a strong value for reliability with a high Spearman-Brown coefficient of .828. This indicates a high reliability of the scale.

The variable “need for interaction with a service employee” was measured by two items: “I like interacting with a person that provides me a service” and “Human contact is more enjoyable for me as a consumer when I buy a product/service”. These items were evaluated using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The items scored moderate for reliability with a Spearman-Brown coefficient of .667. This is marginally lower than the rule of thumb by Nunnally (1978) of 0,70 but is still seen as adequately reliable.

The variable “self-consciousness” was measured by two items: “I am concerned about what other consumers think of me” and “I am concerned about my style of doing things”. These items were evaluated using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The items scored moderate for reliability with a Spearman-Brown coefficient of .620. This is marginally lower than the rule of thumb by Nunnally (1978) of 0,70 but is still seen as adequately reliable.

4.3.2 Measurement of motivational concepts

The variable “perceived usefulness” was measured by four items: “Buying groceries online improves my performance in searching and purchasing my groceries”, “Buying groceries online enables me to buy my groceries faster”, “Using a website/app to buy my groceries online improves my productivity in searching and purchasing my groceries” and “Websites/apps that sell groceries online are useful to me”. These items were evaluated using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The items scored a high value for reliability with a Cronbach's α of .819, indicating high reliability of the scale.

The variable “perceived enjoyment” was measured by four items: “I have fun when I buy my groceries online”, “Purchasing my groceries online provides me with enjoyment”, “I think that purchasing my groceries online is interesting” and “Purchasing my groceries online provides me with excitement”. These items were evaluated using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The items scored a high value Cronbach's α of .931, indicating excellent reliability of the scale.

The variable “perceived ease of use” was measured by five items: “Websites/apps that sell groceries online are easy to navigate”, “Websites/apps that sell groceries online have a user friendly interface”, “Learning to operate websites/apps that sell groceries online is easy”, “Websites/apps that sell groceries

online are easy to use” and “It is easy to become skilful at using a website/app to buy groceries online”. These items were evaluated using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The items scored a high value Cronbach’s α of ,906, indicating excellent reliability of the scale.

4.3.3 Measurement of the effect of the coronavirus pandemic on online grocery shopping

This variable was measured by ten items. Six items were evaluated using a dichotomous scale (agree/disagree): “Before the coronavirus, I did not buy any groceries online”, “The coronavirus has triggered me to buy groceries online”, “The coronavirus has had no influence whatsoever in my decision of buying groceries online or not”, “I combine buying groceries online with going to the actual supermarket”, “I buy my groceries online more often now than I did before the coronavirus” and “In the future, even after the coronavirus, I will continue to buy my groceries online”. Two items were evaluated by multiple choice answers (0-20%, 20-40%, 40-60%, 60-80%, 80-100%): “What percentage of your groceries did you buy online before the coronavirus?” and “What percentage of your groceries do you buy online since the coronavirus?”. The last two items were measured by open ended questions: “What are advantages for you for buying groceries online?” and “What are disadvantages for you for buying groceries online?”.

5. RESULTS

A demographic profile of the participants involved in the online questionnaire is provided in Table 1. The majority of respondents were female (61 percent), were between 18 and 24 years of age (53 percent) and had completed a bachelor degree (42 percent). Almost 60 percent reported an annual income of lower than €20.000 and the majority of participants were from the Netherlands (73 percent) with a second place for Indonesia (14 percent).

Exploratory factor analysis was conducted in order to reconstruct the four consumer traits (inherent novelty seeking, need for interaction with a service employee, self-consciousness and self-efficacy) that influence the adoption of online grocery shopping. For this, a principal component analysis (PCA) with varimax rotation was carried out. The values are compiled in Table 2. In this table, all values below 0,40 are left out. The analysis resulted in each of the variables having their own component and all items scoring strong values. As can be seen by the data, convergent validity is demonstrated by the fact that all factor loadings score strongly on their own construct. Aside from this, discriminant validity is also demonstrated by the fact that there are no cross-construct loadings that exceed 0,40.

| Variable | N (116) | Percent of total |
|------------------------------|---------|------------------|
| <u>Gender</u> | | |
| Male | 45 | 38,8 |
| Female | 71 | 61,2 |
| <u>Age</u> | | |
| Below 18 | - | - |
| 18-24 | 62 | 53,4 |
| 25-34 | 22 | 19,0 |
| 35-44 | 8 | 6,9 |
| 45-55 | 12 | 10,3 |
| 55 and over | 12 | 10,3 |
| <u>Educational level</u> | | |
| Less than high school degree | 2 | 1,7 |

| | | |
|--------------------------|----|-------------|
| High school degree | 37 | 31,9 |
| Associate degree | 17 | 14,7 |
| Bachelor degree | 49 | 42,2 |
| Master degree | 11 | 9,5 |
| <u>Income level (€)</u> | | |
| < 10.000 | 48 | 41,4 |
| 10.000-20.000 | 21 | 18,1 |
| 20.000-30.000 | 9 | 7,8 |
| 30.000-40.000 | 15 | 12,9 |
| 40.000-50.000 | 9 | 7,8 |
| 50.000 < | 14 | 12,2 |
| <u>Country of origin</u> | | |
| Netherlands | 85 | 73,3 |
| Indonesia | 16 | 13,8 |
| Germany | 3 | 2,6 |
| Denmark | 3 | 2,6 |
| United Kingdom | 2 | 1,7 |
| France | 2 | 1,7 |
| Czech Republic | 2 | 1,7 |
| Switzerland | 1 | 0,9 |
| Turkey | 1 | 0,9 |
| United States | 1 | 0,9 |

Table 1 – Demographic profile of online questionnaire participants

| Item | 1 | 2 | 3 | 4 |
|---------------------|------|------|------|------|
| Noveltyseeking_1 | | | | ,805 |
| Noveltyseeking_2 | | | | ,815 |
| NeedInteraction_1 | | ,862 | | |
| NeedInteraction_2 | | ,848 | | |
| Selfconsciousness_1 | | | ,823 | |
| Selfconsciousness_2 | | | ,857 | |
| Selfefficacy_1 | ,915 | | | |
| Selfefficacy_2 | ,926 | | | |

Table 2 – Rotated component loadings for consumer traits influencing the adoption of online grocery shopping

Exploratory factor analysis was also conducted in order to reconstruct the three factors (perceived enjoyment, perceived ease of use, perceived usefulness) that influence the adoption of online grocery shopping. For this, principal component analysis (PCA) with varimax rotation was used. The values are compiled in Table 3. Just like in the previous table, values below 0,40 are left out. As can be seen from the table, each of the variables resulted in having their own component. The PCA of the four items of enjoyment resulted in component 2, with all the items scoring strong values. The PCA of the five items of ease of use resulted in item 2 scoring a moderate value and the other items scoring strong values. The PCA regarding the four items of usefulness resulted in item 4 scoring a weak value, item 2 scoring a moderate value and item 1 and 3 scoring a strong value.

Convergent validity is demonstrated by the fact that all factor loadings score at least a “weak” value of 0,40 on their own construct. Discriminant validity is also demonstrated by the fact that there are no cross-construct loadings that exceed 0,40, aside from Usefulness_4 with Factor 1. Usefulness_4 corresponds to

the item of “Websites/apps that sell groceries online are useful to me”. Respondents might call a website/app useful if operating the website/app is free of effort. This provides a probable explanation to this particular cross-construct moderate value loading.

| Item | 1 (perceived ease of use) | 2 (perceived enjoyment) | 3 (perceived usefulness) |
|--------------|------------------------------|----------------------------|-----------------------------|
| Enjoyment_1 | | ,862 | |
| Enjoyment_2 | | ,885 | |
| Enjoyment_3 | | ,881 | |
| Enjoyment_4 | | ,870 | |
| EaseOfUse_1 | ,879 | | |
| EaseOfUse_2 | ,737 | | |
| EaseOfUse_3 | ,877 | | |
| EaseOfUse_4 | ,931 | | |
| EaseOfUse_5 | ,778 | | |
| Usefulness_1 | | | ,847 |
| Usefulness_2 | | | ,583 |
| Usefulness_3 | | | ,907 |
| Usefulness_4 | ,482 | | ,476 |

Table 3 – Rotated component loadings for items influencing the adoption of online grocery shopping

To see if the hypotheses can be accepted or rejected, regression analysis was carried out. This meant the PCA factors had to be converted into new variables. These variables are then used as independent variables that affect the dependent variables of adoption of online grocery shopping (before/since coronavirus) and if groceries have ever been bought online.

The new variables based on the PCA components for consumer traits are called FAC1_1, FAC2_1, FAC3_1 and FAC4_1. These numbers correspond with the components given in Table 2. The new variables based on the PCA components for the variables perceived usefulness, perceived ease of use and perceived enjoyment are called FAC1_2, FAC2_2 and FAC3_2. The numbers correspond with the components given in Table 3. An overview of the new variables compiled for the regression can be found in Appendix B.

To answer H₁, H₂, H₃ and H₄, binomial logistic regression was carried out for the dependent variable of “BoughtGrocOnline” with the independent variables consisting of FAC1_1, FAC2_1, FAC3_1 and FAC4_1. These variables come forth out of all the variables given in Table 2. The model summary for this analysis is given in Table 4.

Model summary

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|------|----------------------|----------------------|---------------------|
| 1 | 149,829 ^a | ,057 | ,077 |

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than ,001.

Table 4 – Binomial logistic regression model summary BoughtGrocOnline with consumer traits

This table shows two R Squared values, also known as pseudo R² values. In this model, the explained variation in the amount of people that have bought groceries online is 7,7% (Nagelkerke R). The classification table is given in Appendix C. This table shows that on average 57,8% cases were correctly predicted.

Variables in the Equation

| | | B | Std. Error | Sig. |
|---------------------|----------|--------|------------|-------|
| Step 1 ^a | FAC1_1 | 0,453 | 0,220 | 0,040 |
| | FAC2_1 | -0,197 | 0,195 | 0,312 |
| | FAC3_1 | -0,194 | 0,198 | 0,326 |
| | FAC4_1 | -0,096 | 0,194 | 0,620 |
| | Constant | -0,417 | 0,197 | 0,034 |

a. Variable(s) entered on step 1: FAC1_1, FAC2_1, FAC3_1, FAC4_1

Table 5 – Variables in the Equation table for BoughtGrocOnline (DV) with consumer traits (IV)

In Table 5 the Variables in the Equation table is given. This table shows us that only the variable of FAC1_1 has proven to add significantly to the model. FAC1_1, which covers self-efficacy factors, is a positive and significant predictor of groceries being bought online (b=0,453, s.e.=0,220, p=0,04). The other factors are non-significant as they have a p > 0,05. If these other factors were significant, they would show that the other consumer traits (inherent novelty seeking, need for interaction with a service employee and self-consciousness) would be negative predictors of groceries being bought online. This can be seen by the negative B-values.

Inherent novelty seeking has not proven to be a significant determinant of whether or not groceries have been bought online. If the variable were to be significant, it would have shown a negative impact on the adoption of online grocery shopping. H₁ is therefore rejected.

According to the data, self-efficacy has proven to have a significant, positive influence on the adoption of online grocery shopping by the consumer. Therefore, H₂ is accepted.

Need for interaction with a service employee has not proven to be a significant determinant of whether or not groceries have been bought online. However, the data does suggest a negative impact on the adoption of online grocery shopping. H₃ is, nonetheless, rejected.

Self-consciousness has not proven to be a significant determinant of whether or not groceries have been bought online. However, the data does suggest a negative impact on the adoption of online grocery shopping. H₄ is, nonetheless, rejected.

To answer the first part of H₅, H₆ and H₇, multiple regression analysis was carried out for the dependent variable of “PercentBeforeCorona” with the independent variables consisting of FAC1_2, FAC2_2 and FAC3_2. These variables come forth out of all the variables given in Table 3. The model summary for the analysis is given in Table 6.

Model summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | ,410 ^a | ,168 | ,110 | 1,146 |

a. Predictors: (Constant), FAC1_2, FAC2_2, FAC3_2

Table 6 – Multiple regression model summary PercentBeforeCorona with TAM variables

The multiple correlation coefficient (or R) coming forth from the analysis is a value of 0,410. This correlation value corresponds with a moderate value. The R Square (R²) value is 0,168. This

value tells us that the independent variables explain 16,8% of the variability in percentage of groceries bought online before the coronavirus pandemic. Now that we know how well the model fits, we want to see if the regression model is a good fit for the data. Statistics used for this, can be found in Appendix D. The ANOVA table shows that the regression model is a good fit for the data with $F(3,43) = 2,891$, $p < 0,046$.

Coefficients^a

| Unstandardized coefficients | | | |
|-----------------------------|-------|------------|-------------|
| Model | B | Std. Error | Sig. |
| (Constant) | 1,787 | ,167 | ,000 |
| FAC1_2 | ,352 | ,169 | <u>,043</u> |
| FAC2_2 | ,332 | ,169 | ,056 |
| FAC3_2 | ,115 | ,169 | ,499 |

a. Dependent Variable: PercentBeforeCorona

**Table 7 – Multiple regression coefficients table
PercentBeforeCorona with TAM items**

The coefficients table of this analysis can be found in Table 7. From this table we can conclude the equation to predict the adoption of online grocery shopping before the coronavirus:

$$\text{predicted PercentBeforeCorona} = 1,787 + (0,352 * \text{FAC1_2}) + (0,352 * \text{FAC2_2}) + (0,115 * \text{FAC3_2}).$$

From this table we can also conclude that only FAC1_2 is statistically significant as this is the only $p < 0,05$. FAC2_2 is barely not statistically significant, as the value of 0,056 is just over this amount.

To answer the second part of H₅, H₆ and H₇, multiple regression analysis was also conducted for the dependent variable of ‘PercentSinceCorona’, to see if there is any difference between the time before the coronavirus pandemic occurred and the time since it has occurred. The same independent variables are used as in the previous analysis; FAC1_2, FAC2_2 and FAC3_2. The model summary for the analysis is given in Table 8.

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | ,310 ^a | ,096 | ,033 | 1,433 |

a. Predictors: (Constant), FAC1_2, FAC2_2, FAC3_2

**Table 8 - Multiple regression model summary
PercentSinceCorona with TAM variables**

The multiple correlation coefficient (or R) coming forth from the analysis is a value of 0,310. This correlation value corresponds with a weak value. The R Square (R²) value is 0,096. This value tells us that the independent variables explain 9,6% of the variability in percentage of groceries bought online since coronavirus pandemic. If we look at the ANOVA table in Appendix E, we can see that it shows no statistical significance as $p > 0,05$, meaning the regression is not a good fit for the data.

Although the ANOVA table shows that the independent variables do not significantly predict the adoption of online grocery shopping since the coronavirus pandemic, the coefficients table is still depicted in Table 9. This table also shows that all of the variables are not statistically significant, as all $p > 0,05$.

The data from this research shows no significant effect of perceived usefulness on the adoption of online grocery shopping,

either before or since the coronavirus. H₅ can therefore be rejected.

Coefficients^a

| Unstandardized coefficients | | | |
|-----------------------------|-------|------------|------|
| Model | B | Std. Error | Sig. |
| (Constant) | 2,553 | ,209 | ,000 |
| FAC1_2 | ,325 | ,211 | ,132 |
| FAC2_2 | ,261 | ,211 | ,223 |
| FAC3_2 | ,173 | ,211 | ,418 |

a. Dependent Variable: PercentSinceCorona

**Table 9 – Multiple regression coefficients table
PercentSinceCorona with TAM items**

Perceived ease of use has proven to have a statistically significant positive effect on the adoption of online grocery shopping before the coronavirus pandemic. However, the statistical data showed that since the coronavirus pandemic it has had no clear significant effect on the adoption of online grocery shopping. H₆ can therefore be accepted (before the coronavirus) and rejected (since the coronavirus)

Before the coronavirus pandemic, perceived enjoyment barely did not have a significant effect on the adoption of online grocery shopping. Since the coronavirus pandemic occurred it also has not shown any statistical significance. H₇ can therefore be rejected.

To help answer H₈, we will look at descriptive statistics and at a crosstabulation between the variables PercentBeforeCorona and PercentSinceCorona. As can be seen by the data in Table 10, the mean for adoption of online grocery shopping has shifted from 1,79 before the coronavirus pandemic to a value of 2,55 since the coronavirus pandemic. The data in Table 11 shows that only 5 out of 47 respondents claimed to have lowered the amount of groceries they buy online since the introduction of the coronavirus. This value corresponds to 10,6% of respondents. 18 respondents claimed to buy the exact same amount of groceries online before and since the coronavirus pandemic. This comes corresponds with 38,3%. 24 respondents claimed to have increased the amount of groceries they buy online since the introduction of the coronavirus compared to before the coronavirus. This corresponds to 51,1%.

The statistical data has showed that the mean has increased from 1,79 to 2,55. This shows that rounded up, the average consumer bought between 20-40% of their groceries online before the coronavirus pandemic and bought around 40-60% of their groceries online since the coronavirus pandemic. Data also showed that since the coronavirus pandemic, consumers rarely bought less than before the coronavirus pandemic. Therefore H₈ can be accepted.

Descriptive statistics

| | N | Min. | Max. | Mean | Std. dev. |
|----------------------|----|------|------|------|-----------|
| Percent-BeforeCorona | 47 | 1 | 5 | 1,79 | 1,215 |
| Percent-SinceCorona | 47 | 1 | 5 | 2,55 | 1,457 |
| Valid N (listwise) | 47 | | | | |

Table 10 – Descriptive statistics table PercentBeforeCorona and PercentSinceCorona

| | | <i>PercentSinceCorona</i> | | | | | <i>Total</i> |
|-----------------------|---------|---------------------------|---------------|---------------|---------------|----------------|--------------|
| | | <i>0-20%</i> | <i>20-40%</i> | <i>40-60%</i> | <i>60-80%</i> | <i>80-100%</i> | |
| Percent Before-Corona | 0-20% | 15 | 4 | 3 | 5 | 2 | 29 |
| | 20-40% | 2 | 0 | 3 | 2 | 0 | 7 |
| | 40-60% | 0 | 1 | 0 | 5 | 0 | 6 |
| | 60-80% | 0 | 1 | 0 | 1 | 0 | 2 |
| | 80-100% | 1 | 0 | 0 | 0 | 2 | 3 |
| | Total | 18 | 6 | 6 | 13 | 4 | 47 |

Table 11 – Crosstabulation PercentBeforeCorona and PercentSinceCorona

6. DISCUSSION

In this section the results from the previous chapter will be discussed and notable answers of respondents to the questionnaire will be mentioned. To act as guidance, a quick overview of the hypotheses that are accepted/rejected is given in Table 12.

| <i>Hypothesis</i> | <i>Accepted</i> | <i>Rejected</i> |
|-------------------|-----------------|-----------------|
| 1 | | X |
| 2 | X | |
| 3 | | X |
| 4 | | X |
| 5 | | X |
| 6 | X | X |
| 7 | | X |
| 8 | X | |

Table 12 – Hypothesis acceptance/rejection table

The results in Table 5 show that out of all four consumer traits accounted for, only one consumer trait, self-efficacy, has proven to have a significant positive relationship on the adoption of online grocery shopping by consumers. The other three consumer traits; self-consciousness, need for interaction with a service employee and inherent novelty seeking were all indicated to have a negative relationship on the adoption of online grocery shopping by consumers. These findings however were all found not to be significant. Interestingly, increased inherent novelty seeking was hypothesized to have a positive influence on the adoption of online grocery shopping by consumers. However, the data suggests a negative influence, albeit non-significant. When taking a closer look at respondents' answers, it seems that most of the respondents answered these questions with a '3', indicating a 'neutral' opinion. This can be a possible explanation to why this has occurred. The data also suggests that people that have the wish to find new incentives to tackle challenges do not necessarily want to buy their groceries online instead of in actual grocery shops. The other consumer traits all showed a similar relationship as was hypothesized but they still proved to be non-significant. The respondents' answers on self-consciousness indicate that the majority of the respondents are not concerned with a different person's view of him- or herself. However, data suggests that this does not significantly impact whether or not online grocery shopping is adopted by the consumer. Respondents' answers regarding the need for interaction with a service employee showed that most individuals agree somewhat on wanting to have contact with an individual

that provides them with a service. The data also suggests that this leads to a lower amount of people that adopt online grocery shopping. However, this was also non-significant. The outcomes of the research therefore only partially support the previous findings on the consumer traits and their influence on the adoption of technology-based self-service, and in this case the adoption of online grocery shopping.

The results in Table 7 and Table 9 show that out of all the motivational concepts, only perceived ease of use has proven to have significant positive impact on the amount of groceries being bought online, but only before the occurrence of the coronavirus pandemic. Since the coronavirus pandemic, ease of use does not influence the amount of groceries being bought online positively enough to be significant. The other motivational concepts, perceived enjoyment and perceived usefulness, have both not been proven to have significant effect on the percentage of groceries being bought online, both before the coronavirus and since the coronavirus. However, if the variables were to be significant, they would all be positively influencing the percentages of groceries being bought online. When taking a closer look at the respondents' answers, it is made clear that in general people do not see online grocery shopping as something they enjoy doing. However, they also do not see it as something they despise doing. All the items covering perceived enjoyment seem to be normally distributed, indicating that respondents are 'neutral' to the level of enjoyment online grocery shopping offers them. Interestingly, respondents see online grocery shopping as something that is very easy to do. Almost all respondents score the individual items for ease of use at least a '4' or higher indicating they either somewhat agree or fully agree with online grocery shopping being easy to do. However, increased ease of use in this research has not shown to significantly impact the percentages of groceries being bought online since the coronavirus. Respondents tend to see buying groceries online as more useful, as the average answer of respondents is a '4', indicating they agree it is at least somewhat useful. In this research however, usefulness has not shown to significantly affect the percentages of groceries bought online, either before or since the coronavirus pandemic.

Out of all 117 respondents, only 47 respondents admitted to have bought groceries online at least once in their life. This corresponds to around 40% of respondents. Out of these 47 respondents, over 50% said that since the coronavirus pandemic, the amount of groceries they buy online has increased. This logically flows forth from the fact that these individuals tend to be more careful to avoid getting infected with the illness. Only 10% reported to have lowered the amount of groceries they buy online. This data can be found in Table 11. The mean of groceries bought online before the coronavirus pandemic was 1,79, indicating the amount of groceries online was between 0-20% and 20-40%. Since the coronavirus pandemic, this mean has risen to 2,55, meaning the average amount of groceries being bought online since the coronavirus pandemic is between 20-40% and 40-60%. This data shows that since the coronavirus pandemic, generally respondents have increased the amount of groceries they buy online.

Possible explanation for the outcome of this research and the low overall percentage of respondents buying their groceries online is that the majority of respondents are young adults between 18-24 years of age. This age group tends to be seen as one of the lowest 'risk-groups' of the coronavirus pandemic, meaning they have a lower risk of becoming seriously ill when they are infected with the coronavirus. Because of this, they might be less scared of becoming infected with the coronavirus and might therefore be less inclined to avoid contact with others. This can be a possible explanation as to why online grocery shopping has not been adopted by the majority of the respondents.

7. LIMITATIONS & RECOMMENDATIONS

The first limitation is the fact that because of the coronavirus pandemic, the available data collection methods were limited. Online methods were specifically promoted to avoid unnecessary interaction with possible respondents, causing extra risk of spreading the illness. Because of this, an online questionnaire was chosen to still be able to reach a large audience. However this meant that the chosen sampling method was forced to be a convenience sampling method, which brings us to the next limitation.

Convenience sampling is characterized by relying on available subjects, and is also known as “haphazard” sampling. This is a form of non-probability sampling, meaning not all individuals of the population are given an equal chance of being selected for, in this case, the online questionnaire. Therefore, the researcher will have no control over the representativeness of the sample in comparison to the population (Babbie, E. R., 2014). In the case of this research, it is clear that the general population is not reflected by the sample. This can be seen in Table 1. The questionnaire was shared by the researcher on social media such as Facebook, LinkedIn, Instagram and Snapchat. Because of the researcher’s connections, the main audience that was reached was between 18-24 years of age, were (finished) bachelor students and generally had a yearly income of lower than 10.000 euros. Because the sample is therefore not representative of the population as a whole, the results of this research cannot be generalized. For future research, a probability sampling method is recommended to ensure that the outcome of the research can be generalized towards the population.

Another limitation is the fact that for consumer traits, only two item scales are used. If there are only two items in the scale, the risk that the construct might not be appropriately represented by these items is quite large. Generally, adding more items to the scale will lead to better construct representation (Eisinga, R., Grotenhuis, M. Te, & Pelzer, B., 2013). For future research, instead of two-item scales, larger scales are definitely recommended in order to ensure the constructs are appropriately represented.

The last limitation of this research is that in order to ask the respondents questions about the motivational concepts, they had to be asked the question “have you ever bought groceries online?”. If the respondent answered this question with “yes”, another 23 contingency questions were asked. If the respondent answered with “no”, the questionnaire would be ended. This was the case, because respondents who have never bought their groceries online cannot express their opinion on whether or not buying groceries online is enjoyable, easy or useful to them. Because of this, the questions about the motivational concepts were only answered if the respondent had purchased groceries online. Therefore in this research, the influence of motivational concepts on whether or not groceries are bought online cannot be tested. In this research, only the *difference* between the percentage of groceries bought before the coronavirus pandemic and since the coronavirus pandemic is tested. For future research, it is recommended to find a way to test whether or not the motivational concepts (perceived ease of use, enjoyment, usefulness) are directly impacting if groceries are being bought online.

8. CONCLUSION

The aim of this research paper was to find out whether or not the coronavirus pandemic has an effect on the adoption (or discontinuation) of online grocery shopping by consumers. This main research question is answered by setting up multiple hypotheses that have been mentioned in the theoretical

framework chapter and are either accepted or rejected in the results chapter. These hypotheses were created after reviewing previous literature about the concepts of consumer traits and the Technology Acceptance Model. Variables created from these concepts were seen as determinant factors in the adoption of online grocery shopping by consumers. This research did not find enough evidence to suggest all these consumer traits and motivational concepts mentioned influence the adoption of online grocery shopping. However, this research did find that self-efficacy is a significant factor in the adoption of online grocery shopping by consumers. Individuals that are confident in their ability to purchase their groceries online, are more likely to do so than individuals that are less confident in their ability.

Aside from this, research did find that the respondents that have already been buying their groceries online before the coronavirus pandemic, tended to buy a larger percentage of their groceries online since the coronavirus pandemic. This research therefore concludes that the coronavirus pandemic has a positive influence on the percentage of groceries being bought online by individuals that were already buying a portion of their groceries online.

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11. APPENDIX A: ITEMS INCLUDED IN QUESTIONNAIRE

| <i>Variable</i> | <i>Definition</i> | <i>Item name</i> | <i>Item in survey</i> |
|---|--|---------------------|---|
| <i>Inherent novelty seeking</i> | The degree to which an individual has the wish to find new incentives | NoveltySeeking_1 | When things get boring, I like to find some new and unfamiliar experience. (<i>strongly disagree – strongly agree</i>) |
| | | NoveltySeeking_2 | I like to continually change my activities. (<i>strongly disagree – strongly agree</i>) |
| <i>Need for interaction with a service employee</i> | The degree of importance an individual sees in human contact when provided a product or service | NeedInteraction_1 | I like interacting with a person that provides me a service. (<i>strongly disagree – strongly agree</i>) |
| | | NeedInteraction_2 | Human contact is more enjoyable for me as a consumer when I buy a product/service. (<i>strongly disagree – strongly agree</i>) |
| <i>Self-consciousness</i> | The degree to which an individual is concerned about a person's view of him- or herself | Selfconsciousness_1 | I am concerned about what other consumers think of me. (<i>strongly disagree – strongly agree</i>) |
| | | Selfconsciousness_2 | I am concerned about my style of doing things. (<i>strongly disagree – strongly agree</i>) |
| <i>Self-efficacy</i> | The degree to which an individual is confident in his/her ability to perform a certain act | Selfefficacy_1 | I am highly confident I can use online websites to make purchases. (<i>strongly disagree – strongly agree</i>) |
| | | Selfefficacy_2 | Making online purchases has typically been easy for me in the past. (<i>strongly disagree – strongly agree</i>) |
| <i>Perceived ease of use</i> | The extent to which an individual feels that usage of a technology is effortless | EaseOfUse_1 | Websites/apps that sell groceries online are easy to navigate. (<i>strongly disagree – strongly agree</i>) |
| | | EaseOfUse_2 | Websites/apps that sell groceries online have a user friendly interface. (<i>strongly disagree – strongly agree</i>) |
| | | EaseOfUse_3 | Learning to operate websites/apps that sell groceries online is easy. (<i>strongly disagree – strongly agree</i>) |
| | | EaseOfUse_4 | Websites/apps that sell groceries online are easy to use. (<i>strongly disagree – strongly agree</i>) |
| | | EaseOfUse_5 | It is easy to become skilful at using a website/app to buy groceries online. (<i>strongly disagree – strongly agree</i>) |
| <i>Perceived usefulness</i> | The extent to which an individual believes that making use of a particular technology causes their performance or productivity to be increased | Usefulness_1 | Buying groceries online improves my performance in searching and purchasing my groceries. (<i>strongly disagree – strongly agree</i>) |
| | | Usefulness_2 | Buying groceries online enables me to buy my groceries faster. (<i>strongly disagree – strongly agree</i>) |
| | | Usefulness_3 | Using a website/app to buy my groceries online improves my productivity in searching and purchasing my groceries. (<i>strongly disagree – strongly agree</i>) |
| | | Usefulness_4 | Websites/apps that sell groceries online are useful to me. (<i>strongly disagree – strongly agree</i>) |
| <i>Perceived enjoyment</i> | The extent to which an individual believes usage of the technology is enjoyable, without taking possible performance consequences into account | Enjoyment_1 | I have fun when I buy my groceries online. (<i>strongly disagree – strongly agree</i>) |

| | | |
|--|---------------------|---|
| <i>The effect of the coronavirus pandemic on online grocery shopping</i> | Enjoyment_2 | Purchasing my groceries online provides me with enjoyment. (<i>strongly disagree – strongly agree</i>) |
| | Enjoyment_3 | I think that purchasing my groceries online is interesting. (<i>strongly disagree – strongly agree</i>) |
| | Enjoyment_4 | Purchasing my groceries online provides me with excitement. (<i>strongly disagree – strongly agree</i>) |
| | BoughtGrocOnline | Have you ever bought groceries online? (yes/no) |
| | GroceriesFreq | How frequent do you typically buy groceries? (<i>daily/2-4 times a week/once a week/2-3 times a month/once a month</i>) |
| | EffectCorona_1 | Before the coronavirus, I did not buy any groceries online. (<i>agree/disagree</i>) |
| | EffectCorona_2 | The coronavirus has triggered me to buy groceries online. (<i>agree/disagree</i>) |
| | EffectCorona_3 | The coronavirus has had no influence whatsoever in my decision of buying groceries online or not. (<i>agree/disagree</i>) |
| | EffectCorona_4 | I combine buying groceries online with going to the actual supermarket (<i>agree/disagree</i>) |
| | EffectCorona_5 | I buy my groceries online more often now than I did before the coronavirus. (<i>agree/disagree</i>) |
| | EffectCorona_6 | In the future, even after the coronavirus, I will continue to buy groceries online. (<i>agree/disagree</i>) |
| | PercentBeforeCorona | What percentage of your groceries did you buy online before the coronavirus? (<i>0-20%/20-40%/40-60%/60-80%/80-100%</i>) |
| | PercentSinceCorona | What percentage of your groceries did you buy online since the coronavirus? (<i>0-20%/20-40%/40-60%/60-80%/80-100%</i>) |
| | AdvantagesOnline | What are advantages for you for buying groceries online? (<i>open question</i>) |
| | DisadvantagesOnline | What are disadvantages for you for buying groceries online? (<i>open question</i>) |

APPENDIX B: NEW VARIABLES FOR REGRESSION

| Item | Item number | New variables for regression analysis |
|--------------------------|---------------|---------------------------------------|
| <i>NoveltySeeking</i> | 1, 2 | FAC4_1 |
| <i>NeedInteraction</i> | 1, 2 | FAC2_1 |
| <i>Selfconsciousness</i> | 1, 2 | FAC3_1 |
| <i>Selfefficacy</i> | 1, 2 | FAC1_1 |
| <i>EaseOfUse</i> | 1, 2, 3, 4, 5 | FAC1_2 |
| <i>Usefulness</i> | 1, 2, 3, 4 | FAC3_2 |
| <i>Enjoyment</i> | 1, 2, 3, 4 | FAC2_2 |

APPENDIX C: Classification table BoughtGrocOnline with consumer traits

Classification table^a

| <i>Observed</i> | | <i>Predicted</i> | | <i>Percentage correct</i> |
|--|------------|--|------------|---------------------------|
| | | <i>If groceries ever bought online</i> | | |
| | | <i>No</i> | <i>Yes</i> | |
| <i>If groceries ever bought online</i> | <i>No</i> | 53 | 16 | 76,8 |
| | <i>Yes</i> | 33 | 14 | 29,8 |
| <i>Overall percentage</i> | | | | 57,8 |

a. The cut value is ,500

APPENDIX D: ANOVA table PercentBeforeCorona with TAM variables

ANOVA^a

| <i>Model</i> | | <i>Sum of Squares</i> | <i>df</i> | <i>Mean Square</i> | <i>F</i> | <i>Sig.</i> |
|--------------|------------|-----------------------|-----------|--------------------|----------|-------------------|
| 1 | Regression | 11,392 | 3 | 3,797 | 2,891 | ,046 ^b |
| | Residual | 56,481 | 43 | 1,314 | | |
| | Total | 67,872 | 46 | | | |

a. Dependent Variable: PercentBeforeCorona

b. Predictors: (Constant), FAC1_2, FAC2_2, FAC3_2

APPENDIX E: ANOVA table PercentSinceCorona with TAM variables

ANOVA^a

| <i>Model</i> | | <i>Sum of Squares</i> | <i>df</i> | <i>Mean Square</i> | <i>F</i> | <i>Sig.</i> |
|--------------|------------|-----------------------|-----------|--------------------|----------|-------------------|
| 1 | Regression | 9,359 | 3 | 3,120 | 1,520 | ,223 ^b |
| | Residual | 88,258 | 43 | 2,053 | | |
| | Total | 97,617 | 46 | | | |

a. Dependent Variable: PercentSinceCorona

b. Predictors: (Constant), FAC1_2, FAC2_2, FAC3_2

APPENDIX F: ONLINE QUESTIONNAIRE

1-6-2020

Online grocery shopping and the effect of the coronavirus

Online grocery shopping and the effect of the coronavirus

The data gathered in this survey is used for research regarding my bachelor thesis about the effect of the coronavirus on grocery shopping.

By taking part in this survey, you understand that taking part in this research study is voluntary. If you decide to participate, you may withdraw at any given time. Responses to this study will not be personally linked, will be for research purposes only and will remain confidential. The survey will take approximately 5 minutes.

If you wish to contact me for any questions regarding this research, feel free to send an email to r.w.verweijmeren@student.utwente.nl.

Thank you for your participation!

Robin Verweijmeren

* Required

1. What is your gender? *

Mark only one oval.

- ☐ Male
☐ Female
☐ Prefer not to say

2. What is your age? *

Mark only one oval.

- ☐ Under 18
☐ 18-24
☐ 25-34
☐ 35-44
☐ 45-54
☐ 55 or above

3. What is the highest level of education you have completed? *

Mark only one oval.

- ☐ Less than high school degree
- ☐ A high school degree
- ☐ Associate degree
- ☐ Bachelor degree
- ☐ Master degree

4. Where do you live? *

Mark only one oval.

- ☐ Afghanistan
- ☐ Akrotiri
- ☐ Albania
- ☐ Algeria
- ☐ American Samoa
- ☐ Andorra
- ☐ Angola
- ☐ Anguilla
- ☐ Antarctica
- ☐ Antigua and Barbuda
- ☐ Argentina
- ☐ Armenia
- ☐ Aruba
- ☐ Ashmore and Cartier Islands
- ☐ Australia
- ☐ Austria
- ☐ Azerbaijan
- ☐ Bahamas, The
- ☐ Bahrain
- ☐ Bangladesh
- ☐ Barbados
- ☐ Bassas da India
- ☐ Belarus
- ☐ Belgium
- ☐ Belize
- ☐ Benin
- ☐ Bermuda
- ☐ Bhutan
- ☐ Bolivia
- ☐ Bosnia and Herzegovina
- ☐ Botswana
- ☐ Bouvet Island

- ☐ United Arab Emirates
- ☐ United Kingdom
- ☐ United States
- ☐ Uruguay
- ☐ Uzbekistan
- ☐ Vanuatu
- ☐ Venezuela
- ☐ Vietnam
- ☐ Virgin Islands
- ☐ Wake Island
- ☐ Wallis and Futuna
- ☐ West Bank
- ☐ Western Sahara
- ☐ Yemen
- ☐ Zambia
- ☐ Zimbabwe

5. What is your yearly annual income? *

Mark only one oval.

- ☐ Less than 10.000 euro
- ☐ 10.000-20.000 euro
- ☐ 20.000-30.000 euro
- ☐ 30.000-40.000 euro
- ☐ 40.000-50.000 euro
- ☐ 50.000 euro or more

Please select the most appropriate answer for you, given that:

- 1 = Strongly disagree
- 2 = Disagree
- 3 = Neutral
- 4 = Agree
- 5 = Strongly agree

6. When things get boring, I like to find some new and unfamiliar experience. *

Mark only one oval.

| | 1 | 2 | 3 | 4 | 5 | |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly agree |

7. I like to continually change my activities. *

Mark only one oval.

| | 1 | 2 | 3 | 4 | 5 | |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly agree |

8. I like interacting with a person that provides me a service. *

Mark only one oval.

| | 1 | 2 | 3 | 4 | 5 | |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly agree |

9. Human contact is more enjoyable for me as a consumer when I buy a product/service. *

Mark only one oval.

| | 1 | 2 | 3 | 4 | 5 | |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly agree |

10. I am concerned about what other consumers think of me. *

Mark only one oval.

| | 1 | 2 | 3 | 4 | 5 | |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly agree |

11. I am concerned about my style of doing things. *

Mark only one oval.

| | 1 | 2 | 3 | 4 | 5 | |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly agree |

12. I am highly confident I can use online websites to make purchases. *

Mark only one oval.

| | 1 | 2 | 3 | 4 | 5 | |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly agree |

13. Making online purchases has typically been easy for me in the past. *

Mark only one oval.

| | 1 | 2 | 3 | 4 | 5 | |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly agree |

14. How frequent do you typically buy groceries? *

Typical groceries include food/drinks bought from supermarkets.

Mark only one oval.

- ☐ Daily
- ☐ 2-4 Times a week
- ☐ Once a week
- ☐ 2-3 Times a month
- ☐ Once a month

15. Have you ever bought groceries online? *

This could be by using a website or mobile app.

Mark only one oval.

- ☐ Yes
- ☐ No

16. Before the coronavirus, I did not buy any groceries online. *

Mark only one oval.

- ☐ Agree
- ☐ Disagree

17. The coronavirus has triggered me to buy groceries online. *

Mark only one oval.

- ☐ Agree
- ☐ Disagree

18. The coronavirus has had no influence whatsoever in my decision of buying groceries online or not. *

Mark only one oval.

- ☐ Agree
☐ Disagree

19. I combine buying groceries online with going to the actual supermarket. *

Mark only one oval.

- ☐ Agree
☐ Disagree

20. I buy my groceries online more often now than I did before the coronavirus. *

Mark only one oval.

- ☐ Agree
☐ Disagree

21. What percentage of your groceries did you buy online before the coronavirus? *

Mark only one oval.

- ☐ 0-20%
☐ 20-40%
☐ 40-60%
☐ 60-80%
☐ 80-100%

22. What percentage of your groceries do you buy online since the coronavirus? *

Mark only one oval.

- ☐ 0-20%
- ☐ 20-40%
- ☐ 40-60%
- ☐ 60-80%
- ☐ 80-100%

23. In the future, even after the coronavirus, I will continue to buy groceries online. *

Mark only one oval.

- ☐ Agree
- ☐ Disagree

24. What are advantages for you for buying groceries online?

25. What are disadvantages for you for buying groceries online?

Please select the most appropriate answer for you, given that:

- 1 = Strongly disagree
- 2 = Disagree
- 3 = Neutral
- 4 = Agree
- 5 = Strongly agree

26. Websites/apps that sell groceries online are easy to navigate. *

Mark only one oval.

| | 1 | 2 | 3 | 4 | 5 | |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly agree |

27. Websites/apps that sell groceries online have a user friendly interface. *

Mark only one oval.

| | 1 | 2 | 3 | 4 | 5 | |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly agree |

28. Learning to operate websites/apps that sell groceries online is easy. *

Mark only one oval.

| | 1 | 2 | 3 | 4 | 5 | |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly agree |

29. Websites/apps that sell groceries online are easy to use. *

Mark only one oval.

| | 1 | 2 | 3 | 4 | 5 | |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly agree |

30. It is easy to become skilful at using a website/app to buy groceries online. *

Mark only one oval.

| | 1 | 2 | 3 | 4 | 5 | |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly agree |

31. Buying groceries online improves my performance in searching and purchasing my groceries. *

Mark only one oval.

| | 1 | 2 | 3 | 4 | 5 | |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly agree |

32. Buying groceries online enables me to buy my groceries faster. *

Mark only one oval.

| | 1 | 2 | 3 | 4 | 5 | |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly agree |

33. Using a website/app to buy my groceries online improves my productivity in searching and purchasing my groceries. *

Mark only one oval.

| | 1 | 2 | 3 | 4 | 5 | |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly agree |

34. Websites/apps that sell groceries online are useful to me. *

Mark only one oval.

| | 1 | 2 | 3 | 4 | 5 | |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly agree |

35. I have fun when I buy my groceries online. *

Mark only one oval.

| | 1 | 2 | 3 | 4 | 5 | |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly agree |

36. Purchasing my groceries online provides me with enjoyment. *

Mark only one oval.

| | 1 | 2 | 3 | 4 | 5 | |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly agree |

37. I think that purchasing my groceries online is interesting. *

Mark only one oval.

| | 1 | 2 | 3 | 4 | 5 | |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly agree |

38. Purchasing my groceries online provides me with excitement. *

Mark only one oval.

| | 1 | 2 | 3 | 4 | 5 | |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| Strongly disagree | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Strongly agree |

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