ERASMUS UNIVERSITY ROTTERDAM

Erasmus School of Economics

MASTER THESIS

Financial Economics

The impact of fears on spending behaviour: hedonic and utilitarian consumption during COVID19 – Micro-data level evidence from a consumer survey

Author: L.M. Kennepohl (544024lk)

Supervisor: A. Breaban

26-02-2021

Abstract: This study aimed to investigate the impact of COVID-19 on consumer's fears and spending behaviour. Using a micro-data level survey across 4 European countries, the relationship between consumers' fears and their spending behaviour was examined. Results suggest that consumers who experienced higher levels of fears were more likely to increase their spending on particular products to improve mood (hedonic motivation) and to get a sense of control (utilitarian motivation). Furthermore, this study shows that age is a significant predictor for consumer behaviour changes during a stressful event. Results suggest that younger age groups (<40) are more likely to alter their spending. This paper contributes to the rising behavioural literature on drivers of consumer behaviour and spending decisions and the rising literature on COVID-19.

Keywords: COVID-19; fear; spending; utilitarian consumption; hedonic consumption

Table of Contents

1. Introduction

During COVID-19 changing human behaviour was reported globally. As the virus began to spread across the globe, people were faced with drastic changes in many aspects of their lives and had to adapt fast to the new situation. Social-distancing, facemasks and working from home became the new normal. We saw how this pandemic had a significant impact on consumers and their behaviour. For example, scholars have reported increases in purchasing of food, face masks, hand sanitizer, and other items perceived to be important for surviving the pandemic (Goodwin et al., 2019). Unusual consumer behaviour was reported globally, such as hoarding behaviour (Miri et al, 2020; Wang et al., 2020) and excessive retail therapy (Lamantia, 2020). However, also many people delayed their spending and increased their savings as reaction to the increased uncertainty (Arenas, 2020).

In recent world history, there have been several epidemic outbreaks, for example, Ebola, SARS, MERS, swine flu, and dengue fever (Balinska and Rizzo, 2009). Most prominently, the outbreaks have had an impact on two categories of human behaviour: consumer behaviour (Miri et al., 2020) and health risk mitigation behaviour (La Torre, 2019). Previous researchers focused heavily on preventive health behaviour, and consumer behaviour received less attention (Laato et al., 2020). Furthermore, the theoretical foundations of the studies on the impact of epidemics on human behaviour have been limited, making it difficult to generalize and expand the findings to other contexts. Finally, the COVID-19 pandemic situation is unprecedented and unique, it allows us to gain insight into human behaviour during a global pandemic event of massive scale where individuals have considerable uncertainty about how to act with no clear point of reference. This study will therefore study consumer behaviour during COVID-19 and specifically the drivers of this behaviour. While behavioural literature is increasing there is still limited research on the factors influencing consumer's behaviour. Looking at past epidemics and pandemics, the integral human responses to such an event are fear and panic (Bonneux and Van Damme ,2006). Emotions, such as fear and panic, lead most of the time to much-unexplained behaviour which differs between countries, culture and individuals (Arafat et al., 2020). We will therefore study the relationship between fear and behaviour.

This study will take the consumer side into account. We propose that combining a study on an individual's emotions, such as fear, and purchasing behaviour will help to understand human behaviour and would offer insights in how emotions related to the pandemic leads to unusual purchasing. We anticipate that the COVID-19 crisis will not only see an increase in consumer's fear but also the broader repercussions of this fear and uncertainty in spending decisions. The main question that we will be answering in this research is "Can differences in consumer's fears surrounding the coronavirus explain differences in consumer's behaviour?". We will examine the relationship between fear and both utilitarian and hedonic shopping behaviours during lockdown and post lockdown. In doing so, this study responds to Larson and Shin (2018), Sneath et al. (2009) and Kemp, Kennett-Hensel, and Williams (2014) general call for research investigation on the relationship between event-induced emotions and resulting consumption behaviours (Larson and Shin, 2018).

To study drivers of changing consumer behaviour is also of great interest for policymakers and other sectors. A key concern for policymakers is the size and the nature of the consumer response. While some highlight that the shutdown is, in essence, a supply shock with possible spill-overs to the demand side (Guerrieri et al, 2020), others stress that the pandemic may also affect demand directly because the health risk and fears of going to public spaces like shops, restaurants and hairdressers deters consumption (Eichenbaum et al, 2020). The retail industry, customer service industry and financial institutions have to deal directly with changing consumer's spending behaviour and irrational decision making. Understanding consumer's behaviour can therefore be of great interest for marketing purposes and financial support respectively.

This paper is organized as follows. In chapter 2 the literature review will be discussed, focusing on fears during COVID and other stressful events, corresponding consumer behaviour and the link between fear and utilitarian and hedonic shopping. In the literature section the hypotheses will also be formed. Second, the methodology (chapter 3) will be explained followed by the data selection and preparation (chapter 4). In chapter 5 the results of the regression analysis will be discussed and the limitations of the model. In chapter 6 till 10 the conclusion, limitations, discussion, implications, and further research suggestions will be discussed.

2. Literature review

To place my research in perspective, form my hypotheses and explain the research contribution, previous literature is used. This section will discuss relevant literature on (i)fears and its relationship with (ii)consumer behaviour and individual decision making.

There exists very little research on the impact of stressful events on consumer spending behaviour (Sneath, 2009; Larson and Shin, 2018; Laato, 2020). Loxton et al. (2020) found that consumer behaviour during the COVID-19 crisis appears to align with behaviours exhibited during historic shock events such as the 2002-04 SARS outbreak, earthquakes and other natural disasters. Within this literature review we use recent studies on COVID-19 and studies on historic events, where comparable consumer behaviour would likely have been exhibited.

2.1 Fear as psychological reaction to COVID-19

With the outbreak of COVID-19 national polls indicated a sharp increase in fear and worries relating to the virus (Asmundson & Taylor, 2020a). Of the varying emotional responses to COVID-19, extreme fear and uncertainty are two that have become more evident in society (Esterwood and Saed, 2020). In this study we will therefore study the emotion fear, as reaction to the pandemic and increased uncertainty.

Fear is a typical psychological reaction to a disaster (Madakasira & O'Brien, 1987; Larson and Shin, 2018). The psychological state of fear is defined by a low-control, high uncertainty scenario in which there is potential for a harmful outcome (Morreall, 1993). During COVID-19, the high rates of infected people and deaths and a lack of effective prevention and treatment led to such a low-control, high uncertainty scenario and have left people fearful (Schmenti et al., 2020). Fear is a powerful emotion with known effects on perception, thought, and behaviour (Izard, 1991), those experiencing fear could show irrational consumer behaviour and alter their spending behaviour accordingly. Furthermore, when fear is too excessive, this could have detrimental effects both at the individual level (e.g., mental health problems such as phobia and social anxiety), and at the societal level (e.g., panic shopping or xenophobia) (Mertens et al., 2020).

Multiple behavioural studies have already studied the effect of COVID-19 on people's emotions, as pandemics of this scale are rare. Mertens et al. (2020), studied different emotions and identified different topics of fears and concerns as reaction to COVID-19. Besides health fears, people experienced economic fears (Mertens et al., 2020). In contrast to many other studies, that use one type of fear, this study will look at two types of fears surrounding COVID-19: (i) Health fears and (ii) Economic Fears.

2.1.1. Health Fears during COVID-19
On March 11th the WHO announced COVID-19 as a global health crisis. During this pandemic, the high rates of transmission and mortality of COVID-19, combined with a lack of effective prevention and treatment measures, have left many people fearful of COVID-19 (Schimmenti et al., 2020). During a pandemic health fears, such as being infected with the coronavirus infecting others and fear

of going out are possible consequences (Mertens et al., 2020). As the numbers of cases increased, health fears increased, which had a direct impact on people's mood, mobility, and economic behaviour.

2.1.2. Economic Fears

Besides health fears, the arrival of the coronavirus led to a spike in economic anxieties (Van der Wielen & Salvador, 2020). Van der Wielen & Salvador (2020) found evidence from online searches in Europe, capturing the economic sentiment in Europe, that as cases increase, concerns about a recession rise substantially over Europe. Also, people started to search for "unemployment" and "unemployment benefits", indicating an increase in fear of losing job/ job uncertainty (Van der Wielen & Salvador, 2020).

Previous research has already demonstrated that fear influences a range of consumer behaviours (Block 2005; Block and Williams 2002; Griskevicius et al. 2009; Keller and Block 1996; Keller and Lehmann 2008; Morales, Wu, and Fitzsimons 2012; White, Kenrick, and Newberg 2013a; Winterich and Hawes 2011; Coleman et al. 2017) and impacts individual decision making (Shefrin, 2002; Ben-David et al., 2018). However, behavioural economics is still quite new and only few studies have explored behaviour during natural or human-made disasters (Sneath, 2009; Larson and Shin, 2018). Furthermore, previous epidemic researchers focused heavily on preventive health behaviour instead of consumer behaviour (Laato et al., 2020).

We propose that combining a study on individual's emotions, such as fear, and purchasing behaviour will help to understand human behaviour and would offer insights in how emotions could affect decision-making and spending behaviour. By studying the relationship between fear and individual decision making in spending behaviour, this study contributes to the rising literature on behavioural economics/finance during COVID-19.

2.2 The impact of fears on financial decision making and consumer spending behaviour

During perceived instances of high risks, such as a crisis or disaster, the "risk-as-feelings" theoretical perspective describes a trend towards irrational consumption (slovic et al., 2004). In other words, certain scenarios and emotions could impact consumer behaviour. Consumers experiencing uncertainty and fears lead to increasing levels of stress, which could lead to two possible outcomes in research: Economic theory predicts that households will decrease financial risk taking and therefore will increase saving behaviour (Durante and Laran, 2016). However, previous research suggests that emotions could also lead to increased spending behaviour on both utilitarian and hedonic products. Shopping and consumption-related behaviour is frequently used as stress-reduction mechanism.

When in a bad mood people want to feel better immediately. Emotional distress may therefore work against the usual pattern of self-control because distress promotes a short- term focus, whereas self-control requires a long-term one (Tice et al., 2001).

During COVID-19 we have seen various buying behaviours, from panic buying to retail therapy. These buying behaviours were shaped by the increase in uncertainty, anxiety and fear, caused by the rising number of cases around the world (Euroscientist, 2020). The initial spatial and temporal displacement of consumption was the consequence of panic buying during COVID-19 (Hall et al., 2020). Panic buying/ increased buying behaviour has been observed during public health emergencies and natural disasters since the ancient period of time (Arafat et al., 2020). Panic-buying is often used to get a sense of control during times of uncertainty (Chen, Lee & Yap, 2017; Ballantine, 2013; Yuen et al., 2020). Furthermore, as people have been home a lot since March 2020, they have also been spending a lot online (Flagshipbank, 2020). People have been spending more money online than ever. Some non-essential stores saw an increase in sales, as a consequence of retail therapy. Retail therapy is mainly used to improve mood. While retail therapy can cheer someone up, psychologist warn for excessive retail therapy. The trouble is when retail therapy prevents people from paying bills on time, breaking budgets, lying and/or hiding purchases, and feeling guilty or shame (Experian, 2020). Letting emotions impact money decisions can lead people down the wrong path (Experian, 2020).

However, besides individuals showing increased spending behaviour on particular products, the European Central Bank (ECB) reported an increase in household's savings. The increase in household's savings is in line with the economic theory that predicts that in uncertain situations households will decrease financial risk taking and will therefore be more reluctant to spend (Durante and Laran, 2016).

During COVID-19 buying behaviours changed. Factors that influence individual's emotions could explain individual decision making and irrational buying behaviours (Laato et al., 2020). This study will focus on the relationship between both health fears and economic fears and consumer behaviour.

2.4.1. Health fear and consumer spending behaviour

Yuen et al. (2020) found that when consumers perceive the probability and consequences of contracting a disease to be high, they are motivated to undertake self-protective activities, including panic buying, to limit fear of the unknown (Forbes, 2017, Ballantine, 2013). Such panic buying/ increased buying behaviour has been observed during public health emergencies and natural disasters since the ancient period of time (Arafat et al., 2020). It is shown that when panic takes the

overhand during a crisis, consumer reasoning if often outweighed by feelings of anxiety, rather than being made with reasonable cognitive conclusions (Loewenstein et al., 2001). During times of uncertainty, consumer behaviour theories demonstrate that individuals attempt to gain a sense of control through product acquisition (Ballantine 2013; Yuen et al. 2020). Specifically, utilitarian products, such as personal hygiene and food, are often used to get control over the situation (Chen, Lee & Yap, 2017; Ballantine, 2013; Yuen et al., 2020).

H1.1: *The higher a consumer's level of health fear the more likely they are to increase their spending on utilitarian consumption (to get control over the situation) during the lockdown*

Evidence from natural disasters shows that consumers experiencing higher levels of fear are more likely to engage in both utilitarian and hedonic shopping before and after the storm (Larson and Shin, 2018; Sneath et al., 2009). Larson and Shin (2018), suggest that shoppers under the greatest emotional strain are the ones out shopping the most at the time of a natural disaster to alleviate their fears. When increasing utilitarian consumption, people try to get a sense of control during times of uncertainty (Chen, Lee & Yap, 2017; Ballantine, 2013; Yuen et al., 2020). Hedonic products on the other hand, are products that are mostly seen as non-essential, such as luxury goods, alcohol and confectionary. Individuals use hedonic shopping and consumption related behaviour as stress-reduction mechanism and to improve mood (Sneath, 1996). Consumers experiencing fears and stress during COVID-19 are therefore expected to be more likely to increase their spending on hedonic products, to improve their mood.

H1.2: *The higher a consumer's level of health fear the more likely they are to increase their spending on hedonic consumption (stress reduction) during the lockdown*

2.3.3. Economic uncertainty and fears and spending behaviour

Besides health fears, people experienced economic fears as many businesses had to close and people lost their jobs. As mentioned before, fears could lead to increased spending to get control over the situation and improve mood. However, fears of an economic slowdown and fears of future unemployment is a motive that could discourage spending (Pettinger, 2009). According to behavioural finance theories, fears of unemployment stir up precautionary sentiments that induce agents to save more (Haan et al., 2018). Economic fears related to financial stability are common in uncertain situations. Multiple researches have studied the effect of uncertainty, income uncertainty and fears on financial decisions and risk-taking behaviour on which the hypotheses will be based.

Economic theory predicts that uncertainty is an important factor for households' economic behaviour. Households will respond to increased (income) uncertainty by delaying purchases of non-essential goods, increase precautionary savings, lower levels of consumption in general and lower

exposure to risky financial investments (Gollier and Pratt, 1996; Carroll and Samwick, 1998; Bertola, Guiso, and Pistaferri, 2005). Furthermore, a common finding in the study of emotions and decision making is the tendency for fear to decrease risk taking. Fear will lead to emphasize security, while hope will lead to emphasize potential (Shefrin, 2002). As a result, people experiencing fear will exhibit more precaution in their consumption, credit, and investment behaviours (Ben-David et al., 2018).

Based on these previous findings we suggest that economic fears, and thus income uncertainty, leads to less risk-taking in their financials, and more precaution in consumption.

H2.1: *The higher a consumer's level of economic fears the less likely they are to increase their spending on utilitarian consumption during the lockdown*

H2.2: *The higher a consumer's level of economic fears the less likely they are to increase their spending on hedonic consumption during the lockdown*

2.3.2. Consumer behaviour post lockdown

As the coronavirus pandemic may be categorised as a broader healthcare crisis than has been experienced in recent history, for example as experienced during the SARS outbreak, it is not possible to immediately anticipate that all consumer behaviours typically demonstrated during more common shocks or crises, such a natural disasters, to apply here (Loxton et al., 2020). As research has already found evidence that panic buying behaviour exists during early stages of the pandemic and that consumers react similarly to natural disasters in the weeks surrounding the event, it is not yet clear if consumers behave the same after the lockdown as after the event of a natural disaster.

Larson and Shin (2018), suggest that shoppers under the greatest emotional strain are also the ones that are more likely to engage in hedonic and utilitarian shopping after a natural disaster. Excessive fears lead to irrational behaviour and could lead to increased spending behaviour to elevate fears. However, economic theories suggest the opposite and find that fears could decrease financial risk-taking and discourage spending. Post-lockdown evidence also takes another factor into account, namely the fear of going out. Many people were scared to leave their house after the lockdown restrictions were lifted. People experienced 'post-lockdown'-anxiety, fear of infection, fear of infecting others and fear of going out/ returning to the new normal (Goolsbee & Syverson, 2020). According to Reuters (2020), these health fears and increasing financial worries could decrease consumer's economic activity. While people that don't fear for the virus and have less concerns could show increased spending behaviour post lockdown according to Deng et al. (2020), as they start

going to public places, visit friends and family and try to make up for the time lost during the lockdown.

As findings are contradictory, we will study if the relation between fears and consumer spending is negative or positive post-lockdown with the following hypotheses:

H3.1: *The higher a consumer's level of health fear the less likely they are to increase their spending on utilitarian consumption post-lockdown*

H3.2: *The higher a consumer's level of health fear the less likely they are to increase their spending on hedonic consumption post-lockdown*

H4.1: *The higher a consumer's level of economic fears the less likely they are to increase their spending on utilitarian consumption post-lockdown*

H4.2: *The higher a consumer's level of economic fears the less likely they are to increase their spending on hedonic consumption post-lockdown*

3. Methodology

In this section the contribution of this research and the research approach is explained. First, a summary of the research and its contribution on the behavioural finance literature is given. Second, the research approach is explained including the econometric model and the variables used. Additionally, relevant control variables will be determined based on previous literature. This research will use descriptive data extracted from Excel and use STATA for all quantitative analyses.

3.1 Research and Research contribution

To study the effect of fears on consumer spending behaviour this study uses survey data from a global consulting firm. The initial dataset consists of more than 20,000 respondents in Europe. The survey was conducted during COVID-19 in 8 waves: March 19th – 25th, April 2nd – 6th, April 17th – 27th, May 5th – 11th, May 20th – 24th, June 2nd – 8th, June 16th – 22nd and June 30th – July 5th. Since this survey has over 20,000 respondents in 6 countries and covers the period in lockdown and after lockdown this dataset is rich and unique. Survey data could give us relevant insights on people's emotions during the COVID crisis, their fears and concerns and how this influences their spending behaviour. Recent research on spending behaviour during COVID used bank account data, which might show more precise measures of spending, but is limited to only tracking spending behaviour. A survey is needed to study possible drivers of changing spending behaviour, such as health fears and concerns about the economy.

As there have been much research done on spending behaviour, there haven't been much research done on the drivers causing shifts in spending behaviour. Also, previous research on epidemics specifically focused heavily on preventive health behaviour, and consumer behaviour received less attention (Laato et al., 2020). Furthermore, the theoretical foundations of the studies on the impact of epidemics on consumer behaviour have been limited, making it difficult to generalize and expand the findings to other contexts. Finally, the COVID-19 pandemic situation is unprecedented and unique, it allows us to gain insight into consumer behaviour during a global pandemic event of massive scale where individuals have considerable uncertainty about how to act with no clear point of reference. This study will take the consumer side into account. We propose that combining a study on an individual's emotions, such as fear, and purchasing behaviour will help to understand human behaviour and would offer insights in how emotions related to the pandemic leads to changes in purchasing behaviour. With this study we will contribute to the rising literature on behavioural finance/economics, studying drivers of spending/saving behaviour and emotions and consumer behaviours during pandemics/ COVID-19.

3.2 Descriptive data and empirical model

This study will use both descriptive data and statistical analysis using an empirical model. Descriptive data will be used to show initial insights in the relationship between fear and spending. The statistical analysis, using STATA, is used to test the hypotheses.

3.2.1 Descriptive data

Survey data analysis in Excel will give initial insights on how fears are related to spending decisions. We will use descriptive data to show how respondents with different levels of fear altered their spending on utilitarian and hedonic consumption. We will use this data to visualize the findings in the survey. Note that this analysis won't take all variables into account. This descriptive analysis is limited as this won't answer the hypotheses but will only give some initial insights. We will use the two dependent variables that are most likely to be utilitarian and hedonic products (table 3): personal hygiene and luxury goods. And two independent variables: Fear of losing job and fear of own health that represent the economic fears and health fears respectively.

3.2.2 Empirical model

The empirical model is used to test the hypotheses with all dependent and independent variables. The dependent variable "change in spending" is measured on a 3-point scale. Spending on a consumption category is either increased, decreased or stayed the same. We translate this to a

dichotomous scale; spending is either increased or not increased. We will use binary logistic regressions, to test the hypotheses. This method is in line with the method used by Larson and Shin (2018), who tested if consumers with higher fears were more likely to engage in utilitarian and hedonic shopping at the time of a natural disaster. Binary logistic regressions are used to predict the odds of being a case based on the values of the independent variables.

To test the relationship between consumer's spending behaviour and fear, we use a binary logistic regression in 2 panels. Panel 1 during lockdown and panel 2 post lockdown. This research uses spending on (i)utilitarian and (ii)hedonic products as dependent variable and health fears and economic fears as predictive variables, conditioning for the duration of lockdown/ post lockdown, income level, change in income during COVID, age, gender and country.

$$P(U)_{it} = \frac{e^{\beta0+\beta1FEAR1_i+\beta2FEAR2_i+\beta3in_i + \beta4a_i+\beta4g_i+ \beta5w_i+\sum_{i=2}^{k} \beta_iz_i}}{1 + e^{\beta0+\beta1FEAR1_i+\beta2FEAR2_i+\beta3in_i + \beta4a_i+\beta4g_i+ \beta5w_i+\sum_{i=2}^{k} \beta_iz_i}}$$

$$P(H)_{it} = \frac{e^{\beta0+\beta1FEAR1_i+\beta2FEAR2_i+\beta3in_i + \beta4a_i+\beta4g_i+ \beta5w_i+\sum_{i=2}^{k} \beta_iz_i}}{1 + e^{\beta0+\beta1FEAR1_i+\beta2FEAR2_i+\beta3in_i + \beta4a_i+\beta4g_i+ \beta5w_i+\sum_{i=2}^{k} \beta_iz_i}}$$

Where:

U_i is the binary variable for utilitarian spending which is either increased or not

P_i is the binary variable for hedonic spending which is either increased or not

$FEAR1_i$ is the measure for health fears constructed by factor analysis

$FEAR2_i$ is the measure for economic fears constructed by factor analysis

a_i is the categorical variable for age, calculated at the moment of filling in the survey

in_i is the categorical variable for income level either low, medium or high

w_i is the variable for the wave when the survey was conducted

Additional covariates are added to collect information on the relationship between individuals' demographics and spending behaviour. Extra covariates are the change in income during COVID (change in income), gender (gender) and the country of residence (count), which are all categorical variables.

3.3 Dependent and Independent variables

The dependent variable in this study is consumer spending. In the survey used, respondents were asked if their consumption increased, decreased or stayed the same for a consumption category. For

these questions the consumption index was used. The consumption index consists of different types of products: personal hygiene, fresh food, frozen food, tinned food, cleaning products, wellness, online entertainment, pet care, OTC, non-alcoholic beverages, "apparel, footwear and accessories", beauty, DIY tools and materials, home décor, take-away/delivery from restaurants, alcoholic beverages, confectionary and luxury goods. To test the hypotheses, the consumption index will be divided in "utilitarian" and "hedonic" consumption. Utilitarian consumption is considerably linked to necessities, whereas hedonic consumption is substantially linked to luxuries (Kivetz & Simonson, 2002a, 2002b) and consumed for sensory pleasure and enjoyment (Holbrook and Hirschman, 1982).

The independent variables are the different fears, health fears and economic fears. Fears of the coronavirus was measured using a multiple item scale, all scale items were rated on Likert type 5-point scales. While this survey was conducted by a consulting firm and wasn't related to any academic study, the measures of consumer's fears don't fully align with previous used methods. However, a recent study on fears during COVID-19 does show that common fears are: (i) Fear of getting infected, (ii) fear of infecting others, (iii) concerns about the economy and (iv) job security concerns (Mertens et al. 2020). All these variables of fear were included in the survey as direct questions. This study will therefore use self-reported fears instead of the commonly used fear scales.

We assume that fear of COVID-19 isn't just one type of fear. We distinguish between health fears and economic fears in this study as we expect other outcomes according to our previously mentioned hypotheses. Using a factor analysis, we test if (i) overall concerns, health fears, and fear of infecting others predict the overall health fear factor and if (ii) job security concerns and concerns about the economy predict economic fears. To test whether the data is suitable for factor analysis the Kaiser-Meyer-Olkin measure for adequacy is performed.

3.4. Control Variables

This study will include multiple control variables to get a more unbiased estimation of the relation between consumer spending and fears, but also to draw conclusions on the relationship between demographics and spending during COVID-19. First, the impact of the pandemic varies based on social roles and risk factors that are present at different points in the adult life span (Klaiber et al., 2020). According to past research, older age is linked with greater emotional well-being and decreased reactivity to stressors (Klaiber et al., 2020). We will therefore include the control variable age. Cox et al. (2020) found that spending during lockdown and spending recovery after lockdown differed between income levels. The variable income level, which can either be low, medium or high is therefore included as control variable. Also, a change in income can have a significant effect on someone's spending behaviour and is also included as control variable. Furthermore, gender is a

widely used variable in micro data level studies and therefore included. Lastly, the control variable country of residence is included. The dataset used only includes European countries but as countries were hit differently, measures/restrictions slightly differed between countries and culture differences could influence difference in consumer behaviour, it is important to include this variable.

3.5 COVID-19 restrictions in the survey data

A major contribution of this study to the growing literature on the effect of COVID-19 on consumers and their spending behaviour is the timespan of the survey. We can study how consumers' fears, concerns and spending behaviours changed during and after the lockdown. To test differences between the period in lockdown and after lockdown it is important to control for differences in restrictions across countries. We do this by only comparing the countries that went into a strict lockdown, approximately around the same time.

The survey included respondents from all over the world, however the virus spread differently across each continent, country and region. To compare the period into lockdown and after lockdown it is needed to choose countries that (i) went into a strict lockdown and (ii) had a similar restriction trend. To narrow the survey data, we filter the data on countries in Europe. The countries included in the survey are France, Germany, Italy, Spain, and the United Kingdom.

We explore stay-at-home policies in this paper, which is in line with the method proposed by Allcott et al. (2020). As each of these countries had different restrictions it is important to give a clear definition of lockdown and the end of the lockdown. We define lockdown as the moment where a country imposed a national lockdown, which is an enforced stay-at-home order (Allcott et al., 2020; ECDC, 2020). All countries, expect for Germany, went into a strict lockdown in March. As Germany never went into a strict lockdown, we exclude Germany from our dataset. Post-lockdown is defined as the period after Stay at home orders were fully lifted. Meaning that both "Stay-at-home" orders and "Stay-at-home-Partially" orders ended. These dates are known as the reopening dates (Mervosh et al., 2020; ECDC, 2020).

The countries included all issued a nationwide lockdown between March 9th and March 16th. The first few waves will therefore represent the lockdown period. Since the lockdown period don't run parallel across countries, this study will add a lockdown variable per country to examine the changes in consumer spending during lockdown and after the lockdown.

3.5 Assumptions

The survey used is a general population survey with sample quotas. Quota sampling is a sampling method that doesn't use random sampling. Instead, the target population is divided into subgroups based on certain known characteristics. Together with the consulting firm, who provided the dataset,

we assume that this is done correctly, as professional survey companies were used to collect the data needed. Assuming this means we can avoid researcher bias, population definition errors, sampling frame errors and nonresponse errors. Furthermore, respondents couldn't fill in the survey twice. We therefore assume that all respondents are individuals. Lastly, independency is assumed meaning that all respondents filled in the survey independently.

4. Data

In this section the survey and the corresponding data are described in detail, followed by the data preparation process. As described in the methodology section the questionnaire slightly differed between waves, which requires data preparation. The section ends with describing the influence of missing values on the validity of the results.

4.1 Data description

In this research a dataset from a global consultancy firm is used. The consumer survey was conducted during the pandemic to get insights in the "Future Consumer", their sentiments, spending behaviour, brand loyalty and trust in banks, as a result of COVID-19. The survey was conducted in 8 waves: March $19^{th} - 25^{th}$, April $2^{nd} - 6^{th}$, April $17^{th} - 27^{th}$, May $5^{th} - 11^{th}$, May $20^{th} - 24^{th}$, June $2^{nd} - 8^{th}$, June $16^{th} - 22^{nd}$ and June $30th - $ July 5th in 18 countries. To get the results that aligned with the consumer behaviour study, a general population survey with quota sampling was used. Quota sampling can be used to monitor the number of respondents that are allowed to complete a survey based on particular traits like age, gender, race and location (Surveymonkey). Using quota sampling also means that respondents come to you randomly. As the survey consists of multiple waves the sampling also made sure that a respondent couldn't answer the questionnaire twice, meaning that all replies were independent.

This paper will use the first part of the survey: Consumer sentiments and spending behaviour. Within these sections respondents all reported (i) their demographic characteristics, such as age, gender, country of residence, income level, (ii) their feelings surrounding COVID-19, including overall concern, fears and comfort with going out, (iii) the impact COVID has on their lives, including change in available disposable income and change in employment status and (iv) their spending patterns. As stated earlier, the questionnaire wasn't consisted over the waves and therefore needs some preparation.

4.2 Data summary and preparation

In this section choices on how to interpret the data, prepare them and deal with missing values will be discussed. The database provided contains categorical variables and some missing datapoints.

Most variables in the dataset are categorical and their needs to be decided whether to treat them as categorical or in a numerical manner. Furthermore, there needs to be decided on how to deal with N/A, Other and missing values in the dataset.

4.2.1 Independent variables

All questions related to fears and concerns were asked on a 5-point Likert-scale. An example statement is: "I am fearful for my own health: To what extent do you agree or disagree with the following statements?", on a scale from 1-5 (significantly, disagree, disagree, neutral, agree, significantly agree). The questions and summary of the data can be found in table 2.

Table 1. Summary table questions used for independent variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Concern: *I am concerned about the coronavirus*	13.093	3,77	1,15	1	5
Ownhealth: *I am fearful for my own health*	13.093	3,62	1,05	1	5
Healthothers: *I am fearful for the health of others*	13.093	4,04	0,89	1	5
Job security: *I am worried about the impact coronavirus will have / is having on my personal job security:*	13.093	3,56	1,24	1	5
Economy: *I am worried about the impact coronavirus will have / is having on the economy*	13.093	4,34	0,82	1	5

There is an ongoing debate as whether to treat Likert scale data as ordinal or continuous. As we follow the method used by Larson and Shin (2018), who study the effect of fears on utilitarian and hedonic shopping, we treat the Likert scale data as continuous in our regressions.

A correlation and factor analysis will be performed to test whether concern, own health and health others can function as predictive variables for one latent variable health fears/concerns and whether job security and concerns for the future of the economy can be predictive variables for one latent variable economy fears.

4.2.2 Control variables

To test the relationship between fears and spending we control for multiple variables. In each wave respondents were asked the same fear related questions, however not all demographic questions were the same in each wave. Two questions were only present in 5 out of 8 waves: 1. "How has your disposable income changed during COVID?" and 2. "What is your employment status?". Including the data from 5 waves still results in enough datapoint for the variable *change in disposable income.* However, *employment status* question wasn't included across all countries and the data wasn't enough to find a direct and significant effect on spending behaviour. The variable *employment status* was therefore excluded from the dataset.

The demographical variables: gender, age, income, change in income and country of residence are all categorical. The gender of a respondent is either female, male, non-binary or other. 99,5% of the respondents chose either for male or female. Of the 0,5% of the respondents that didn't identified themselves as male or female, more than half didn't complete all the questions resulting in missing observations. We therefore chose to exclude the 0,5% and only use female and male respondents in our sample. As a result, the variable gender was treated as a dummy variable, where 1 is female and 0 is male.

The age of the respondents is divided in categories. Each respondent was asked in which category they belong 18-24, 25-31, 32-39, 40-55. 56-69 and 70+. Respondents needed to be older than 18 as it was assumed that respondents younger wouldn't buy their groceries and other products by themselves. We chose to treat the age variable as categorical instead of in a numeric matter as it is often more informative to categorize such variables.

The income of the respondents was denoted differently across countries. In the UK respondents were asked what their total annual household income from all sources, and before taxes was and could choose between: <10k, between 10k-19,9k, between 20k-29,9k, between 30k-49,9k, between 50k-74,9k, between 75k-99,9k and >100k. Based on these answers income groups were formed, respondents were either in the low (<29,9k), middle (30k-49,9k) or high (>50k) income group. In all other countries only the income level low, middle, or high was given in the dataset and therefore we will use these categories in our dataset to control for different income categories in our dataset. The dataset consists of 25% low income respondents, 37% middle income respondents and 32% high income respondents. Furthermore, as income could feel for some people as too sensitive information the option "prefer not to say" was included. 6% of the respondents chose for this option. As income questions are marked as sensitive questions, it is not recommended to treat these values

as "missing" as in non-sensitive questions would be the case (Joinson et al., 2008). We therefore will include the 6% that reported "prefer not to say" in our sample.

Table 2. Summary table demographic variables

Variable	Freq.	Percentage%	Cum.
age			
18-24	1.749	13,36	13,36
25-31	2.136	16,31	29,67
32-39	2.333	17,82	47,49
40-55	3.256	24,87	72,36
56 -69	2.214	16,91	89,27
70+	1.405	10,73	100,00
gender			
Female	6.755	51,59	51,59
Male	6.338	48,41	100,00
country			
France	3.08	23,52	23,52
Italy	4.154	31,73	55,25
Spain	2.935	22,42	77,67
UK	2.924	22,33	100,00
Income group			
Low	3.337	25,49	25,49
Middle	4.803	36,68	62,17
High	4.161	31,78	93,95
Prefer not to say	792	6,05	100,00

Change in income during COVID-19			
Decreased by:			
0-24%	2.190	19,16	19,16
25-49%	964	8,43	27,59
50-100%	744	6,51	34,10
Increased by:			
0-24%	651	5,70	39,80
25-49%	788	6,89	46,69
50-99%	595	5,21	51,90
>100%	310	2,71	54,61
Stayed the same	5.188	45,39	100,00
Sample			
Total	13.093	100.00	

4.2.2 Dependent variables

For the dependent variables (spending on utilitarian and hedonic products) the consumption index was used. Per product category respondents were asked: "How have your purchasing habits changed for the following products or services compared to pre-COVID?". The questions could be answered with either increased, decreased, stayed the same and N/A, I never buy this product. As not applicable is related to not buying a product, this option should be considered as valuable information. Given the nature of our hypotheses, the dependent variables needed to be transformed to binary variables. Only then we will be able to test whether respondents with more fears are more/less likely to increase their spending on utilitarian and hedonic products. This means that respondents increasing spending on a consumption category will be denoted with 1 and respondents not increasing their spending in a consumption category will be denoted with 0. The question that then arises is: what to do with respondents that chose the option N/A-I never buy this product? As

this study wants to test the relation between fears and consumer spending, we only want to include respondents that actually buy the product. Only this way we can accurately test whether fear is related to an increase in consumer spending on certain product categories. To prepare the data, respondents that chose N/A- I never buy this product are denoted as missing. By default, missing values are excluded in STATA and the results are based on the number of non-missing values.

The consumption index slightly differed between waves and therefore some categories couldn't be analysed. Consumption categories that weren't included in more than two waves were excluded from the dataset. The category luxury goods was only included in wave three till eight. However, whether people spend more on luxury goods was also asked in the additional questions in the survey. Instead of asking did you increase/decrease your consumption the question was: "How likely are you to buy more little luxuries to treat yourself" on a scale from 1-5. This question was included in all waves and functioned as replacement for the luxury category (1,2=decreased; 3=stayed the same; 4,5=increased). After excluding all categories, the consumption index consists of 13 categories.

To divide the consumption index the classification proposed by Vale and Duarte (2013) is used. They studied the utilitarian/hedonic value per product category. This study unfortunately didn't include all consumption categories used in this research and is limited to data from Portugal. Therefore, besides this framework, common sense (based on literature) is used to divide the consumption categories.

Table 3. Consumption categories after excluding incomplete categories

Utilitarian	Hedonic
Personal hygiene	Luxury goods
Frozen food	Alcoholic drinks
House care/ cleaning products	Home décor
Fresh food	Take-away/delivery from restaurants
Tinned food	Apparel, footwear and accessories
Beauty products	
OTC medicines	
Non-alcoholic beverages	

To test the hypotheses, we selected the first three products from the consumption index. These are most likely deemed to be unambiguously hedonic or utilitarian (Chen, Lee and Yap, 2016). The three product categories to test the hypotheses for spending on utilitarian products are: House

care/cleaning products, personal hygiene and frozen food. The three product categories to test the hypotheses for spending on hedonic products are: Alcohol, luxury goods and home décor.

4.2.2 COVID-19 in dataset

We explore stay-at-home policies in this paper, which is in line with the method proposed by Allcott et al. (2020). We define lockdown as the moment where a country imposed a national lockdown, which is an enforced stay-at-home order (Allcott et al., 2020; ECDC, 2020). Post-lockdown is defined as the period after Stay at home orders were fully lifted. Meaning that both "Stay-at-home" orders and "Stay-at-home-Partially" orders ended. These dates are known as the reopening dates (Allcott et al., 2020; Mervosh et al., 2020). We use the database on country response measures to COVID-19 from the European Centre for Disease Prevention and Control (ECDC). The data used is based on information available from official public sources. The response measures displayed are national measures, reported on official public websites (ECDC, 2020). We will use national measures as respondents were group on country level.

Table 4. Stay at home order and reopening dates according to the ECDC

Country	StayHomeOrder	Reopening	Wave lockdown	Wave post-lockdown
France	17-3-2020	2-6-2020	1,2,3,4,5	6,7,8
Italy	10-3-2020	18-5-2020	1,2,3,4	5,6,7,8
Spain	14-3-2020	11-5-2020	1,2,3,4	5,6,7,8
United Kingdom	16-3-2020 (partially)	23-3-2020	1	
United Kingdom	24-3-2020	4-7-2020	2,3,4,5,6,7,8	

Note: StayHomeOrder is the date that the stay at home order got active. Reopening is the date that the stay at home order was lifted. Wave lockdown shows the survey wave when a country was in lockdown. Wave post-lockdown shows the survey wave when a country wasn't in lockdown anymore.

To test the hypotheses during lockdown and post-lockdown a variable lock2 was created, where a respondent in lockdown was denoted with a 1 and a respondent not in lockdown was denoted with 2. 7710 Respondents were in lockdown when filling in the survey and 5383 respondents weren't in lockdown when filling in the survey.

Table 5. Summary data points lockdown and post lockdown

	Freq.	Percentage%	Cum.
Lockdown	7.710	58,89	58,89
Post Lockdown	5.383	41,11	100,00
Total	13.093		

4.2.3 Missing values

For this research the first part of the survey is used. As a result, we deal with limited missing values. The respondents that filled in less than 90% of the questions were excluded from the data. This resulted in a total dataset of 13093 respondents.

5. Results

In this section the results will be discussed. We will first discuss the descriptive results to give initial insights in the effect of fears on consumer behaviour. Secondly, the multiple tests that were conducted to test the data and model will be discussed. Thirdly, we will discuss the results of the binary logistic regression and hypotheses and lastly, limitations and additional insights will be shared.

5.1 Descriptive data

Descriptive data will show us initial insights on the relationship between fears and consumer spending decisions. Figures 1 and 2 show the initial findings on the relationship between fears and spending behaviour. Figure 1 shows the relationship between fears and spending on personal hygiene and figure 2 shows the relationship between fears and spending on luxury goods. On the x-axis fear is shown on a 5-point Likert scale. The coloured blocks represent the answers on spending behaviour, with on the y-axis the percentage of respondents that chose that answer.

Figure 1 shows the relationship between fears and spending on personal hygiene. What we observe is that the higher a respondent's reported level of fear, the more likely they are to having increased spending on personal hygiene. This is evidence that people who experience fears, both health and job fears, try to get a sense of control by product acquisition (utilitarian shopping). This would suggest that H1.1 is accepted and H2.1, H3.1 and H4.1 is rejected.

Figure 1. Different levels of fears and spending change on personal hygiene (utilitarian consumption)
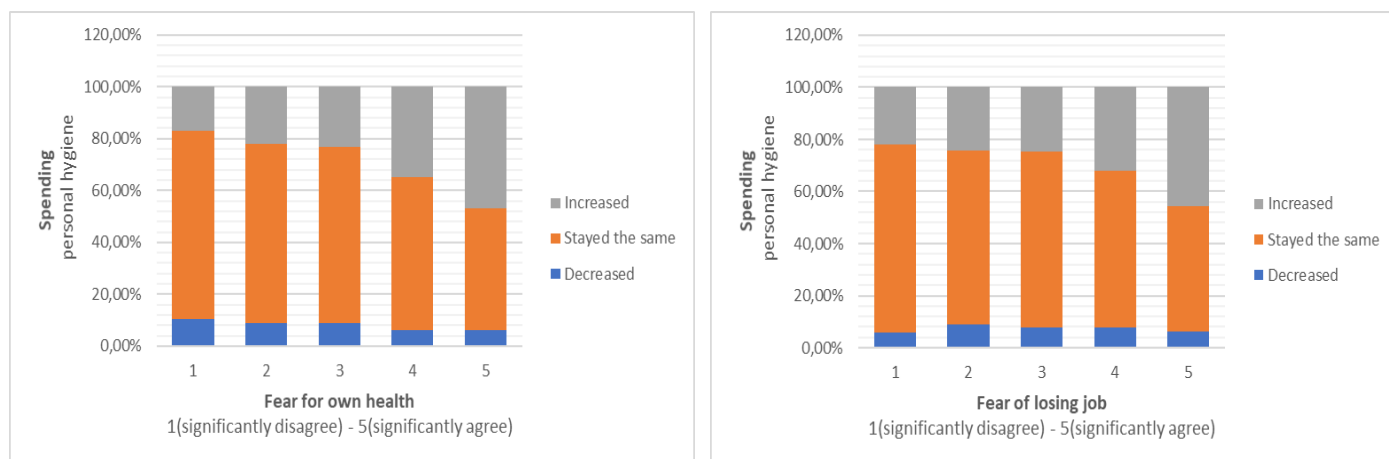
Figure 2 shows the relationship between fears and spending on luxury goods. We also observe here that the higher a respondent's reported level of fear, the more likely they are to having increased spending on luxury goods. This is evidence that people experiencing fears and (financial) stress, want to feel better and do this by treating themselves (hedonic shopping). This would suggest that H1.2 is accepted and H2.2, H3.2 and H.4.2 are rejected.

Figure 2. Different levels of fears and spending change on luxury goods (hedonic consumption)
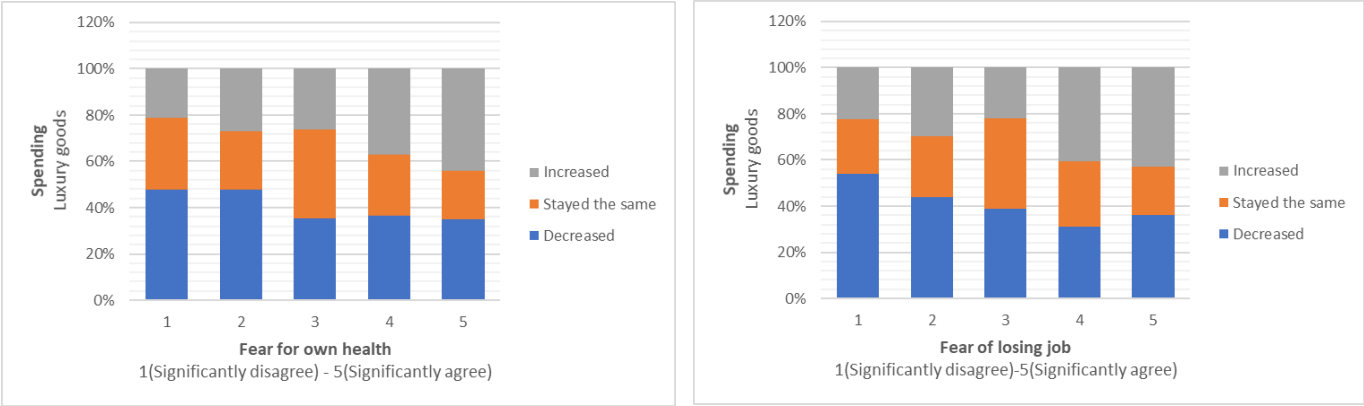
While above figures don't answer the hypotheses, it does give a first impression how fears impact consumer spending. According to above results, fear increases the probability that someone will increase its spending on utilitarian and hedonic consumption. Also, health fears and job fears tend to have the same effect on both personal hygiene and luxury goods. This would suggest that economic theory that states that people who experience stress, reduce financial risk taking by delaying non-essential purchases doesn't hold here. It is important to study the relationship further, and to test for correlation between the predictive variables.

5.2 Testing data and variables

This section describes the process of factor analysis to form my measure for health fears and fears of the economy. Since an individuals' degree of fear is hard to measure and some fears tend to correlate, there is expected to be underlying factors that measure fear. To check this multiple tests and tables were constructed.

First, we will test our variables for multicollinearity. This is important as the respondents were asked multiple questions that relate to (i) Health Fears and (ii) Concerns about the Economy. It is important to note that collinearity may also be incidental, meaning that variables may be collinear by chance, for example when the sample size is low, because not all combinations of environmental conditions exist in the study area or when very many variables are involved (as in hyperspectral remote sensing data, Schmidt et al. 2004). As our study contains a great sample size and not many variables are involved, we assume this isn't the case in this study. To test for multicollinearity

between predictive variables we can use the multicollinearity test "collin" in STATA. This command tests the multicollinearity between the predictive variables without following a regress command.

The collin test shows no VIF's greater than 2. This means that we can conclude that there is no multicollinearity between the predictive variables.

Table 6. VIF analysis

Variable	VIF
ownhealth	1,82
healthothers	1,78
economy	1,21
job	1,17
concern	1,47

Note: VIF<2, test for multicollinearity is not accepted. No multicollinearity.

Second, we will use the factor analysis proposed by Kaiser-Meyer-Olkin, also known as the KMO-test, to measure how suited the data is for factor analysis The factor analysis for the two independent variables "Health fears" and "Economic fears" will help to validate the choice of factor analysis. The KMO test will check whether all the factor loadings for the measurement items exceed 0,5. Performing the KMO test for Fears directly related to COVID-19, with variables "Fear of own health", "Fear of health of others" and "overall concern about the virus", gives only one Eigenvalue that is greater than 1. The results of eigenvalues tell us that there is only one dominant underlying variable (Brown, 2001), which is in line with our expectations. The underlying latent variable is the overall fear of the virus. The KMO test shows correlations above the threshold of 0,5 for the variables "concern", "fear of getting infected" and "fear of infecting others". Meaning that the latent variable "Health fears" and the corresponding measures are suited for factor analysis (Brown, 2001).

Table 7. KMO test for the latent variable health fears

Variable	Factor1	Uniqueness
ownhealth	0,7389	0,4540
healthothers	0,7083	0,4983

concern	0,6302	0,6029

Note: All factors >0,5 with one eigenvalue >1, so accepted.

The KMO test for the latent variable "economic concerns", with measures "job security concerns" and "concerns about the economy", shows eigenvalues below 1 and factor loadings below 0,5. Which means that this latent variable isn't suited for factor data analysis. We therefore decide to treat the two variables independent in the rest of our research.

Using a SEM test we then predicted the latent variable Health fears. The factor loadings are again all greater than 0,5 with an acceptable fit of SRMR < 0,8 (Kline, 2005). The goodness of fit of models is evaluated by multiple indices (Kline, 2005): the ratio of the chi-square statistic to the degrees of freedom ($\chi 2/df$, acceptable if ≤3), comparative fit index (CFI, acceptable if ≥0.90), Tucker-Lewis index (TLI, acceptable if ≥0,90), root mean square error of approximation (RMSEA, acceptable if ≤0,08), and standardized root mean square residual (SRMR, acceptable if ≤0,08). All indices show an acceptable fit.

Lastly, we use the method proposed by Bagozzi and Philips (1991), which is also used in the study of Jian et al. (2020), to detect the problem of data homology deviation. Bagozzi and Philips (1991) propose that the correlation coefficient of each construct shouldn't be greater than 0,9. The Pearson correlation coefficients is calculated using a two-tailed test. Results show that there is no problem of data homology deviation, all correlations are below 0,9.

Table 10. Pearson correlation coefficient test

	ownhealth	healthothers	economy	job	concern
ownhealth	1				
healthothers	0,6005**	1			
economy	0,2456**	0,3715**	1		
job	0,3288**	0,2726**	0,2529**	1	
concern	0,5156**	0,4736**	0,2874**	0,2381**	1

Note: Correlations with p<0,01 are denoted with "**"

5.3 Quantitative results

In this section the results of the binary logistic regressions are discussed. First the results of the hypotheses during lockdown will be discussed, both for economic fears and health fears. Second, the

results of the hypotheses post-lockdown will be discussed, both for economic fears and health fears. Note that the factor analysis showed that there is no latent variable for economic fears, thus the variables economic concerns (Economy) and job concerns (Job) will be tested separately for the hypotheses on the relationship between economic fears and spending. Besides predictive variables, we use multiple control variables. A legend of all variables included in the logistic regressions can be found in table 11.

Table 11. Legend of included variables

Variables	Description	Type
Fear	Latent variable for health fears with underlying factors: "Fear of own health", "Fear of health of others" and "overall concern about the virus"	Ordinal variable 1-5
Job	Job security variable, how worried are you about your job security?	Ordinal variable 1-5
Economy	Economic fear variable, how worried are you about the impact on the economy?	Ordinal variable 1-5
Age	The age group the respondent is in	Categorical variable Base: 18-24 years
Gender	Female/Male	Categorical variable Base: female
Income	Income level (Low, Middle, High)	Categorical variable Base: Low
Income change		Base: Stayed the same
Decrease/Increase	The decrease/ increase of income in %	Categorical variable 0-100%
Country	Country of residence	Base: France

WAVE	The wave the respondent was	Ordinal variable
	questioned in	1-8

Note: Base = base/reference category

5.3.1 Results lockdown

The first hypothesis "H1.1: *The higher a consumer's level of health fear the more likely they are to increase their spending on utilitarian consumption (to get control over the situation) during the lockdown",* was tested using a binary logistic regression on personal hygiene, house care and frozen food. The results (Table 12) for personal hygiene, house care and frozen food show that there is a significant positive relationship between health fear and utilitarian consumption. The odds ratio predicts that for each 1-point increase in fear there is an over 100% increase in the likelihood of having increased spending on personal hygiene and house care. The odds ratio for fresh food, predicts that for each 1-point increase in fear there is a 44% increase in the likelihood of having increased spending on frozen food. The hypothesis that higher levels of health fear increase the likelihood of having increased spending on utilitarian consumption is accepted. This is in in line with the findings of Ballantine (2013) and Yuen at al. (2020), who suggested that during times of uncertainty, individuals attempt to gain a sense of control through product acquisition.

The second hypothesis "H2.1: *The higher a consumer's level of economic fear the less likely they are to increase their spending on utilitarian consumption during the lockdown*", was tested with two variables: (i) concerns for the future of the economy and (ii) concerns about losing a job. Meaning that both the relationship between job concerns and spending and economic concerns and spending is tested. The results in table 12 show that there is a positive significant relationship between both economic fear variables and utilitarian consumption. These findings don't support the hypothesis that there is a negative relation between economic concerns and consumption. To be more specific, the odds ratio's predict that for each 1-point increase in job concerns there is a 4% increase in the likelihood of having increased spending on personal hygiene, a 5% increase in the likelihood of having increased spending on house care and a 7% increase in the likelihood of having increased spending on frozen food. These findings suggest that people with more concerns about losing their job are more likely to increase spending on utilitarian products. Looking at the positive relationship between economic concerns and utilitarian spending, the odds ratio's predict that for each 1-point increase in economic concerns there is a 21% increase in the likelihood of having increased spending on personal hygiene, a 18% increase in likelihood of having increased spending on house care and a 20% increase in likelihood of having increased spending on frozen food. H2 for the relation between economic fears and utilitarian spending is therefore not supported.

Whereas H1.1 is supported and shows that health fears are positive related to utilitarian consumption, H2.1 isn't supported. To form our hypotheses for economic fears we used the economic theory that fears reduces risk-taking and would lead to precautionary saving instead of increased buying behaviour to get a sense of control. However, our findings suggest that different fear factors have the same effect on utilitarian spending. These findings suggest that people try to get a sense of control of the situation by product acquisition, regardless of the nature of that fear.

The control variable age shows that when a respondent is older than 40 the likelihood of increasing its spending on utilitarian consumption is significantly lower compared to when a respondent is in the age category 18-24. This is consistent with past findings; older age is associated with better emotional well-being, higher positive affectivity (PA) and lower negative affectivity (NA) (Charles et al., 2010). As a result, younger people were more affected personally by COVID-19 (Klaiber et al., 2020). As a logical consequence, these findings suggest that younger people are more likely to engage in utilitarian shopping to get a sense of control of the situation during COVID-19. Furthermore, according to the results, when a respondent is a male he is more likely to increase its spending compared to a female respondent. While this is not in line with most researches, who suggest that females are more emotional buyers, multiple factors can play a role here. For example, the gender pay gap; women are not only making less money research also show that women are losing jobs at higher rates during COVID-19 (Henriques, 2020). The results also reveal that income is a significant predictor for utilitarian spending, likelihood of increasing spending on personal hygiene and house care is significantly higher for high incomes than it is for low incomes. While the results also show an odds ratio greater than 1 for high income under frozen food, this finding isn't significant. Furthermore, the control variable "change in income" shows that only people that experienced an increase in income greater than 50% were more likely to increase spending compared to people who didn't experience a change. Lastly, the variable country shows that respondents from Italy and Spain are significantly more likely to increase utilitarian consumption compared to respondents from France.

Table 12. Binary logistic regression analysis of utilitarian consumption under different levels of fear during lockdown

	Personal hygiene		House care		Frozen food	
Predictor	β (SE)	Odds ratio	β (SE)	Odds ratio	β (SE)	Odds ratio

	Model 1		Model 2		Model 3	
Fear	0,72**		0,71**		0,37**	
	(0,04)	2,06	(0,05)	2,05	(0,05)	1,44
Job	0,14**		0,15**		0,17**	
	(0,02)	1,14	(0,03)	1,15	(0,03)	1,17
Economy	0,21**		0,18**		0,20**	
	(0,03)	1,24	(0,04)	1,20	(0,05)	1,22
Age:						
25-31	-0,11		-0,13		-0,03	
	(0,11)	0,90	(0,11)	0,88	(0,10)	0,96
32-39	-0,15		-0,06		-0,06	
	(0,09)	0,85	(0,11)	0,94	(0,10)	0,93
40-55	-0,24*		-0,12**		-0,44**	
	(0,09)	0,78	(0,10)	0,88	(0,10)	0,64
56 -69	-0,25*		-0,13*		-0,89**	
	(0,10)	0,78	(0,12)	0,87	(0,14)	0,40
70+	-0,33*		-0,52**		-1,18**	
	(0,13)	0,71	(0,15)	0,59	(0,17)	0,30
Gender:						
Male	0,21**		0,20**		0,13	
	(0,06)	1,23	(0,06)	1,23	(0,07)	1,14
Income						
Middle	0,09		0,04		0,09	
	(0,07)	1,09	(0,08)	1,04	(0,08)	1,10
High	0,31**		0,21*		0,05	
	(0,08)	1,36	(0,08)	1,23	(0,09)	1,05
Prefer not to say	-0,01		-0,08		-0,01	
	(0,13)	0,92	(0,14)	0,92	(0,16)	0,96

Change in income

<u>*Decrease*</u>

0-24%	0,11		0,13		-0,01	
	(0,08)	1,12	(0,09)	1,14	(0,10)	0,99
25-49%	0,20		0,20		-0,12	
	(0,11)	1,22	(0,12)	1,22	(0,13)	0,98
50-100%	-0,02		-0,04		-0,05	
	(0,12)	0,97	(0,13)	0,95	(0,14)	0,94

<u>*Increase*</u>

0-24%	0,03		0,03		0,16	
	(0,12)	1,03	(0,14)	0,96	(0,14)	1,18
25-49%	0,03		0,12		0,14	
	(0,12)	1,03	(0,13)	1,13	(0,13)	1,15
50-99%	0,30*		0,26*		0,36*	
	(0,13)	1,35	(0,14)	1,30	(0,14)	1,43
>100%	1,16**		1,08**		1,06**	
	(0,16)	3,20	(0,16)	2,95	(0,16)	2,90

Country

Italy	0,76**		0,81**		0,26*	
	(0,08)	2,14	(0,08)	2,25	(0,09)	1,30
Spain	0,67**		0,77**		0,28*	
	(0,09)	1,96	(0,11)	2,15	(0,09)	1,32
UK	-0,23*		0,08		0,17	
	(0,08)	0,79	(0,09)	1,17	(0,09)	1,16
wave	-0,01		-0,02		-0,17**	
	(0,02)	0,99	(0,02)	0,98	(0,02)	0,84

_cons	-2,29**		-2,86**		-1,98**	
	(0,25)	0,10	(0,23)	0,06	(0,29)	0,14
N	7710	7710	7710	7710	7710	7710
χ2	839,79** (26)		654,75** (26)		430,79** (26)	
Pseudo R2	0,1126		0,1912		0,1752	

Note: The goodness of fit for all three models was tested using a Hosmer-Lemeshow test. All models showed a goodness of fit with prob> χ2 greater than 0,05. The overall model evaluation was tested by exhibiting a Wald χ2 test, with prob>χ2 smaller than 0,05 for all three models. All statistics reported herein use 2 decimal places. Variables without 1 in the confidence interval and with p<0,01 are denoted with "**". Variables without 1 in the confidence interval with p<0,05 are denoted with "*".

Secondly, the hypotheses were tested for hedonic consumption "H1.2: *The higher a consumer's level of health fear the more likely they are to increase their spending on hedonic consumption (stress reduction) during the lockdown"* and "H2.2: *The higher a consumer's level of economic fears the less likely they are to increase their spending on hedonic consumption during the lockdown."*

In table 12 the results of the binary logistic regressions can be found. The results show a positive significant relationship between health fears and hedonic consumption for luxury goods and home décor, however not for the dependent variable alcohol. A logical explanation could be that health fears make people more aware of their health and therefore decreases consumption of unhealthy products such as alcohol. For luxury goods the odds ratio predicts that for each 1-point increase in health fears there is a 24% increase in likelihood of having increased spending. The odds ratio for home decor predicts that for each 1-point increase in health fear there is a 31% increase in likelihood of having increased spending. Two out of three logistic regressions showed a significant relation and therefore H1.2 for the relationship between health fears and hedonic consumption is supported. This indicates that consumers who experience health fears are indeed more likely to buy hedonic products and use shopping and consumption related behaviour as stress-reduction mechanism (Sneath, 1996).

Furthermore, the results show a positive relationship between job concerns and hedonic consumption. The relationship between economic concerns and hedonic consumption isn't

significant and therefore not different from zero. These findings are again contradictory to the hypothesis that there is a negative relationship between economic concerns and hedonic consumption. To be more specific the odds ratio's predict that for each 1-point increase in job security concerns there is a 21% increase in the likelihood of having increased spending on alcohol, a 30% increase in the likelihood of having increased spending on luxury goods and an 8% increase in the likelihood of having increased spending on home decor. Hypothesis 2.2 isn't supported, instead a significant positive relation between job concerns and hedonic consumption has been found. Again, these findings aren't in line with the behavioural finance theory that suggests that income uncertainty leads to less risk taking and delaying of purchases on non-essential goods (Gollier and Pratt, 1996; Carroll and Samwick, 1998; Bertola, Guiso, and Pistaferri, 2005). Instead these results suggest that people who experience job concerns tend to use hedonic consumption to improve mood (Larson and Shin, 2018) and increase their spending on these products.

Furthermore, there isn't a significant relation found between economic concerns and hedonic consumption. An explanation for this could be that concerns about the future of the economy doesn't have to affect an individual's financial situation or financial certainty, and therefore doesn't necessarily leads to stress or bad mood. While, fear of losing a job puts a lot of pressure on an individual, leads to stress and is predictive for depression and cognitive function (Chapman et al., 2020).

The results for the control variables show similar coefficients and significance as the results for utilitarian spending. Respondents >40 are significantly less likely to increase their hedonic consumption compared to the age group 18-24, which is consistent with past findings that young people show more behavioural changes during periods of uncertainty (Charles et al., 2010; Klaiber et al., 2020). Also, respondents that saw their income increase during COVID-19 are more likely to having increased spending on hedonic products, within all categories. While, on the other hand, a decrease in income doesn't have a significant effect on hedonic consumption. An interesting finding is the significant positive coefficient for the variable WAVE. This means that as respondents were longer in lockdown, they were more likely to increase spending on hedonic consumption. The underlying reason for this could be that the longer an individual is in lockdown, the more stress and anxiety they experience and the more likely they are to use hedonic consumption to improve mood.

Table 12. Binary logistic regression analysis of hedonic consumption under different levels of fear during lockdown

	Alcohol		Luxury		Home decor	
	β (SE)	Odds ratio	β (SE)	Odds ratio	β (SE)	Odds ratio
Fear	0,11		0,22**		0,27**	
	(0,06)	1,10	(0,09)	1,24	(0,07)	1,31
Job	0,21*		0,30**		0,08**	
	(0,04)	1,12	(0,06)	1,35	(0,05)	1,08
Economy	0,13		-0,03		0,05	
	(0,06)	1,19	(0,07)	0,096	(0,06)	1,05
Age:						
25-31	-0,23		-0,44		-0,27	
	(0,12)	0,78	(0,15)	0,64	(0,12)	0,75
32-39	-0,23		-0,64		-0,52	
	(0,13)	0,78	(0,16)	0,52	(0,13)	0,59
40-55	-0,49**		-1,03**		-0,90**	
	(0,12)	0,61	(0,17)	0,35	(0,15)	0,40
56 -69	-0,83**		-1,66**		-0,99**	
	(0,16)	0,43	(0,17)	0,18	(0,19)	0,37
70+	-1,13**		-2,55**		-1,86**	
	(0,19)	0,36	(0,27)	0,07	(0,29)	0,15
Gender:						
Male	0,13*		0,47**		0,22*	
	(0,08)	1,15	(0,15)	1,61	(0,09)	1,25
Income						

Middle	0,07		0,05		0,06	
	(0,12)	1,07	(0,14)	1,06	(0,11)	1,06
High	0,25*		0,12		0,19	
	(0,11)	1,29	(0,14)	1,12	(0,12)	1,21
Prefer not to say	-0,44		-0,07		-0,01	
	(0,25)	0,64	(0,28)	0,92	(0,24)	0,99
Change in income						
Decrease						
0-24%	0,02		-0,42		0,27	
	(0,14)	1,02	(0,23)	0,65	(0,15)	1,31
25-49%	0,06		0,02		0,37	
	(0,19)	1,06	(0,26)	1,02	(0,20)	1,45
50-100%	0,50		-0,28		-0,18	
	(0,18)	1,65	(0,32)	0,74	(0,25)	0,99
Increase						
0-24%	0,59**		1,13**		1,02**	
	(0,17)	1,81	(0,20)	3,11	(0,17)	2,76
25-49%	0,79**		1,41**		0,95**	
	(0,15)	2,22	(0,18)	4,12	(0,16)	2,57
50-99%	0,87**		1,43**		1,37**	
	(0,16)	2,41	(0,18)	4,21	(0,17)	3,93
>100%	1,73**		2,32**		2,27**	
	(0,18)	5,65	(0,21)	10,17	(0,18)	9,69
Country						
Italy	-0,09		0,01		-0,32	
	(0,12)	0,89	(0,18)	1,01	(0,13)	0,77

Spain	0,05		0,14		-0,14	
	(0,15)	1,05	(0,19)	1,15	(0,14)	0,86
UK	0,65**		0,13		-0,14	
	(0,11)	1,83	(0,16)	1,13	(0,12)	0,86
Wave	0,12**		0,15**		0,17**	
	(0,03)	0,87	(0,02)	1,16	(0,03)	1,19
_cons	-3,14**		-4,56**		-3,06**	
	(0,30)	0,04	(0,14)	0,01	(0,31)	0,02
N	7710	7710	7710	7710	7710	7710
χ2	309,31**		612,50**		469,86**	
	(26)		(26)		(26)	
Pseudo R2	0,1740		0,2038		0,1282	

Note: The goodness of fit for all three models was tested using a Hosmer-Lemeshow test. All models showed a goodness of fit with prob> $\chi 2$ greater than 0,05. The overall model evaluation was tested by exhibiting a Wald χ2 test, with prob>χ2 smaller than 0,05 for all three models. All statistics reported herein use 2 decimal places. Variables without 1 in the confidence interval and with p<0,01 are denoted with "**". Variables without 1 in the confidence interval with p<0,05 are denoted with "*".

5.3.2 Results post lockdown

For the dataset post-lockdown, the following was hypothesized: "H3.1: *The higher a consumer's level of health fear the less likely they are to increase their spending on utilitarian consumption (to get control over the situation)" and,* H4.1: *The higher a consumer's level of economic fears the less likely they are to increase their spending on utilitarian consumption during the lockdown".* The findings of the binary logistic regression are shown in table 13.

The results show that there is a positive significant relationship between health fears and utilitarian spending, which means H3.1 is rejected. Results show that respondents with higher levels of reported health fear are more likely to increase spending on utilitarian products. More specifically, the odds ratio for personal hygiene predicts that for each 1-point increase in fear there is a 73% increase in the likelihood of having increased spending. The odds ratio for house care predicts that for each 1-point increase in fear the likelihood of having increased consumption doubles (odds ratio = 2,08). The odds ratio for frozen food predicts that for each 1-point increase in fear the likelihood of

having increased consumption increases with 63%. Hypothesis 3 is rejected, instead we have found evidence that fear increases the likelihood of increasing utilitarian spending, regardless of social distancing laws, which could be used as a mechanism to get control over the situation.

Furthermore, results show that there is a positive significant relationship between economic fears and utilitarian consumption. For personal hygiene, house care and frozen food the coefficient is positive, and the odds ratio is greater than one as showed in table 13. The odds ratio for personal hygiene predicts that for each 1-point increase in the fear of losing a job due to COVID there is 10% increase in the likelihood of having increased spending. The odds ratio for house care predicts that for each 1-point increase in the fear of losing a job due to COVID there is a 12% increase in the likelihood of having increased spending. The odds ratio for house care predicts that for each 1-point increase in the fear of losing a job due to COVID there is 27% increase in the likelihood of having increased spending. The results for economic concerns show a significant positive relation for personal hygiene and house care, but a non-significant relation for frozen food. Concluding, hypothesis 4.1 is rejected. Results show an overall positive significant relation between economic fears and utilitarian consumption. Overall findings suggest that regardless of social distancing laws, health fears and economic fears increases the likelihood of increasing utilitarian consumption which could be used as a mechanism to reduce stress according to previous findings.

Control variables show similar results compared the regression with respondents in lockdown for age. Likelihood of increasing utilitarian consumption decreases with age (>40). Another interesting finding is the significant negative coefficient for wave. This indicates that after the lockdown is officially over and restrictions start to ease, over time people are less likely to increase spending on utilitarian consumption. An explanation for this could be that after the strict lockdown, restrictions were lifted slowly per wave to the point that in July bars and restaurants opened again in Italy, France and Spain. This could have led to less fear and less utilitarian shopping.

Table 13. Binary logistic regression analysis of utilitarian consumption under different levels of fear post lockdown

	Personal hygiene		House care		Frozen food	
	β (SE)	Odds ratio	β (SE)	Odds ratio	β (SE)	Odds ratio
Fear	0,55** (0,05)	1,73	0,72** (0,05)	2,08	0,49** (0,07)	1,63

Job	0,10**		0,12**		0,27**	
	(0,03)	1,11	(0,03)	1,13	(0,05)	1,32
Economy	0,22**		0,13**		0,04	
	(0,05)	1,25	(0,05)	1,15	(0,06)	1,04
Age:						
25-31	-0,41**		-0,12		-0,41**	
	(0,11)	0,65	(0,11)	0,88	(0,11)	0,66
32-39	-0,47**		-0,12		-0,38**	
	(0,11)	0,62	(0,11)	0,88	(0,13)	0,67
40-55	-0,71**		-0,49**		-0,75**	
	(0,10)	0,48	(0,10)	0,61	(0,13)	0,47
56 -69	-0,84**		-0,56**		-1,23**	
	(0,12)	0,43	(0,12)	0,57	(0,17)	0,29
70+	-0,81**		-0,74**		-1,33**	
	(0,16)	0,44	(0,16)	0,47	(0,25)	0,26
Gender:						
Male	0,08		0,18		0,07	
	(0,06)	1,10	(0,06)	1,13	(0,09)	1,07
Income						
Middle	0,08		0,08		-0,13	
	(0,09)	1,09	(0,09)	1,09	(0,12)	0,87
High	0,22*		0,14		0,12	
	(0,08)	1,25	(0,08)	1,16	(0,11)	1,12
Prefer	0,11		-0,12		-0,12	
	(0,14)	1,11	(0,14)	0,88	(0,19)	0,89
Country						
Italy	0,02		0,33**		-0,02	
	(0,08)	1,02	(0,08)	1,40	(0,12)	0,98

Spain	0,22*		0,44**		0,12	
	(0,09)	1,25	(0,09)	1,56	(0,12)	1,13

Change in income

<u>Decrease</u>

0-24%	0,12		0,17		0,21	
	(0,08)	1,12	(0,08)	1,19	(0,15)	1,24
25-49%	-0,07		-0,01		0,25	
	(0,12)	0,92	(0,12)	0,98	(0,20)	1,28
50-100%	-0,15		-0,12		0,21	
	(0,13)	0,86	(0,14)	0,88	(0,25)	1,24

<u>Increase</u>

0-24%	0,15		0,03		0,55**	
	(0,15)	1,17	(0,17)	1,03	(0,19)	1,74
25-49%	0,08		0,12		0,91**	
	(0,16)	1,07	(0,15)	1,06	(0,16)	2,49
50-99%	0,30		0,23		0,81**	
	(0,16)	1,34	(0,17)	1,26	(0,19)	2,27
>100%	0,71**		0,36**		1,39**	
	(0,20)	2,03	(0,14)	1,44	(0,21)	4,04
wave	-0,19**		-0,19**		-0,21**	
	(0,03)	0,83	(0,03)	0,82	(0,04)	0,80
_cons	-0,65*		-1,05**		-1,59**	
	(0,31)	0,52	(0,31)	0,35	(0,43)	0,20
N	5383	5383	5383	5383	5383	5383
χ^2	504,93**		555,07**		461,09**	
	(25)		(25)		(25)	
Pseudo R2	0,1752		0,1713		0,1122	

Note: The goodness of fit for all three models was tested using a Hosmer-Lemeshow test. All models showed a goodness of fit with prob> $\chi2$ greater than 0,05. The overall model evaluation was tested by exhibiting a Wald $\chi2$ test, with prob>$\chi2$ smaller than 0,05 for all three models. All statistics reported herein use 2 decimal places. Variables without 1 in the confidence interval and with p<0,01 are denoted with "**". Variables without 1 in the confidence interval with p<0,05 are denoted with "*".

There was further hypothesized that "H3.2: *The higher a consumer's level of health fear the less likely they are to increase their spending on hedonic consumption post-lockdown".* Recent research shows that people that don't experience health fears are more willing to increase spending after lockdown to make up for the time loss, which could be translated to hedonic consumption. According to the results (table 14) in this study the opposite is true. Health fear has a positive significant relationship with hedonic spending across all three categories (alcohol, luxury and home décor). Meaning that a 1-point increase in health fear increases the likelihood of having increased hedonic spending. This indicates that after the lockdown health fear is still a significant predictor for hedonic consumption, which could help people to reduce stress and feel better and is in line with findings of Larson and Shin (2018).

Furthermore, there was hypothesized that "H4.2: *The higher a consumer's level of economic fears the less likely they are to increase their spending on hedonic consumption post-lockdown".* Results in table 14 show that there is a significant positive relationship between fear of losing a job and the likelihood of having increased spending on hedonic products (Alcohol, luxury and home décor). The results for health fear and job uncertainty are in line with previous findings that suggest that fear leads to stress and mental health issues and that hedonic consumption is often used to reduce stress and to feel better. During natural disasters these results were found also after the storm, which could be compared to after lockdown as people were stuck in their homes as well.

Results for the variable fear of the impact of the economy show a non-significant negative coefficient. The same explanation for previous findings on the variable economic concerns hold. As an economic downturn shouldn't necessarily affect your personal life these fears could be less stressful and therefore have no significant effect on hedonic spending decisions.

Control variables show that compared to the age group 18-24, all other age groups are less likely to increase their hedonic consumption. Furthermore, an increase in income has a positive significant impact on the likelihood of having increased spending on hedonic products. All other control variables aren't significant across all three categories and therefore are assumed not to be explanatory for differences in behaviour.

Table 14. Binary logistic regression analysis of hedonic consumption under different levels of fear post lockdown

	Alcohol		Luxury		Home decor	
	β (SE)	Odds ratio	β (SE)	Odds ratio	β (SE)	Odds ratio
Fear	0,35**		0,39**		0,42**	
	(0,08)	1,42	(0,08)	1,49	(0,07)	1,51
Job	0,29**		0,31**		0,11*	
	(0,06)	1,40	(0,06)	1,36	(0,05)	1,11
Economy	-0,08		-0,15		0,13	
	(0,07)	0,84	(0,07)	0,86	(0,07)	1,14
Age:						
25-31	-0,35*		-0,67**		-0,74**	
	(0,14)	0,68	(0,13)	0,51	(0,14)	0,47
32-39	-0,66**		-1,03**		-0,84**	
	(0,15)	0,49	(0,14)	0,35	(0,14)	0,43
40-55	-1,08**		-1,44**		-1,20**	
	(0,15)	0,30	(0,16)	0,24	(0,14)**	0,30
56 -69	-1,47**		-1,99**		-1,75**	
	(0,20)	0,19	(0,23)	0,13	(0,19)	0,17
70+	-2,52**		-1,81**		-2,04**	
	(0,43)	0,06	(0,31)	0,16	(0,30)	0,13
Gender:						
Male	0,41**		0,21		0,01	
	(0,10)	1,57	(0,11)	1,23	(0,09)	1,19
Income						

Middle	-0,13		-0,28		-0,14	
	(0,13)	0,79	(0,14)	0,74	(0,12)	0,86
High	0,18		0,29*		0,17	
	(0,13)	1,17	(0,13)	1,34	(0,12)	1,19
Prefer	-0,13		-0,77*		-0,34	
	(0,23)	0,75	(0,29)	0,46	(0,22)	0,71

Change in income

Decrease

0-24%	0,32		-0,17		0,20	
	(0,13)	1,12	(0,16)	0,84	(0,13)	1,22
25-49%	-0,09		-0,04		0,05	
	(0,20)	0,92	(0,20)	0,95	(0,18)	1,05
50-100%	-0,12		-0,55		-0,37	
	(0,21)	0,86	(0,28)	0,57	(0,23)	0,69

Increase

0-24%	0,78**		0,83**		0,80**	
	(0,20)	1,17	(0,21)	2,29	(0,19)	2,22
25-49%	0,76**		0,96**		1,05**	
	(0,18)	1,07	(0,18)	2,63	(0,17)	2,85
50-99%	0,99**		1,25**		0,98**	
	(0,19)	1,34	(0,19)	3,51	(0,19)	2,67
>100%	1,19**		1,68**		1,63**	
	(0,23)	2,03	(0,22)	5,39	(0,21)	5,10

Country

Italy	0,00		-0,17		-0,24*	
	(0,14)	0,94	(0,15)	0,84	(0,12)	0,78

Spain	0,35*		0,33*		0,03	
	(0,14)	1,32	(0,09)	1,39	(0,12)	1,03
wave	0,00		0,13**		0,07	
	(0,05)	0,99	(0,03)	1,13	(0,04)	1,07
_cons	-2,95**		-3,21**		-2,80**	
	(0,49)	0,11	(0,29)	0,04	(0,46)	0,06
N	5383	5383	5383	5383	5383	5383
χ2	387,31**		531,07**		443,29**	
	(24)		(25)		(25)	
Pseudo R2	0,1165		0,1688		0,1191	

Note: The goodness of fit for all three models was tested using a Hosmer-Lemeshow test. All models showed a goodness of fit with prob> χ2 greater than 0,05. The overall model evaluation was tested by exhibiting a Wald χ2 test, with prob>χ2 smaller than 0,05 for all three models. All statistics reported herein use 2 decimal places. Variables without 1 in the confidence interval and with p<0,01 are denoted with "**". Variables without 1 in the confidence interval with p<0,05 are denoted with "*".

5.3 Model limitations

This study has its limitations. Based on previous research multiple product categories were selected to test for hedonic and utilitarian consumption. However, limiting the study to 6 product categories could give biased outcomes. Therefore, another test was done. Respondents were asked to answer the question whether their spending increased, decreased or stayed the same on 20 categories, but only 13 were included in all waves and only 6 were included in the binary logistic regression. To test if higher fears lead to an increase in overall utilitarian/hedonic consumption, for each participant two new variables were added. These variables represent the sum of the "increased" answers for (i)utilitarian and (ii)hedonic categories. The results of the OLS regression (table 15) show that results are similar to the binary logistic regression results. Health fears and job concerns show a positive significant coefficient, economic concerns only show significant positive coefficients for utilitarian consumption. These findings are in line with Durante and Laran (2016), who demonstrated (using an experiment) that stress can lead to increased spending. This may occur when stress is caused by an event where consumers are led to believe they cannot change the control they have over their environment (Duran and Laran, 2016), such as the event of a pandemic.

Table 15. OLS regression with utilitarian and hedonic consumption as dependent variables, during and post-lockdown

variable	Lockdown		Post-lockdown	
	Utilitarian	Hedonic	Utilitarian	Hedonic
	β (SE)	β (SE)	β (SE)	β (SE)
Fear	0,50**	0,06**	0,43**	0,12**
	(0,03)	(0,01)	(0,03)	(0,01)
Job	0,12**	0,05**	0,14**	0,04**
	(0,02)	(0,01)	(0,02)	(0,01)
Economy	0,13**	0,01	0,08**	-0,01
	(0,02)	(0,01)	(0,03)	(0,01)
Age	-0,17**	-0,09**	-0,21**	-0,14**
	(0,01)	(0,01)	(0,02)	(0,01)
Gender	-0,20**	-0,10**	-0,11**	-0,07**
	(0,04)	(0,02)	(0,04)	(0,02)
Income	0,03*	-0,01	0,01	-0,01
	(0,02)	(0,01)	(0,03)	(0,01)
Change in income				
Decrease	-0,12	-0,07	-0,12	-0,32
	(0,04)	(0,02)	(0,06)	(0,18)
Increase	0,98**	1,12**	0,34*	0,98**
	(0,12)	(0,18)	(0,11)	(0,13)
wave	-0,03**	0,04**	-0,12**	0,04**
	(0,01)	(0,00)	(0,02)	(0,01)
country				

	0,36**	-0,06	0,21	-0,05
Italy	(0,06)	(0,02)	(0,06)	(0,03)
	0,36*	-0,05	0,01	0,11
Spain	(0,07)	(0,03)	(0,05)	(0,03)
	0,066	0,079		
UK	(0,05)	(0,02)	N/A	N/A
	0,95**	0,32**	1,51**	0,37**
_cons	(0,14)	(0,06)	(0,23)	(0,12)
N	7710	7710	5383	5383
F statistic	145,09**	58,71**	98,67**	65,4**
R2	0,1488	0,1735	0,1625	0,1967
Adj R2	0,1378	0,1725	0,1412	0,1953
Root MSE	1,6490	0,6957	1,5850	0,8336

Note: White test for heteroskedasticity: Prob>F <0,05. Robust standard errors were used. Coefficients with significance level p<0,01 are denoted with "**" and coefficients with significance level p<0,05 are denoted with "*".

6. Conclusion

This research was designed to get more insights in the spending behaviours of consumers during stress-full events. As there is limited research and findings are contradictory, this study contributes to the rising behavioural literature on drivers of consumer behaviour and in particular consumer spending behaviours. The COVID-19 crisis is used for this study, which makes this a relevant and unique study.

Economic theory predicts that during uncertainty households will decrease financial risk taking and therefore will increase saving behaviour (Durante and Laran, 2016). Other behavioural studies found that when in a bad mood, people want to feel better immediately and use product acquisition as stress reduction mechanism. Emotional distress may therefore work against the usual pattern of self-control because distress promotes a short- term focus, whereas self-control requires a long-term one (Tice et al., 2001). Our findings are in line with the latter. Our findings suggest that the greater someone's reported level of health fear the more likely they are to increase their utilitarian and hedonic consumption. Also, the greater someone's concerns about their job security, the more likely they are to increase their utilitarian and hedonic consumption. This is in line with the findings of Larson and Shin (2018), who showed that shoppers under the greatest emotional strain are also

the ones out shopping the most. A person experiencing fear, finds itself in a low-control state. An increase in utilitarian consumption such as personal hygiene, house care and frozen food suggests that people try to get a sense of control with product acquisition during stressful events (Chen, Lee & Yap, 2017; Ballantine 2013; Yuen et al. 2020). Furthermore, individuals frequently use shopping and consumption-related behaviour as stress-reduction mechanism (Sneath, 1996). When in a bad mood people want to feel better immediately. Hedonic consumption, such as alcohol, luxury goods and home décor, is often used to repair mood. This study shows evidence that during COVID-19 people that experienced higher levels of fears (that could directly affect their mental state) are more likely to show increased product acquisition to improve mood (hedonic) and to get a sense of control (utilitarian). Fear of the future of the economy doesn't necessarily leads to more stress and mental health issues and is found not to be a strong predictor for consumer spending behaviour. Furthermore, this study shows that age is a significant predictor for consumer behaviour. Respondents above 40 are significantly less likely to increase spending on hedonic and utilitarian products. This contributes to the literature on life-span development and suggests that older people are less likely to change their spending behaviour during a stress-full event such as COVID-19.

7. Limitations

Besides the model limitations this study has several other limitations that we are aware of. In this section the limitations will be discussed.

Firstly, the survey data used has its limitation. By using an existing survey, we weren't able to measure fear as proposed by previous research. Self-reported fear is often biased and could give other outcomes than when using a validated sale to measure fear. Furthermore, in all 8 waves different respondents were used, panel data might have given more interesting insights. By using panel data, we would have been able to track the same respondents across waves and study the changing consumer sentiment and consumer behaviour.

Secondly, the lockdown variable used has its limitations. In contrast with Allcot et al. (2020) we used lockdown measures on national level instead of regional level. It should be noted that due to the evolution of the outbreak in certain regions, regional or local measures often preceded national ones. Because we didn't have access to more detailed information (only the country of residence was asked in the survey) we could only look at stay at home order on national level in this study. Furthermore, the use of the "stay at home order" as lockdown variable can be questioned. As proposed by Allcott et al. (2020), the end of the stay at home order can be used as measure for the end of the lockdown. However, restrictions were slowly lifted, and most stores and restaurants opened only after a few weeks. Also, the level of enforcement of measures may vary between

countries and there may be specific rules and exceptions to the measures. The difference in measures on regional and national level could be an important factor in differences in consumer behaviour and should be looked at in a more detailed study.

Thirdly, the use of survey data to study consumer spending behaviour has multiple limitations. The main limitation is that respondents often don't know exactly how much they spend on each product category and therefore the chance exist that the answers are guesses rather than the actual spending pattern. Also, respondents were asked if their spending increased, decreased or stayed the same and weren't asked how much their spending increased or decreased. A more detailed questionnaire could already give more insights. Most researchers use bank transaction level data to study changing spending behaviour, however this doesn't give insights in behavioural drivers of changing spending behaviour. A solution to this issue is to survey clients at a bank and get access to their bank transaction data.

Fourthly, it is notable that despite the huge amount of data the R-squared is quite low. However, it is important to mention that the R-squared statistic doesn't mean what R-square means in OLS regression (UCLA). Although pseudo R^2 values for logistic regression are available as output in most statistical packages and are often reported in practice, few if any guidelines exist for their interpretation (Smith and McKenna, 2013). It is also found that most commonly used pseudo R^2 indices, like the McFadden's index, yield lower estimates than their OLS R^2 counterparts (Smith and McKenna, 2013). The low R-squared in the logistic regressions therefore doesn't necessarily mean that there is a low proportion of variance explained by the predictors. While the low R-squared could be interpreted as a limitation by some researchers, it is not considered to be of serious importance.

Lastly, the findings could have been extended using the aforementioned model that use categorical and continuous dependent variables. This could have given more insights in the demographics explaining differences in fear and consumer behaviour. This needs to be modelled in Matlab or R, due to tie limitations this was unfortunately not possible. Additionally, work can be done to examine potential mediating and moderating variables, towards a clearer understanding of the process behind the relationship between fear during a disaster and subsequent spending behaviour (Larson and Shin, 2018). For example, individual differences in personal orientation toward the present versus the future (i.e., temporal orientation) have been shown to influence attitudes, evaluations, and behaviours among those presented with messages highlighting threat (e.g., Strathman, Gleicher, Boninger, & Edwards, 1994). Also, consumer's spending self-control (CSSC) have been shown to be a major factor underlying financial decision making (Haws et al., 2011).

Furthermore, a longer time span, depth study into one country or a dataset including more countries could have given more insights.

8.Discussion

The study of consumer behaviour during uncertain and stressful events becomes increasingly important. While weather-related disasters already increased in the past years and led to researchers studying the impact on consumer behaviour, this pandemic is something new. It is a pandemic from a whole other scale, affecting everyone around the globe. Furthermore, there is yet little known how emotions influence consumer spending (Andreasen, 1984; Moschis, 2007; Larson and Shin, 2018) and current findings are contradictory (Durante, 2016). Because fear is a common reaction to a (natural) disaster, we studied the effect of fear on consumer spending. We proposed that during COVID-19 people experienced different kind of fears: health fears and economic fears related to the loss of jobs and future of the economy.

The current study demonstrates that higher levels of both health and job fears during COVID-19 leads to an increased probability of increasing spending on both utilitarian and hedonic consumption. This suggests that those shoppers under the greatest emotional strain are also the ones out shopping the most (Larson and Shin, 2018). Fears related to the economy show less significant outcomes for both utilitarian and hedonic consumption, which suggests that those consumers are under a less emotional strain. These results contribute to previous research that found that emotions affect people's spending decisions and sheds a light on the relationship between fears during a pandemic and consumption behaviour. This study answers the research imperative of studying the relationship between event-induced emotions and consumption behaviour, highlighted by many other researches (Sneath et al., 2009; Kennett-Hensel et al., 2012; Kemp et al., 2014; Larson and Shin, 2018).

9.Implications and further research

This study shows that during COVID-19, fear increases the likelihood of consumers increasing spending on both utilitarian and hedonic products. The evidence holds for both during and post-lockdown. This implies that most of the change in consumer spending is caused by the virus itself and occurs regardless of social distancing. This finding is of great interest for policymakers, whose key concern is the size and the nature of the consumer response during an event like the coronavirus.

Furthermore, these findings have implications for consumers. Consumers should be aware that uncertainties, fears and stress could lead to increased spending on certain types of products. Excessive fears could lead to excessive expenditures, which may include necessities (e.g. stockpiling

household goods), but also non-necessities that some stressed consumers perceive to be necessities (e.g. luxury goods), or products that are detrimental to one's health (e.g. alcohol). Although these expenditures are often used to restore control or improve mood, these products may have harmful long-term consequences. Spending under stress may be perceived as a failure of self-regulation, resulting in feelings of guilt or shame (Baumeister & Exline, 1999; Yi & Baumgartner, 2011), and causing emotional dissonance between the desire for self-control and the hedonic reward of shopping (Rook, 1987). Therefore, managing consumer's consumption to an adequate level is important (Durante, 2016).

Financial institutions should be aware of these implications. To the extent customers are aware of a bias toward increased spending, they may be able to better control excessive expenditures (Durante, 2016). If this isn't the case, financial institutions such as banks can help their customers in managing their money whenever they experience emotional distress. Making their role in uncertain times to create awareness and help their customers with managing their financials.

Given the finding that consumers may spend relatively more on utilitarian and hedonic products when experiencing fears, this information can be useful for understanding trends, product planning, and improving market forecasts (Durante, 2016). Retailers and marketers may also be able to reposition specific products in certain times of year to alter the perception that a particular product is a necessity or useful in restoring a sense of control over one's life.

10. References

Ahorsu, D.K.; Lin, C.Y.; Imani, V.; Saari, M.; Griths, M.D.; Pakpour, A.H. The fear of COVID-19 scale: Development and initial validation. Int. J. Ment. Health Addict. 2020.

Allcott, H., Boxell, L., Conway, J. C., Ferguson, B. A., Gentzkow, M., & Goldman, B. (2020). What Explains Temporal and Geographic Variation in the Early US Coronavirus Pandemic?. NBER Working Paper, (27965).

Arafat, S. Y., Kar, S. K., Marthoenis, M., Sharma, P., Apu, E. H., & Kabir, R. (2020). Psychological underpinning of panic buying during pandemic (COVID-19). Psychiatry Research.

Arenas, J.G. (2020). Savings and COVID-19: How far will Europe's saving fever go? CaixaBank. Accessed at: https://www.caixabankresearch.com/en/economics-markets/activity-growth/savings-and-covid-19-how-far-will-europes-saving-fever-go

Asmundson, G. J., & Taylor, S. (2020). How health anxiety influences responses to viral outbreaks like COVID-19: What all decision-makers, health authorities, and health care professionals need to know. Journal of Anxiety Disorders, 71, 102211.

Bagozzi, R.P.; Yi, Y.; Phillips, L.W. Assessing construct validity in organizational research. Adm. Sci. Q. 1991, 36, 421–458.

Baker, S. R., Farrokhnia, R. A., Meyer, S., Pagel, M., & Yannelis, C. (2020). How does household spending respond to an epidemic? consumption during the 2020 covid-19 pandemic (No. w26949). National Bureau of Economic Research.

Ballantine, P. W., Zafar, S., & Parsons, A. G. (2014). Changes in retail shopping behaviour in the aftermath of an earthquake. The International Review of Retail, Distribution and Consumer Research, 24(1), 1-13.

Ballantine, Paul W. 2013. Changes in retail shopping behaviour in the aftermath of an earthquake. The International Review of Retail, Distribution and Consumer Research 1: 28–42.

Ben-David, I., Fermand, E., Kuhnen, C. M. and Li, G. (2018). Expectations Uncertainty and Household Economic Behavior, NBER Working Papers 25336, National Bureau of Economic Research, Cambridge (US).

Bonneux, L., & Van Damme, W. (2006). An iatrogenic pandemic of panic. Bmj, 332(7544), 786-788.

Brown, J.D. (2001). What is an eigen value?. Statistics corner. Accessed at: http://hosted.jalt.org/test/bro_10.htm#:~:text=In%20factor%20analysis%2C%20eigenvalues %20are,646).

Chapman, B., Swainston, J., Grunfeld, E. A., & Derakshan, N. (2020). COVID-19 outbreak effects on job security and emotional functioning amongst women living with breast cancer. Frontiers in Psychology, 11, 2864.

Charles, S. T., Luong, G., Almeida, D. M., Ryff, C., Sturm, M., & Love, G. (2010). Fewer ups and downs: Daily stressors mediate age differences in negative affect. Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 65(3), 279-286.

Chronopoulos, D. K., Lukas, M., & Wilson, J. O. (2020). Consumer Spending Responses to the COVID-19 Pandemic: An Assessment of Great Britain. Available at SSRN 3586723.

Coleman, N. V., Williams, P., Morales, A. C., & White, A. E. (2017). Attention, attitudes, and action: When and why incidental fear increases consumer choice. Journal of Consumer Research, 44(2), 283-312.

Connolly, M. (2017). A study of stress as a predictor of irrational decision making for workers in the financial services sector (Doctoral dissertation, Dublin, National College of Ireland).

Cox, N., Ganong, P., Noel, P., Vavra, J., Wong, A., Farrell, D., & Greig, F. (2020). Initial impacts of the pandemic on consumer behavior: Evidence from linked income, spending, and savings data. University of Chicago, Becker Friedman Institute for Economics Working Paper, (2020-82).

Den Haan, W. J., Rendahl, P., & Riegler, M. (2018). Unemployment (fears) and deflationary spirals. Journal of the European Economic Association, 16(5), 1281-1349.

Deng, S., Wang, W., Xie, P., Chao, Y., & Zhu, J. (2020). Perceived Severity of COVID-19 and Post-pandemic Consumption Willingness: The Roles of Boredom and Sensation-Seeking. Frontiers in Psychology, 11, 2437.

Do Vale, R.C., Duarte, J. (2013). Classification of FMCG Produt Macro-Categories on the Utilitarian vs. Hedonic Dimensions. Labroratorio de Psicologia(1): 29-36.

Durante, K. M., & Laran, J. (2016). The effect of stress on consumer saving and spending. Journal of Marketing Research, 53(5), 814-828.

ECDC. (2020). Data on country response measures to COVID-19. European Centre for Disease Prevention and Control. Accessed at https://www.ecdc.europa.eu/en/publications-data/download-data-response-measures-covid-19

Eichenbaum, M. S., Rebelo, S., & Trabandt, M. (2020). The macroeconomics of epidemics (No. w26882). National Bureau of Economic Research.

Esterwood, E., & Saeed, S. A. (2020). Past epidemics, natural disasters, COVID19, and mental health: learning from history as we Deal with the present and prepare for the future. Psychiatric quarterly, 1-13.

Forbes, S. L. (2017). Post-disaster consumption: Analysis from the 2011 Christchurch earthquake. The International Review of Retail, Distribution and Consumer Research, 27(1), 28-42.

Forbes, Sharon L. 2017. Post-disaster consumption: analysis from the 2011 Christchurch earthquake. The International Review of Retail, Distribution and Consumer Research 27: 28–42

Goolsbee, A., & Syverson, C. (2020). Fear, lockdown, and diversion: Comparing drivers of pandemic economic decline 2020 (No. w27432). National Bureau of Economic Research.

Greasley, D., Madsen, J. B., & Oxley, L. (2001). Income uncertainty and consumer spending during the Great Depression. Explorations in Economic History, 38(2), 225-251.

Guerrieri, V., Lorenzoni, G., Straub, L., & Werning, I. (2020). Macroeconomic Implications of COVID-19: Can Negative Supply Shocks Cause Demand Shortages? (No. w26918). National Bureau of Economic Research.

Hall, M. C., Prayag, G., Fieger, P., & Dyason, D. (2020). Beyond panic buying: consumption displacement and COVID-19. Journal of Service Management.

Haws, K.L., Bearden, W.O., & Nenkov, G.Y. (2012). Consumer spending self-control effectiveness and outcome elaboration prompts. Journal of the Academy of Marketing Science, 40, 695-710.

Henriques, M. (2020). Why Covid-19 is different for men and women. BBC. Accessed at: https://www.bbc.com/future/article/20200409-why-covid-19-is-different-for-men-and-women.

Izard, C. E. (1991). The psychology of emotions. New York, NY: Plenum Press.

Jian, Y., Yu, I.Y., Xang, M.X., & Zeng. K.J. (2020). The Impacts of Fear and Uncertainty of COVID-19 on Environmental Concerns, Brand Trusts, and Behavioral Intentions toward Green Hotels. MDPI.

Joinson, A. N., Paine, C., Buchanan, T., & Reips, U. (2008).Measuring Self-disclosure Online: Blurring and Non-response to Sensitive Itemsin Web-based Surveys. Computers in Human Behavior 24(5):2158-171.

Kemp, E., Kennett-Hensel, P. A., & Williams, K. H. (2014). The calm before the Examining emotion regulation consumption in the face of an impending disaster. storm: Psychology & Marketing,31(11), 933–945.

Klaiber, P., Wen, J. H., DeLongis, A., & Sin, N. L. (2020). The ups and downs of daily life during COVID-19: Age differences in affect, stress, and positive events. The Journals of Gerontology: Series B.

Kline, R. B. (2015). Principles and practice of structural equation modeling. Guilford publications.

LaMantia, S. (2020). Retail Therapy: Online Shopping and Covid-19. Flagshipbank. Accessed at: https://www.flagshipbanks.com/blog/retail-therapy-online-shopping-in-covid-19.

Larson, L. R., & Shin, H. (2018). Fear during natural disaster: Its impact on perceptions of shopping convenience and shopping behavior. Services Marketing Quarterly, 39(4), 293-309.

Li, Guangdi, and Erik De Clercq. 2020. Therapeutic options for the 2019 novel coronavirus (2019-nCoV). Nature Reviews Drug Discovery 19: 149–50.

Liu, Wei, Xiao-Guang Yue, and Paul B. Tchounwou. 2020. Response to the COVID-19 Epidemic: The Chinese Experience and Implications for Other Countries. International Journal of Environmental Research and Public Health 17: 2304.

Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. Psychological bulletin, 127(2), 267.

Loewenstein, George F., Elke U. Weber, Christopher K. Hsee, and Ned Welch. 2001. Risk as feelings. Psychological Bulletin 127: 267–86.

Loxton, M., Truskett, R., Scarf, B., Sindone, L., Baldry, G., & Zhao, Y. (2020). Consumer behaviour during crises: Preliminary research on how coronavirus has manifested consumer panic buying, herd mentality, changing discretionary spending and the role of the media in influencing behaviour. Journal of Risk and Financial Management, 13(8), 166.

Loxton, M., Truskett, R., Scarf, B., Sindone, L., Baldry, G., & Zhao, Y. (2020). Consumer behaviour during crises: preliminary research on how coronavirus has manifested consumer panic buying, herd mentality, changing discretionary spending and the role of the media in influencing behaviour. Journal of Risk and Financial Management, 13(8), 166.

Madakasira, S., & O'Brien, K. F. (1987). Acute posttraumatic stress disorder in victims of a natural disaster. The Journal of Nervous and Mental Disease,175(5), 286–290.

Mertens, G., Gerritsen, L., Duijndam, S., Salemink, E., & Engelhard, I. M. (2020). Fear of the coronavirus (COVID-19): Predictors in an online study conducted in March 2020. Journal of Anxiety Disorders, 102258.

Mervosh, S. Lee, K. C., Gamio, L., & Popovich, N. (2020) See how all 50 states are reopening. Accessed at: https://www.nytimes.com/interactive/2020/us/statesreopen-map-coronavirus.html.

Montalvo, J. G., & Reynal-Querol, M. (2020). Distributional effects of COVID-19 on spending: A first look at the evidence from Spain (No. 1740).

Morreall, J. (1993). Fear without belief. The Journal of Philosophy,90(7), 359–366.

Pettinger, T. (2009). Economic Fears. Economicshelp. Accessed at: https://www.economicshelp.org/blog/1946/economics/economic-fears/

Qiu, J.; Shen, B.; Zhao, M.;Wang, Z.; Xie, B.; Xu, Y. A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: Implications and policy recommendations. Gen. Psychiatry 2020, 33.

Schimmenti, A.; Billieux, J.; Starcevic, V. The four horsemen of fear: An integrated model of understanding fear experiences during the COVID-19 pandemic. Clin. Neuropsychiatry 2020, 17, 41–45.

Shefrin, H. (2016). Behavioral risk management: managing the psychology that drives decisions and influences operational risk. Springer.

Slovic, P. (2020). Risk perception and risk analysis in a hyperpartisan and virtuously violent world. Risk analysis, 40(S1), 2231-2239.

Smith, T.J., McKenna, C.M. (2013). A comparison of logistic regression pseudo R2 indices. Multiple linear regresion viewpoints, Vol.39(2)

Sneath, J. Z. (1997). The impact of stressful life events on consumers' impulsive and compulsive buying behaviors.

Sneath, J. Z., Lacey, R., & Kennett-Hensel, P. A. (2009). Coping with a natural disaster: Losses, emotions, and impulsive and compulsive buying. Marketing letters, 20(1), 45-60.

Tice, D., Baumeister. R., & Bratslavsky, E. (2001). Emotional distress regulation takes precedence over impulse control: If you feel bad, do it!. Journal of personality and social psychology, 80(1):53-67

UCLA. (2020). Logistic regression analysis - STATA annoted output. Institute for Digital Research and education. Accessed at: https://stats.idre.ucla.edu/stata/output/logistic-regression-analysis/

Waldersee, V. (2020). Fear and frustration: Europe's wealthy keep wallets closed. Reuters. Accessed at:https://www.reuters.com/article/us-consumer-spending-europe-analysis-idUSKBN2620ME

Wielen van der, W. Barrios, S. (2020). Fear and Employment During COVID Pandemic: Evidence from Search Behaviour in the EU. European Commission: JRC Technical Reports.

Wilken, J. (2020). Why we hoard: Fear at root of panic-buying, psychologists say. The San Diego Union-Tribune. Retrieved from: https://www.sandiegouniontribune.com/news/health/story/2020-03-22/hoard-fear-panic-buying-psychology

Yoon, Jiho, Ram Narasimhan, and Myung K. Kim. 2017. Retailer's sourcing strategy under consumer stockpiling in anticipation of supply disruptions. International Journal of Production Research 56: 3615–35

Yuen, K. S., Ye, Z. W., Fung, S. Y., Chan, C. P., & Jin, D. Y. (2020). SARS-CoV-2 and COVID-19: The most important research questions. Cell & bioscience, 10(1), 1-5.

Yuen, Kum F., Xueqin Wang, Fei Ma, and Kevin X. Li. 2020. The psychological causes of panic buying following a health crisis. International Journal of Environmental Research and Public Health 17: 3513