An Abnormal Apple A Day, Keeps Food Waste At Bay!

Effect of Food Shape and Firm Reputation on Perceived Food Quality and Purchase Intention

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Master's Thesis

7481 words

29 – 06 – 2018

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Abstract

This study researched the main effect of food shape (normal versus abnormal) on purchase intention and examined if perceived food quality mediated the effect, and if firm reputation (low vs. high) moderated this mediated effect. This study adds to the existing knowledge in two ways. Firstly, this study clarifies the decline in consumers' purchase intention when food shape deviates by looking into perceived food quality. Retailers could use this insight to enhance consumers' perceived quality by informing them that abnormal shaped foods are of the same quality as normal shaped foods. Secondly, this study adds to the existing knowledge about cue utilisation theory and the dominance of intrinsic over extrinsic cues by examining if a positive extrinsic high-scope cue can counter the negative effect of an intrinsic high-scope cue.

The study has been performed amongst 214 consumers and consisted out of a 2 (food shape: normal or abnormal) x 2 (firm reputation: low or high) factorial between-subjects design. The results showed that food shape influences consumers' purchase intention: consumers are less likely to purchase abnormal shaped foods when compared to normal shaped foods. The results also showed that perceived quality partially mediates the effect of food shape on consumers' purchase intention: when consumers are exposed to abnormal shaped foods, their quality perceptions are lower, which consequently weakens their purchase intentions. The study did not find a moderation effect of firm reputation on the mediation effect. This implies that a high firm reputation cannot eliminate the negative effect of abnormal shaped foods on perceived quality and purchase intention.

Future research should measure consumers' price perception, as research shows that high reputational firms can form higher reference price scales while consumers are less likely to purchase a product when they perceive the price as high.

Introduction

Annually, 1.3 billion tonnes of food is wasted and Western countries produce the greatest amount of it (Gustavsson, Cederberg, Sonesson, Van Otterdijk, & Meybeck, 2011). In these countries, food waste occurs notably in the production to retailing stages and out of all foods, especially fruits and vegetables are wasted (Gustavson et al., 2011). These wasted foods deviate from normal foods and do not meet the consumption standards, however, there is no deviation on the intrinsic quality or safety (Halloran, Clement, Kornum, Bucatariu, & Magid, 2014), making them still fine for human consumption. Nonetheless, retailers are unwilling to sell suboptimal foods (Aschemann-Witzel, De Hooge, Amani, Bech-Larsen, & Oostindjer, 2015; Buzby & Hyman, 2012; Buzby, Hyman, Stewart, & Wells, 2011), as they believe that consumers dislike and do not want to consume these abnormal fruits and vegetables (Aschemann-Witzel et al., 2015; Buzby & Hyman, 2012; Buzby et al., 2011). Especially in Europe, in comparison to other continents, an outstanding amount of fruits and vegetables is wasted in the pre-consumption stage (Gustavson et al., 2011). This significant amount of food waste of fruits and vegetables has to be reduced, as it implies a negative impact on the environment (Nelleman et al., 2009), including waste in the use of chemicals (e.g., pesticides, fertilizers), energy (e.g., greenhouses, transportation), water, and land (Nelleman et al., 2009).

Although retailers are unwilling to sell abnormal foods to their consumers, it is interesting that consumers base their quality evaluations on a combination of cues and not only on the food's appearance (Dawar & Parker, 1994; Dodds, Monroe, & Grewal, 1991; Miyazaki, Grewal, & Goodstein, 2005). The food's appearance can be categorised as an intrinsic cue (Olson, 1972), which is a product-related attribute (e.g., food shape). However, during an evaluation process, consumers are not just faced with intrinsic cues, but also with multiple extrinsic cues, such as price, quality labels and the firm's reputation. Extrinsic cues represent product-related attributes that are not part of the physical product (Olson, 1972).

Due to the many cues that have to be processed, not all cues can be equally important: consumers tend to rank cues on their relative importance as to what they can distinguish as a low- or high-quality product. The ranking of cues can be categorised into low- or high-scope (Purohit & Srivastava, 2001). Low-scope cues are temporary and are relatively easily and inexpensively changeable (e.g., price can easily be decreased or increased). High-scope cues evolve over time and cannot be changed instantly (e.g., the reputation of a brand or a firm cannot be easily changed, particularly from negative to positive, as great amounts of effort, money and time are required). High-scope cues give a better indication of the product quality when compared to low-scope cues and are found to be the driving force of a purchase decision (Purohit & Srivastava, 2001). The appearance of food can also be considered a high-scope cue, as it cannot be changed easily (Loebnitz, Schuitema, & Grunert 2015).

In order to weaken consumers' negative evaluations of abnormal foods, another positive high-scope cue may counter the negative effect of the high-scope abnormal food appearance. Research shows that consumers tend to use both intrinsic and extrinsic cues concurrently when evaluating product quality (Jacoby, Olson, & Haddock, 1973; Simonson, 1989; Szybillo & Jacoby, 1974). As only the most important intrinsic and extrinsic cues are simultaneously processed, the most important high-scope cue should be deployed for enhancing consumers' perceived overall food quality. Firm reputation has been found to be one of the most important determinants for consumers to rely on when assessing the quality of the product (Dodds, et al., 1991; Nevin & Houston, 1980). The associations consumers have of the firm's reputation is found to influence the perception of the value of the product (Brown & Dacin, 1997; Dodds, et al., 1991; Grewal, Monroe, & Krishnan, 1998) and intention to purchase a product (Buckley, 1991). Moreover, brand reputation – which is similar to firm reputation, as they are both high-scope cues – has been shown to positively affect consumers' quality perceptions when there are visible differences in product quality

(Dodds, et al., 1991; Jacoby, et al., 1973). By using firm reputation as an opposing cue that is just as strong a cue as abnormal food appearance, the negative effect that abnormal appearance can elicit, may be diminished. The study adds to the existing knowledge about abnormal foods and consumer preferences by looking into firm reputation as a high-scope factor that moderates the effect of food appearance.

Moreover, this study looks into consumers' food quality perceptions as an explanatory variable for these effects. Research suggests that when consumers evaluate products, they often evaluate them on their quality (e.g., freshness, taste, nourishment and safety of the product; De Hooge et al., 2016; Olson & Jacoby, 1972; Tal, Gvili, Amar, & Wansink, 2017). Several studies found that purchase intentions are weaker the more foods deviate from the norm and suggest that this could be mediated by quality perceptions (De Hooge et al., 2016; Loebnitz & Grunert, 2014; Loebnitz et al., 2015; Verhulst et al., 2017). By looking into perceived quality as a mediator, a clarification can be provided for this decline. Retailers could use this insight to enhance consumers' perceived quality by informing them that these foods are of the same quality as normal foods (e.g., same taste, nutritional and sanitary quality).

This study will examine fruits and vegetables that deviate in shape, as it has found to be the most preferred abnormality (De Hooge et al., 2016). This study aims to research the main effect of food shape (normal versus abnormal) on purchase intention and will look into perceived quality as a mediator. Moreover, this study will examine if firm reputation interacts with food shape, as such that a firm with a high reputation increases consumers' quality perceptions and consequently strengthens their purchase intentions. Researching these effects may give retailers insight on how abnormal shaped foods are perceived by consumers and in which type of supermarkets they are more likely to be successful. This may positively impact the environment, as less chemicals, energy, water and land is wasted, and it may possibly

even lead to a reduction in usage of the aforementioned production processes. Additionally, this study contributes to the literature in two ways: it gives insight into how firm reputation can be used to positively influence consumers' negative evaluation of abnormal shaped foods and it clarifies the underlying structure of the effect on purchase intention. The following research question has been posed to examine the aim of the study:

> RQ: To what extent is there a difference between normal versus abnormal shaped food on the purchase intention amongst adults living in the Netherlands? And to what extent is this effect moderated by a low or high firm reputation and mediated by the perceived quality?

Theoretical Framework

In this section, the hypotheses that belong to the overall research question will be specified and explained. See Figure 1 for a visual representation of the hypotheses.

Effects of Abnormalities on Quality Perceptions and Purchase Intentions

Consumers generally have the tendency to reject abnormal foods: they prefer products that are typical of a product category, such that 'typical' appearances of products are used as cognitive reference points to evaluate atypical products (Hurling & Shephard, 2003; Veryzer & Hutchinson, 1998; Wilkins, BokaerSmith, & Hilchey, 1996). Examples of abnormal foods in retail settings are rare, which may reinforce normative knowledge, such that consumers become familiar with a particular appearance. Consumers might use any differences in food appearances to infer quality, which may lead to a rejection to purchase these foods (Creusen & Schoormans, 2005).

Although consumers do not prefer abnormal foods, they are not necessarily unwilling to purchase these products (Aschemann-Witzel et al., 2015; Buzby & Hyman, 2012; Buzby et al., 2011). A recent study by De Hooge et al. (2016), which conducted a survey amongst

consumers from five Northern European countries including the Netherlands, found that consumers do not necessarily dislike abnormal foods. Especially Dutch consumers, younger consumers and consumers who have a higher commitment to environmental sustainability, showed a higher preference for suboptimal products. However, these consumers did still perceive suboptimal foods as inferior to 'normal' foods (De Hooge et al., 2016).

When taking the extent of food shape deviation into regard, differences in effect can occur. All research to date about food shape abnormality show that the more food shape deviates, the weaker consumers' purchase intentions are (De Hooge et al., 2016; Loebnitz & Grunert, 2014; Loebnitz et al., 2015; Verhulst et al., 2017). The study by Verhulst et al. (2017) looked into consumers' food quality perceptions as well and found the same negative relation for quality perceptions. However, Verhulst et al. (2017) did not examine perceived quality as a determinant of purchase intention, hence this recent study looks into this mediation. In all past studies on food shape, food shape abnormality was operationalised as a continuum, with normal and abnormal as the extremes. The foods only differed in shape. Although normal shaped foods were similar in these studies, abnormal shaped foods differed in their abnormality and how realistic they looked. Furthermore, these past studies looked into different types of fruits and vegetables and differed in how many foods were examined. While De Hooge et al. (2016) only looked into one type of vegetable, Loebnitz and Grunert (2014), Loebnitz et al. (2015) and Verhulst et al. (2017), looked into two types of fruits and vegetables. Although the operationalisations differed, the past studies did still find similar results of food shape abnormality on quality perceptions and purchase intentions. Therefore, the following hypotheses are assumed:

H1: Normal shaped foods lead to stronger purchase intentions than abnormal shaped foods.

H2: This effect is positively mediated by higher quality perceptions.

Effects of Extrinsic Quality Cues on Quality Perceptions and Purchase Intentions

In the pre-purchase phase, consumers can assess product quality based on multiple cues (Connolly & Srivastava, 1995). According to the cue utilisation theory, these cues can be classified as intrinsic or extrinsic (Olson, 1972). Intrinsic cues are product-related attributes that cannot be manipulated without altering physical properties of the product (e.g., ingredients, colour and food shape). Conversely, extrinsic cues are product-related attributes that can be altered without altering physical properties of the product (e.g., packaging, price, firm reputation; Richardson, Dick, & Jain, 1994). Research shows that consumers tend to use both intrinsic and extrinsic cues when evaluating product quality (Jacoby et al., 1973; Simonson, 1989; Szybillo & Jacoby, 1974). Several reviews of the literature on cue utilisation theory examined multiple extrinsic cues, and firm reputation was found to be one of the most important extrinsic cues consumers relied on when making quality assessments (Wheatley, Chiu, & Goldman, 1977). In this study, both the shape of food and firm reputation, are cues that can indicate the level of food quality.

Although consumers use both intrinsic and extrinsic cues to rely on, intrinsic cues are found to dominate extrinsic cues, in terms of their perceived usefulness (Purohit & Srivastava, 2001). However, this does depend on the strength of the cue. No dominance is expected to occur when using a positively loaded extrinsic cue that is just as strong as the negatively loaded intrinsic cue. This study examined the interaction effect of food shape and firm reputation which are both considered high-scope cues according to the cue diagnosticity framework and Loebnitz et al.'s (2015) extension on the definition (see Table 1 for a summary of the definitions).

Table 1

Definitions of Intrinsic and Extrinsic, Low- and High-Scope Cues

	Low-Scope	High-Scope
Intrinsic	According to Purohit and Srivastava (2001), product-related attributes cannot be classified as either low- or high-scope, because making alterations in intrinsic cues is impossible without changing physical properties.	According to Loebnitz et al.'s (2015) extension of the high-scope definition, with regards to food shape, product-related attributes cannot be manipulated without altering the physical properties of the product, but the cues of the attributes can be changed by adding a new product type to the range (i.e., abnormal shaped foods). It is a time consuming process, as consumers' quality perceptions communicated by the shape have to be changed.
Extrinsic	Product-related attributes that can be altered relatively quickly and inexpensively (e.g., price, quality label; Purohit & Srivastava, 2001).	Product-related attributes that can be altered, but it is time consuming and expensive (e.g., firm or brand reputation; Purohit & Srivastava, 2001).

According to the cue diagnosticity framework, extrinsic cues can be divided into two levels: low-scope (e.g., price, quality label) and high-scope cues (e.g., brand or firm reputation; Gidron, Koehler, & Tversky, 1993; Hoch & Deighton, 1989). Low-scope cues are transitory in nature and their valence (e.g., height of the price), can be changed quickly and inexpensively; they are perceived as ambiguous and less diagnostic as they can be used to send false signals about a product (Hoch & Deighton, 1989). In contrast, high-scope cues are established over time and are perceived to be more stable, credible, and diagnostic as they lead to a more accurate categorisation of products; they can be perceived as 'stand-alone' cues, as they are relatively less dependent on the presence of other cues (Purohit & Srivastava, 2001). Firm reputation is an extrinsic high-scope cue, as it is a stable and credible quality cue

that is established over time and cannot be changed easily. Food shape is an intrinsic cue, and therefore not a low- or high-scope cue, as shape cannot be changed without altering the food itself (Purohit & Srivastava, 2001). However, Loebnitz et al. (2015) extended this definition and argued that it can be considered a high-scope cue as well. Even though the food's physical appearance cannot be changed, retailers can include abnormal shaped foods, which can slowly change consumers' quality perception communicated by the shape.

Reputation is a signal of quality (Shapiro, 1982; 1983). Consumers perceive a firm with a good reputation, as opposed to one with a poor reputation, to be more trustworthy and credible which positively influences consumers' quality perceptions (Boulding & Kirmani, 1993; Chen & Dubinsky, 2003). Just as with the shape of food, firm reputation is not ambiguous in assigning a product to a particular quality category (Purohit & Srivastava, 2001): a product from a low quality firm is likely to be of a low quality and a product from a high quality firm is likely to be of a high quality. Several studies examined the effect of firm reputation and found that it positively influences consumers' perceived product value (Dodds, et al., 1991; Grewal et al., 1998) and intention to purchase a product (Buckley, 1991). Dodds et al. (1991) combined the results of three studies that looked into the effect of extrinsic cues, and suggested that retailer reputation, amongst price and brand name, is one of the most important determinants of purchase intention. Similar results were found in the earlier study by Jacoby et al. (1973) that looked at several products with visible differences in product quality. Purohit and Srivastava (2001) examined the relation between a negative and a positive high-scope cue (product with a low brand reputation, and high firm reputation) and found that a firm with a high reputation played a dominant role and diminished the negative effect of the product with a low brand reputation on purchase intention. This suggests that a positive high-scope cue can be used to positively spill-over onto a negative high-scope cue. Based on this, the following hypotheses are posed:

H3a: Firms with a high reputation that sell normal shaped foods lead to similar quality perceptions and consequently purchase intentions when compared to abnormal shaped foods.

H3b: Firms with a low reputation that sell normal shaped foods lead to higher quality perceptions and consequently stronger purchase intentions when compared to abnormal shaped foods.

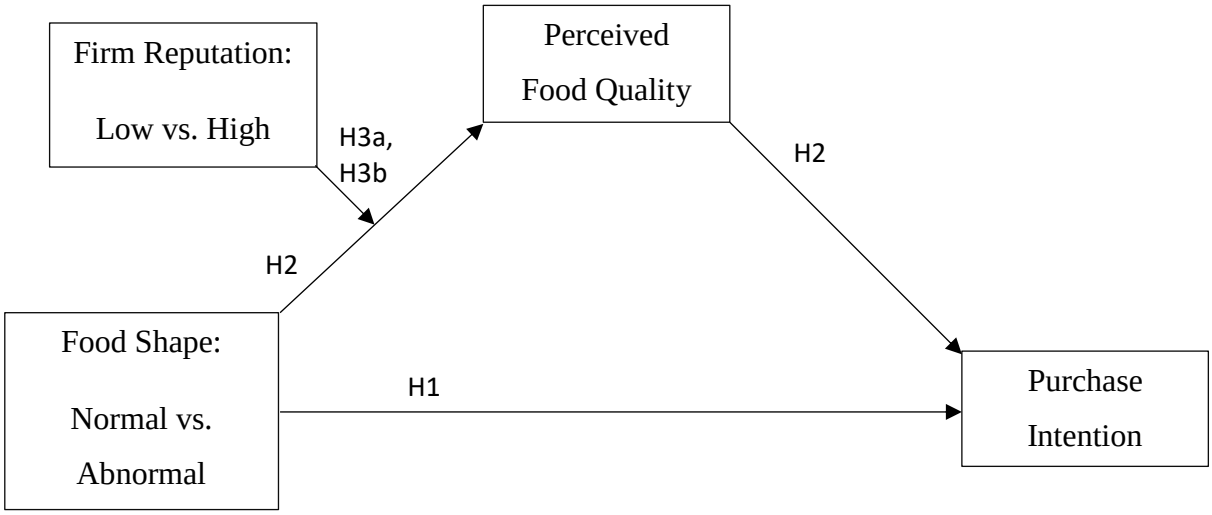

Figure 1. Conceptual model.

Method

Design

The study was conducted with an online experiment in order to establish a causal effect of food shape and firm reputation on the perceived quality and purchase intention. The experiment consisted out of a 2 (food shape: normal or abnormal) x 2 (firm reputation: low or high) factorial between-subjects design.

Pilot Study

A pilot study was conducted in order to examine which two firms (low and high reputation) should be included in the main experiment. Participants were informed that they cooperated in a study about supermarket preferences (see Appendix A for the full pilot study). It consisted out of several demographic questions and two questions that measured the firm's reputation. Firm reputation was measured on a two-items, seven-point Likert scale (strongly disagree [1] to strongly agree [7]). The measures were adopted from Purohit and Srivastava's (2001) study. Participants were asked to indicate the extent to which they agree with the following statements: "This is a supermarket one can trust" and "This supermarket has a reputation for selling high-quality food products". Participants who did not know a supermarket, were able to choose the answer option 'I do not know this supermarket'. These answers were made missing before the analysis. All 26 supermarket chains in the Netherlands, as stated in Distrifood (n.d.), were included in this study.

The pilot study was performed amongst 53 participants who currently lived in the Netherlands and lived there for longer than one year. These requirements had to be met as participants needed to be familiar with the firms and their reputations. Participants were generally female (52.8%) as opposed to male (47.2%). The average age was 26 (M = 25.77, SD = 8.89, Min = 18, Max = 71). 83% were Dutch, the remaining were Austrian (1.9%), Bulgarian (1.9%), Canadian (1.9%), German (7.5%), Greek (1.9%) and Swiss (1.9%).

Eight supermarkets appeared to be most known: at least 92% of the participants knew these firms. The ninth most known supermarket was known amongst 68% of the participants and even fewer knew the remaining supermarkets. In order for firm reputation to have an influence in the main study, participants should be familiar with the firm. Therefore, 92% was taken as a cut-off point. A pearson correlation, factor and reliability analysis was conducted on the items that measured firm reputation. Only the two supermarkets with the highest

average on the reputation scale (Albert Heijn and Jumbo) and the two supermarkets with the lowest average (Aldi and Spar) were examined in this analysis[1]. The analyses showed that the two firm reputation items were correlated for all supermarkets (see Table 2), loaded onto one factor and were (reasonably) reliable (see Table 3). The paired samples t-test showed significant results on all four supermarket combinations, except for combination 'Aldi' and 'Spar' (see Table 4). Aldi (M = 4.60, SD = 1.30) and Albert Heijn (M = 6.23, SD = 0.93) were selected for the main study, as most participants knew these supermarkets (> 95%) and because Aldi held the lowest average on the reputation scale and Albert Heijn held the highest average. The paired samples t-test showed that the firms significantly differed from each other, $t(49) = 9.05$, $p < .001$, 95% CI [1.27, 1.99].

Table 2

Pearson Correlation Results of the Two Firm Reputation Items for Each Supermarket

Supermarket	*N*	*M*	*SD*	*p* (2-tailed)	*R*
Albert Heijn	53	6.23	0.92	< .001	.75
Jumbo	52	5.80	1.11	< .001	.69
Aldi	50	4.60	1.30	< .001	.57
Spar	50	4.90	1.05	< .001	.54

[1] A within subjects repeated measures ANOVA could not be examined, as the dataset contained a high amount of listwise missing values, due to the many participants who were not familiar with all supermarkets.

Table 3

Summary of Factor and Reliability Analysis Results

Supermarket	Item	Factor Loadings	Eigenvalues	% of Variance	Cronbach's α
Albert Heijn	Trust	.94	1.75	87.41	.84
	Reputation	.94			
Jumbo	Trust	.92	1.67	84.25	.81
	Reputation	.92			
Aldi	Trust	.89	1.60	78.74	.71
	Reputation	.89			
Spar	Trust	.87	1.54	76.77	.70
	Reputation	.87			

Table 4

Paired Samples T-Test Results

	95% CI of the Difference				
Supermarket Pair	Lower	Upper	*t*	*df*	*p (2-tailed)*
Albert Heijn – Aldi	1.27	1.99	9.05	49	< .001
Albert Heijn – Jumbo	0.19	0.79	3.30	51	.002
Albert Heijn - Spar	0.10	1.68	7.92	49	< .001
Aldi – Jumbo	-1.52	-0.80	-6.43	49	< .001
Aldi – Spar	-0.56	0.03	-1.82	48	.075
Jumbo - Spar	0.57	1.19	5.66	49	< .001

Note. A bonferroni correction of α = .008 was used, in order to reduce the chances of obtaining type I errors. For this, a regular α = .05 was divided by the six comparisons.

Sample

The sample of the main study included 283 participants. When filtering out those who refused to participate (n = 5), did not currently live in the Netherlands (n = 7) , did not live there for at least one year (n = 6), did not correctly fill in the attention check (n = 20) and did not

remember the supermarket (n = 30), the sample dropped down to 214 participants (see Appendix B for the demographics). Participants needed to live in the Netherlands for at least one year, so they would be familiar with the supermarkets included in this study and their reputations.

Participants were collected through a convenience sample and were approached through social media (e.g., Facebook, WhatsApp; 59.3%), face-to-face contact (35%) or a telephone conversation (5.6%). This study controlled if the type of approach had an influence on perceived quality and purchase intention. Participants were also collected through a snowball sample; participants who cooperated in the study were asked to send the study to their friends, colleagues and/or family members.

Participants were generally female (63.1%) as opposed to male (36.9%). The average age was 25 (M = 25.49, SD = 8.89, Min = 18, Max = 72). 81.3% were Dutch and 6.1% were German; the remaining 12.6% consisted of a variety of other nationalities. Regarding the highest completed level of education, 39.7% had a bachelor's degree, 31.3% a high school degree, 15% a master's degree, 9.3% did some college and did not receive a degree, 4.2% had an associate degree and 0.5% had less than a high school degree. Generally, participants understood the English vocabulary used in the study well to extremely well (M = 6.47, SD = 0.82). This study controlled if participants' English proficiency had an influence on perceived quality and purchase intention.

Procedure and Stimuli

Participants were informed that they would be participating in a study about food preferences (see Appendix C for the main study). They were able to cooperate in the study with the URL provided. After reading the factsheet (see Appendix D) and accepting the informed consent (see Appendix E), participants could start the study. Participants who did not accept the informed consent, were sent to the end of the study. Those who agreed to participate, were

asked about their country of residence. Participants who did not reside in the Netherlands (at the moment of the study) or did not live in the Netherlands for longer than one year, were sent to the end of the study. Those who did continue, were asked how they were approached to participate in the study and several demographic questions. Participants were then randomly distributed to see one of the four conditions: normal shaped foods from a low reputation firm, normal shaped foods from a high reputation firm, abnormal shaped foods from a low reputation firm or abnormal shaped foods from a high reputation firm (see Table 5 for an overview of the foods).

In every condition, the supermarket that sold the foods was specified in a text. Participants were told to imagine they were doing their groceries at either Aldi or Albert Heijn. They were told that they are wanting to purchase an apple, a carrot, a lemon and an aubergine and when they walk down the aisle looking for these products, they see the foods that were displayed in the study. This study builds forward on Loebnitz and Grunert's (2014) and Loebnitz et al.'s (2015) study, therefore the same food products were used[2]. These foods were perceived as products that are domestically produced (apple and carrot) and imported (lemon and aubergine). Only extremely abnormal shaped foods were examined, as this type of deviation is the most preferred abnormality (De Hooge et al., 2016) and as Loebnitz et al. (2015) only found a significant difference for normal and extremely abnormal shaped foods on purchase intention and not for moderately abnormal shaped foods. The images used by Loebnitz and Grunert (2014) and Loebnitz et al. (2015) were constructed by the commercial photographer Uli Westphal and were designed to be similar in size and pixels, to minimise any extraneous variance in the results. The images provided real examples of naturally occurring abnormalities. To ensure that the resulting images controlled for all factors except shape, each image was required to show no abnormalities based on colour (i.e., shades, colour

[2] Permission for usage of the stimuli was granted by Natascha Loebnitz, author of both studies.

of fruit), size, or damage, and all images provided a full frontal view. Participants had to look at the displayed foods and supermarket firm for at least 10 seconds, for which a timer was used.

Afterwards participants answered several questions that measured purchase intention, perceived quality and their attention to the study. Following this were the manipulation checks and a question concerning English proficiency. Afterwards, the debriefing (see Appendix F) was shown. After continuing, they were sent to the end of the survey.

Table 5

Overview of the Food Shape Conditions

	Apple	Lemon	Carrot	Aubergine
Normal				
Abnormal				

Note. The same images as in Loebnitz and Grunert's (2014) and Loebnitz et al.'s (2015) study were used. The images were constructed by Uli Westphal.

Dependent Variables

All measures were adopted from previous research and were factor analysed using a principal component analysis with varimax (orthogonal) rotation (see Appendix E for the items and measurement model results).

Perceived quality was measured on a six-items, seven-point Likert scale (very low [1] to very high [7]), as used by Verhulst et al. (2017). The questions started with "I will be satisfied by ..." and included the following items: *the taste of the fruits and vegetables, the nutritional quality of the fruits and vegetables, the sanitary quality of the fruits and*

vegetables, the ease of preparation of the fruits and vegetables, the environmental impact of the production of the fruits and vegetables and *their global quality.* Although Verhulst et al. (2017) found a unidimensional scale, this study found a two-dimensional scale. The items 'environmental impact' and 'global quality' did not load onto the perceived quality scale, but onto a separate scale (*EV* = 1.13, R^2 = 29.36). This factor was disregarded for further analysis, as the two items did not relate to perceived quality. The perceived quality scale included the items 'taste', 'nutritional and sanitary quality' and 'ease of preparation', *EV* = 3.05, R^2 = *40.31,* α = .78, *M* = 5.18, *SD* = 1.05, *Min* = 1, *Max* = 7.

Purchase intention was measured on a five-items, seven-point semantic scale, as developed by Spears and Singh (2004) who examined multiple purchase intentions. The questions were "I … purchase these fruits and vegetables." and included the following items: *would never/definitely, definitely do not intend/definitely intend to, have a very low/high interest to, would definitely not/definitely* and *would probably not/probably.* A unidimensional scale was found, *EV* = 4.33, R^2 = 86.63, α = .96, *M* = 4.54, *SD* = 1.57, *Min* = 1, *Max* = 7.

Attention check

An attention check was performed to assess participants' attention during the study. Participants did not receive an incentive for their cooperation. Research shows that participants answer scale items carelessly when they receive no incentive for cooperation in a study (Berry et al., 1992; Hauser & Schwarz, 2016; Meade & Craig, 2012) which can distort the results (Bowling et al., 2016; Huang, Liu, & Bowling, 2015; Maniaci & Rogge, 2014). The check included an instructed-response item (i.e., question with an obvious correct answer) as it has shown to successfully screen out inattentive participants to protect the validity of the scale (Meade & Craig, 2012; Woods, 2006). The check was done after the first four items of the perceived quality scale and was measured on a one-item, seven-point Likert scale in order for it to resemble this scale. The question was: "Please respond to this question

by clicking 'strongly agree'". Participants who did not choose for the answer option 'strongly agree', were regarded as inattentive and filtered out before analysing the results.

Manipulation Check

The images were subjected to a manipulation check to verify the distinctions amongst normal and abnormal shaped foods. Participants were asked how normal the depicted fruits and vegetables appeared on a one-item, seven-point Likert scale (very normal [1] to very abnormal [7]; Loebnitz et al., 2015), $M = 3.64$, $SD = 1.99$, $Min = 1$, $Max = 7$.

Participant's perceptions about firm reputation were measured on a two-items, seven-point Likert scale (strongly disagree [1] to strongly agree [7]). The manipulation check used the same scale for firm reputation as the pilot study. The principal component analysis with varimax (orthogonal) rotation showed a unidimensional scale, $EV = 1.65$, $R^2 = 82.34$, $\alpha = .78$, $M = 4.63$, $SD = 1.34$, $Min = 1$, $Max = 7$.

In order to check if participants were aware of the firm they were exposed to, participants were asked which supermarket sold the foods. The answer options were 'Aldi', 'Albert Heijn' and 'I cannot remember'.

Results

Randomisation Check

A randomisation check was performed for gender and age. The chi-squared test showed no significant differences between the conditions for gender, $\chi^2(3) = 5.68$, $p = .128$. The one-way ANOVA demonstrated no significant differences between the conditions for age, $F(3, 210) = 1.02$, $p = .384$, 95% CI [-0.96, 0.71][3].

[3] Levene's test indicated unequal variances, $F(3, 210) = 4.08$, $p = .008$. The groups were still perceived as homogeneous, as the largest group was not 10% bigger than the smallest group.

Control Variables Check

A pearson correlation was performed for gender, age, received degree, type of approach and English proficiency to control for a correlation with perceived quality and purchase intention. Although no significant correlation was found for gender and perceived quality (R = .99, p = .148), one was found for purchase intention (R = .21, p = .002). Therefore, gender was controlled for in the hypothesis testing. Age was also controlled for in the hypothesis testing, as a significant correlation was found for perceived quality (R = .14, p = .047) and purchase intention (R = .15, p = .027). Received degree was controlled for, as a significant correlation was found for perceived quality (R = .14, p = .035) and purchase intention (R = .18, p = .010). The type of approach was not controlled for, as no significant correlation was found for perceived quality (R = -.09, p = .188) and purchase intention (R = -.11, p = .108). English proficiency was not controlled for either, as no significant correlation was found for perceived quality (R = .07, p = .312) and purchase intention (R = .04, p = .555).

Manipulation Check

A two-way ANOVA was performed to assess if participants perceived the foods as normal/abnormal and if participants perceived the firm as one with a low/high reputation. Both manipulation checks appeared to be statistically successful (see Table 6 for an overview of the results). A significant, large effect was found for food shape, $F(3, 210) = 38.52$, $p < .001$, $\eta^2 = .36$[4]. Participants who were exposed to normal shaped foods from Aldi (M = 2.67, SD = 1.87) and Albert Heijn (M = 2.28, SD = 1.52) generally perceived the foods as more normal than participants who were exposed to abnormal shaped foods from Aldi (M = 4.95, SD = 1.56) and Albert Heijn (M = 4.69, SD = 1.43). A significant, moderate effect was found for the reputation of the firm, $F(3, 210) = 9.24$, $p < .001$, $\eta^2 = .12$[5]. Although a significant

[4] Levene's test indicated equal variances, $F(3, 210) = 1.58$, $p = .195$.
[5] Levene's test indicated equal variances, $F(3, 210) = 0.77$, $p = .515$.

effect was found, food shape seemed to have an influence on the firm's perceived reputation: participants who were exposed to abnormal shaped foods from Albert Heijn (M = 4.66, SD = 1.29) rated the firm's reputation significantly lower than participants who were exposed to normal shaped foods from Albert Heijn (M = 5.38, SD = 1.18), p = .025, 95% CI [-0.06, 1.38].

Table 6

Summary of the Manipulation Check Results

	Normal Shape		Abnormal Shape				
	AH	Aldi	AH	Aldi	*F*	*p*	η^2
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*(3, 210)*		
Food Shape	2.28 (1.52)^{ab}	2.67 (1.87)^{cd}	4.69 (1.43)^{ad}	4.95 (1.56)^{bc}	38.52	< .001	.36
Reputation	5.38 (1.18)^{abc}	4.21 (1.22)^{a}	4.66 (1.29)^{b}	4.32 (1.37)^{c}	9.24	< .001	.11

Note. The superscripts indicate which means in the same row significantly differed from each other according to the bonferonni post-hoc test with $\alpha < .05$. 'AH' stands for Albert Heijn.

Hypothesis Testing

Effect of food shape on purchase intention.

A two-way ANCOVA has been performed with food shape and supermarket as the predictor of purchase intention and gender, age and received degree as covariates. No significant main effect was found for the firm, $F(1, 213) = 0.00$, $p = .999$. A significant, moderate to large main-effect was found for food shape, $F(1, 213) = 87.37$, $p < .001$, $\eta^2 = .30$ (see Figure 2). Participants who were exposed to normal shaped foods had a significantly stronger intention to purchase these foods (M = 5,37, SD = 1.14) than participants who were exposed to abnormal shaped foods (M = 3.69, SD = 1.50). No significant interaction effect was found for firm and food shape, $F(1, 213) = 0.71$, $p = .401$. As a significant main effect of food shape on purchase intention was found, H1 could be supported.

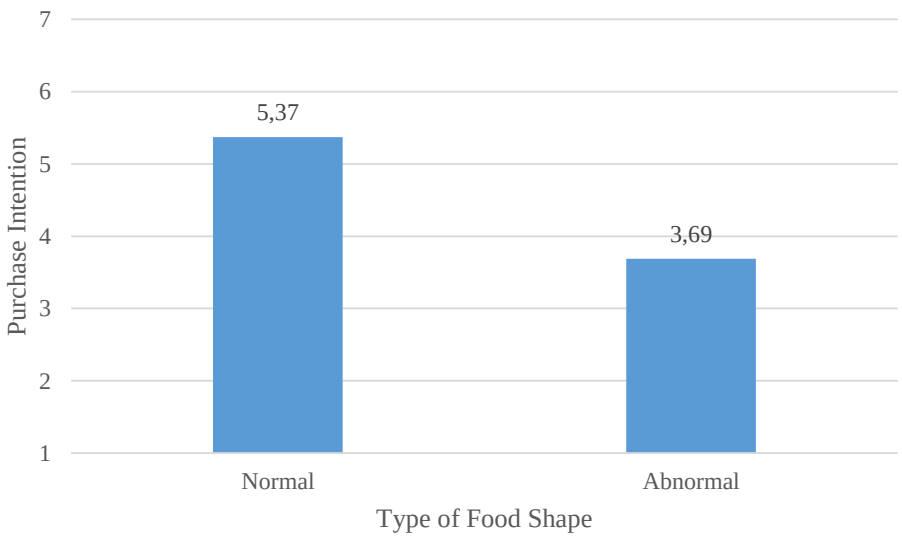

Figure 2. Main effect of food shape on purchase intention.

Mediation effect of perceived quality on food shape and purchase intention.

Baron and Kenny's (1986), Judd and Kenny's (1981), and James and Brett's (1984) four steps in establishing mediation have been used to examine if perceived quality mediates the relation between food shape and purchase intention (see Figure 3). In all tests, gender, age and received degree were included as covariates. The examination was performed with a regression analysis, therefore, gender, received degree, and the experimental condition food shape, were re-coded as dummy variables. A significant effect was found for food shape as the predictor of perceived quality (path a), $F(8, 205) = 2.95$, $R^2 = .10$, $p = .004$. There was a negative correlation between food shape and perceived quality, $b = -0.48$, $b^* = -0.23$, $t = -3.45$, $p = .001$, 95% CI [-0.76, -0.21]. A significant effect was found for food shape as the predictor of purchase intention (path c), $F(8, 205) = 15.24$, $R^2 = .37$, $p < .001$. There was a negative correlation between food shape and purchase intention, $b = -1.68$, $b^* = -0.54$, $t = -9.59$, $p < .001$, 95% CI [-2.04, -1.32]. A significant effect was found for food shape and perceived quality as the predictors of purchase intention, $F(9, 204) = 28.38$, $R^2 = .56$, $p < .001$.There was a positive correlation between perceived quality and purchase intention (path b), $b = 0.68$, $b^* = 0.45$, $t = 9.17$, $p < .001$, 95% CI [0.53, 0.82]. A negative correlation was still

found for food shape and purchase intention (path c'), b = -1.36, b^* = -0.43, t = -8.91, p < .001, 95% CI [-1.66, -1.06]. However, the unstandardized coefficient did decrease from -1.68 to -1.36 (b_{diff} = 0.32), which means that perceived quality partially mediated the effect of food shape on purchase intention. An estimate of the indirect effect using the Sobel's Z test also indicated that perceived quality meditated the direct effect, *Sobel's Z* = -3.26, *SE* = 0.12, p = .001. Based on these results, H2 could be supported.

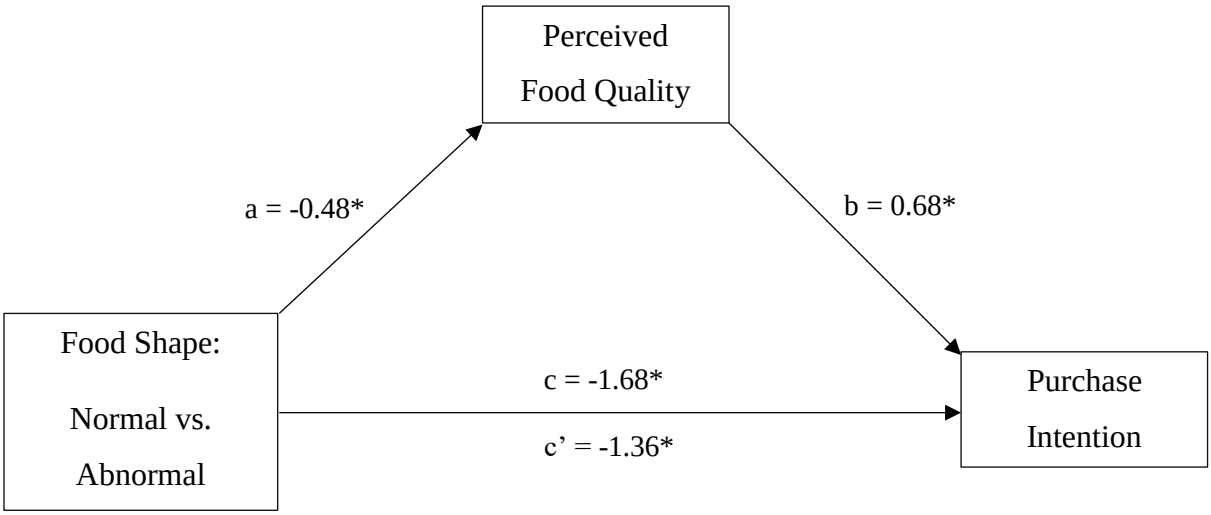

Figure 3. Mediation model with unstandardized regression coefficients for the mediation effect of perceived quality on food shape and purchase intention. *Significant at α < .05.

Moderation mediation effect of firm reputation on food shape, perceived quality and purchase intention.

To test for a moderation mediation effect, a bootstrapping analysis (model 7) was run, using the SPSS process macro that Hayes (2013) developed. The bootstrapping process was created with a large sample from the original data (5000 for this study) through a sampling replacement strategy. A confidence interval of 95% was used for the indirect effect. The analysis was controlled for the covariates age, gender and received degree. The bootstrapping analysis showed a significant effect of food shape on perceived quality, b = -0.47, t = -3.35, p

= .001, 95% CI [-0.74, -0.19]. Food shape also had a significant effect on purchase intention, b = -1.32, t = -8.79, p < .001, 95% CI [-1.62, -1.03]. Perceived quality had a significant effect on purchase intention too, b = 0.69, t = 9.45, p < .001, 95% CI [0.55, 0.83]. However, a significant effect was not found for the firm on perceived quality, b = 0.09, t = 0.63, p = .527, 95% CI [-0.19, 0.37]. Also, no significant interaction effect of food shape and firm reputation on perceived quality was found, b = 0.27, t = 0.95, p = .344, 95% CI [-0.29, 0.82]. No moderation mediation effect was found for firm on the relation between food shape, perceived quality and purchase intention, as the confidence interval crossed zero, which implies that zero was a probable value, *index* = 0.18, 95% CI [-0.20, 0.57]. As the firm did not have a significant direct effect nor an interaction effect, H3a and H3b were rejected.

Conclusion and Discussion

This study included three main research objectives. The first objective was to see if food shape influenced purchase intention, the second objective was to see if perceived quality mediated the direct effect of food shape on purchase intention and the third objective was to see if firm reputation moderated the effect of food shape on perceived quality and consequently on purchase intention.

This study, performed on 214 participants who (at the time of the study) lived in the Netherlands and for longer than one year, found that the shape of food does influence consumers' purchase intentions. Consumers are less likely to purchase abnormal shaped foods when compared to normal shaped foods, which confirmed H1. This is in line with the results of earlier studies on food shape (De Hooge et al., 2016; Loebnitz & Grunert, 2014; Loebnitz et al., 2015; Verhulst et al., 2017). The results also showed that perceived quality partially mediated the effect of food shape on purchase intentions. When consumers were exposed to abnormal shaped foods, their food quality perceptions were lower, which influenced their purchase intentions. This confirmed H2. This finding adds to the existing literature on food

shape. Although Verhulst et al. (2017) found a negative effect of food shape on perceived quality as well, consumer's purchase intention was not examined and therefore no mediation analysis could be performed. The results for the third research objective showed that firm reputation did not moderate the direct and indirect effect, which implies that a high firm reputation cannot eliminate the negative effect of abnormal shaped foods on perceived quality and purchase intention. This means that H3a and H3b were rejected. Although an effect was expected, it does add to the existing scientific knowledge that a high firm reputation cannot be used in order to generate an increase in sales for abnormal shaped foods.

The insignificant effect of firm reputation can be explained by the manipulation check. Although the manipulation check was significant, the bonferonni post-hoc test showed that food shape had an influence on firm reputation: when Albert Heijn sold normal shaped foods it had a significantly higher reputation than when it sold abnormal shaped foods. This implies that foods of a lower perceived quality negatively influences the firm's reputation. Retailers with a high reputation may learn from this. For these retailers, it would be recommended to not supply products that are of too low a perceived quality, as it can damage their high reputation.

Another reason for the insignificant effect of the firm could be the activation of negatively loaded perceptions, such as higher price perceptions. Several studies on brand reputation – which is similar to firm reputation, as they are both high-scope cues (Boulding & Kirmani, 1993) – found a positive relationship between a high firm reputation and a high price perception (Bearden, Lichtenstein, & Teel, 1984; Biswas, Wilson, & Licata, 1993). Studies show that consumers form an internal reference price scale based on their past experiences with the firm (Monroe, Grewal, & Compeau, 1991): when a firm reputation is high compared to low, consumers perceive a product to be sold for a higher price. Consumers however, are found to want a price discount for purchasing abnormal shaped foods (Verghese,

Lewis, Lockrey, & Williams, 2013). This suggests that consumers are less likely to purchase abnormal foods when they perceive the price as high, which could be the reason why the firm did not moderate the effect. Future research on food shape should measure price perception in order to assess if a high firm reputation instigates higher price perceptions than a low firm reputation.

Limitations and Future Research

As with any study, this research has some limitations, which provide possibilities for future research. Firstly, this study adopted a cross-sectional approach; behaviour over a period of time could therefore not be analysed. Attitudes, and subsequently purchase intentions, may however change through mere exposure, as consumers are able to get more familiar with abnormal products (Zajonc, 1968). Exposing consumers to unfamiliar foods for a longer period of time, is found to be an effective strategy to increase consumers' acceptance of unfamiliar foods (Tuorila, Meiselman, Cardello, & Lesher, 1998), which suggests that consumers might be more positive towards abnormal shaped foods when they are exposed to them for a longer period. Future research on food abnormality should therefore adopt a longitudinal approach. Participants could be exposed weekly to abnormal shaped foods, for example through a fictive supermarket e-mail newsletter. The study could consist of several conditions, including a control condition, one with normal shaped foods and one with abnormal shaped foods. Through the use of a pre- and a post-test, changes in consumers' perceptions could be examined.

Secondly, the findings of this study may not be generalizable for the entire study population. Because participants were not collected at random, some groups were over- and/or underrepresented. In this study, 90.2% of the sample was between 18 and 30 years old. The results showed that age significantly determined consumers' quality perceptions and purchase intentions: the older the person, the higher their quality perceptions and the stronger

their purchase intentions were, $b = 0.02$, $b^* = 0.10$, $t = 2.07$, $p = .040$, 95% CI [0.00, 0.04]. Research shows as well that younger consumers tend to waste more food based on their sub-optimality (e.g., appearance, date labelling; Buzby & Hyman, 2012; Canali et al., 2013; Quested et al., 2013; Van Herpen, Tudoran, & Lahteenmaki, 2013), which may suggest that they have a weaker intention to purchase and consume abnormal shaped foods. This may have distorted the results and could have led to lower food quality perceptions and weaker purchase intentions. Future research should collect participants through random sampling and should include the same amount of participants from different age groups in order to prevent data bias.

Implications

The findings of this study are important for academia, because the underlying process of the relation between food shape and purchase intention has been partially explained. This study provides concrete evidence for perceived quality as a mediator, where other studies only suggested it (De Hooge et al., 2016; Loebnitz & Grunert, 2014; Loebnitz et al., 2015; Verhulst et al., 2017). Moreover, this study revealed that in this particular case, a positive high-scope cue cannot positively transmit over to a negative high-scope cue.

The current study provides useful recommendations for retailers as well. The results indicated that consumers perceived abnormal shaped foods to be of a lower quality. Retailers could use this insight to enhance consumers' quality perception by ensuring consumers that the taste, nutritional and sanitary quality and the ease of preparation are the same as normal foods. Retailers could perform a field study to examine which one of the proposed quality aspects should be communicated and how it should be communicated (e.g., poster or video, informative or interactive). Herein lies the challenge, but it is worthy to do so, as it could reduce a significant amount of unnecessary waste of fruits and vegetables.

AN ABNORMAL APPLE A DAY, KEEPS FOOD WASTE AT BAY!

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AN ABNORMAL APPLE A DAY, KEEPS FOOD WASTE AT BAY!

Appendix A

Pilot Study Questionnaire

Do you currently reside in the Netherlands?

o Yes

o No

Have you been living in the Netherlands for longer than one year?

o Yes

o No

How were you asked to participate in the study?

o Through online media, such as WhatsApp, Facebook, LinkedIn or e-mail

o Through face-to-face contact

o Other; _____

What is your nationality?

▼ Afghanistan ... Zimbabwe

What is your gender?

o Male

o Female

o Non-binary

What is your age in years?

_____

In the next pages, several questions will be asked. I would kindly like to ask you if you could attentively read the questions before answering them. Take into account that you should not think too long about the answers; the first answer is often the best answer.

Please choose the answer option you agree with the most for every supermarket. If you do not know the supermarket, choose the option "I do not know this supermarket".

	This is a supermarket one can trust								This supermarket has a reputation for selling high-quality food products							
	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)	I do not know this supermarket (8)	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)	I do not know this supermarket (8)
Albert Heijn	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Jumbo	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Aldi	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Lidl	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Plus	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Dirk	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Dekamarkt	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Coop	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Spar	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

	This is a supermarket one can trust								This supermarket has a reputation for selling high-quality food products							
	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)	I do not know this supermarket (8)	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)	I do not know this supermarket (8)
Hoogvliet	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Deen	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Vomar	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Jan Linders	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Poiesz	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Boni	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Ekoplaza	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Emté	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Dagwinkel	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

	This is a supermarket one can trust								This supermarket has a reputation for selling high-quality food products							
	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)	I do not know this supermarket (8)	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)	I do not know this supermarket (8)
Landmarkt	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Marqt	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
MCD	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Makro	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Natuurwinkel	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Nettorama	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Attent	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Troefmarkt	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Appendix B

Overview of the Sample Demographics

	Frequency	Valid Percentage
N	214	100
Sex		
Male	79	36.9
Female	135	63.1
Age		
18–19	24	10.20
20–24	119	55.70
25–29	46	21.50
30–34	8	3.73
35–39	1	0.47
40–44	1	0.47
45-49	4	1.87
50–54	5	2.34
55–59	3	1.40
60–64	2	0.93
65–69	0	0.00
70 >	1	0.47
Nationality		
Austria	2	0.90
Brazil	1	0.50
Bulgaria	2	0.90
Canada	1	0.50

Finland	1	0.50
Germany	13	6.10
Greece	1	0.50
Hong Kong (S.A.R)	1	0.50
Italy	2	0.90
Japan	1	0.50
Mexico	1	0.50
Netherlands	174	81.3
Panama	1	0.50
Poland	1	0.50
Portugal	1	0.50
Russian Federation	2	0.90
Slovakia	1	0.50
South Korea	1	0.50
Sweden	1	0.50
Switzerland	2	0.90
Tunisia	1	0.50
Turkey	1	0.50
United Kingdom of Great Britain and Northern Ireland	2	0.90
Education		
Less than a high school diploma	1	0.50
High school degree or equivalent	67	31.30
Some college, no degree	20	9.30
Associate degree (e.g., AA, AS)	9	4.20

Bachelor's degree (e.g., BA, BSc)	85	39.70
Master's degree (e.g., MA, MSc)	32	15.0
English Proficiency		
Understood the survey not at all	0	0.00
Understood the survey a little bit	1	0.50
Understood the survey somewhat not	0	0.00
Understood the survey not badly nor well	7	3.30
Understood the survey somewhat well	14	6.50
Understood the survey well	59	27.60
Understood the survey extremely well	133	62.1

Appendix C

Main Study Questionnaire

Do you currently reside in the Netherlands?

o Yes

o No

Have you been living in the Netherlands for longer than one year?

o Yes

o No

How were you asked to participate in the study?

o Through online media, such as WhatsApp, Facebook, LinkedIn or e-mail

o Through face-to-face contact

o Other; _____

What is your nationality?

▼ Afghanistan ... Zimbabwe

What is your gender?

o Male

o Female

o Non-binary

What is your age in years?

_____

What is the highest degree or level of education you have completed? If currently enrolled, highest degree received.

o Less than a high school diploma

o High school degree or equivalent

o Some college, no degree

o Associate degree (e.g., AA, AS)

o Bachelor's degree (e.g., BA, BSc)

o Master's degree (e.g., MA, MSc)

o Professional degree (e.g., MD, DDS, DVM)

o Doctorate (e.g., PhD, EdD)

AN ABNORMAL APPLE A DAY, KEEPS FOOD WASTE AT BAY!

On the following page several fruits and vegetables are displayed. Please read the short description and thoroughly observe the fruits and vegetables before answering the questions.

Imagine **you are in the [name supermarket]**. You are walking in the fruit and vegetable department and want to purchase an apple, a carrot, a lemon and an aubergine. When you walk down the aisle looking for these products, you see the foods that are displayed below.

Display of either a normal or an abnormal shaped apple, carrot, lemon and an aubergine.

Take a good look at the fruits and vegetables presented. After 10 seconds, you are able to go to the next page.

In the next pages, several questions will be asked. Please attentively read the questions before answering them. Take into account that you should not think too long about the answers; the first answer is often the best answer.

Please describe your overall feelings of the fruits and vegetables that were displayed.

	Never / Definitely 1 2 3 5 6 7
I would ... purchase these fruits and vegetables.	

	Definitely do not intend / Definitely intend 1 2 3 5 6 7
I ... to purchase these fruits and vegetables.	

	Very low interest / Very high interest 1 2 3 5 6 7
I have a ... in purchasing these fruits and vegetables.	

AN ABNORMAL APPLE A DAY, KEEPS FOOD WASTE AT BAY!

	Definitely not				Definitely
	1	2	3	5	6	7
I would ... purchase these fruits and vegetables.						

	Probably not				Probably
	1	2	3	5	6	7
I would ... purchase these fruits and vegetables.						

AN ABNORMAL APPLE A DAY, KEEPS FOOD WASTE AT BAY!

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I will be satisfied by the taste of the fruits and vegetables.	○	○	○	○	○	○	○
I will be satisfied by the nutritional quality of the fruits and vegetables.	○	○	○	○	○	○	○
I will be satisfied by the sanitary quality of the fruits and vegetables.	○	○	○	○	○	○	○
I will be satisfied by the ease of preparation of the fruits and vegetables.	○	○	○	○	○	○	○
Please respond to this question by clicking 'strongly agree'. This is to check if you read the questions attentively.	○	○	○	○	○	○	○
I will be satisfied by the environmental impact of the production of the fruits and vegetables.	○	○	○	○	○	○	○

AN ABNORMAL APPLE A DAY, KEEPS FOOD WASTE AT BAY!

I will be satisfied by the global quality of these fruits and vegetables.	○ ○ ○ ○ ○ ○ ○

Please describe your overall feelings of the fruits and vegetables that were displayed.

	Very normal 1	2	3	5	6	Very abnormal 7
The fruits and vegetables that were displayed, were ...						

Please choose the answer option you agree with the most.

AN ABNORMAL APPLE A DAY, KEEPS FOOD WASTE AT BAY!

	Strongly disagree	Disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Agree	Strongly agree
The supermarket that sells the fruits and vegetables, is a supermarket one can trust.	○	○	○	○	○	○	○
The supermarket that sells the fruits and vegetables, has a reputation for selling high-quality food products.	○	○	○	○	○	○	○

Which supermarket was selling the fruits and vegetables that were displayed?

o Aldi

o Albert Heijn

o I cannot remember

How well did you understand the English vocabulary used in this survey?

	Not at all					Extremely well
	1	2	3	5	6	7
1						

Appendix D

Factsheet

Dear participant,

I would like to invite you to participate in a research study to be conducted under the auspices of the Graduate School of Communication, a part of the University of Amsterdam.

The study for which I am requesting your cooperation looks into people's food preferences. In the online survey, several fruits and vegetables will be displayed. Afterwards, a few questions will be asked about your preference for these products. In addition, several questions will be asked about your food consumption behaviour. You have to be 18 years old or above in order to be able to cooperate into this study. The goal of this research is to generate insight into the food preferences of people who live in the Netherlands. The survey will take about 6 minutes.

As this research is being carried out under the responsibility of the ASCoR, University of Amsterdam, I can guarantee that:

1) Your anonymity will be safeguarded, and that your personal information will not be passed on to third parties under any conditions, unless you first give your express permission for this.

2) You can refuse to participate in the research or cut short your participation without having to give a reason for doing so. You also have up to 24 hours after participating to withdraw your permission to allow your answers or data to be used in the research.

3) Participating in the research will not entail your being subjected to any appreciable risk or discomfort, the researcher will not deliberately mislead you, and you will not be exposed to any explicitly offensive material.

4) No later than five months after the conclusion of the research, we will be able to provide you with a research report that explains the general results of the research.

For more information about the research and the invitation to participate, you are welcome to contact Rody Le by sending an e-mail to rody.rle@live.nl at any time. Should you have any complaints or comments about the course of the research and the procedures it involves as a consequence of your participation in this research, you can contact the designated member of the Ethics Committee representing ASCoR, at the following address: ASCoR Secretariat, Ethics Committee, University of Amsterdam, Postbus 15793, 1001 NG Amsterdam; 020-525 3680; ascor-secr-fmg@uva.nl. Any complaints or comments will be treated in the strictest confidence.

I hope that I have provided you with sufficient information. I would like to take this opportunity to thank you in advance for your assistance with this research, which I greatly appreciate.

Kind regards,

Rody Le

Appendix E

Informed Consent

I hereby declare that I have been informed in a clear manner about the nature and method of the research, as described in the introduction for this study. I agree, fully and voluntarily, to participate in this research study. With this, I retain the right to withdraw my consent, without having to give a reason for doing so. I am aware that I may halt my participation in the experiment at any time. If my research results are used in scientific publications or are made public in another way, this will be done such a way that my anonymity is completely safeguarded. My personal data will not be passed on to third parties without my express permission.

If I wish to receive more information about the research, either now or in future, I can contact Rody Le by sending an e-mail to rody.rle@live.nl. Should I have any complaints about this research, I can contact the designated member of the Ethics Committee representing the ASCoR, at the following address: ASCoR secretariat, Ethics Committee, University of Amsterdam, Postbus 15793, 1001 NG Amsterdam; 020-525 3680; ascor-secr-fmg@uva.nl.

√ I understand the text presented above, and I agree to participate in the research study and I am 18 years old or above

√ I understand the text presented above, and I do not agree to participate in the research study and/or I am younger than 18

Appendix F

Debriefing

Dear participant,

I would like to thank you for participating in this research study. The study you just cooperated in looks into people's food preferences for normal and abnormal shaped foods. You were randomly selected to see either one of these. The food products are based on real representations on what these foods can look like. Besides this, the study looks into the fact if a supermarket's reputation can influence the way people perceive certain food products. You were randomly selected to read information with either the Aldi or the Albert Heijn mentioned in it. It is possible that the mentioned supermarket does not sell these foods in actual life. The supermarket is in no way affiliated in this research.

Again, I would like to thank you for participating in this research study. In case you would like to talk about this study with others, I would kindly like to ask you if you could do this after their participation in the study.

In case you have any remarks about the study, please write your comments in the text box below.

If you wish to receive more information about the research, either now or in future, you are welcome to contact Rody Le by sending an e-mail to rody.rle@live.nl.

Kind regards,

Rody Le

Appendix G

Main Study's Measurement Model Results

Construct and Scale Items	Factor Loadings	Variance Explained in %	Cronbach's α
Perceived Quality			
I will be satisfied by the taste of the fruits and vegetables.	**.76**	40.31	.78
I will be satisfied by the nutritional quality of the fruits and vegetables.	**.74**		
I will be satisfied by the sanitary quality of the fruits and vegetables.	**.75**		
I will be satisfied by the ease of preparation of the fruits and vegetables.	**.77**		
I will be satisfied by the environmental impact of the production of the fruits and vegetables.	.02		
I will be satisfied by the global quality of the fruits and vegetables.	.35		
Purchase Intention			
I would never/definitely purchase these fruits and vegetables.	**.94**	86.63	.96
I definitely do not intend/definitely intend to purchase these fruits and vegetables.	**.95**		

I have a very low/high in purchasing these fruits and vegetables.	**.92**		
I would definitely not/definitely purchase these fruits and vegetables.	**.94**		
I would probably not/probably purchase these fruits and vegetables.	**.91**		
Firm Reputation			
The supermarket that sells the fruits and vegetables, is a supermarket one can trust.	**.91**	82.34	.78
The supermarket that sells the fruits and vegetables, has a reputation for selling high-quality food products.	**.91**		

Note. Factor Loadings > .45 are in boldface.