Consumer Perception and Evaluation of Packaging:

The effect of consumption goal and perishability on consumer perception of packaging functions for bakery products

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Abstract

The current paper studies how the perishability and usage goal of bakery products influence consumers' perception of packaging. The effect of these function perceptions on different types of packaging evaluation are discussed. This study adds new insights for the perception of bakery product packaging, as current knowledge is limited. Packaging of four different products was kept constant, while a survey measured respondents' perception of the packaging functions and evaluations for one of the four products (n=123).

Results indicate that packaging of perishable products has lower perceived containment. Packaging of utilitarian products has higher perceived containment and convenience. Therefore, the packaging of these products should ensure that those specific functions are present in the packaging. Reported packaging appropriateness was significantly influenced by the respondents' perception of the experiential communication-, convenience-, containment-, and sustainability function. Purchase intention was significantly influenced by both functional- and experiential communication. Lastly, food waste was significantly influenced by the perception of the protective function of the packaging. Correlations occurred between multiple function perceptions, and between the reported packaging appropriateness and purchase intention.

Stakeholders striving to maximize purchase behavior through packaging design should focus on the communicative nature of packaging. In terms of food waste, consumers do appear to possess knowledge regarding the ability of packaging to decrease food waste. However, this knowledge does not influence purchase intention. Driving consumers to take this food waste into account in their purchasing process could be done using the communicative nature of packaging, as this function of packaging is the predominant influence on purchase intention.

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Introduction

Packaging is considered to be an important influence on consumers' perception and evaluation of a product (Underwood, Klein, & Burke, 2001; Agariya, Johari, Sharma, Chandraul, & Singh, 2012). Whereas consumers often have a negative perception of packaging as a whole, opinions on individual packaging solutions are often much more positive as consumers start to perceive and appreciate the different functions of packaging (Rokka & Uusitalo, 2008). One of the reasons why consumers perceive packaging as being something negative is due to the pollution caused by packaging that is disposed improperly, but also because of other types of pollution related to packaging (Rhodes, 2018; French, 2019). For example, packaging might also contribute to pollution through poor design. It has been noted that 20-25% of all food waste in households is caused by packaging that is difficult to empty, is too big, or does not provide sufficient protection after opening (Williams, Wikström, Otterbring, Löfgren, & Gustafsson, 2012). Therefore, it could be important to research how different products are perceived by consumers in terms of packaging functions, and how this influences their final product packaging evaluation including expected food waste.

Generally speaking, packaging has four key functions: protection, communication, containment, and convenience (Robertson, 2013). However, recent recognition of the importance of packaging sustainability has led to the inclusion of sustainability as a fifth packaging function (Azzi, Battini, Persona, & Sgarbossa, 2012; European Organization for Packaging and the Environment, 2019). Sustainability is a broad construct which can be hard to define. In this research, sustainability is considered to encompass the extent to which, in this case packaging, meets the needs of today without inhibiting the needs of future generations (United Nations, 1987).

This could include the usage of natural resources for packaging materials, but also the facilitation of food waste prevention.

Consumers' attitude towards packaging functions is thought to differ based on the product type and the consumers' intention with the specific product. These product types could be perishable or non-perishable, while the consumption goal could be hedonic or utilitarian. Whereas a hedonic product, like cookies, might result in more consumer attention to experiential communication features, a utilitarian product, like bread, might result in more attention to functional communication features (Ampuero & Vila, 2006; Mundel, Huddleston, Behe, Sage, & Latona, 2018). On the other hand, the perishability of a product can result in different consumer perceptions of, amongst others, the protective function of packaging (Tsiros & Heilman, 2005).

Research by French (2019) has shown that some of the key factors which consumers often consider to be more important than sustainability are quality, price, and convenience. However, consumers have shown to prioritize different characteristics for hedonic and utilitarian goods, as well as for perishable and non-perishable products (French, 2019). Specifically, sustainable features are often considered more relevant for utilitarian products than for hedonic products (Maehle, Iversen, Hem, & Otnes, 2015). Besides that, as hedonic purchases are often more experiential and involve emotions, packaging of these products should provide sensory stimulation. In contrast, utilitarian purchases are expected to be more functional, which should be reflected in functional and informative packaging (Batra & Ahtola, 1991; Babin, Darden, & Griffin, 1994; Voss, Spangenberg, & Grohmann, 2003; Maehle et al., 2015; Baltas, Kokkinaki, & Loukopoulou, 2016). It is argued that hedonic purchases are evaluated in a more affective manner, while utilitarian purchases are often evaluated more rationally (Mittal, 1988; Batra & Ahtola, 1991; Babin, Darden, & Griffin, 1994; Voss, Spangenberg, & Grohmann, 2003). In terms of

perishability, existing research regarding consumers' attitudes for packaging functions has shown that the protection and functional communication aspects of packaging are considered more important for perishable than for non-perishable products (Tsiros & Heilman, 2005; Ampuero & Vila, 2006; Fortin, Goodwin, & Thomsen, 2009; Amorim, Costa, & Almada-Lobo, 2014). This difference is thought to occur due to an increase in consumers' perceived risk for perishable products. When it comes to the sustainable function of packaging, consumers often show great differences between their appreciation of sustainable packaging and their actual purchasing behavior (Rokka & Uusitalo, 2008). This incongruence between attitude and behavior could, amongst others, be due to the fact that purchasing decisions are often a trade-off situation between desirable and undesirable aspects (Rokka & Uusitalo, 2008).

Current knowledge in terms of consumer perceptions of packaging functions, including sustainability, is limited. Previous research has focused on the influence of packaging on evaluation (Rokka & Uusitalo, 2008; Luchs & Kumar, 2017). However, the influence of product attributes on the perceptions of most of these functions has remained relatively explored, especially when it comes to product perishability *(*Okada, 2005; Ampuero, & Vila, 2006). Furthermore, although the evaluation of packaging is a more common research interest, the independent contributions of the different functions have been largely ignored (Rokka & Uusitalo, 2008; Luchs & Kumar, 2017). Therefore, this research strives to uncover how product factors, specifically perishability and consumption goal, influence consumers' perception of packaging functions for the same type of packaging. Besides that, the contribution of each of these perceptions to the final evaluation will be discussed. The above has led to the following research question:

RQ: How do product consumption goal and perishability influence consumer perception of packaging functions for bakery products?

Uncovering the influence of specific product characteristics on packaging perception could benefit manufacturers of packaging solutions, as well as stakeholders in food production. By knowing what packaging functions contribute to the overall evaluation in different ways, professionals can design packaging that provides the highest benefit to end users. Furthermore, the knowledge on the effect of specific product characteristics on these packaging perceptions ensures that manufacturers and designers can create packaging that focuses on the functions which are perceived most. Besides that, findings in terms of the contributions of packaging perceptions to food waste could help in developing packaging that could drive consumers to decrease food waste.

The current paper will first explore relevant literature relating to this research question, after which specific hypotheses will be drawn. Next, the methodology will provide an overview of the study design. Lastly, the results of the study are discussed followed by a discussion of these results.

Literature Review

Consumer preferences and priorities for products are very dependent on the purchasing context and the eventual consumption goal (Maehle et al., 2015). Therefore, this literature review will first elaborate on current knowledge regarding general packaging functions, with more in-depth information on the sustainability function. Next, the perception and judgement of packaging functions are explored, along with the effects that perishability and usage goals might have on these. Lastly, a synthesis will elaborate on the underlying relations between the different aspects, highlight the knowledge that is currently lacking, and provide the hypotheses for the current research.

Functions of Packaging

There are three distinct types of packaging, the first of which is primary packaging (Robertson, 2013). Primary packaging is the packaging which the product itself is contained in. This type of packaging is often the packaging that consumers are exposed to and interacting with. Secondary packaging is usually a bundle of primary packages, for example a large cardboard box containing multiple smaller product boxes. The last type, tertiary, is packaging that is mostly used in the large-scale shipment of goods. An example of tertiary packaging would be a shrink-wrapped pallet containing multiple secondary packaging boxes (Robertson, 2013). Although primary packaging tends to be the packaging that is shown to consumer, this is not always the case. For example, packaging of granola bars found in supermarkets often consists of primary packaging and secondary packaging. In this case, the primary packaging could be considered to be the individual wrapper, while the secondary packaging might be the box of individually wrapped granola bars. The current study does not make an active distinction between these types of

packaging, but solely focuses on packaging that consumers are faced with in their purchasing process.

As briefly mentioned before, the key functions of primary packaging are communication, convenience, containment, protection, and sustainability (Azzi et al., 2012; Robertson, 2013; European Organization for Packaging and the Environment, 2019). Each of these functions contributes to the consumers' purchasing decision in a different way, which is why these separate functions are briefly explored.

Communication. The communication function of packaging has been argued to be a key marketing tool for businesses to attract consumers' attention (Underwood, Klein, & Burke, 2001; Agariya, Johari, Sharma, Chandraul, & Singh, 2012). Furthermore, packaging is used to inform shoppers of a products' attributes (Underwood & Klein, 2002). Examples of the communication function can be packaging design, colors, and fonts used. Moreover, information such as a products' expiry date and nutritional labels are also considered to be a part of the communication function (Agari et al., 2012). In this research a distinction is made between the experiential communication aspect of packaging and the functional communication of packaging. The experiential dimension includes those aspects that strive to engage the emotions and provide the consumer with pleasure, whereas functional communication includes aspects that aim to objectively inform the consumer on functional benefits, such as expiry dates and nutritional content (Schmitt, 1999). In research by Agariya et al. (2012), communication, both functional and experiential aspects, was found to have a significant effect on consumers' purchasing behavior.

Convenience. Most convenience attributes of packaging revolve around the ease of handling, use, and disposal (Agariya et al., 2012). For example, packaging should be sized in a way that is appropriate for the expected use and might have to be resealable to ensure easy storage

between uses (Berk, 2009; Agariya et al., 2012). Similar to communication, convenience of product packaging was of significant influence on the consumers' eventual purchasing decision (Agariya et al., 2012).

Containment. In order to transport a product, it is important that the packaging successfully contains the product without spilling or leaking (Berk, 2009; Robertson, 2013). If product contents would spill this could result in annoyance for the consumer or be damaging to the environment. The extent to which packaging has to contain a product differs on the specific product.

Protection. Whereas the containment function aims to minimize pollution caused by the product, the protection function is meant to preserve the product itself (Berk, 2009; Robertson, 2013). For example, canned goods should be sealed properly and not let oxygen through, otherwise the product would spoil much sooner than expected. Furthermore, the protection function also entails the physical protection of the product (Berk, 2009). For example, a carton of eggs aims to mitigate the risk of the eggs breaking before usage. It has previously been established that the ability of packaging to extend the 'best before' date is considered to be consumers' preferred packaging attribute (Koutsimanis, Getter, Behe, Harte, & Almenar, 2012).

Sustainability. In general, sustainable packaging has been defined by the Sustainable Packaging Coalition (2011) as packaging that is produced and designed to optimize material usage, while utilizing renewable energy and clean production processes. Furthermore, the packaging materials should be recoverable post-usage while being (cost-)efficient. While this definition might provide a base for sustainable packaging, it does not regard the interaction between the packaging and the actual product itself (Pauer, Wohner, Heinrich, & Tacker, 2019). As there are

some ambiguities in the sustainability function of packaging this aspect will be elaborated upon below.

Sustainability of Packaging

The sustainability function of packaging is often considered without regards for the interaction between packaging and the food product. This absence of the product dimension of packaging is consistent with many life cycle assessments that have been executed. These life cycle assessments can provide valuable information on the extent to which packaging is sustainable, albeit excluding product interactions such as the role of packaging on food waste. This interaction between packaging and food waste might be important, as it is estimated that 20-25% of all household food waste is potentially caused by packaging. Specific causes for this waste are, for example, packaging that is too large, or packaging that is difficult to empty (Williams & Wikström, 2011; Williams, Wikström, Otterbring, Löfgren, & Gustafsson, 2012; Wikström et al., 2013; Wikström et al., 2014; Aschemann-Witzel, de Hooge, Amani, Bech-Larsen, & Oostindjer, 2015). However, as food waste has not yet been included in most LCA's, it is difficult to assess the interaction between packaging materials and food waste for specific products.

Different LCA's have shown that carton-based options tend to be most sustainable, whereas glass is often the least sustainable option (Humbert, Rossie, Margni, Jolliet, & Loerincik, 2008; Zabaniotou & Kassidi, 2013; Steenis, van Herpen, van der Lans, Lighthart, & van Trijp, 2017). While glass is one of the least sustainable materials according to LCA's, consumers often assume it is the most sustainable option (Humbert et al., 2009; Steenis et al., 2017). These ambiguities in packaging sustainability mostly arise from a lack of knowledge of consumers. However, even when consumers are knowledgeable it is assumed that they often do not behave

according to their knowledge and preference for sustainability (Rokka & Uusitalo, 2008; Young, Hwang, McDonald, & Oates, 2010; Grunert et al., 2014; Steenis et al., 2017). One third of consumers consider sustainable packaging to be the most important packaging attribute (Rokka, & Uusitalo, 2008). However, these consumers do not have a preference for materials that will be recycled or will end up in landfill (Koutsimanis et al., 2012). Besides that, there are some factors which are more salient than sustainability for the majority of consumers. Maehle et al. (2015) shows that consumers often prioritize price and taste over product sustainability in a purchasing decision. Besides that, similar research by Agariya et al. (2012) has shown that the sustainability function of packaging generally does not affect consumers' purchases at all.

Consumer Perception of Packaging

Consumers base their product evaluations and purchasing decisions on their perceptions of a product, or on a pre-existing attitude. In this perception formation consumers often solely base their perception of a product on its packaging, as the product itself is not visible (Ampuero, & Vila, 2006). The perception process works through the registration of sensory information, which is then combined with knowledge or emotion (Johnson & Stewart, 2005; Krishna, 2009). As each individual has their own specific set of knowledge and prior experiences, perceptions are also person specific (Hamlyn, 1957). These subjective perceptions could possibly result in individuals' perceptions being inaccurate interpretations of the truth (Hamlyn, 1957; Kardes, Posavac, Cronley, & Herr, 2008; Solomon, & Bamossy, 2013). Therefore, it would be interesting to see to what extent packaging perceptions are affected by product characteristics, such as consumption goal and perishability, as this could showcase the flexibility of perceptions.

Consumer perceptions in the purchasing context are mostly focused on extrinsic search attributes such as product type, packaging, and price (Ragaert, Verbeke, Devlieghere, & Debevere, 2004). An example of the perception in the purchasing context would be consumers' use of visual sensory information to deduce the size of a package and its contents. This visual sensation is processed and leads to an understanding and evaluation of the specific product size. The extent to which the different packaging functions are perceivable by the consumer might differ. For example, while the communication aspect is mostly conveyed through visuals, the perception of the protective function of the packaging could be the result of haptics when the consumer touches the packaging and feels the sturdiness of the material. Besides vision and haptics, the other sensory receptors are olfaction, audition and taste (Krishna, 2012). Information received from these sensory stimuli is inferred by consumers, which is often done based on the categories which a product belongs to (Kardes et al., 2008).

Once the stimuli have been perceived, the consumer is thought to engage in either experiential/affective processing or more rational/cognitive processing (Holbrook & Hirschmann, 1982**;** Holbrook, 1986**;** Knox, 2000; Fiore & Kim, 2008). These two different types of processing have also been called 'system 1' processing for the fast/affective kind, and 'system 2' for the more deliberate/logical one (Kahneman, 2011). These different processing types might lead to different types of information being the most salient. Specifically, consumers utilize objective factors in rational processing and subjective factors in the affective processing (Knox, 2000). For example, the functional communication of packaging could include expiry dates and nutritional information, both of which can be interpreted objectively. On the other hand, slogans and catchphrases such as 'farm fresh' would be considered a part of the experiential communication function, which is more salient in a subjective appraisal.

A key distinction in consumers' food purchases is the difference between hedonic and utilitarian products. Purchasing hedonic goods is thought to involve more experiential shopping, unplanned purchases, and thus system 1 type processing. Utilitarian goods involve more information processing and rational considerations, which is more like the system 2 type of processing (Mittal, 1988; Batra & Ahtola, 1991; Babin, Darden, & Griffin, 1994; Voss, Spangenberg, & Grohmann, 2003). In purchases made for hedonic purposes, it might be the case that the automatic and unconscious system 1 processing inhibits the extent to which a consumer perceives certain utilitarian functions of food packaging, such as protection. In the meantime, it could reinforce the perception of hedonic functions such as packaging appearance, which is part of the experiential communication function.

In the purchasing process consumers have differing priorities when it comes to hedonic or utilitarian products. For example, people are willing to pay more in terms of time for hedonic goods, whereas they are willing to pay more money for utilitarian goods (Okada, 2005). Packaging of both utilitarian and hedonic products is considered to be an important marketing tool to communicate branding and product benefits. However, research has shown that consumers generally spend more time looking at the packaging of hedonic products than at the packaging of utilitarian products (Ampuero & Vila, 2006; Mundel, et al., 2018). This is reiterated by Underwood et al. (2001) who show that hedonic products can benefit from using more experiential communication functions, such as engaging graphics and product pictures, to drive consumers' attention. This difference in attention to the communicative function of packaging again signals the possibility of the usage goal influencing the perceptions of a products' packaging functions.

Another factor which might influence the perception of packaging functions is the products' perishability. Perishable food products are those that undergo a deterioration in quality

in a relatively limited amount of time, such as fresh produce (Farahani, Grunow, & Günther, 2012). The perishability of a food product is likely to affect consumer perception of, inter alia packaging attributes, due to the differences in marketing practices and consumer expectations of perishable and non-perishable food (van Trijp & Meulenberg, 1996; Ali, Kapoor, & Moorthy, 2010). While the differences in the consumer perception of packaging functions of perishable and non-perishable food packaging have not been researched very extensively, there are some general findings. For example, it has been shown that consumers are often more concerned with the protective function of packaging for food products with a high perishability, such as bread, than products with a lower perishability, like rice cakes (Tsiros & Heilman, 2005). The existing research that has been executed regarding perishability has mostly focused on the technical aspects of the packaging of perishable foods, and consumers' willingness to pay for products nearing their expiry date (Tsiros & Heilman, 2005; Fortin et al., 2009; Amorim et al., 2014).

Whereas these product factors can independently influence the perceptions of packaging functions, it is important to realize that consumers do not, in a natural setting, assess their perceptions distinctly. This is also a common idea in gestalt psychology, a school of psychology created in the early 20th century. The key idea in gestalt theory is that humans do not perceive an object as a bundle of separate aspects, but a unified singular item (Hamlyn, 1957; Guberman, 2017). In the perception of packaging, gestalt theory would mean that consumers do not consciously differentiate between the different packaging functions, but perceive it as a whole. Similarly, following gestalt theory the product could then also be assumed to be a part of the perception of the packaging, as the product and packaging combined are then the perceptive object. Because the product would be perceived as one with the packaging, it is likely that the product would then influence the perception of the packaging functions.

Consumer Evaluation of Packaging

Using the rational and/or affective processing techniques consumers aim to understand and evaluate a specific product. Along with other factors, such as perceived behavioral control, this evaluation leads to purchasing intention and eventually purchasing behavior (Ajzen, 1991). The perceptions of the different functions of packaging lead to different evaluations of the packaging as a whole.

As each packaging function has specific benefits, the evaluation of the packaging involves trade-offs between different more- and less desirable product aspects (Rokka & Uusitalo, 2008; Luchs & Kumar, 2017). However, the attitude resulting from the evaluation is often incongruent with consumers' eventual behavior. One of the reasons for this gap between attitude and behavior could be a low correspondence between attitudinal and behavioral entities (Ajzen, & Fishbein, 1977). These so-called entities are comprised of the action towards which an attitude or behavior is formed, along with the target, context, and time of the action. For example, sustainability could have a prevalent role in the evaluation and attitude formation of a consumer. But if the context of a hedonic purchase does not correspond with this attitude, the behavior will likely not be congruent with the attitude. The premise that sustainability is less important in the evaluation of hedonic products than in the evaluation of utilitarian products has been reiterated by Maehle et al. (2015).

Evaluation in itself is a complex construct, as consumers' evaluations often include many different cognitive processes (Boccia, Manzo, & Covino, 2019**)**. Consumer evaluations are also called judgements, which is similar to the 'judgement' stage of Brunswik's lens model (Orquin, 2014). This final judgement is comprised of various evaluative judgements, affective judgements, and perceived appropriateness (Howard, & Sheth, 1969**;** Ajzen, 1991). These judgements and the appropriateness are considered to provide intentions and beliefs regarding the target of the initial

evaluation or judgement (Howard, & Sheth, 1969**;** Ajzen, & Fishbein, 1975; Jahn, Tsalis, & Lähteenmäki). The current research has a similar assumption as the lens model, as it considers consumers' perception of certain packaging characteristics to be influenced by specific product attributes. These perceptions are then combined to form the consumers' general evaluation of the product. For example, a consumer might perceive a specific packaging to be very protective based on the materials used. This high assumed protection aspect will then be one of the considerations used in the overall product evaluation.

Besides the similarity to the lens model, Fishbein and Ajzen's (1975) expectancy-value model of attitudes also provides a basis. Their model argues that an individuals' attitude towards a behavior is comprised of the sum of beliefs regarding this behavior, and subjective evaluation of these beliefs (Fishbein, & Ajzen, 1975). Furthermore, Fishbein and Ajzen also assume that consumers form beliefs regarding a product based on the extent to which it is associated with certain desirable attributes. In this research, this idea is followed as it is assumed that consumers' overall belief and attitude regarding product packaging is formed by the sum of the beliefs to which the product packaging is expected to fulfill its functions.

Synthesis

Product perishability. From the literature above it seems that perishability has a direct influence on the packaging perception of consumers (van Trijp & Meulenberg, 1996; Ali, Kapoor, & Moorthy, 2010). However, most existing research has not elaborated on the differences in the perception of the specific packaging functions. The key difference that has been researched more extensively is consumers' risk perception of products. This perceived risk has been said to lead to consumers being more focused on both the protective attributes of packaging, and the functional

communication such as expiry or manufacturing dates (Tsiros & Heilman, 2005). Therefore, it is assumed that a perishable food product will increase the consumers' perception of the functional communication and protection function of packaging, compared to a non-perishable food product with the same packaging. The above has led to the following two hypotheses:

H1: Product perishability increases the perception of the functional communication function of packaging.

H2: Product perishability increases the perception of the protection function of packaging.

There is reason to believe that product perishability will also influence the remaining functions of packaging (van Trijp & Meulenberg, 1996; Ali, Kapoor, & Moorthy, 2010). However, since these functions have not been investigated, the influence of product perishability on the remaining functions of packaging will be examined through a more exploratory approach. This exploratory component will focus on the following sub-question:

Does the perishability of a bakery food product influence the consumers' perception of the experiential communication, convenience, containment, and sustainability functions of packaging?

Product consumption goal. Besides the perishability of a product, this paper includes the product consumption goal as a second independent variable. The extent to which a product is hedonic or utilitarian is thought to influence a consumers' perceptions through the perceptive

process which the consumer engages in (Batra & Ahtola, 1991; Babin, Darden, & Griffin, 1994; Voss, Spangenberg, & Grohmann, 2003). For example, research argues that consumers are more likely to perceive the communicative function of packaging when the product is meant for hedonic consumption (Ampuero & Vila, 2006; Mundel, et al., 2018). These hedonic goods lead to consumers being more likely to perceive affective benefits, such as the attractiveness packaging, which are largely provided by the experiential communication function. On the other hand, the utilitarian foods are assumed to lead to higher perceptions of more rational functions including the protective, convenience, and containment functions of packaging (Ampuero & Vila, 2006; Avery Dennison, 2018; Mundel, Huddleston, Behe, Sage, & Latona, 2018). These findings from literature have provided the following hypotheses:

H3: Product utilitarianism increases the perception of the functional communication function of packaging.

H4: Product hedonism increases the perception of the experiential communication function of packaging.

H5: Product utilitarianism increases the perception of the convenience function of packaging.

H6: Product utilitarianism increases the perception of the containment function of packaging.

H7: Product utilitarianism increases the perception of the protection function of packaging.

The perception of the packaging sustainability function is considered to be influenced by the consumers' attributed importance of this function. It is assumed that specific factors of a product are perceived as being larger when these factors contribute to the attainment of a goal (Veltkamp, Aarts, & Custers, 2008). Furthermore, the majority of consumers can be confronted with feelings of guilt when they deliberately purchase non-sustainable products (Luchs, Brower, & Chitturi, 2012; Onwezen, Bartels, & Antonides, 2013). In the context of a hedonic product these feelings are incongruent with the goal, which is to have an emotionally pleasurable experience (Schmitt, 1999). Therefore, the combination of consumers' search for pleasurable experiences in hedonic products, and the positive effect that sustainability has on this pleasure, would arguably lead to perception of sustainability to be higher in the context of a hedonic purchase. Therefore, the following hypothesis aims to test this relation between product consumption goal and the perception of the sustainable function of packaging:

H8: Product hedonism increases the perception of the sustainability function of packaging.

Interactions between perishability and consumption goal. Besides the main effects that are expected to occur, interactions between perishability and consumption goal could also influence the perception of the packaging functions. Interactions effects are effects that are caused by two variables interacting in a certain way (Lavrakas, 2008). For example, the perishability and consumption goal separately might not have any significant effects on the perception of functions. But, if the combination of a perishable product meant for utilitarian consumption leads to a significant effect, then this might indicate an interaction effect between perishability and consumption goal. However, similar to the influence of perishability on perception, interaction

effects have not been studied. For this reason, the possible interaction effect of these two variables will be another explorative aspect of the current research. This has been formulated in the following sub-question:

> *To what extent does an interaction effect occur between product perishability and consumption goal in their possible effect on packaging function perception?*

Evaluation. The evaluation of product packaging is largely based on the perception of the packaging functions. This seems similar to the general relationship found in Brunswik's lens model, which highlights the relationship between 'cues', which would be the packaging perceptions, and a 'judgement', which would be the final evaluation (Orquin, 2014). As shown in the literature review, consumer judgements are comprised of many different evaluative dimensions. Generally, various packaging functions have already proven to influence the packaging evaluation significantly. Firstly, experiential communication and functional communication are both positively related to the packaging evaluation (Silayoi, & Speece, 2007; Agariya et al., 2012). Next, the convenience, containment, and protection function of packaging have been investigated by Avery Dennison, a global packaging manufacturing company, which has shown that all these functions positively influence consumers evaluation of packaging (Avery Dennison, 2018). These positive influences of convenience, containment, and protection have also been shown in literature (Silayoi, & Speece, 2007; Raheem, Vishnu, & Ahmed, 2014). Lastly, the sustainability function of packaging provides more ambiguity in the extent to which it influences a consumers' evaluation. On the one hand, sustainability is considered to positively influence a consumers' attitude (Rokka & Uusitalo, 2008; Wikstrom et al., 2014). However, it is believed that

sustainability does not affect the eventual purchasing decision (Agariya et al., 2012; Maehle et al., 2015). As this paper considers packaging evaluation prior to purchase, it seems appropriate to assume that, following Rokka & Uusitalo, sustainability positively influences the consumer evaluation of packaging. The above has led to the following hypotheses, which are also included in the Conceptual Framework (Figure 1):

H9: The perception of the functional communication function of packaging is positively related to the packaging evaluation.

H10: The perception of the experiential communication function of packaging is positively related to the packaging evaluation.

H11: The perception of the convenience function of packaging is positively related to the packaging evaluation.

H12: The perception of the containment function of packaging is positively related to the packaging evaluation.

H13: The perception of the protection function of packaging is positively related to the packaging evaluation.

H14: The perception of the sustainability function of packaging is positively related to packaging evaluation.

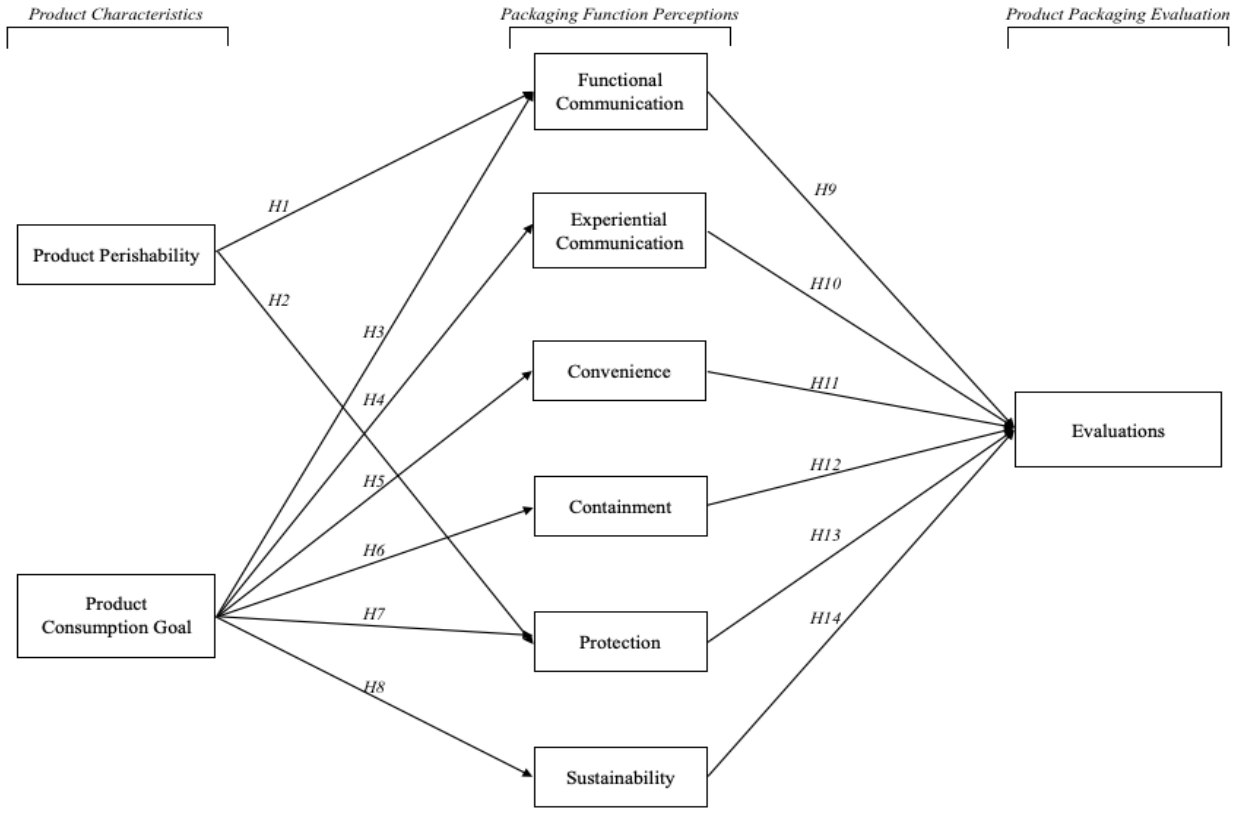

Figure 1: Conceptual Framework

Methodology

Design

The two independent variables included in the study, perishability and consumption goal of the product, are categorical variables with 2 levels. Therefore, the research has a 2x2 between-group factorial design, which measures outcomes based on the combinations of these two categorical variables (Gacula, & Singh, 1984). The current research uses one sample, in which respondents are randomly assigned to one of four surveys. Each survey is specific to a combination of the two independent variables. These are consistent with the product picture which the respondents are shown. Surveys are a commonly used technique in investigating consumer perceptions of packaging (Silayoi, & Speece, 2007; Rokka, & Uusitalo, 2008; Agariya et al., 2012; Koutsimanis et al., 2012; Steenis et al., 2017).

Sample

The study utilizes a convenience sampling method, which is a method based on the ease of access to the respondents (Ritchie, Lewis, & Elam, 2003; Lavrakas, 2008). Convenience sampling has also been used in many similar research settings (Silayoi, & Speece, 2007; Agariya et al., 2012; Koutsimanis et al., 2012; Steenis et al., 2017). Besides that, this type of sampling is deemed relevant as the objective of the study is to uncover the differences in perception for products differing in terms of perishability and consumption goal, without aiming to uncover the role of individual factors in this. As the individual factors, such as demographics, are not expected to interact with any of the relevant variables of the study, the differences between a convenience sample and a random sample are likely to be minimal (Etikan, Musa, & Alkassim, 2016).

Stimuli

The stimuli consist of the two independent variables: perishability, and consumption goal. These stimuli are provided to the respondents as pictures in the survey, which will display either a hedonic/perishable product, hedonic/non-perishable product, utilitarian/perishable product, or a utilitarian/non-perishable product. Four products were initially selected for the pilot of the survey (n=8). However, the respondents' categorization of these four products in terms of consumption goal and perishability did not correspond with the anticipated categorization. Specifically, the selected utilitarian/non-perishable product was perceived as being hedonic, while the hedonic/perishable product was perceived as being non-perishable. Therefore, a pretest (n=9) with a larger set of 12 products was executed, which resulted in a different set of final products which are used in the final survey (Appendix 1). These products are bread, rice cakes, biscotti (also called cantucci), and apple turnovers.

As shown in Table 1, packaging of the products is kept constant, except for the product name on the label, and the food-item shown in the picture. The packaging used ensures the presence of all functions. Firstly, the functional communication is provided through a list of ingredients. These ingredients have been made unintelligible to ensure the actual ingredients do not affect the perception or evaluation. Next, the experiential communication function is provided through a picture of a smiling woman consuming the specific product. This approach to communicating affect and emotion has also been used in prior research (Liao, Corsi, Chrysochou, & Lockshin, 2015). The convenience function of the packaging has been included with double wire twist tie closures, which provides easy opening and resealing. Containment of the product is simply provided by showing an intact and closed plastic packaging, which is also deemed to provide the consumer with a perception of the protection function. Lastly, the sustainability

function has been provided through green icons, which is thought to provide the consumer with a sense of sustainability.

Table 1: Stimuli

Consumption Goal	Perishable	Non-perishable
Utilitarian	Bread	Rice Cakes
		
Hedonic	Apple Turnovers	Biscotti
		

Measures

Firstly, the survey measured the respondents' perception of each of the different packaging functions for the specific product which they were randomly assigned to. The perception of experiential communication was measured by the extent to which the respondent perceived the packaging to have a pleasant appearance (Hedge, & Stanton, 1998; Schmitt, 1999; Underwood, Klein, & Burke, 2001; Magnier, Schoorman, & Mugge, 2016). Next, the perception of the functional communication aspect was assessed through two questions. These questions focused on the product's ingredients and expiry date, which are two common parts of functional

communication (Berk, 2009). The convenience function has been operationalized as the expected ease of use in terms of packaging size, and the ease with which consumers can open the packaging (Stanton, 1998; Williams et al., 2012; Robertson, 2013). With regard to containment, the primary specific application for consumers is convenience during storage and transport, both of which have been included in the survey (Hedge, & Stanton, 1998; Berk, 2009; Williams et al., 2012; Robertson, 2013). The perception of the protection function revolves around both the shelf life extension, and the protection from external bacteria and other pollutants. Consequently, the survey included questions for both of these dimensions, using questions which have been adapted from Chang & Chen (2009). Lastly, the sustainability function is thought to include many different aspects. Packaging material sustainability and packaging disposal sustainability are two aspects which have proven important in the literature review. Therefore, these aspects were included in the survey using questions adapted from Magnier, Schoorman, and Mugge (2016) (Table 2). The answers to all perception statements were provided on a 7-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. The survey questions, including the Dutch translations, are provided in Appendix 2: Survey Questions. A pilot study (n=8) was executed to test respondents' understanding of the questions, and to test the validity of the items using Cronbach's alpha. Although respondents did not report any ambiguities, the Cronbach's alpha was deemed too low for two items ($\alpha<0.6$), resulting in the deletion of these items from the survey. These specific items were part of the measurement for experiential communication ($\alpha=.487$) and convenience ($\alpha=.598$). The statements deleted were regarding consumption enjoyment for the experiential communication, and the ease of closing the packaging for the convenience function. Items with $\alpha>0.6$ were deemed sufficiently accurate, as a relatively low Cronbach is inherent to surveys that

have a small number of test items (Tavakol, & Dennick, 2011). The specific Cronbach alpha for the different perception aspects are included in table 2.

Table 2: Perception Questions

Perception of	Term	Statement	Cronbach α
Experiential Communication	Pleasure from appearance	This package is attractive	n/a
Functional Communication	Ingredients	This package provides information regarding the products' ingredients	.621
	Expiry date	This package provides information regarding the products' expiry date	
Convenience	Size	This package has a convenient size	.974
	Easy open	This package seems convenient to open	
Containment	Efficient transportation	This packaging will contain the product during transportation	.711
	Efficient storage	This packaging will contain the product during storage	
Protection	Shelf life	This packaging increases the products' shelf life	.886
	Bacterial, etc., protection	This packaging protects the product from bacteria and other external pollutants	
Sustainability	Packaging material	This packaging material is sustainable	.823
	Packaging disposal	This packaging allows for sustainable disposal	

As the evaluative dimension is rather complex, it was operationalized in three separate dimensions (Table 3). Firstly, the evaluation in terms of subjective packaging appropriateness was measured. Then, the respondents were asked about their intention to buy the product package. This purchase intention has been said to be the consumers' prediction for a future state (Howard, & Sheth, 1969). Lastly, respondents were asked about the expected food waste, which may or may not be influenced by the packaging functions. Similar to purchase intention, expected food waste could be considered as a belief or prediction regarding the probability that something will happen (Ajzen, 1991). The item on appropriateness, which has been adapted from Elzeman, Hoek, van Boekel, & Luning (2011), was answered using a 7-point Likert scale ranging from 'very

inappropriate' to 'very appropriate'. Purchase intention was measured using a question from Wu and Holsapple (2014) and used the same 7-point likert scale ranging from 'strongly disagree' to 'strongly agree'. Expected food waste was included in the survey using a question from Wan (2019), using a 7-point scale ranging from 'none' to 'everything'.

Table 3: Evaluative Questions

Evaluative dimension	Questions
Packaging Appropriateness	How appropriate do you find this packaging for this product?
Purchase Intention	Assuming I would purchase *product*, I would purchase the product displayed above.
Expected Food Waste	Considering you would buy this product, how much of the product do you expect to throw away?

As the survey strived to uncover the differences in packaging perceptions for different products in the same packaging, it is important to control for product liking, as this might influence the perception of packaging factors and the packaging evaluation. For example, if a respondent has high aversion to one of the products, their evaluation of the packaging will likely be more negative than if it had been a product that they liked. Therefore, five different questions were included in the survey to allow for controlling product liking in the analysis (Table 4) (Hedge, & Stanton, 1998; Bredahl, 2001; Finger, 2016).

Table 4: Product Liking Questions

Measure	Questions
Opinion	What is your general opinion of *product*?
Flavor	I enjoy the taste of this product.
Healthiness	*Product* is a healthy product.
Consumption Experience	I enjoy the experience of consuming *product*
Purchase Frequency	How often do you purchase *product*?

In the final part of the survey respondents were asked to provide basic demographic information. This demographic information consisted of the respondents' gender, age and education level.

Data Analysis

The two independent variables (perishability and consumption goal) are both dichotomous variables. The dependent variables in this research are considered as continuous data, as the datapoints are sourced from multiple items in the survey. In order to test the different hypotheses, the first analysis will focus on the effect that perishability and consumption goal might have on the perception of the packaging functions. This is analyzed using a factorial MANOVA, which provides insights into both the main effects and the interaction effects of perishability and consumption goal on perception. A factorial MANOVA is useful for this type of analysis as it is able to test for mean differences in the responses of different groups (French, Macedo, Poulsen, Waterson, & Yu, 2008). The second analysis will test the effects of the packaging function perception on the different evaluative variables, utilizing a multiple regression. As the evaluation of product packaging is likely to be influenced by the respondents' liking of the product itself, general product liking is measured in the survey and controlled for in the multiple regression.

Results

In the first part of this chapter data on the influence of the independent variables (usage goal and perishability) on the perception of packaging is provided. Next, the outcomes of the survey (n=123) regarding the extent to which function perceptions contribute to different evaluative aspects are shown. Lastly, relevant secondary results are discussed.

Influence of Product Characteristics on Packaging Function Perception

Hypotheses one through eight were tested using a factorial MANOVA, using the product characteristics (perishability and usage goal) as independent variables and the different function perceptions as dependent variables. The observed means of the test are shown in table 5: Observed Means. The multivariate test was conducted using Wilks' Lambda, which shows that perishability does not significantly influence overall packaging function perception $F(6,114)=2.148$, $p=.053$, $\eta^2=.102$. The product's usage goal also does not provide a significant effect on packaging function perception $F(6,114)=2.086$, $p=.060$, $\eta^2=.099$. Furthermore, no interaction effect has seemed to occur between the two independent variables $F(6,114)=2.028$, $p=.067$, $\eta^2=.096$.

Table 5: Observed Means of Function Perceptions (SD)

Product Characteristic	Experiential Communication	Functional Communication	Convenience	Containment	Protection	Sustainability
Perishable						
Hedonic	2.636 (1.410)	4.061 (1.514)	4.833 (1.021)	4.606 (1.402)	4.379 (1.111)	2.924 (1.353)
Utilitarian	3.188 (1.378)	3.672 (1.235)	5.406 (0.777)	5.234 (1.178)	4.438 (1.598)	3.188 (1.349)
Non-Perishable						
Hedonic	3.379 (1.781)	3.672 (1.128)	5.207 (1.013)	5.000 (1.210)	3.948 (1.478)	3.239 (1.340)
Utilitarian	3.379 (1.545)	4.672 (1.502)	5.379 (1.115)	5.776 (1.005)	4.414 (1.598)	3.672 (1.270)

As the factorial MANOVA shows p-values which are very close to being significant, it could be useful to look at the influences of the product aspects on the specific function perceptions.

Testing the effect of product characteristics in a univariate manner shows various significant effects (Table 6). Firstly, perishability affects the perception of the containment function $F(1,119)= 4.555$, $p=.035$, $\eta^2=.037$, in which the containment function is perceived higher for non-perishable products than for perishable products. Next, usage goal affects both the perception of convenience $F(1,119)= 4.380$, $p=.038$, $\eta^2=.035$, and the perception of containment $F(1,119)= 15.107$, $p=0.002$, $\eta^2=.079$. Specifically, the packaging of utilitarian products was perceived as being more convenient, and able to contain the product more effectively than the packaging of hedonic products. An interaction effect was found when looking at perception of specifically functional communication $F(1,119)= 8.012$, $p=.005$, $\eta^2=.063$. This interaction effect shows that non-perishable utilitarian product packaging has the highest perceived functional communication (M=4.672), followed by the packaging of perishable hedonic products (M=4.061). The packaging of both perishable utilitarian products and non-perishable hedonic products have the lowest perceived functional communication (M=3.672).

Table 6: Estimated Marginal Means

Product Characteristic	Experiential Communication	Functional Communication	Convenience	Containment	Protection	Sustainability
Perishability						
Non-Perishable	3.379	4.172	5.293	5.388	4.181	3.483
Perishable	2.912	3.866	5.120	4.920	4.408	3.056
Mean Difference	0.467	0.306	0.173	0.468*	-0.227	0.427
Usage Goal						
Hedonic	3.008	3.867	5.030	4.803	4.164	3.109
Utilitarian	3.283	4.172	5.393	5.505	4.426	3.430
Mean Difference	-0.276	-0.306	-0.373*	-0.702**	-0.262	-0.321

* . Significant at the .05 level
**. Significant at the .005 level

Based on the data above, no evidence was found that confirms hypotheses H_1, H_2, H_3, H_4, H_7, and H_8, while supporting evidence was found for H_5 and H_6.

Influence of Packaging Function Perception on Evaluation

The multiple regressions of packaging function perceptions on the different evaluative dimensions, while controlling for the variables such as product liking, shows different significant relationships. The perception of packaging functions has a significant effect on packaging appropriateness $F(11,111)=6.920$, $p<.001$, $R_2=.407$, and purchase intention $F(11,111)=1.170$, $p<.001$, $R_2=.390$. No significant effect was found for the general influence of the packaging function perceptions on the expected food waste $F(11,111)=6.464$, $p=.316$, $R_2=.104$. These specific results will be discussed per evaluative dimension.

Packaging Appropriateness. Packaging appropriateness is generally significantly influenced by the extent to which a respondent perceives the experiential communication function of the packaging. Of the different function perceptions, experiential communication, convenience, containment, and sustainability all have significant effects on packaging appropriateness (Table 7).

Table 7: Function Perception Effects on Packaging Appropriateness

Perceptive Dimension	Unstandardized β	Std. Error
Experiential Communication	.262**	.860
Functional Communication	.008	.900
Convenience	.273*	.134
Containment	.210*	.104
Protection	-.006	.097
Sustainability	.246*	.098

* . Significant at the .05 level
**. Significant at the .005 level

Purchase Intention. The perception of packaging functions combined significantly influence respondents' reported purchase intention. In terms of the function specific perceptions,

only the perception of experiential communication and functional communication affect the individuals' purchase intention (Table 8).

Table 8: Function Perception Effects on Purchase Intention

Perceptive Dimension	Unstandardized β	Std. Error
Experiential Communication	.450**	.090
Functional Communication	.187*	.095
Convenience	.130	.141
Containment	-.023	.109
Protection	.197	.102
Sustainability	.124	.103

* . Significant at the .05 level
**. Significant at the .005 level

Expected Food Waste. The general influence of function perceptions on expected food waste was found non-significant. However, looking at the influence of the individual functions it becomes apparent that the perception of the protection function of packaging does significantly affect the expected food waste (Table 9).

Table 9: Function Perception Effects on Expected Food Waste

Perceptive Dimension	Unstandardized β	Std. Error
Experiential Communication	.047	.092
Functional Communication	.073	.097
Convenience	-.077	.144
Containment	-.113	.112
Protection	-.270*	.104
Sustainability	.047	.105

* . Significant at the .05 level

Based on the data shown above there is no evidence that supports H_9, H_{10}, H_{11}, H_{12}, H_{13}, and H_{14}, as none of the function specific perceptions seem to influence all of the different evaluative dimensions.

Secondary Results

In addition to the hypothesized relationships, and the exploratory aspects of the research, the results provide various interesting insights.

Influence of Product Characteristics on Evaluation. A factorial MANOVA was executed using perishability and usage goal as independent variables, and the evaluative dimensions as dependent variables (Table 10 and 11). This showed significant relationships of both perishability, $F(3,117)=2.885$, $p=.039$, $\eta^2=.069$, and usage goal, $F(3,117)=11.212$, $p<.001$, $\eta^2=.223$, on the evaluations. There was no interaction effect found for perishability and usage goal on the evaluation $F(3,117)=1.021$, $p=.386$, $\eta^2=.026$. Looking at the influence of the product characteristics on the different evaluative dimensions shows that, once considered separately, perishability and usage goal do not equally influence all evaluations. In terms of perishability, it is only significantly related to the reported packaging appropriateness $F(1,119)= 4.978$, $p=.028$, $\eta^2=.040$. Usage goal appears to significantly influence packaging appropriateness, $F(1,119)= 25.043$, $p<.001$, $\eta^2=.174$, and purchase intention, $F(1,119)= 13.420$, $p<.001$, $\eta^2=.101$.

Table 10: Estimated Means: Influence of Product Characteristics on Evaluations

Product Characteristic	Appropriateness	Purchase Intention	Expected Waste
Perishability			
Non-Perishable	4.431	3.862	2.310
Perishable	3.842	3.346	2.016
Mean Difference	0.589*	0.516	0.295
Usage Goal			
Hedonic	3.476	3.077	1.983
Utilitarian	4.797	4.130	2.343
Mean Difference	-1.320**	-1.053**	-0.360

*. Significant at the .05 level
**. Significant at the .001 level

Table 11: Observed Means of Packaging Evaluations (SD)

Evaluative Dimension	Appropriateness	Purchase Intention	Expected Waste
Perishable			
Hedonic	3.091 (1.422)	2.879 (1.293)	2.000 (1.250)
Utilitarian	4.594 (1.542)	3.812 (1.731)	2.031 (1.031)
Non-Perishable			
Hedonic	3.862 (1.529)	3.276 (1.509)	1.966 (1.426)
Utilitarian	5.000 (1.336)	4.448 (1.804)	2.655 (1.838)

This interrelatedness shown in the factorial MANOVA could mean that the product characteristics influence the packaging evaluation through the perception of the functions. Alternatively, the effect of perishability and usage goal could be direct, or through relations that are not included in the model. To measure this, the regression including the function perceptions was compared to a regression that also included the product characteristics as variables. Both of these regressions also included the control variables such as product liking.

As mentioned before, the regression of perception of functions on the packaging appropriateness evaluation found significant effects $F(11,111)=6.920$, $p<.001$, $R^2=.407$. The regression including product characteristics was also found significant $F(13,109)=6.136$, $p<.001$, $R^2=.423$, but does not show a significant increase in R^2 ($p=.230$). Therefore, the effect of perishability and usage goal on packaging appropriateness can be assumed to be indirect influences that go through the packaging perceptions.

The regression of function perceptions on purchase intention showed significant predictive value $F(11,111)=1.170$, $p<.001$, $R^2=.390$. The regression including product characteristics showed a non-significant increase in R^2 as $F(13,109)=5.758$, $p<.001$, $R^2=.407$, which is a non-significant change in R^2 ($p=.221$). Similar to packaging appropriateness, this means the effect of product characteristics on the purchase intention is indirect and goes through the packaging perceptions.

In terms of expected food waste, the initial regression did not show significant predictive value of the packaging perceptions on reported expected food waste $F(11,111)=6.464$, $p=.316$, $R^2=.104$. The regression including product characteristics on the other hand does show predictive value $F(13,109)=2.238$, $p=.012$, $R^2=.211$, which is a significant increase in R^2 ($p=.001$). Looking at the individual influence of the different variables, it appears that perishability itself does not have provide significant value ($p=.554$), while usage goal does show significant predictive value ($p<.001$). This indicates that the predictive value of perishability on the expected food waste goes through the function perceptions, while the predictive value of usage goal on expected food waste is either direct or goes through variables which have not been measured in the current study. In terms of usage goal, utilitarian products show higher expected food waste compared to hedonic products (Table 12).

Table 12: Unstandardized β's (Std. Error) of Product Characteristic Effects on the Evaluative Dimensions

Characteristic	Packaging Appropriateness	Purchase Intention	Expected Food Waste
Perishability	.203 (.148)	.149 (.155)	.090 (.151)
Usage Goal	.192 (.211)	.302 (.221)	.800 (.215)*

*. Significant at the .005 level

Interrelatedness of Function Perceptions. The function perceptions as measured in the survey show various correlations (Table 13). Different functional benefits show a significant correlation, such as protection and functional communication $r(123)=.225$, $p=.012$, protection and convenience $r(123)=.228$, $p=.011$, and protection and containment $r(123)=.199$, $p=.028$. Other unanticipated correlations also show, such as experiential communication and convenience $r(123)=.259$, $p=.004$. Importantly, the correlation analysis provides confirmation that experiential communication and functional communication are perceived as being two separate constructs through a lack of significant correlation.

Table 13: Perception Correlations

Pearson Correlation	Experiential Communication	Functional Communication	Convenience	Containment	Protection	Sustainability
Experiential Communication						
Functional Communication	.164					
Convenience	.259**	.141				
Containment	.058	.133	.361**			
Protection	.104	.225*	.228*	.199*		
Sustainability	.307**	.075	.146	.184*	.240**	

*. Significant at the .05 level
**. Significant at the .01 level

Interrelatedness of Evaluative Dimensions. Besides correlations in function perceptions, various correlations were also found between the evaluative dimensions (Table 14). A correlation is found between packaging appropriateness and purchasing intention $r(123)=.632$, $p<.001$.

Table 14: Evaluation Correlations

Pearson Correlation	Purchase Intention	Packaging Appropriateness	Expected Food Waste
Purchase Intention			
Packaging Appropriateness	.632**		
Expected Food Waste	-.156	-.151	

*. Significant at the .05 level
**. Significant at the .001 level

Conceptual Framework

The findings in this chapter have led to various adjustments of the conceptual model. These changes are displayed in Figure 2: Theoretical Framework.

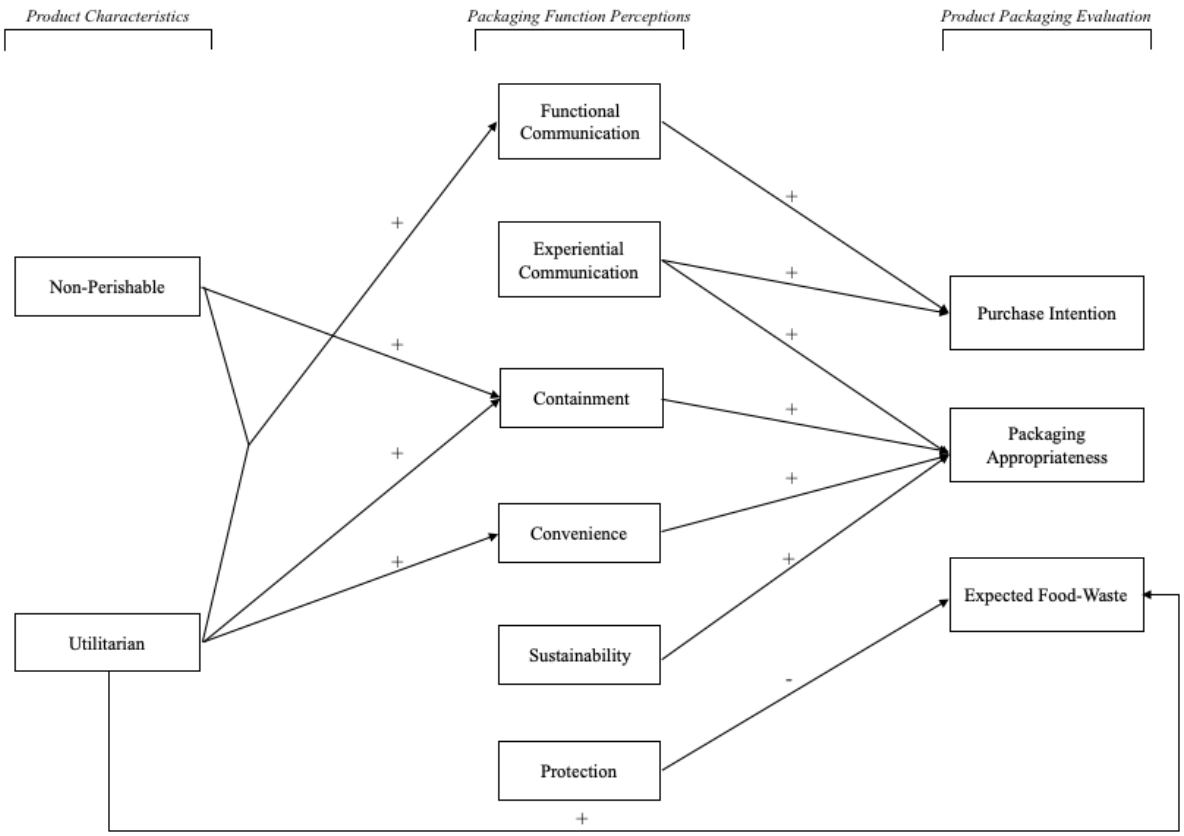

Figure 2: Theoretical Framework

General Discussion

The results indicate that influence of product perishability and consumption goal on packaging perception is only relevant for a limited amount of function perceptions. The packaging of non-perishable products provides higher perceived containment. Similarly, packaging of utilitarian products has higher perceived containment, along with higher perceived convenience.

In terms of perishability it was hypothesized that a perishable product would cause higher perceptions of the protection and functional communication functions, as these are thought to be used to mitigate risk (Tsiros et al., 2005). However, the results show that neither protection nor functional communication was significantly influenced by the products' perishability. A probable reason for this could be that perishable products in general are not homogeneous in terms of consumers' perceived risk. For example, a piece of meat has higher perceived risk than fresh vegetables, and it might be that apple turnovers and bread have a relatively low perceived risk (Tsiros & Heilman, 2005). This low perceived risk of the products used in this study could alleviate the consumers' need to mitigate risks using protection and functional communication aspects of packaging. The perception of the containment function of packaging was found to be higher for non-perishable products, compared to packaging of perishable products. A possible explanation for this could be that the containment function included the respondents' perception with which the packaging could safeguard the products' physical integrity, as the perishable products used in the study might be considered more vulnerable to physical damage than the non-perishable products. However, more specific research is needed to establish the extent to which this effect could originate from the physical product characteristics, or purely from the product's perishability.

As hypothesized, consumption goal was found to have a significant effect on the perception of the convenience and containment functions. In both of these relations, a utilitarian product was found to have higher perceived containment and convenience compared to a hedonic product. This effect is thought to occur due to the functional nature of utilitarian products, as the consumption goal is congruent with the rational functions of containment and convenience (Mundel et al., 2018). In contrast to expectations, consumption goal did not significantly influence the perception of functional communication, experiential communication, protection, or sustainability. This means there are no differences between utilitarian and hedonic products in consumers' perception of the packages' communicative, protective, and sustainable functions.

The interaction effect found between perishability, consumption goal, and functional communication perception shows that a non-perishable utilitarian product has the highest perceived functional communication. After the non-perishable utilitarian product (rice cakes), the perishable hedonic product (apple turnovers) has the highest perceived functional communication, followed by the two remaining products which have the same perceived functional communication. A possible cause for this interaction effect could be the products, as one of the items measuring functional communication is the extent to which consumers perceive to be informed about the products' ingredients. Both of the two products ranking relatively high on perceived functional communication have an ingredient in the product name, which could provide the respondent with a sense of knowledge about the products' ingredients.

The different function perceptions have varying effects on the distinct evaluative dimensions. The regression showed that reported packaging appropriateness is positively influenced by the experiential communication, convenience, containment, and sustainability. This is similar to existing research which has also found these function perceptions to be of significant

influence (Underwood, Klein, & Burke, 2001; Rokka & Uusitalo, 2008; Agariya et al., 2012). Interestingly, the perception of the functional communication aspect of packaging did not contribute significant predictive value to the reported packaging appropriateness. Therefore, it could be the case that consumers do not consider the ingredients label or expiry date to contribute to the packaging appropriateness. This seems to contradict previous research, as these often show that especially expiry date is of influence on product evaluation (Tsiros & Heilman, 2005). However, it might be the case that expiry date and ingredients are considered to be more intrinsic product attributes, rather than packaging attributes. This could result in consumers to not take the functional communication into account when evaluating the appropriateness of packaging, as they see the functional communication as the communication of intrinsic product features. The protection function also does not seem to provide a significant effect on packaging appropriateness. This is again contrasting existing research which shows that the ability of packaging to extend shelf-life is consumers' preferred packaging attribute (Koutsimanis et al., 2012). Similar to the lack of effects from perishability, this might be due to the specific products used, which could fall in a relatively low risk category for consumers.

Both experiential- and functional communication seem to provide a significant positive influence on the respondents' purchase intention. This follows a well-established idea that the visuals and information provided by packaging are of great importance to attract consumers and to drive purchase decisions (Underwood, Klein, & Burke, 2001; Agariya et al., 2012). This finding also resonates with Agariya et al. (2012), as their research also indicated that both experiential and functional communication aspects have a significant positive influence on consumer purchases. None of the other function perceptions have shown a significant effect on reported purchase intention. Although this seems to contrast different research that packaging generally does

influence behavior, these existing studies often only consider the marketing perspective of packaging, rather than functional perspective (Mueller, & Szolnoki, 2010; Shafiq, Raza, & Zia-ur-Rehman, 2011).

In terms of expected food waste, perception of the protection function was the only packaging function that exercised a significant effect. Specifically, the higher the perceived protection of the packaging was, the lower the expected food waste. This shows that consumers are aware that an increased protective value of packaging would lead to lower food waste. However, this is not of influence on the consumers reported appropriateness of packaging, nor on their purchase intention of the product. This provides a similar finding as in the study by Rokka and Uusitalo (2008), whom show that even sustainably minded consumers often do not act in a sustainable manner in the context of food purchases. This is proven further when looking at the correlations between the evaluative dimensions, which show a significant correlation between packaging appropriateness and purchase intention, but no correlation between either of these two and food waste. Therefore, the extent to which consumers consider food waste in their purchases seems minimal. It is often assumed that the unsustainable behavior of consumers is the result of a lack of knowledge (Rokka & Uusitalo, 2008; Young et al., 2010; Grunert et al., 2014; Steenis et al., 2017). However, it seems like there is enough knowledge, since respondents do seem to recognize that increased protection leads to decreased food waste. Unfortunately, this realization does not translate into behavior, as the purchase intention seems largely unaffected by the food waste expectation. Therefore, in order to reduce household food waste, it might be necessary to ensure that consumers do let the expected food waste influence their decisions. Or, alternatively, packaging could be designed in a way that maximizes protection whilst also engaging with consumers through functional and experiential communication. In this way, consumers will not

have to adapt their product evaluation but will nonetheless be able to benefit from the decreased food waste caused by more protective packaging. In this packaging design it is important to realize that food waste preventative packaging might be a more sustainable option, even if it makes the packaging itself a bit less sustainable (Wikström et al., 2014).

The second set of regression analyses show that any effects of perishability and usage goal on reported packaging appropriateness and purchase intention go through perception of functions which then influences these evaluative dimensions. The exception to this is the effect of usage goal on expected food waste, as utilitarian products show an increase in the expected food waste. The increased accuracy of the regression model when adding the usage goal could mean that usage goal has a direct influence on the consumers' expected food waste, or it could mean that there is a mediator at play which has not been included in the current study. Numerous explanations could provide answers to this relation, through for example consumers' consumption habits of utilitarian bakery products. However, these possible mediators are assumed to fall outside of the packaging aspect of the product, and thus outside of the scope of this research. On the other hand, the effect of usage goal on food-waste could also be the result of the measurements used in this study. For example, all other product aspects (except for a utilitarian product) show an observed mean of expected waste of around 2.0. This might simply be a minimum waste-level that consumer generally expect. Consequently, future research could study if and how the usage goal truly influences the expected food waste.

Besides the correlation found in the evaluative dimensions, different correlations in the packaging function perceptions could provide interesting insights into packaging perception. The different correlations show that most function perceptions are somewhat related to each other. The initial idea following gestalt theory, arguing that packaging is perceived as one unified whole does

not seem to be entirely accurate. Besides the fact that not all function perceptions are correlated, the perceptions of the functions also play differing roles on the evaluative dimensions, which would not be possible if the functions were all seen as one unified bundle of functions. However, the product does seem to influence the perception of certain functions, which is similar to what would be assumed following gestalt theory. Therefore, it seems like the perception and evaluation of bakery product packaging could be a combination between gestalt theory and perceptions as included in the lens model. Specifically, the product/packaging interactions seems to indicate a slight presence of gestalt thinking, in which the product is connected to the packaging perception. The lens model seems to apply in some form as well, as the perceptions of functions are used in different ways in the consumers' evaluations of the packaging. However, it is not the case that each perception is used for each type of evaluation. Thus, the perception of packaging seems to combine both gestalt type theories, in which the entire product/packaging combination is perceived as one, and the general idea that different aspects of packaging are treated as distinct percepts.

Implications

The results of the current study provide various theoretical and managerial implications. The extent to which perishability and usage goal influence the perception of the packaging of bakery products is limited. However, perishable products seem to lead to decreased perception of the containment aspect of packaging compared to non-perishable products. Utilitarian products on the other hand have increased importance of the convenience and containment function, likely because these packaging functions provide utility which is congruent with the consumption goal.

As avoiding food waste is a contemporary topic throughout the food supply chain, it is important to know that consumers do show knowledge regarding the positive effect of protective

packaging on decreasing food waste. Besides that, while the knowledge on sustainability is used in evaluating the appropriateness of the packaging, consumers do not use this knowledge in their purchasing process. This is a general trend which is visible throughout different sustainable topics, in which consumer attitude varies greatly from actual consumer behavior (Rokka & Uusitalo, 2008). Therefore, consumers might need additional nudges to transform their attitude into purchase decisions that help avoid food waste. These nudges should be provided through the communicative functions of packaging, as these are the predominant functions leading to purchase intention. More specifically, packaging could for example include statements highlighting the effects of packaging on food waste, to try and make consumers take it into consideration during their purchases.

In terms of packaging design and development, it seems consumers do not have large perceptive differences for perishable or non-perishable bakery products. The differences that do occur show that consumers perceive the containment function more for the non-perishable product. In the development of packaging, attention should be paid to ensuring that the containment function is clearly present for these consumers of non-perishable products. Through this, consumers can be sure that the packaging will facilitate storage, which will positively impact their evaluation in terms of packaging appropriateness. Similarly, the packaging of hedonic and utilitarian products does not require large differences, although consumers do display higher perception of convenience and containment for utilitarian products. Therefore, businesses might benefit from this increased perception by equipping the packaging of utilitarian bakery products with convenience attributes such as easy open & reseal closures, and by using packaging solutions that are able to store the product between uses. When trying to use packaging to influence consumer purchases, stakeholders should focus on utilizing the communicative features of the

packaging, as these are the two main packaging functions that significantly influence the consumers' purchase intention of bakery products.

Limitations and Future Research

The current study has posed various challenges. Although the pretest was executed to provide a set of products which matched the required perishability and usage goal, the stimuli might have been more heterogeneous than initially anticipated. For example, structural differences of the product in terms of crispiness and vulnerability to impact damage might have influenced the perception of some functions. So, even though the respondents' liking for the product was controlled for in the analysis, the product specific characteristics could have been an influence on the perception and evaluation. Nonetheless, this research does provide reason to believe that the various perceptions are somewhat affected by specific product attributes, and that these perceptions have different roles in different types of evaluations. Therefore, future research could include various sets of products. Having a set of, for example, three products per stimuli could mitigate these differences between products, as these differences could then be controlled for in the analysis. Besides controlling for minor differences in products, this approach could also be used to extend the studies' findings to a broader product category. Whereas the current study measures the packaging perceptions of products that might be considered to fit into the bakery product category, future research could include a wide array of products. As especially the effects of perishability are assumed to vary greatly between product categories this could provide great insights into perception of packaging. Next, the study has shown that usage goal does significantly influence the expected food waste, either directly or indirectly. However, the variables included in the study do not provide an explanation for this relation. Therefore, future research could focus on

this relation between usage goal and expected food waste, aim to explain how this effect works, and how it could be mitigated to alleviate wastage of utilitarian products. Besides that, rather than using an online survey with stimuli shown in pictures, it might be relevant to provide respondents with physical product-packaging combinations, as various packaging functions, such as convenience, are also derived from consumers' interaction with packaging.

Although there are numerous improvements to be made in future research endeavors, the current study provides a first glance at the influence of usage goal and perishability on the perception and evaluation of bakery product packaging. This new information shows that product and packaging influence one another, as utilitarian products lead to higher perception of containment and convenience. Perishability of a product leads to lower containment perception, while the combination of a non-perishable/utilitarian product lead consumers to perceive the functional information more. This knowledge might can prove useful in both the development of packaging materials and in steering consumer behavior.

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Appendix

Appendix 1: Stimuli Pretest

The initial pilot of the survey included the products bread, crackers, biscotti and sugar bread. While respondents did categorize bread and biscotti in the expected way, crackers and sugar bread were not. Therefore, a pretest for the stimuli included 8 more products which could be better alternatives for crackers and sugar bread in terms of categorization. Besides the alternative products, bread and biscotti were included as well to ensure the appropriateness once more. An overview of the products included in the pretest are shown below:

Hedonic:	Utilitarian:
	


BISCOTTI
BROOD
CHOCOLADE-
CROISSANTS
CRACKERS

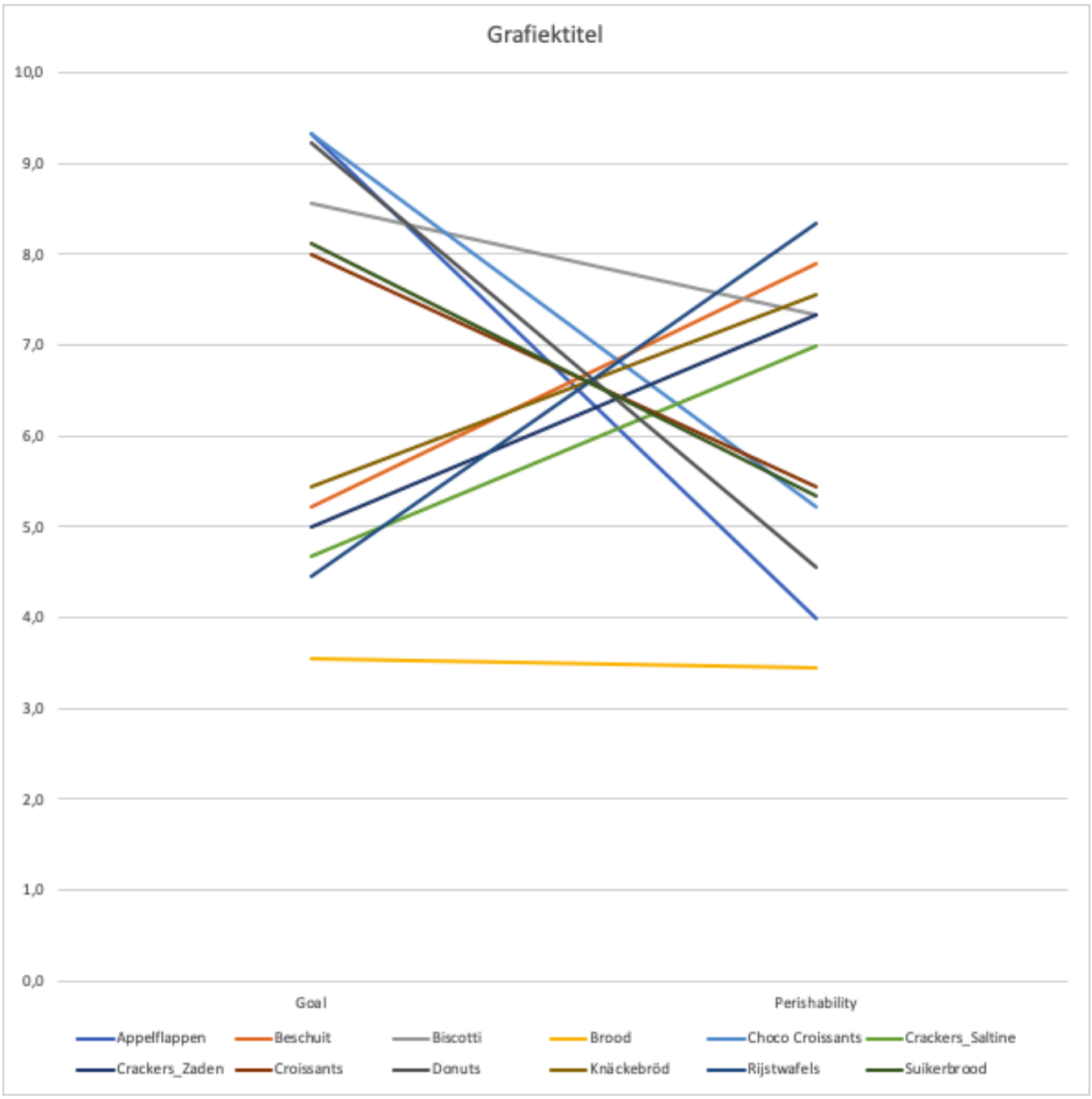

CROISSANTS
CRACKERS
DONUTS
KNÄCKEBRÖD

The averages for the different products is shown in the table below:

Averages	1=Uti,10=Hedo	1=Peri,10=Non
Product	Goal	Perishability
Appelflappen	9,3	4,0
Beschuit	5,2	7,9
Biscotti	8,6	7,3
Brood	3,6	3,4
Choco Croissants	9,3	5,2
Crackers_Saltine	4,7	7,0
Crackers_Zaden	5,0	7,3

Croissants	8,0	5,4
Donuts	9,2	4,6
Knäckebröd	5,4	7,6
Rijstwafels	4,4	8,3
Suikerbrood	8,1	5,3

These numbers are visualized in the graph below:


Grafiektitel
10,0
9,0
8,0
7,0
6,0
5,0
4,0
3,0
2,0
1,0
0,0
Goal
Perishability
Appelflappen
Beschuit
Biscotti
Brood
Choco Croissants
Crackers_Saltine
Crackers_Zaden
Croissants
Donuts
Knäckebröd
Rijstwafels
Suikerbrood

Appendix 2: Survey Questions

Experiential communication:

This package is attractive (Hedge, & Stanton, 1998; Magnier, Schoorman, & Mugge, 2016)
Strongly disagree - disagree - tend to disagree - neither disagree nor agree - tend to agree - agree - strongly agree

NL:
Deze verpakking is aantrekkelijk
Sterk mee oneens - oneens - enigszins oneens - niet oneens/niet eens - enigszins eens - eens - sterk mee eens

Functional communication:
This package provides information regarding the products' ingredients
Strongly disagree - disagree - tend to disagree - neither disagree nor agree - tend to agree - agree - strongly agree

NL:
Deze verpakking voorziet mij van informatie over de ingrediënten van het product
Sterk mee oneens - oneens - enigszins oneens - niet oneens/niet eens - enigszins eens - eens - sterk mee eens

-

This package provides me with information regarding the products' expiry date
Strongly disagree - disagree - tend to disagree - neither disagree nor agree - tend to agree - agree - strongly agree

NL:
Deze verpakking voorziet mij van informatie over de houdbaarheid van het product
Sterk mee oneens - oneens - enigszins oneens - niet oneens/niet eens - enigszins eens - eens - sterk mee eens

Convenience:
This package has a convenient size (Hedge, & Stanton, 1998; Williams et al., 2012)
Strongly disagree - disagree - tend to disagree - neither disagree nor agree - tend to agree - agree - strongly agree

NL:
Deze verpakking heeft een handig formaat
Sterk mee oneens - oneens - enigszins oneens - niet oneens/niet eens - enigszins eens - eens - sterk mee eens

-

This package seems convenient to open (Hedge, & Stanton, 1998; Williams et al., 2012)
Strongly disagree - disagree - tend to disagree - neither disagree nor agree - tend to agree - agree - strongly agree

NL:
Deze verpakking lijkt makkelijk te openen
Sterk mee oneens - oneens - enigszins oneens - niet oneens/niet eens - enigszins eens - eens - sterk mee eens

Containment:
This packaging will contain the product during transportation (Hedge, & Stanton, 1998; Williams et al., 2012)
Strongly disagree - disagree - tend to disagree - neither disagree nor agree - tend to agree - agree - strongly agree

NL:
Deze verpakking houd het product bijeen gedurende transport
Sterk mee oneens - oneens - enigszins oneens - niet oneens/niet eens - enigszins eens - eens - sterk mee eens

-

This packaging will contain the product during storage (Hedge, & Stanton, 1998; Williams et al., 2012)
Strongly disagree - disagree - tend to disagree - neither disagree nor agree - tend to agree - agree - strongly agree

NL:
Deze verpakking houd het product bijeen gedurende opslag
Sterk mee oneens - oneens - enigszins oneens - niet oneens/niet eens - enigszins eens - eens - sterk mee eens

Protection:
This packaging increases the product’s shelf life (Chang, & Chen, 2009)
Strongly disagree - disagree - tend to disagree - neither disagree nor agree - tend to agree - agree - strongly agree

NL:
Deze verpakking verlengt de houdbaarheid van het product
Sterk mee oneens - oneens - enigszins oneens - niet oneens/niet eens - enigszins eens - eens - sterk mee eens

-

This packaging protects the product from bacteria and other external pollutants (Chang, & Chen, 2009)
Strongly disagree - disagree - tend to disagree - neither disagree nor agree - tend to agree - agree - strongly agree

NL:
Deze verpakking beschermt het product van bacteriën en andere vervuilende stoffen
Sterk mee oneens - oneens - enigszins oneens - niet oneens/niet eens - enigszins eens - eens - sterk mee eens

Sustainability:
This packaging material is sustainable (Magnier, Schoorman, & Mugge, 2016)
Strongly disagree - disagree - tend to disagree - neither disagree nor agree - tend to agree - agree - strongly agree

NL:
Dit verpakkingsmateriaal is duurzaam
Sterk mee oneens - oneens - enigszins oneens - niet oneens/niet eens - enigszins eens - eens - sterk mee eens

-

This packaging allows for sustainable disposal (Magnier, Schoorman, & Mugge, 2016)
Strongly disagree - disagree - tend to disagree - neither disagree nor agree - tend to agree - agree - strongly agree

NL:
Na gebruik van het product is deze verpakking is op een duurzame manier weg te gooien
Sterk mee oneens - oneens - enigszins oneens - niet oneens/niet eens - enigszins eens - eens - sterk mee eens

Intention:
Assuming I would purchase *product*, I would purchase the package displayed above (Wu, Holsapple, 2014)
Strongly disagree - disagree - tend to disagree - neither disagree nor agree - tend to agree - agree - strongly agree

NL:
Als ik *product* zou kopen, zou ik de verpakking kopen die hierboven staat afgebeeld
Sterk mee oneens - oneens - enigszins oneens - niet oneens/niet eens - enigszins eens - eens - sterk mee eens

Appropriateness:
How appropriate do you find this packaging for this product? (Elzeman, Hoek, van Boekel, & Luning, 2011)

Very inappropriate - inappropriate - slightly inappropriate - neither inappropriate nor appropriate - slightly appropriate - appropriate - very appropriate

NL:
Hoe geschikt vind je deze verpakking voor dit specifieke product?
Totaal ongeschikt - ongeschikt - enigszins ongeschikt - niet ongeschikt/niet geschikt - enigszins geschikt - geschikt - totaal geschikt

Food waste:
Considering you would buy this product, how much of the product do you expect to throw away? (Wan, 2019)
None - 2 - 3 - 4 - 5 - 6 - Everything

NL:
Als je dit product zou kopen, hoeveel van het product verwacht je uiteindelijk weg te gooien?
Niets - 2 - 3 - 4 - 5 - 6 - Alles

General Opinion:
What is your general opinion of *product*?
Strongly negative - Negative - Mostly negative - Neutral - Mostly positive - Positive - Strongly positive

NL:
Wat is je algemene mening van *product*?
Sterk negatief - negatief - voornamelijk negatief - neutraal - voornamelijk positief - positief - sterk positief

Taste Experience:
I enjoy the taste of *product*
Strongly disagree - disagree - tend to disagree - neither disagree nor agree - tend to agree - agree - strongly agree

NL:
De smaak van *product* bevalt me
Sterk mee oneens - oneens - enigszins oneens - niet oneens/niet eens - enigszins eens - eens - sterk mee eens

Healthiness
Product is a healthy product
Strongly disagree - disagree - tend to disagree - neither disagree nor agree - tend to agree - agree - strongly agree

NL:
Product is een gezond product
Sterk mee oneens - oneens - enigszins oneens - niet oneens/niet eens - enigszins eens - eens - sterk mee eens

Consumption Experience

I enjoy the experience of consuming *product*

Strongly disagree - disagree - tend to disagree - neither disagree nor agree - tend to agree - agree - strongly agree

NL:

Ik geniet van de ervaring bij het consumeren van *product*

Sterk mee oneens - oneens - enigszins oneens - niet oneens/niet eens - enigszins eens - eens - sterk mee eens

Background Questions:

Age:

Leeftijd:

Highest obtained education:

- Less than high school
- High school or equivalent
- Bachelors degree
- Masters degree
- Doctorate
- Other:_____

Wat is je hoogste afgeronde opleiding?

- Lager dan middelbare school
- Middelbare school
- MBO
- HBO
- WO Bachelor
- WO Master
- Doctoraat
- Anders:_____

How often do you purchase *product*?

- Never

- 1 - 4 times a year
- 5 - 11 times a year
- 1 - 3 times a month
- Every week or more

Hoe vaak koop je *product*?

- Nooit
- 1 - 4 keer per jaar
- 5 - 11 keer per jaar
- 1-3 keer per maand
- Elke week of vaker