Influence of Packaging Interaction Experience on Willingness to Pay

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Previous research shows that consumers' experience of product packaging affects their value perception and that willingness to pay (WTP) is linked with package experience attributes. However, studies addressing the link between packaging interaction experience and WTP are rare. Yet, interaction experience may affect repeat purchase behaviour. The present study examines how consumers' WTP changes when measured before and after opening and interacting with a new package. A between-subjects experiment of three different package prototypes for different products was administered to 77 consumers. The first WTP was based on the first impression and appearance of the package. The second WTP measurement was performed after the subjects had opened the package and had been exposed to its functional dimensions. Both qualitative and quantitative data were used to understand the relations between interaction experience and WTP. Spontaneous experience descriptions were collected through a questionnaire before and after opening of the package. The sensomotoric interaction experience was studied with a short version of the Interaction Vocabulary scale. Our main finding is that interaction experience can change WTP. There was an increase in WTP for 57% of the respondents, no change for 29% and decreased WTP for 14% of the respondents. Differences in the increase of WTP were found between respondent groups and between packages. Stimulating user experiences were found to have a significant impact on the increase in WTP, while pragmatic flaws decreased it. By combining the experiential data to WTP, the study sheds light on how packaging interaction experience influences consumers' WTP.

INTRODUCTION

A common principle in designing new commercial products is to address their technical feasibility, business viability and desirability from the human perspective.[1] The three aspects are the feet (cornerstones) on which product success relies, and the same aspects apply to packaging. Packaging research has addressed all three topics, but research on desirability is clearly a minority in this field. Desirability addresses the consumers' perception of the product and is close to the concept of user experience, which is the consequence of the perceived pragmatic and hedonic aspects of the product.[2] The focus in user experience is not only on the static but also on the functional aspects of the product, which is why this paper applies the concept of user experience to packaging.

   The concept of experience has been studied in various disciplines such as philosophy,[3] economics,[4,5] psychology and product design.[6] In the field of human–computer interaction, user experience investigates how and why people use interactive technologies. The first wave of human–computer

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interaction studied the human factors influencing computer use in the 1980s. The second wave focused on usability aspects in the 1990s. The concept of user experience became the keyword in the third wave only after the year 2000.[7] It seems that the field of human–packaging interaction (HPI) follows the same development. Since the early HPI work on human factors and ergonomics related to the handling of packaging,[8] we have seen research increasing on package usability,[9] but so far, only a few publications address the user experience of packaging beyond the pragmatic aspects.[10–13] In a recent literature review of packaging design by Azzi et al.,[14] there are no categories addressing the packaging user experience research.

At the point of purchase, also known as the first moment of truth,[15,16] the role of packaging is to win attention, communicate and sell the product.[17] Packaging acts as the 'silent salesman'.[18] The visual communication of the packaging influences purchase decisions especially with everyday products and low-involvement commodities[19,20] and adds value to the product by enhancing the experience associated with it.[21] Opening and in-depth interaction with the package happen after the purchase, at the point of consumption, also known as the second moment of truth.[15,16] As packaging and consumption are interrelated, packaging-related experiences typically emerge as a part of the consumers' everyday routines and practices. Carú and Cova[22] distinguish between consumer and consumption experiences. A consumer experience, i.e. a purchase situation, happens in the marketplace, whereas a consumption experience is extended to also include experiences outside the marketplace, i.e. experiences of using the product at home. According to Löfgren et al.,[16] at both first and second moments of truth, packaging-related customer satisfaction is dependent on three factors: the technical quality, ergonomic quality and communicative quality of the package. Similarly, Pousette et al.[9] found that customer satisfaction is related to packaging usability issues such as the openability of the package, especially with elderly consumers. De la Fuente et al.[23] propose that the concept of affordance can be used to bridge visual interpretation of the package and its actual functionality. In other words, consumers' understanding precedes their actions such as grabbing or opening a package in a particular way; that is, packaging predetermines behaviour.[23] Experiences are context-bound and personal, as well as shaped by the characteristics of the user.[24]

Packaging has a strong influence on consumers' food choices, and packaging characteristics were observed to yield significant market price differences.[25] Packaging formats seem to trigger consumers' subconscious symbolic associations and valuations[26] and have an effect on consumers' ability to inspect food characteristics and to transport the product safely.[27] Rebollar et al.[28] showed that willingness to buy was linked to package experience attributes such as fun, dynamic, attractive, rebellious, mysterious, innovative and sophisticated. While in-depth interaction with a package is often not possible before purchasing, package interaction affects user experience and is therefore likely to affect future willingness to pay (WTP) and repeat purchase.

In our paper, we investigate experiences with packaging in relation to value perceptions measured with WTP. Our study extends previous HPI and WTP research by investigating how package interaction affects WTP. Our hypothesis is that consumers' WTP changes as consumers interact with a new package. We also study whether hedonic aspects of packaging experience affect WTP, or whether WTP is determined by the pragmatic aspects of user experience only. In our study, we collect descriptions of experiences with packaging using a questionnaire prior and after package opening as well as by inquiring WTP before and after package opening. We study the effect of package interaction experience on given prices.

METHODS AND MATERIALS

Three package prototypes were tested in a between-subjects experiment. Participants were studied regarding their packaging interaction, resulting experiences and WTP with a questionnaire in a laboratory-like environment.

Willingness to pay

In this study, we used a non-hypothetical value elicitation method and followed the Becker–DeGroot–Marschack (BDM) procedure.[29] Non-hypothetical experiments have gained popularity because they

closely resemble a real situation by using real products and allowing exchange of real money. The BDM experiment was conducted to measure how packaging experience affects WTP before and after the opening experience, with the participants reporting twice their WTP for a single unit of a specific product. The difference between the two rounds of consumer-specified WTP responses signifies how packaging and its value changes as experience accumulates, and the difference indicates whether the opening experience was positive or negative. In our study, the packaging is treated as a part of the total offer.[15] In consumers' minds, the product and package are also often seen as one and the same.[15,30,31]

We began the experiment with an explanation of the BDM procedure to participants and by highlighting the importance of expressing their true WTP. Prior to the actual valuation task, we employed a training ground for the auction mechanism and WTP by using a cookie bar as an example. After this, we showed how price is determined and who will be determined as buyers during the experiment. Drichoutis et al.[32] demonstrated that extensive training with numerical examples tends to yield more accurate WTP values.

The experiment was set up in a lab-like environment, and four participants could simultaneously participate in the experiment that lasted approximately 30 min. A total of seven such sessions could be arranged daily. Each participant was seated separately without visibility to other participants, so each could take their time to examine the package independently and report related experiences without disturbance. No interaction between participants was allowed. On every table, there was a single packaging prototype and a computer setup with the survey and questions (Figure 1).

After the BDM procedure, the experimenter chose one of the participants to randomly draw a single price from a pre-determined price distribution set. In practice, this was carried out by using small lottery balls (Figure 1). For example, in one product case in the study, the price ranged from 2 to 8 Euros. The range of the price set was built around the actual market price given by the company ±€3. Participants who gave a WTP higher than the drawn price were included as potential buyers for the product. In each research session (with max four participants), the highest bidder was declared as the buyer, and if the bid was higher than the randomly drawn price, they bought the product at the price equal to the randomly drawn price. One product prototype was set for sale in every session.

Experience descriptions

Experience data concerning the packaging were collected both quantitatively and qualitatively.

Figure 1. The experiment setup at the point of packaging evaluation.

The qualitative open-ended questions were used to study spontaneous reflections of the experience without limiting possible options for pragmatic or hedonic experiences. The online questionnaire provided open-ended questions on the first impression and appearance of the package before opening the package and, after opening the package, on the opening experience and ideal context of use. At the end of the survey, the respondents had the opportunity to provide any additional feedback regarding the package. In our study, we focus on the first three questions.

The first two questions, concerning the first impression and appearance, resemble a pre-purchase packaging evaluation on a visual basis at the first moment of truth (with the difference that the evaluation happens in a lab environment). The third question simulates a post-purchase situation when the consumers open and start to use the product, also known as the second moment of truth.[15] The third question was 'How does it feel to use the package? Please describe how you find the user experience to be like, in your opinion'.

The research materials consist of short, written packaging-related descriptions of experiences. The qualitative data were analysed with summative content analysis[33] and coded with the Atlas.ti 1.0.38 software for Mac. The words, content and patterns in the answers were identified and coded in order to explore how often they occur in the data. Codes were sorted into categories and subcategories, and codes with similar meanings were combined under the same label. The themes were created by combining synonyms and words with closely related meanings and translated by the first author.

Experience scales

The quantitative information on the packaging experience was collected using three different scales measuring packaging appearance, HPI and the brand. AttrakDiff2,[34] Interaction Vocabulary[35] and Brand Personality[36] scales were used to observe how the prototypes performed in terms of given quantifiable and general (not case-specific) packaging-related experiential criteria. In this paper, the focus is on the results from the Interaction Vocabulary scale as it is the most relevant to the HPI at the moment when consumer interacts with the structural mechanisms provided by the package (the second moment of truth).

A short version of the Interaction Vocabulary scale[35] was applied to study dimensions of the opening experience. The method has been developed to 'conceptualize the aesthetics of interaction' [35 p. 126], and it consists of a systemically varied set of low-level (i.e. sensomotoric) semantic attributes addressing '*how an interaction feels*' [35 p. 126]. It sticks to the simple descriptive interaction attributes, e.g. slow–fast, but does not address higher-level meaningful or emotional experiences, such as positive surprise, emerging from the interaction [35 pp. 127–128]. According to the creators of the method, '*the interaction vocabulary is a set of qualities inherent to any interaction*' [37 p. 611]. The method provides information about the interaction experience on a bodily level, which might not be addressed in qualitative answers.

The vocabulary was translated into Finnish by the authors by iteratively testing the understandability of the translations in small tests. In the preliminary tests, users reported challenges with comprehension of some terms and their ability to connect the terms to experiences with packaging. This might be because the users were not accustomed to thinking about packaging interaction with these terms. According to Diefenbach *et al.*,[37] the Interaction Vocabulary is mainly developed as an inspirational tool for designers to assess characteristics and set goals for their design work. This may explain some of the challenges encountered when testing the scale with non-designers. As a user group, designers, owing to their education, training and professional experience with packaging, differ from consumers (non-designers) in the degree in which they consider packaging characteristics. The aesthetic quality of interaction and emerging experiences are seen as crucial for designing interactive products.

Based on our experiences from the preliminary tests and with respect to the packaging product context, we decided to include in the final version of the interaction scale only five of the most unambiguous and seemingly best working interaction attributes. These were 'slow–fast, approximate–precise, gentle–powerful, apparent–covered and stepwise–fluent'. Our test did not address interaction attributes 'instant–delayed, mediated–direct, incidental–targeted, uniform–diverging, constant–inconstant and spatial separation–spatial proximity'. It is also possible that

some of the encountered challenges in understanding are language and culture dependent and caused by challenges in finding working and sufficiently unambiguous translations for the attributes.

Packages

The packages used in the study were designed by students in an interdisciplinary packaging design course, Pack-Age, at Aalto University. During the course, the students worked in interdisciplinary teams with real projects from the packaging industry. At the beginning of the course, companies briefed the teams about the objectives, scope and limitations of the design project. Experience goals for the designs were also addressed. The pedagogical approach in the course is problem-based and project-based learning supported by a variety of specialist theme lectures. As the course outcomes, the students developed a packaging concept, a physical mock-up and a project report for the clients. In this study, three packaging prototypes for different products were used as the sample material. For the consumer experience evaluations, more prototypes of each package were produced by a printing house specialized in packaging. The prototypes were evaluated for the experience they conveyed by a small number of participants representing their target groups, and participants' WTP was measured with a two-step method, before and after package opening.

The e-commerce package brief. Create a gift packaging solution made of corrugated cardboard for e-commerce. It should be a combined delivery (transport) and a gift box offering a nice, unique and memorable personal experience and an element of surprise. The packaging is expected to promote high quality and delightful functionality. It should be easy to open and close, as well as reuse or recycle later. The package would be an added value service purchased from an e-commerce retailer for direct gift-sending purposes and would work with varied contents.

Target group: young 20- to 35-year-old male and female consumers who frequently use e-commerce providers and order products online.

The students designed a package with a layered structure (Figure 2). The outside of the package is considered discrete and neutral in terms of colours and design, to avoid drawing too much attention in the shipping phase. The inside of the box is decorated with vivid colours and graphic patterns. A pop-up structure serves a greeting card immediately when the package lid is opened. The first inside layer functions as a cover structure for the actual content and can be lifted to reveal a space for the items to

Figure 2. The design of the e-commerce gift delivery packaging.

be shipped as a gift. This space has a separate adjustable frame-like placeholder that secures the items for shipping. The design also includes a thank-you card at the bottom of the box.

The ready meal package brief. Redesign a ready meal package for traditional food made of real, high-quality ingredients and without additives. The packaging is expected to stand out and communicate the home-cooked feel of the product, as well as convey company values. The design should reduce the plastic look of the previous version of the package.

Target group: 25- to 45-year-old consumers, single persons and families with children using ready meals frequently.

The resulting package concept (Figure 3) draws inspiration from a traditional lunch bag. The paper bag contains a vacuum-packed single meal on a tray with plastic film covering the portion (the materials used by the company's current production line). The bag is closed with a sticker seal with the text 'no additives'. The designers selected natural materials and a minimalist visual communication style in order to communicate authenticity, clarity and naturalness that they considered fitting for the brand and the story behind the product.

The chocolate gift package brief. Create a packaging concept for wrapped chocolates for year-round casual gift giving. The package is expected to delight and surprise, demonstrate thoughtfulness, convey quality but be casual enough for modest gift giving.

Target group: 20- to 35-year-old male and female consumers who frequently buy and consume chocolate.

The resulting package (Figure 4) is a small rectangle box (200 g of chocolate) with an unorthodox telescopic opening mechanism. By pulling upwards on the white part of the package, the structure extends, and the white flap-like parts on the top move aside revealing an opening that functions as the dispenser for the chocolate. The package has no lid, and instead, it is formed as a one-piece structure utilizing double-sided printing. By sliding the white part upwards, the structure reveals additional, previously hidden graphic patterns, on the sides of the package. The colours and illustrations draw inspiration from the brand tradition.

Participants

A marketing company was used to recruit 77 participants representing the target groups of the three products to be evaluated. The participants were defined by age (20–45 years) and gender distribution

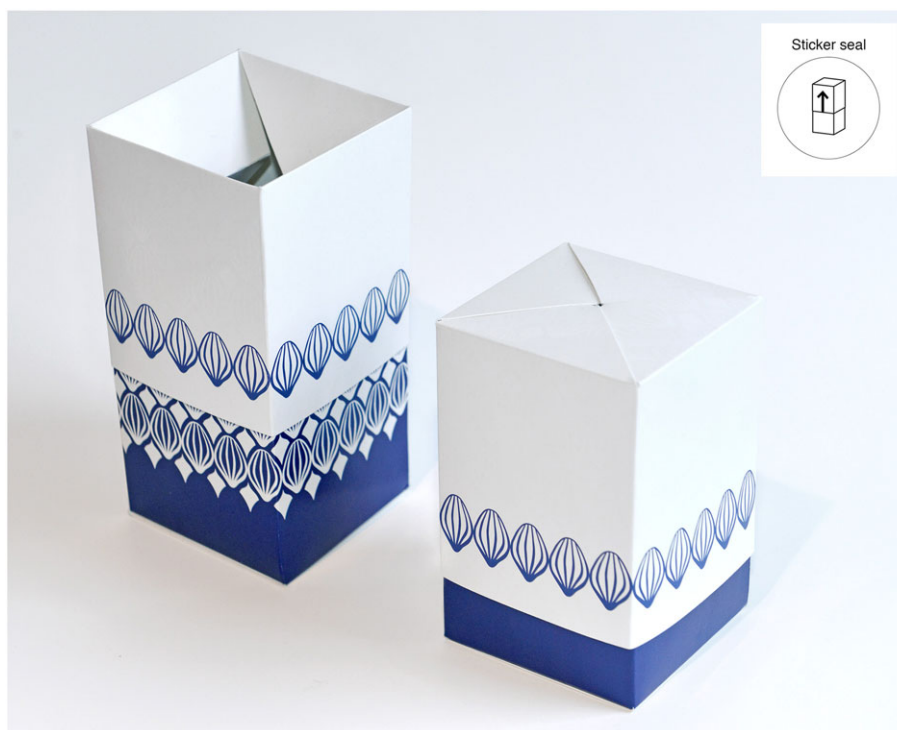Figure 3. The design of the ready meal packaging.

Figure 4. The design of the chocolate gift packaging.

(at least 40% male participants) together with relevant product experience and frequency of use. Respondents were rewarded with a possibility of choosing three products from a selection offered.

For each product, the experiences were collected on different days. Under constraints set by the number of prototypes, physical testing spaces and time, the objective was to study approximately 20 participants a day. According to this plan, the study was intended to be completed in 3 days. However, an additional study day was required to compensate for the participants breaking chocolate packages after failing to operate the novel opening mechanism.

RESULTS

In this chapter, we report both qualitative and quantitative results of the user experiences of the three package prototypes. Qualitative data reveal the variety of experiences that participants spontaneously reported for each packaging prototype. Quantitative data collected with the Interaction Vocabulary scale provide more specific information on the sensomotoric interaction experiences. The WTP data measured before and after package opening reveal the impact of interaction experience on WTP. To better understand the reasons behind WTP change, we tested whether surprise, originality or other stimulating experiences could explain the WTP change. Finally, we ran a latent class analysis on the five sensomotoric interaction qualities to see how they related to WTP change.

Qualitative packaging experience

The most frequently recurring themes found in the experience descriptions are depicted in Table 1. The participants' descriptions of the first impressions and visual appearances were based on the look and feel of the package on the outside, prior to opening or testing any functional aspect of the packaging. Therefore, any graphics that were revealed after opening the package did not affect the first two questions. This is noteworthy as all three packages contained graphics or messages also on the inside of the package, revealed only after the consumer began opening the package.

Table 1. The most frequently occurring experience descriptions in questions 1–3. (minimum three instances), the experience categorization and the frequency of the topic.

	1. First Impression		2. Visual Appearance		3. Opening Experience	
E-commerce Package	Robust & Durable [TQ] Boring [HQS] Sober [CQ] Stylish & Attractive [HQI] Ordinary & Neutral [HQS]	8 6 4 4 3	Ordinary & Neutral [HQS] Sober [CQ] Present [CQ] Valuable [CQ] Multi-functional [EQ] Stylish & Attractive [HQI]	8 5 4 3 3 3	Hard to open [EQ] Pleasant & Positive [HQA] Surprise [HQS] Easy to open [EQ] Stylish & Attractive [HQI] Robust & Durable [TQ] Good idea [HQS] Practical [EQ] Does not work [EQ] Difficult to close [EQ] Exciting [HQS] Original [HQS] Dislikes color [HQI]	12 10 7 6 6 5 4 4 3 3 3 3 3
Ready Meal Package	Distinctive & Different [HQS] Stylish & Attractive [HQI] Interesting [HQS] Informative [CQ] Big [EQ] Shows product [CQ] Clear [CQ]	5 4 4 3 3 3 3	Ecological [CQ] Home cooking [CQ] Trendy [HQI] Authentic & Genuine [CQ] Natural [CQ]	7 4 4 3 3	Easy to open [EQ] Practical [EQ] Pleasant to touch [HQS] Too much plastic [TQ] Fits into a small space [EQ] Pleasant to use [HQA] Surprise [HQS]	15 5 4 4 3 3 3
Chocolate Package	Stylish & Attractive [HQI] Fun & Delight [HQS] Simple & Minimalistic [HQI] Different & Interesting [HQS] Fit for brand [CQ] Good size [EQ] Everyday [CQ] Classical & Traditional [CQ] Fit for gifting [CQ] Finnish [CQ] Boring [HQS]	14 8 6 5 4 4 3 3 3 3 3	Stylish & Attractive [HQI] Finnish [CQ] High quality [TQ] Fit for brand [CQ] Different & Interesting [HQS] Festive [CQ] Everyday [CQ] Fit for gifting [CQ] Ordinary & Neutral [HQS]	12 11 7 6 5 4 3 3 3	Different & Interesting [HQS] Difficult to use [EQ] Surprise [HQS] Easy to use [EQ] Cramped [EQ] Fun & Delight [HQS] Stylish & Attractive [HQI] Innovative [HQS] Does not lock open [TQ] Practical & Clever [EQ] Unique & New design [HQS]	10 9 8 7 6 6 5 4 3 3 3

Following the model of Löfgren *et al.*[16] of the three quality types related to customer satisfaction, the qualitative descriptions given by users in the different phases of the experiment are classified as technical, ergonomic and communicative qualities. One of the authors did the first classification, and another author reviewed it and proposed some changes, and disagreements were discussed until consensus was reached. Technical quality refers to the technical function, construction and production of the package; ergonomic quality addresses the ability of the package to adapt to the human physique and behaviour, and communicative quality describes the ability of the package to transmit a message to the consumer.

In our data, there were many experience attributes that did not fit in the three quality types listed by Löfgren *et al.*[16] This was expected, as user experience is known to consist of both pragmatic and hedonic aspects,[2] but the qualities in Löfgren's model only include pragmatic qualities. Thus, the hedonic (emotional) qualities (HQ) were mapped to the *Stimulation* (HQS) and *Identification* (HQI) qualities as in the commonly used user experience scale, AttrakDiff2[34]; see also Hassenzahl.[38] Some hedonic items were not specific enough to be categorized under '*Stimulation* or *Identification*', but because they were close to the items listed under the appeal quality reported in Hassenzahl *et al.*,[39] we used *Appeal* (HQA) as an additional hedonic category.

E-commerce package

For the e-commerce package ($N = 21$), the appearance was perceived to be neutral and even boring on the outside, but opening the box changes the experience as the inside reveals a colourful and lively design with a layered structure.

At the level of first impression, robust and durable (8) was most dominant theme. The first impression was also described as boring by six persons, sober by four persons and stylish and attractive by four persons. When asked more specifically about the visual appearance (the second question), the most common answer was that the packaging looks quite neutral and ordinary (8) on the outside. The packaging was also found sober (5) and resembling a present (4). At the opening phase, the package was deemed hard to open by 12 people (the manufactured prototypes suffered from an overly tight lid), yet the opening experience was perceived as pleasant and positive by 10 people and surprising by seven people. Themes related to the visual appearance also emerged at this stage, as the inside graphics were revealed. Six people found the package to be stylish and attractive after opening it.

Ready meal package

In the ready meal case ($N = 22$), easy to open was clearly the most significant theme with 15 people mentioning it. The three most prominent themes found at the level of first impression were distinctive and different (5), stylish and attractive (4) and interesting (4). The three most prominent themes found at the level of visual appearance were ecological (seven), home cooking (4) and trendy (4). At the level of usage experience, in addition to easy to open (15), the packaging was found practical (5) but also containing too much plastic (4). It is interesting that also the theme pleasant to touch (4) was quite strong in the data, indicating that haptical experiences are also important to address in design.

Chocolate package

In the chocolate package case ($N = 34/22$), the biggest themes were related to the aesthetics: stylish and beautiful was spontaneously mentioned 14 times at the first impression level and 12 times when inquired about visual appearance. Other strong themes at the level of first impression were fun and delight (8) and simple and minimalistic (6). When inquired more specifically about the visual appearance, in addition to stylish and attractive (12), the strongest themes were Finnish (11) and high quality (7). At the level of opening experience, different and interesting (10) was the most significant theme, followed by difficult to use (9) and surprise (8).

It is noteworthy that 12 participants had problems with opening the package. This might be related to ignoring or not understanding the opening instructions printed on the closing seal (sticker) on the top of the package. Participants, who could not open the package as it was intended, forced the box open by tearing up a structure that slightly resembled dust flaps on the top of the package, thus actually ending up breaking the package. These 12 participants were excluded from the analysis of the opening experience question on the basis that their answers and reported experience were referring to a totally different opening mechanism. Including these answers would provide no useful information on how the intended telescopic opening experience was actually experienced by the consumers. Regarding the structural design, one can conclude that the perceived affordance [e.g. Desmet and Hekkert[23] and Norman[40]] of this design was poor in terms of an intuitive opening mechanism. However, these 12 participants are included in the analysis of the first impression and visual appearance (the first moment of truth).

Summary of the qualitative results

Comparing the experience descriptions between all packages, it can be concluded that the e-commerce packaging and the chocolate packaging suffered from challenges with the opening of the box, whereas the ready meal was experienced as easy to open. All package experiences were more dominantly on the positive side, indicating that the packaging design was fairly successful. One interesting result is that surprise was spontaneously mentioned in all three packages at the point of opening. It was most strongly present in the chocolate (8) and e-commerce packages (7) but also mentioned for the ready meal (3).

According to Ludden *et al.*,[41] surprise can work as an effective design strategy for creating interesting and original products. However, despite its usually positive connotations, surprise can also lead to disappointment, if users feel they were misled when experiencing the surprise. In our material, surprise was described in a positive sense.

"Exciting, fun, cheery. I thought that the lid is lifted off, but this was really a fun surprise. I could imagine my godchildren opening this and bursting into laughter. Great idea!" ID50 (chocolate package)

"When opening the package, a funny text is revealed inside, which tells more about the company. Slightly different inside from what I expected. It was a positive surprise. Easy to open. On the other hand, is the seal sufficient as a closure mechanism? It fits in a small space." ID18 (meal package)

"Interesting. A positive surprise. And it seems that you could put whatever you want in it and it suits all kinds of things." ID3 (e-commerce package)

In addition to visual experience, other sensory experiences were also mentioned. For the ready meal package, pleasantness to touch was mentioned by four participants. The sound of the package also seemed to matter to one participant.

"Opening is easy, surprisingly pleasant. I like the softness of the package compared to hard plastic and cartons." ID6 (meal package)

"Feels good to fingers, clear, and easy to open. The portion was nice and neatly packed." ID75 (meal package)

"Practical, easy to open. On the other hand, too loud." ID74 (meal package)

Vision dominates product experience as it precedes other senses in perception and interaction, but touch is also important particularly in consumer products. Vision creates expectations for touch. According to Schifferstein and Cleiren,[42] product experience is based on perceptual information retrieved through different senses, but the impact that the different senses have on the overall experience varies. Some sensory modalities may elicit stronger sensations than others, and the congruence or incongruity of the stimuli affects the overall experience.[43–45] Consumers prefer products in which different types of sensory information complement one another[44] According to Spence and Gallace,[46] touch can have an effect on consumers' product evaluations as well as product sales. Design for experience is more likely to succeed when designers pay attention to the messages conveyed by the different sensory channels.[47]

Interaction experience scale

The qualities of how the packaging interaction feels at the moment of opening were studied with a shortened version of the *Interaction Vocabulary* by Lenz *et al.*[35] The method can capture some of the lower-level dimensions of the opening experience that were not mentioned in the qualitative answers provided by the respondents, and thus, it complements the qualitative experience questionnaire. According to Lenz *et al.* '*Actions on the How-level* [of interaction] (e.g., sensomotoric) *become quickly automatized and, thus, remain unconscious* (referring to Kaptelinin and Nardi[48]). *This makes it*

quite difficult to discuss how an interaction feels or should feel. The vocabulary provides attributes to talk about interaction' [35 p. 129]. These low-level interaction attributes included in the scale are not evaluative in the sense that one could say whether 'fast' or 'slow' is better because these are dependent on the kind of higher-level experience, such as surprise, that designers intended to create. In the design phase, the intended experience should guide the choice and appropriate use of interaction attributes.[35] However, when used for user evaluation of packaging, the vocabulary can capture the essence of interaction on the sensomotoric level and thus point to opportunities or problems with the performance of the packaging on the interaction level.

The e-commerce packaging was perceived to be somewhat precise, powerful and covered (not-apparent) to open as shown in Figure 5. Because the package had two layers, opening consisted of two separate steps, which show in the evaluation of the stepwise–fluent as well as apparent–covered attributes. Because of some manufacturing issues, the package prototype actually became stiffer to open than the designers had originally intended. This is in line with the qualitative results in which hard to open was the most frequently mentioned theme in terms of ergonomic quality. Some of these qualities are addressed in the quotes in the succeeding text.

> *"A little difficult to open at first, but it did not matter. The opening was exciting and the contents surprised me. I am tempted to keep the packaging."* ID39

> *"A fun idea, more gorgeous inside than what you might believe from the surface. It is a good idea that when you open the package you first get the greeting, and only then the gift, so it is not revealed immediately. A nice idea to have a card at the bottom of the package that might have greetings from the packet sender."* ID23

The ready meal package had a clear interaction profile depicted in Figure 6. The package was experienced as fast, apparent and fluent to open. These data seem to be in line with the strong easy to open theme found in the qualitative data.
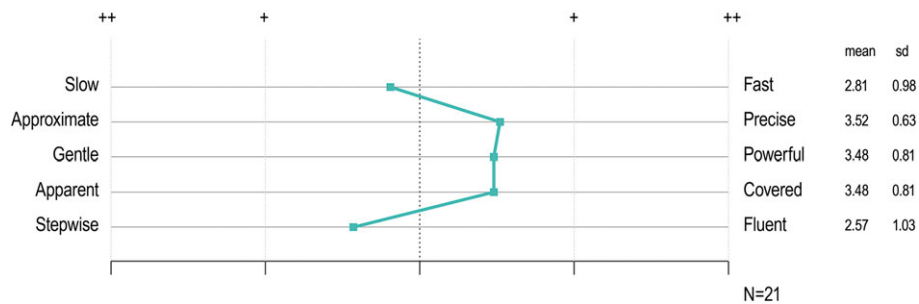

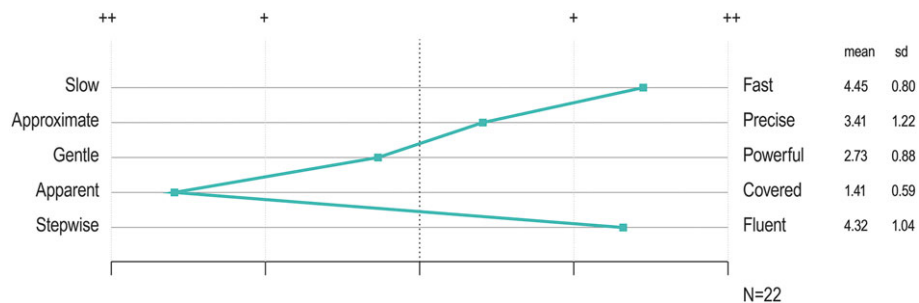Figure 5. Interaction of opening the e-commerce package.

Figure 6. Interaction of opening the ready meal package.

"Truly pleasant! Packing slips nicely out of the cover and a fun little text is revealed while opening the bag! If the taste of the prepared food and nutritional content were more appealing to me, I would absolutely buy! I like the homey cardboard bag. Perhaps the cardboard is a bit thick and you have to be a bit wary of wrinkling it when opening it." ID69

"Very fast and easy. Pleasant in the hand." ID81

Figure 7 shows that the opening of the chocolate package was experienced in general as somewhat fast, precise, gentle and covered, but interestingly, a significant number of participants ($n = 12$) could neither understand nor operate the unorthodox opening mechanism of the package. These participants opened the package by force, which often resulted in broken boxes. Thus, their opening experience is clearly different (Figure 7 in red) from the participants who could operate the package as intended. Even though we had very small sample sizes when dividing participants to those able to open ($n = 22$) and those unable to open ($n = 12$) the box correctly, we were able to find statistically significant differences with paired t-tests for two of the experience variables: slow–fast (p-value 0.029) and approximate–precise (p-value 0.016). Those who did not open the package as intended perceived the opening as slower and more approximate, whereas the correct way of opening was perceived faster and more precise. We assume the reason why so many participants were struggling with the opening mechanism was that they had not been exposed to this kind of packaging before. There are no similar packaging structures currently on the market.

"Opening is a bit unclear, it tore when I opened it. The cover seems as if it should be opened, even if it only needs to be lifted upwards." ID60 (could not open)

"Fun, a new type of packaging. The layout is more interesting when the package lid is lifted up and the bottom part reveals more of the additional pattern. The package can be opened and closed conveniently and quickly. The hand fits well in the package. The packaging remains beautiful when opened because there won't be tears." ID72 (could open)

"Wow! A really positively surprising packaging. I was ready to "lift off" the white hood of the package, but instead it opened much more smartly! It may be that some other manufacturer makes packaging like that, but I have never come across anything similar. Very clever! It's nice when the lid of the package is not "separate". The hand fits nicely in the container, a bigger hand may get caught when pulling it out." ID67 (could open)

Willingness to pay

The WTP data included 77 observations. To measure how interaction with a novel package affects WTP, we analysed the difference in WTP using a two-step WTP method. We first tested WTP based
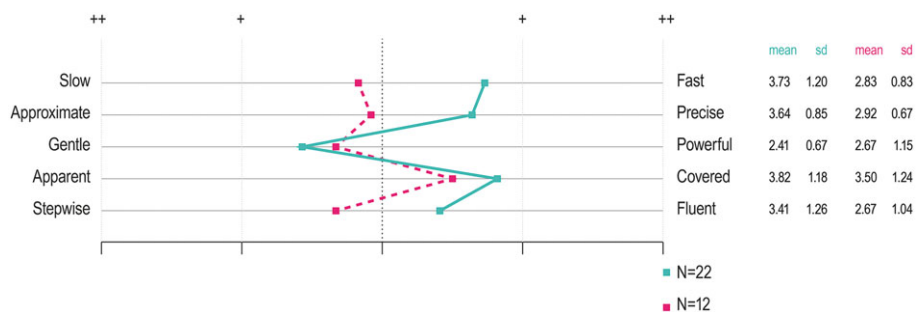

Figure 7. Interaction of opening the chocolate package. The solid line depicts those who opened the package as intended, and the dotted line those who could not operate the package at the point of opening.

only on an external, visual evaluation of the package (WTP1) and a second time after the respondents had experiences of using the package (WTP2). The paired *t*-tests analysed with the IBM SPSS Statistics Version 22 software indicated that there are statistically significant differences between the WTP1 and WTP2 responses ($n = 75$, two outliers with unrealistic WTP removed, $p = 0.000$).

In our study, the average increase in the WTP was €0.56 (0.61 USD), which means that on average, the effects of using the package were on the positive side. There was an increase in WTP for 57% of the respondents, no change in WTP for 29% of the respondents and decreased WTP for 14% of the respondents. The opening experience of the e-commerce package had the strongest positive effect (+€1.34) when measured with change in WTP, followed by the chocolate package (+€0.32). The ready meal package had the smallest change in WTP (+€0.18). Descriptive statistics of the data are graphically illustrated as a box plot diagram [median €0.50, T-bars indicating 95% confidence interval for the difference, outliers marked as round circles] (Figure 8).

For some participants, experiences of the package opening yielded a rather high WTP score as indicated in Figure 8, where four participants were marked as outliers (a round circle above the box). These participants were included in the final analysis because in the qualitative part of the survey, they described their experience as 'a positive surprise' and the package design was described as 'innovative' and 'very special'.

Notably, there were also some negative experiences that resulted in negative WTP. At its lowest, WTP decreased by -;€1.50, and in the comments, the respondent explained having had bad experiences when opening the package.

Reasons for diminishing WTP emerged mainly if a respondent, after experiencing the surprise element, started to think about the functionality of the package, for example, if there were difficulties to open the package or taking the product out of the package. One of the products (the ready meal package) also had an inner package that wrapped food ingredients tightly to the plastic serving plate. This plastic-look experience led to some negative evaluations for the product itself and resulted in negative WTP.

Next, we will explore the WTP results product by product (Table 2 and Figure 9).

The results indicate that the opening experience of the e-commerce package had the strongest positive effect when measured with WTP change by using the mean (+€1.34). The chocolate package had the second largest change in WTP (+€0.32), while the ready meal package had the smallest change in WTP (+€0.18). The ready meal package had the smallest standard deviation of the WTP1 and WTP2.
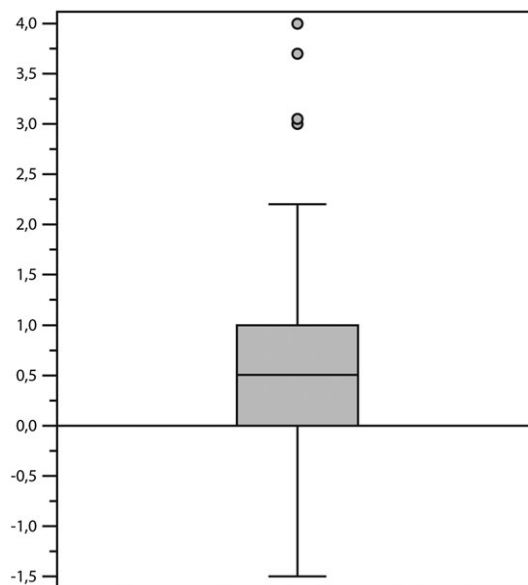

Figure 8. Difference in WTP (WTP2–WTP1) in an experiment illustrated as a box plot diagram.

Hedonic Quality Stimulation

Because earlier research has focused on the pragmatic side, e.g. technical, ergonomic and communicative quality,[16] an interesting question is whether the hedonic (also known as emotional, non-instrumental) interaction experiences such as stimulation or identification can explain the differences in WTP. Our analysis focused on the Hedonic Quality Stimulation element, HQS (e.g. Hassenzahl[38]).

Based on the content analysis of the qualitative interaction experience descriptions related to the opening of the package, participants were divided into three groups having a positive HQS ($n = 32$), a negative HQS ($n = 5$) or no HQS ($n = 40$). With the WTP difference (WTP2–WTP1) as the main variable, we tested whether there is a statistically significant difference between these three HQS groups. The non-parametric test (independent samples Kruskall–Wallis test for equality of means) showed a statistically significant difference between these groups (*p*-value 0.005). A pairwise comparison showed that the groups with statistically different means were negative HQS–positive HQS (Sig. 0.019) and no HQS–positive HQS (Sig. 0.039). For the negative HQS group, the change in the WTP mean was -€0.40; for the group no HQS, the mean increased by +€0.36; and for positive HQS, group mean increased as much as +€0.96.

One of the design aims mentioned in the briefs for both chocolate and e-commerce package was a surprising experience, which is one kind of HQS. In the user evaluation phase, the concept of surprise occurred seven times in the experience descriptions of opening of the e-commerce package and eight times in the experience descriptions of the opening of the chocolate package. Surprise was also mentioned by three participants at the moment of opening the ready meal package. A total of 18 participants mentioned the element of surprise in their descriptions of the opening experience. We therefore analysed the WTP difference between these two groups (surprise mentioned $n = 18$, surprise not mentioned $n = 59$). The mean indicated a WTP difference between these groups (surprise mentioned: €0.85 increase, surprise not mentioned: €0.47 increase), but this difference was not statistically significant ($p = 0.163$). However, the increase in the average WTP rating for people who mentioned surprise was extremely high for the e-commerce package, 58.47%.

Latent class analysis

As the final analysis, we tested how the five sensomotoric interaction qualities affected WTP. A latent class analysis (LCA)[50] with Latent Gold 5.0 was used for forming consumer clusters based on the participants' WTP and experiences of opening the package. The indicator variable WTP was classified in three classes: WTP increased, WTP unchanged and WTP decreased. As explanatory variables in the model, there were five interaction adjectives from the Interaction Vocabulary scale.[35] For the estimation of the model, we reduced the scale of interaction variables from 1–7 to 1–5.

The estimation of the LCA relies on probabilities. In general, LCA models aim to find substantively meaningful groups of people that are similar in their responses to measured variables and to identify classes by using explanatory variables as interaction variables in this study that best distinguish between

Table 2. Descriptive statistics by product.

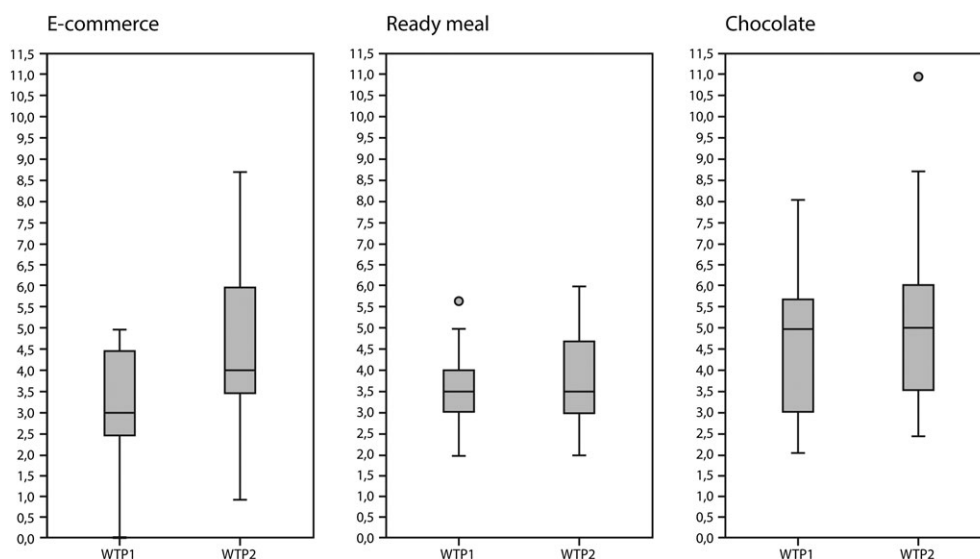|	E-commerce package		Ready meal package		Chocolate package	
	WTP1	WTP2	WTP1	WTP2	WTP1	WTP2
Mean	3.19	4.53	3.61	3.79	4.73	5.05
95% Confidence interval						
Lower	2.53	3.66	3.22	3.26	4.17	4.38
Upper	3.84	5.40	4.00	4.32	5.29	5.72
Median	3.00	4.00	3.50	3.50	4.95	5.00
Min	0.00	1.00	2.00	2.00	2.00	2.40
Max	5.00	8.70	5.65	6.00	8.00	10.95

WTP, willingness to pay.

Figure 9. Box plot diagrams by product.

classes. In this study, the model with the lowest Akaike's information criterion value[49] was a four-class model, and it was chosen for further analysis (Akaike's information criterion = 149.33, Npar = 23, L2 = 95.01, df = 54, p = 0.00048, bootstrap p-value 0.054). The explanatory power of the four-class model for indicator variable WTP seems to perform well (Wald 14.14, p-value 0.003, R^2 0.60).

The first class (33.9%) is named as WTP++, indicating a strongly positive WTP after interaction and opening of the package. The mean increase of WTP for this group is €0.99 (1.09 USD). Table 3 shows how the clusters are related to the indicator WTP variables and means for the explanatory variables in each cluster.

All respondents in the WTP-- cluster (9.3%), i.e. those whose WTP decreased the most, evaluated the opening experience as requiring precision (mean 4.29) and being slow (mean 2.43). More than the participants in the other clusters, the participants in the WTP++ cluster with the highest WTP increase seem to think that the opening experience is more powerful, even though the mean for this variable (2.99) was only slightly higher than others. The WTP+ cluster (35%), having a positive WTP mean for the opening experience (€0.55), considered the perceived opening experience as being faster and more covered compared with the other clusters.

Table 3. Cluster profile description.

	Cluster1 WTP++	Cluster2 WTP+	Cluster3 WTP−	Cluster4 WTP −−	Wald	*p*-value
Cluster size, %	33.9	35.0	21.8	9.3		
Indicators						
WTP decreases	0.00	0.03	0.26	0.81		
WTP no change	0.01	0.39	0.59	0.18		
WTP increases	0.99	0.58	0.15	0.00		
Mean	0.99	0.55	−0.11	−0.81	*14.14*	*0.003*
Covariates						
Slow (1) to fast (5)	3.19	4.08	3.71	2.43	*7.00*	*0.072*
Approximate (1) to precise (5)	3.79	3.57	2.26	4.29	*7.73*	*0.052*
Gentle (1) to powerful (5)	2.99	2.87	2.64	2.58	*4.65*	*0.200*
Apparent (1) to covered (5)	2.61	3.55	2.72	2.86	*7.64*	*0.054*
Stepwise (1) to fluent (5)	2.97	4.08	2.80	3.00	*5.90*	*0.120*

WTP, willingness to pay.
The Wald test is a different thing used to determine whether the item coefficients for these outcome variables in the model are significantly different from each other across classes.

DISCUSSION

Based on our quantitative results for the three different packaging designs, it is evident that positive packaging interaction experience increases WTP at the second moment of truth. In specific, our study also shows that a stimulating interaction experience increases WTP. With the packages that incorporated the element of surprise, WTP increased on average by 20%, whereas for those who did not mention any surprise elements, the increase was 12%. The increase indicates that a positive surprise adds value for consumers, and they are willing to pay substantially more. However, if the opening affordance in the novel package is weak, e.g. the unorthodox opening mechanism is too difficult to understand or operate, the effect is reversed. It is thus important to test the affordance and usability of a new package design. Interestingly, ease of opening, which clearly was the most significant qualitative theme for the ready meal packaging (with 15 mentions) at the second moment of truth, did not seemingly contribute much to the increase in WTP (+€0.18). All this is in line with the findings by Hassenzahl et al.[51] that the hedonic quality acts as a 'motivator' and pragmatic quality as a 'hygiene factor'. Hygiene factors, when not addressed properly, can decrease WTP, but when addressed, do not increase WTP. Participants were motivated to pay more when the design was addressing hedonic factors.

In the case of the chocolate packaging, the deviating form and novel opening mechanism clearly divided consumer evaluations and experiences. If the consumer did not understand how to open the package, it was rated more poorly on the interaction scale as well as in the verbal experience descriptions. This can be linked to the innovativeness of the design. Schoormans and Robben[52] suggest that the degree to which a packaging deviates from the product category affects how well it is received by consumers, because deviation and positive appreciation are interlinked. A packaging attracts more attention when it deviates from the category, but, on the other hand, excessive deviation results in lower product evaluation and can lead to unacceptability in the category. According to Hekkert et al.,[53] typicality (goodness of example) and novelty of a product are both equally good at explaining aesthetic preference of consumer products. However, as they are each other's opposites, they suppress each other's positive effects. Following the MAYA principle (acronym for most advanced yet acceptable, coined by Raymond Loewy in 1951), the designer should balance his or her work between novelty and typicality. If a design is too innovative without any typicality, it becomes too different for consumers, and it will score low in aesthetic preference. In addition to poor perceived affordance, this can explain some of the more critical responses.

The Interaction Scale indicates that the opening experience for the ready meal package was the most straightforward, whereas opening of the e-commerce gift package can be described as more demanding. These differences are caused by the differences in the nature and intended use of the products. The opening of a gift package may take some time, and it only heightens the excitement and emphasizes the moment of product revealing. In case of the ready meal package, a simple opening experience is typically more wanted and perhaps an expected must-be feature. The opening experience for the chocolate packaging can be described as relatively effortless, given that the participant could understand the opening mechanism. The interaction can be also described as somewhat covered, as the packaging opened in an unexpected way. The Interaction Scale provided some indication on the quality of the opening experience in terms of low-level (sensomotoric) interaction attributes and is able to capture some dimensions of the interaction not provided in the qualitative answers. The method can provide means to capture data on consumers' HPI as well as means for researchers to compare differences between various packaging structures and opening mechanisms, although the method is originally developed as an inspirational tool for designers designing interactions.

CONCLUSIONS

A package interaction study was conducted on the link between user experiences and WTP with 77 consumers. New packages for three different product contexts – chocolate, ready meal and e-commerce – were used. The inquiry into the user experiences was conducted with a questionnaire addressing first impression, visual communication and opening experience. Short, spontaneous and

written reflections of the packaging experiences were collected as qualitative data and analysed with summative content analysis. The packaging experiences were positive in general but varied between the packages. A short version of the Interaction Vocabulary scale[35] was used to study sensomotoric dimensions of the opening experience. WTP was inquired twice, before and after package opening, to find out whether interaction experience has an effect on the WTP.

Our study suggests that the opening experience does have an influence on WTP, and in our study, the average increase in the WTP was €0.56 (0.61 USD). A positive interaction experience can thus provide added value that translates into a heightened WTP. The analysis on the possible reasons behind the WTP change showed that WTP decreased owing to pragmatic problems in opening the package and increased when the design was addressing hedonic factors. Our study did not find positive pragmatic experiences to increase WTP, but a specific analysis of the stimulating experiences (surprising, original, innovative, etc.) in all three packages showed that WTP increased significantly with positive stimulation. We conclude that also with package design, pragmatic factors seem to act as hygiene factors that remove disappointments, but it is the hedonic factors that motivate consumers to pay more.

Good user experience stems not only from the pragmatic usability but also from the emotional, non-instrumental aspects of the design. Although previous research has largely focused on the pragmatic aspects of HPI, in this study, a large portion of the qualitative data was reporting hedonic experiences. This emphasizes the need to pay more attention to the emotional aspects of packaging design. It is difficult to give specific guidance on designing hedonic package features, because experiences are subjective and context-sensitive. For example, the experience of surprise changes over time, and designers need to constantly find new ways of creating the surprise experience. At the same time, they have to balance typicality and novelty. A positive surprise turns easily to a negative experience if the affordance is poor, such as the unorthodox opening mechanism that yielded to problems with the chocolate package. Package designers are thus encouraged to design stimulating experiences with also pragmatic packaging affordance in mind.

Limitations

Our sample size was relatively low for each tested package. All participants were from one country, Finland, and represented the youngish target user groups of each package. Generalizability of the results should thus be tested with different audiences.

The participants experienced packaging in an artificial lab-like environment diverging from the typical marketplace where these product packages would normally be found next to competing products. WTP was evaluated in isolation without references to competing products.

Further, as in any similar experiment, we had a limited set of different types of packaging designs. The packages were prototypes designed by students but produced by a professional printing company. Yet, the designs were suffering from minor production-related imperfections leading to some of the witnessed and unwanted usability problems (i.e. material stiffness at the point of opening). These would most likely be solved before large-scale manufacturing.

Future work

We plan to continue studying interaction experience with different types of packaging designs. It is intriguing, for example, to study the relation between hedonic and pragmatic experiences and WTP in more detail. We also aim to collect more experience descriptions from different cases and usage contexts and eventually produce a new scale for packaging interaction experience. We hope the scale will help both design practitioners and researchers to study interaction experiences with various kinds of packaging designs.

ACKNOWLEDGEMENTS

Interdisciplinary Packaging Design Project course, as well as our students for their packaging design contribution: Petriina Piuhola, Heli Juuti, Oona Casalegno, Rodrigo Prieto Padila, Anu Penttinen, Janika Haataja, Anna Anc Ciechanowicz, Eriko Ishii, Sara Ceccherini, An-Ting Din, Terhi Isokuortti, Tatu Laakso, Mukundhan Kulur, Essi Huotari, Karoliina Heikkinen, Du Yuexin, Anna-Miia Suominen and Jenna Virrankari.

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