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Factors associated with Finnish, German and UK consumers' intentions to test, buy and recommend reusable fast-moving consumer goods packaging

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ABSTRACT

This study investigates factors connected with consumers' intentions to test, buy and recommend reusable packaging for Fast-Moving Consumer Goods (FMCGs) by extending the Theory of Planned Behavior model with positive and negative emotions as facilitators of intentions and all behavioral determinants (i.e. attitude, subjective norm, perceived behavioral control). In addition, the connection of five perceived value dimensions (functional, emotional, social, price, environmental sustainability) and attitudes is explored. A conceptual model and relevant hypotheses were tested with consumers from Finland, Germany, and the UK (total $N = 2400$) through Partial Least Squares - Structural Equation Modeling (PLS-SEM). Main results show that positive emotions have a key role in consumers' assessment of reusable FMCG packaging: They have a direct and strong influence on intentions and also influence perceived behavioral control and subjective norms. Additionally, none of the examined perceived values had a significant connection with consumers' attitudes. Consumers' adoption of reusable FMCG packaging solutions can be encouraged through positive emotional experiences related to packaging reuse. Behavioral change and marketing strategies can support consumers' experiences by considering affect (e.g., positive emotions), cognition (e.g., perceived behavioral control), and social expectations (e.g., subjective norms) as influential factors.

1. Introduction

Fast-Moving Consumer Goods (FMCGs) are retail products such as food, personal, and household care items with a short lifespan. Single-use packages are often used to protect and enable transportation of FMCGs (Dopico-Parada et al., 2021). This comes with a problem as single-use packages entail severe environmental burden; they generate 36 % of solid waste and are responsible for 40 % of annual plastic waste globally, which is projected to reach 380 Mt. per year in 2060 from 142 Mt. in 2019 (OECD, 2022). Consequently, pressure and interest to improve the packaging environmental sustainability are on the rise. For instance, EU member states have committed to make environmentally sustainable packaging the new norm (European Commission, 2022). Consumers are also aware and concerned about the environmental impact of household products and have raised their expectations towards the FMCG industry to use more sustainable packaging alternatives (Otto et al., 2021). Finally, businesses are setting goals to adopt practices and invest in sustainable packaging optimization in order to meet consumer demands and improve packaging efficiency (Morashti et al., 2022).

Ways to maintain the use and value of FMCG packaging before final disposal is key in reducing packaging waste. Packaging reuse is one way to achieve this (Greenwood et al., 2021; Otto et al., 2021). For FMCGs, reusable packaging refers to the repeated packaging refill and/or return by consumers for the same purpose as it was originally designed (Muranko et al., 2021). Due to the problems with single-use packaging, reusable packaging has gained interest and received support from policymakers. Examples are the recent provisional agreement on revamped rules to reduce, reuse and recycle packaging, increase safety and boost the circular economy in European Union (European Parliament, 2024) and the Plastics Bill in the United Kingdom (UK Parliament, 2022).

Consumers' commitment to packaging reuse is an essential element for establishing environmentally sustainable FMCG packaging. Without commitment by consumers to buy and use FMCGs in reusable packaging systems, the environmental benefits of packaging reuse cannot be realized by value chain actors (e.g. packaging industry, brand owners, retailers) and risks for making significant capital investments on reuse systems without equal returns arise (Kunamaneni et al., 2019;

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Greenwood et al., 2021; Miao et al., 2023). Reuse poses challenges to consumers unseen with the current sustainable packaging disposal manners, such as recycling. Packaging reuse requires sustained relationship between consumers and FMCG packaging. In recycling, FMCG packages are disposed after usage whereas reuse is based on the continuous refill and return of packages. Depending on the reuse model, consumers may refill and return FMCG packaging at their homes and/or at retail points (see Muranko et al., 2021 for a review of consumer-led FMCG reuse models). Furthermore, recycling is familiar to consumers whereas packaging reuse for FMCGs is just gaining momentum (Bradley and Corsini, 2023). Above-mentioned differences suggest that there might not be a "one-size-fits-all" solution for consumers to deal with FCMG packaging in environmentally friendly way and that different changes are needed by consumers to perform each behavior (White et al., 2019). Due to consumers' different role in recycling versus reuse, consumer research on recycling, for instance, may not fully apply to understanding consumers' responses to packaging reuse. Since reusable FMCG packaging systems do not yet exist, it is of utmost importance for both practitioners and researchers to gain a specific understanding of consumers' intentions to consume FMCGs in reusable packaging.

Literature offers some understanding of consumers' views on packaging reuse. In general, consumers seem to understand the environmental sustainability benefits and perceive the idea of reusable packaging positively (e.g. Babader et al., 2016; Miao et al., 2023). However, concerns have been identified in forms of lack of convenience (e.g. Bashir et al., 2020), low packaging quality (Lofthouse et al., 2009, 2017), and high price (e.g. Miao et al., 2023). As reusable FMCG packaging solutions are not widely available in the market (Greenwood et al., 2021), consumers' behavior remains unknown (Branca et al., 2024; Greenwood et al., 2021). Nevertheless, consumers' intentions, which are fundamental antecedents of the behavior (Ajzen, 1991) have received some attention in studies on reusable fabric bags (Ertz et al., 2017), home cleaning products (Bashir et al., 2020), and take-away coffee cups (Keller et al., 2021). Currently, knowledge exists for some specific products, but broader understanding on consumers' intentions and related factors towards the reusable FMCG packaging is missing. Overall, despite an ever-growing significance of sustainable packaging in the supply chain, consumers' behavior has received limited attention (Morashti et al., 2022). Due to the novelty of reusable packaging, consumer research in the domain is in its infancy, explorative, and lacking solid theoretical approaches (few exceptions being Ertz et al., 2017; Keller et al., 2021; Song et al., 2023). This leads to scattered knowledge on how to support consumers in switching from single-use to reusable FMCG packaging. For example, are there factors beyond environmental sustainability that influence consumers' intentions to use reusable packaging? What are the underlying bases for consumers' attitude formation towards packaging reuse? Answers to these questions could enable formation of strategies, which ultimately could play a role in convincing consumers to favor reusable FMCG packaging.

The aim of this study is to analyse the factors connected with consumers' intentions to test, buy and recommend FMCGs in reusable packaging. The study takes as its backbone the Theory of Planned Behavior (TPB) (Ajzen, 1991) developed for explaining consumers' intentions and behaviors towards specific objects, also in sustainable consumption context (e.g. Paul et al., 2016; Randall et al., 2024). TPB was chosen as the main theoretical framework since it has proven capacity in explaining variation in consumers intentions in various sustainable consumption contexts, such as food (e.g. Randall et al., 2024), energy (e.g. Wong et al., 2024), transportation (e.g. Si et al., 2020), tourism (Han et al., 2017) and packaging (e.g. Santos et al., 2021). TPB allows for a more comprehensive and theoretically founded understanding of behavioral intentions as compared to majority of previous studies in reuse domain, which have adopted explorative or descriptive approaches to consumers' general reactions, perceived enablers, and barriers of reusable FMCG packaging (e.g. Babader et al., 2016; Greenwood et al., 2021; Miao et al., 2023; Bashir et al., 2020; Magnier and Gil-Pérez, 2023).

Application of TPB is not new in pro-environmental consumption (see review by Yuriev et al., 2020) or even in the relatively new packaging reuse (e.g. Ertz et al., 2017) domain. However, the core constructs of TPB are cognition-driven concepts (Yuriev et al., 2020), lacking the equally, or in some cases even more important, affective side of consumers' decision making (Shiv and Fedorikhin, 1999; Russel et al., 2017), found important also in environmentally sustainable consumption contexts such as food (Onwezen et al., 2022) and sustainable packaging (Koenig-Lewis et al., 2014; Lombardi et al., 2024). This neglect is visible in the TPB studies focusing on green consumption (few exceptions being e.g. Carrus et al., 2008, Russel et al., 2017 and Lam et al., 2022) despite its potentially strong exploratory power. In addition, the attitude, one of the main contributors to consumers' behavioral intentions in TPB is often left unexplained or the explanations do not apply conceptually solid and holistic approaches to capture as much variance behind the attitude formation as possible. For these reasons, in this study, the TPB model is extended with the concepts of positive and negative emotional responses and perceived value (Sweeney and Soutar, 2001). Positive and negative emotions are included in the proposed model as facilitators of consumers' attitudes, subjective norms, perceived behavioral control, and intentions related to reusable packaging, in order to integrate the affective side of decision-making and better explain consumers' responses towards packaging reuse. Perceived value concept allows a theoretically established approach to capture crucial factors influencing consumers' attitude formation through five dimensions (functional, social, emotional, environmental, price). These extensions are especially important in approaching novel research topics such as packaging reuse to gain holistic understanding of the relevant factors behind consumers' decisions. The model is empirically tested and validated with survey data from three European countries; Finland, Germany, and the UK (Total $N = 2400$). It is expected that the results of the study shed light in the relative role of cognitions and affections in formation of consumers' intentions to test, buy and recommend FMCGs in reusable packaging. Such knowledge is important as it serves building blocks for designing the content for further research focusing on the ways to nudge consumers towards packaging reuse as well as for example public campaigns with similar aims.

2. Literature review, conceptual model and hypotheses development

This section is structured as follows: Section 2.1 reviews literature about consumers' perceptions, challenges and expectations related to reusable packaging and Section 2.2 examines factors predicting consumers' intentions and behavior. Section 2.3 presents the conceptual model used in this study, followed by a detailed development of relevant hypotheses.

2.1. Consumers' perceptions on reusable packaging

Consumers' views towards reusable packaging seem to be mixed. On the positive side, packaging reuse is inherently perceived environmentally sustainable (e.g. Miao et al., 2023; Magnier and Gil-Pérez, 2023). For instance, Dutch consumers perceived a reusable packaging system for food refill as an opportunity to reduce their plastic packaging consumption and waste (Miao et al., 2023). In addition to environmental sustainability, functionality (e.g. convenience, product protection) and price have positive influence on consumers' views and seem to shape their expectations. For example, Norwegian consumers who perceived a home cleaning refill solution as inexpensive, convenient and of high quality were more inclined to use and recommend it to others (Bashir et al., 2020).

On the negative side, some consumers have expressed concerns regarding lack of convenience (e.g. Lofthouse et al., 2017; Kunamaneni et al., 2019; Bashir et al., 2020), inferior quality (e.g. Miao et al., 2023),

and high prices (e.g. Lofthouse et al., 2017; Miao et al., 2023). Concerning expectations, UK consumers expected that certain refill types (e.g. dispensed products and deposit systems) are or should be cheaper than the conventional solutions, due to the general perception that refills cost less in terms of production and transportation (Lofthouse et al., 2017). Also, Dutch consumers who tried an experimental reusable packaging system for food refills expressed their expectations related to product protection, such as that reusable packages should be safe for storing food and scratch-proof over multiple reuse cycles (Miao et al., 2023). Finally, some indications exist that reusable packaging may spark perceptions of emotional and social value for consumers. For instance, in the UK some packaging refill types were considered as "fun to use" (Lofthouse et al., 2009, 2017) while Dutch consumers referred to positive feelings and increased social value in connection the positive environmental impact of reusable packaging systems (Miao et al., 2023).

2.2. Consumers' behaviors and intentions related to reusable packaging

Some experimental studies have focused on consumers' packaging reuse behaviors in contexts of food take-away and beverage refill (e.g. Dorn and Stöckli, 2018; Tenhunen-Lunkka et al., 2024; Miao et al., 2023) and warm beverage cups (e.g. Poortinga and Whitaker, 2018; Novoradovskaya et al., 2021; Nicolau et al., 2022). Packaging reuse behaviors are influenced by knowledge related to the reuse systems (e.g. Miao et al., 2023), social environment (see Dorn and Stöckli, 2018), environmental messaging (see Poortinga and Whitaker, 2018) and interventions referring to environmental sustainability, possible financial benefits and psychological ownership (see Novoradovskaya et al., 2021). For instance, a study of reusable take-away boxes for food in Switzerland showed that choices of reusable boxes at restaurants were more likely to occur for customers when others around them bought or used their own reusable boxes (Dorn and Stöckli, 2018). Findings from a pilot with reusable take-away pizza boxes in Finland showed that consumers perceived functional, environmental, social and emotional value related to the use of the boxes and that such value was sustained over the study period (i.e. two months) (Tenhunen-Lunkka et al., 2024). However, the study took no stand on whether the value perceptions drive consumers' attitude formation and consequently the behaviors.

Some validated behavioral models have been used to study consumers' intentions (e.g. Ertz et al., 2017; Keller et al., 2021; Song et al., 2023). Drawing on Theory of Planned Behavior (TPB), Ertz et al. (2017) demonstrated that its main constructs (i.e. attitude, perceived behavioral control, and subjective norms) adequately predict Western and Asian consumers' intentions to use reusable coffee mugs, thermal bottles, and fabric bags. The same study showed that culture moderates the relationship between some of the predictors and intentions. For instance, attitude was found as a significantly stronger predictor of intentions for Westerners than Asians to use reusable containers (e.g. shopping bags). Keller et al. (2021) applied the stage model of self-regulated behavioral change (SSBC) to predict intentions towards reuse alternatives to single-use coffee cups (i.e. own reusable cups and deposit-based system). The study found that awareness of environmental consequences and related emotions, ascription of responsibility, social norms and goal feasibility explained increased intentions among consumers from the city of Darmstadt (Germany) to refrain from using single-use coffee cups and that perceived behavioral control strongly predicted consumers' choices of reusable alternatives. Finally, Song et al. (2023) extended the Norm Activation Model (NAM) with the construct of subjective norms to predict Shanghaies consumers' intentions to use reusable express packaging. The results showed that subjective norms have a direct and significant influence to intentions alongside personal norms (which is the only direct predictor of intentions in the main model).

2.3. Conceptual model and hypotheses development

The current study examines Finnish, German, and UK consumers' intentions to test, buy and recommend reusable FMCG packaging by extending the TPB model by Ajzen (1991) with the constructs of perceived value and emotional response towards reusable packaging.

Fig. 1 presents the conceptual model for this study. The model includes the basic TPB expectations: attitudes, subjective norm, and perceived behavioral control are connected with consumers' intentions to test, buy and recommend FMCGs in reusable packaging (cf. Ajzen, 1991). It is to be noted that while the original TPB model posits intention as the antecedent of actual behavior (Ajzen, 1991), this study focuses on intentions as the lack of FMCGs in reusable packaging in retail shops prevents the study of the actual self-reported behaviors. On top of the standard TPB constructs, positive and negative emotional responses towards reusable packaging are included as shapers of consumers' attitudes, subjective norms, perceived behavioral control and intentions to test, buy and recommend FMCGs in reusable packaging. Finally, consumers' perceived value is expected to facilitate consumers' attitude formation. Next, rationale for the proposed connections and formal hypotheses are discussed.

2.3.1. Intentions, attitude, subjective norms, and perceived behavioral control related to reusable packaging

In TPB, intentions capture the motivational factors that influence a behavior and indicate people's willingness to try and put effort in order to perform the behavior in question (Ajzen, 1991). Intention to perform a behavior is the immediate antecedent of that behavior; the stronger the intention, the more likely it is that the behavior will follow (Ajzen, 2020). In reusable packaging context, consumers' intentions have been approached from intentional use, recommendation, and repurchase perspectives. For instance, use intentions have been studied for hot beverage cups (e.g. Ertz et al., 2017; Keller et al., 2021), and some cleaning products (Bashir et al., 2020) whereas recommendation and repurchase intentions have been studied for all-purpose cleaner sprays and Greek style yogurt (Magnier and Gil-Pérez, 2023).

Attitude, subjective norm, and perceived behavioral control form the core of TPB model and determine intentions (Ajzen, 1991, 2020). Attitude towards the behavior refers to a person's favorable or unfavorable evaluations concerning the behavior's likely outcomes (Ajzen, 2020). As a consequence of the formed unfavorable/favorable attitude, the TPB expects negative/positive correlation with the intentions to perform the behavior of interest (Ajzen, 1991). The role of attitudes in explaining the behavioral intentions has been established in several environmentally sustainable consumption domains (Yuriev et al., 2020). The same applies to packaging reuse. For instance, Ertz et al. (2017) and Keller et al. (2021) showed that positive attitudes correlate positively with consumers' intentions towards reuse. Thus,

H1. Consumers' positive attitude towards the reusable packaging is associated with higher intentions to test, buy and recommend FMCGs in reusable packaging.

Subjective Norm (SN) refers to a person's expectation that an important individual (e.g. spouse) and/or group (e.g., friends, family, coworkers) approves or disapproves the behavior in question, thus adding the social aspect to the TPB model as determinant of behavioral intentions (Lam et al., 2022). TPB expects that stronger perceived approval (or advocating influence) of the behavior leads to increased behavioral intentions (Ajzen, 1991). Literature on packaging reuse indicates that others' views can make a difference. For instance, Miao et al. (2023) in their qualitative study with Dutch consumers found that the participants associated positive social value in packaging reuse. Similar results were found in a Finnish field experiment dealing with consumers' views on reusable take-away pizza packaging (Tenhunen-Lunkka et al., 2024). However, the previous examples did not establish the connection between SN and intentions, but the basic premise that increased SN

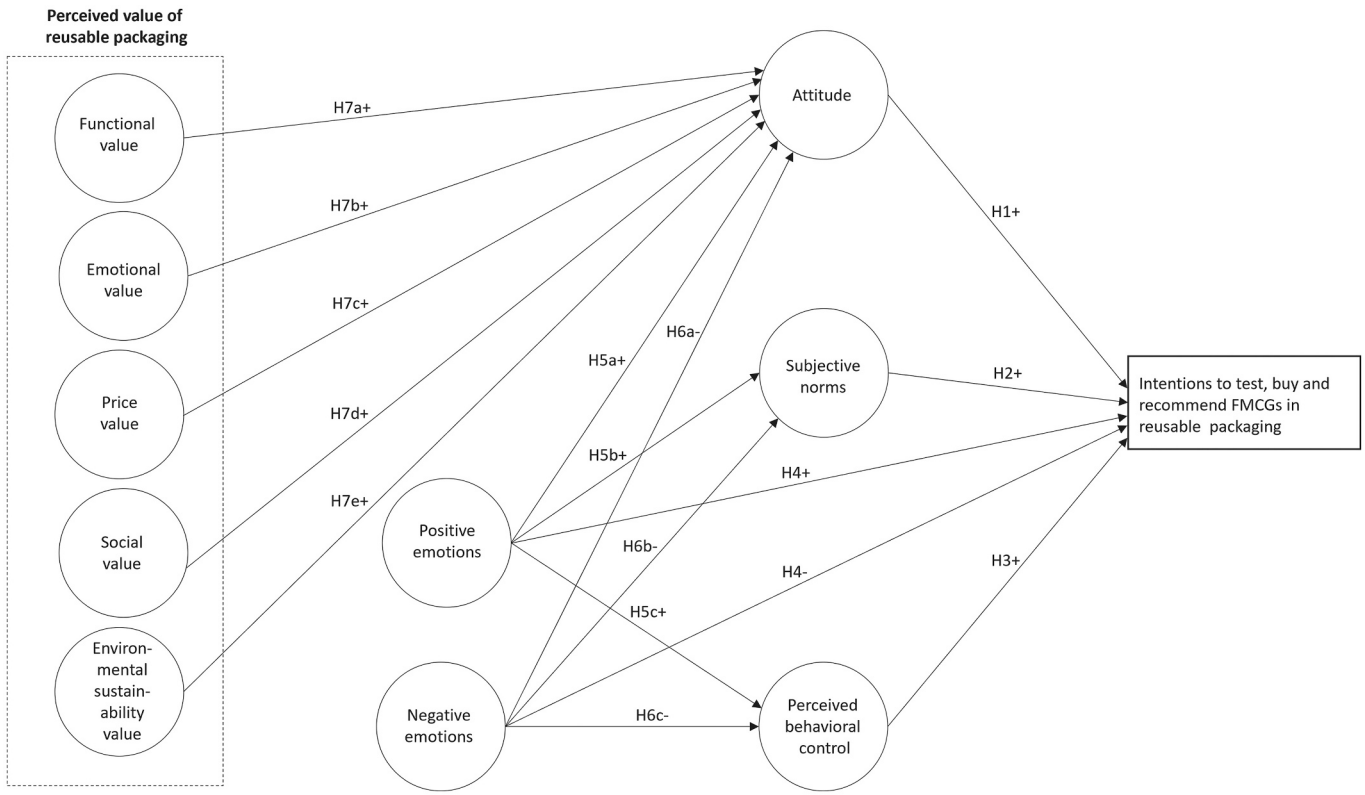

Fig. 1. Conceptual model and hypothesized relationships between the constructs. In the model, + stands for positive expected relationship between the constructs while - is used to show a negative expected relationship.

leads to increased intentions has been confirmed in wider sustainable consumption domain (e.g. Randall et al., 2024; Si et al., 2020) and in earlier studies dealing with consumers' packaging reuse (Ertz et al., 2017; Keller et al., 2021; Song et al., 2023). Similarly,

H2. Consumers' perception of prevailing positive subjective norms is associated with higher intentions to test, buy and recommend FMCGs in reusable packaging.

Perceived behavioral control (PBC) refers to one's perception over the ease or difficulty to perform the behavior of interest. PBC considers two aspects. First, it taps into the person's internal control, meaning one's perceived abilities and resources, such as money and time, to perform the behavior of interest (Kidwell and Jewell, 2003; Carrus et al., 2008). Second, it considers the external control referring to external barriers to perform the behavior (e.g. in the case of reuse, availability of the solutions) (Kidwell and Jewell, 2003). TPB posits that the weaker/stronger the perceived PBC is, the weaker/stronger the behavioral intentions are (Ajzen, 1991). The research carried out in packaging reuse has corroborated this TPB premise on PBC. The research has shown that increased PBC has a positive association with consumers' intentions towards different reuse solutions such as to-go coffee cups, thermal bottles, and shopping bags (Ertz et al., 2017; Keller et al., 2021). Thus,

H3. Consumers' perceived positive behavioral control is associated with higher intentions to test, buy and recommend FMCGs in reusable packaging.

2.3.2. Positive and negative emotions and intentions towards reusable packaging

Consumers make their decisions based on cognition, affection, or combination of both (White et al., 2019). With new objects, such as reusable packaging, the emotional response becomes important as consumers often lack the knowledge and resources to evaluate the object through cognition and thus base their intentions on the initial affective reaction (Shiv and Fedorikhin, 1999; Valor et al., 2022). Indeed, within sustainable innovation domain, emotional responses have been found to connect with consumers' intentions, even being the strongest predictor among various factors (e.g. Onwezen et al., 2022).

In brief, emotions can be defined as "short-term affective responses to appraisals of particular stimuli, situations or events having reinforcing potential" (Gibson, 2006, p. 54). In the context of reusable packaging, some indications hint that positive and negative emotions might have a role to play. A study on alternatives to single-use coffee cups found that positive emotions related to the reduced use of single-use coffee cups and negative emotions related to the environmental consequences of single-use coffee cups had a positive influence to German consumers' intentions to shift from single-use to reusable alternatives (Keller et al., 2021). Furthermore, research in sustainable packaging suggests that positive and negative emotions can have direct effects on intentions (e.g. Koenig-Lewis et al., 2014; Lombardi et al., 2024).

There are also some attempts to integrate consumers' emotional responses with TPB in the broader green consumption arena. Carrus et al. (2008) studied use of public transportation and recycling. Among other constructs, they included anticipated negative and positive emotions into their extended TPB model. As a result, their study indicates that both emotions play a role in explaining consumers' views on public transportation and negative emotions on recycling. Interestingly, the results of Carrus et al. (2008) show that in their model with emotions, the attitudes do not connect to intentions, suggesting important role for emotions. Lam et al. (2022) extended TPB with positive and negative anticipated emotions towards the use of air conditioning along with consumers' affective connection to nature to explain consumers' intentions (and further behavior). Their results showed that once these three affective constructs were included in the model, attitude lost its explanatory power and the explained variance in the model increased close to 20 percentage points. This result explicitly states that emotional response towards sustainable consumption could be highly relevant.

Similar notions have been done in other contexts and studies as well (Richards et al., 2021; Martini et al., 2024). Taken together, as emotional appraisals seem to be important and some indications exist that emotions might play a role in packaging reuse context (Keller et al., 2021), the following is hypothesized:

H4a. Consumers' positive emotional responses towards reusable packaging is associated with higher intentions to test, buy and recommend FMCGs in reusable packaging.

H4b. Consumers' negative emotional responses towards reusable packaging is associated with lower intentions to test, buy and recommend FMCGs in reusable packaging.

2.3.3. Relationship of positive and negative emotions with TPB determinants of intentions: attitude, subjective norms, and perceived behavioral control

As described in the previous sub-section, consumers' emotional responses towards the appraised behavior may have significant effect on behavioral intentions (e.g. Lam et al., 2022). However, emotional responses can also affect the other core constructs of TPB. In terms of the attitude, it could be argued that positive emotional appraisals should contribute favorably to consumers overall attitude towards the specific behavior. This type of argument is supported by the emotion theories, which postulate that positive emotional appraisal in general leads to more positive cognitive evaluations (such as attitude) of the object (Bagozzi et al., 1999; Watson and Spence, 2007).

Emotions and social influences are intertwined together (van Kleef and Côté, 2022). Therefore, the logic of emotion theories could stem for the subjective norms as well. It can be argued that the result of consumers' positive emotional appraisal would lead to positive thoughts on how others view the behavior in question. This might not be the case with vice products such as tobacco or alcohol, but sustainable consumption is often viewed positively in the societies (e.g. White et al., 2019). Emotional responses can have influence on consumers' perceived behavioral control, too. For instance, a study on sustainable consumption choices (Antonetti and Maklan, 2014) shows that the positive emotion "pride" and the negative emotion "guilt" were connected to consumers' perceived effectiveness. Another study (Winterich and Haws, 2011) showed that especially future-focused emotion of hopefulness was in connection to consumers' self-control in snack choices.

With regards to sustainable consumption domain, the study of Berki-Kiss and Menrad (2022) considers emotional responses and their connections to all core TPB constructs. In that study, the basic TPB framework was extended by adding the constructs of emotions and perceived consumer effectiveness as predictors to consumers' behavioral intentions to buy Fairtrade cut roses. The results of the study suggest that emotions and subjective norms are the two most influential determinants of intention to purchase Fairtrade roses. Moreover, the emotions significantly influenced all the determinants of behavioral intention introduced to the extended model. This augmentation also increased the explanatory performance of the model. For the present study, their test of hypothesis 4 is highly important. Berki-Kiss and Menrad (2022, p.85) report: "When considering the effects of emotions in more detail, the statistically significant path coefficients leading from emotions to attitude (0.728), to subjective norm (0.645), to behavioral control (0.562) and to perceived consumer effectiveness (0.698) indicate the strongest effects resulting in high and statistically significant effect sizes." Thus, the following is hypothesized:

H5. Consumers' positive emotional responses towards reusable packaging are associated with higher attitudes (a), subjective norms (b) and perceived behavioral control (c) related to reusable FMCG packaging.

H6. Consumers' negative emotional responses towards reusable packaging are associated with lower attitudes (a), subjective norms (b) and perceived behavioral control (c) related to reusable FMCG packaging.

2.3.4. Perceived value and attitudes towards reusable packaging

Perceived value is defined as the "consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given" (Zeithaml, 1988, p.14). From the TPB perspective, the concept is relevant as it directly touches the attitude formation. That is, the result of the value assessment has been found to shape consumers' attitudes, i.e. supporting the formation of favorable or unfavorable view on the behavior under scrutiny (Boksberger and Melsen, 2011; Lee et al., 2019; Roh et al., 2022). Consumers can associate various types of value in the products. Sweeney and Soutar (2001) divide perceived value into four dimensions: 1) functional value, which refers to the perceived quality and expected performance of the product, 2) emotional value, which refers to the utility derived from the feelings or affective states that a product generates, 3) price value, which refers to the utility derived from the product due to the reduction of its perceived short term and longer-term costs and, 4) social value, which refers to the utility derived from the product's ability to enhance social self-concept.

The concept of perceived value is important from packaging reuse research perspective as well. When the results from the earlier explorative studies are viewed through this conceptual lens, most of them can be organized under the four dimensions. For example, several studies in reusable packaging domain touch the functional value. Consumers' quality and convenience perceptions of packaging reuse have emerged (Lofthouse et al., 2009; Kunamaneni et al., 2019; Bashir et al., 2020; Miao et al., 2023; Tenhunen-Lunkka et al., 2024). Further, consumers have been found to have positive or negative perceptions about the packaging functionality. For instance, reusable packaging for a home cleaning product in Norway (Bashir et al., 2020) was perceived as burdensome (i.e. inconvenient) and several product refill types in the UK were perceived as convenient and/or that they were easy to refill and use (Lofthouse et al., 2009). Some indications exist that consumers associate emotional value to reusable packaging. For instance, a recent study (Tenhunen-Lunkka et al., 2024) showed that a reusable take-away pizza packaging solution sparked emotional value among Finnish consumers. Also, Babader et al. (2016) found that consumers associated pleasant feelings with packaging reuse. In another study, UK consumers considered some packaging refill types as "fun to use" referring to a value with emotional tone (Lofthouse et al., 2009).

Price of reusable packaging influences consumers' perceptions and expectations. Packaging refill has been perceived by consumers as cheaper compared to the single-use packaging (Lofthouse et al., 2009, 2017). In the case of reusable packaging systems, consumers have been expecting reduced product prices as a reward to their waste-reduction efforts and for returning the packaging (Miao et al., 2023). Finally, a study in UK showed that use of reusable coffee cups increased when an explicit price charge of 25 pence was introduced for single-use coffee cups (Poortinga and Whitaker, 2018). These indications point that price is an important value for consumers in packaging reuse. Some findings from the broader sustainable packaging domain suggest that product packaging may be connected to consumers' perception of social value, which in turn can associate with their attitudes. For instance, social value had a significant positive impact to consumers' attitudes towards environmentally sustainable packaging (Wahab et al., 2021). Also, buying eco-designed packaging might be disapproved by others, but may also lead to an appreciation and respect by others (Magnier and Crié, 2015). Furthermore, recycling of glass jars may offer to consumers a positive image among others of being an environmentally responsible person (Kunamaneni et al., 2019). With regards to packaging reuse domain, Finnish consumers who used reusable take-away pizza packaging perceived it as making a positive impression and positively contributing to how others viewed them (Tenhunen-Lunkka et al., 2024). Finally, Dutch consumers referred to enhanced social value in connection with the use of a reusable packaging system for dry food products (Miao et al., 2023). These findings indicate that heightened social value associated with reusable packaging can contribute to higher attitudes.

Considering the wide range of perceived value consumers are found to associate with reusable packaging, and the conceptual premise that perceived value serves as antecedent of attitudes, it is hypothesized as follows:

H7a. Consumers' positive perceived functional value of reusable packaging is associated with a higher attitude towards FMCGs in reusable packaging.

H7b. Consumers' positive perceived emotional value of reusable packaging is associated with a higher attitude towards FMCGs in reusable packaging.

H7c. Consumers' positive perceived price value of reusable packaging is associated with a higher attitude towards FMCGs in reusable packaging.

H7d. Consumers' positive perceived social value of reusable packaging is associated with a higher attitude towards FMCGs in reusable packaging.

The theory of perceived value does not touch upon a value which is unique to the environmentally sustainable products, i.e. the environmental sustainability value. The existence of this value is well-documented in several studies dealing with consumers and reusable packaging (Babader et al., 2016; Bashir et al., 2020; Kunamaneni et al., 2019; Miao et al., 2023; Tenhunen-Lunkka et al., 2024). From the perceived value perspective, these associations refer to the utility derived from the expected contribution of reusable packaging to environmental sustainability. Along with the other value dimensions, it is expected that the increased perception of environmental sustainability contributes to elevated attitudes towards reusable packaging. Thus,

H7e. Consumers' positive perceived environmental sustainability value of reusable packaging is associated with a higher attitude towards FMCGs in reusable packaging.

3. Methods

Partial Least Squares structural equation modeling (PLS-SEM) was applied to examine the conceptual model and the hypotheses. The aim of PLS-SEM is to analyse connections and associated path strengths between independent and dependent variable(s) (Guenther et al., 2023). PLS-SEM further offers possibility to analyse the relative strength of the independent variables in explaining the variance in the dependent variable (Hair et al., 2017a, 2017b). Covariance-based SEM (CB-SEM) is an alternative to PLS-SEM. In contrast to PLS-SEM, CB-SEM estimates model-based covariance matrix with as little difference as possible from the observed covariance matrix in the data. Thus, CB-SEM is about fitting the theoretical model to the data to confirm the proposed theory (Guenther et al., 2023).

One criterion to choose between the SEM methods lays in the nature of the data. PLS-SEM is developed for composite model data while CB-SEM restricts in a data that follow common factor model (e.g. Sarstedt et al., 2023). Despite the theoretical expectations, in applied research the data do not always follow the common factor model, but might actually be composite-based suggesting the use of PLS-SEM (e.g. Sarstedt et al., 2016). Regardless, PLS-SEM is found robust in analysing common factor model data too, although it produces some biases, however those being smaller than the biases produced by CB-SEM in cases of data following composite model (Sarstedt et al., 2023). The data model is difficult to identify in practice, which supports the application of PLS-SEM. Finally, PLS-SEM has been found suitable method for estimating models, which aims for extending some established theories (TPB in this study) with new theoretical concepts (perceived value and emotional response towards reusable packaging) (Hair et al., 2019). This is because PLS-SEM comes with higher statistical power than CB-SEM, allowing more sensitive observations of theoretically justified, yet empirically unestablished connections between constructs. Taking all the above considerations into account, PLS-SEM was considered more feasible than CB-SEM for this study purposes.

3.1. Data collection and sample

Data were collected in Finland, Germany, and the UK at the end of 2022 through an online survey, administered by a professional market research agency. In each country, 800 respondents were recruited from the agency's panels, aiming for an equal gender distribution and including individuals aged 18 and above. A diverse sample of individuals, varying in age, gender, education, self-reported income and area of residence, was included to capture key similarities and differences across the populations studied. For instance, the majority of people in all countries included in the study live outside the capital cities, in both urban and rural areas.

The country choice was based on a following logic. First, all countries have had established and well-known reusable FMCG packaging system in the past. In Finland, the reusable beverage bottles (Palpa, currently recycling system), in the UK the reusable milk bottles (Magnier and Gil-Pérez, 2023), and in Germany the beverage bottle reuse system (Pfand, currently recycling system). This choice was deemed important as it enabled that the study participants might have at least some touch point with the study topic. Second, the study included countries that are advanced in circular economy. This was considered important as the implementation of the FMCG packaging reuse system requires knowledge in both business and technological innovations and collaboration between the key stakeholders such as companies, policymakers, and the consumers (Sundqvist et al., 2024). Finland is considered as an open-minded market for sustainable innovations and also one of the leaders in circular economy initiatives (Marino and Pariso, 2020). Germany is found very advanced in circular economy topics and offers incentives for reuse (Marino and Pariso, 2020). There are also initiatives to advance circular economy and reuse in the UK (the Plastics Bill in the United Kingdom (UK Parliament, 2022). Third, two major Western European markets (Germany and the UK) were included in the study as they provide large potential for environmental sustainability impact, if reuse system for FMCG is to be developed and implemented in the future. Therefore, understanding the consumers' views from these countries is important. Finland, instead, is a geographically large and sparsely populated country in Northern Europe. However, Finland is a homogeneous society in which few dominant actors (e.g. two dominant retail chains and food producers) are able to implement reuse system throughout the country if they found it valuable. Such environment could offer good grounds for the first large scale reuse system initiatives in Europe making understanding of the Finnish consumers' perspectives valuable.

Prior to data collection, study approval was granted by the Ethics Committee for Human Sciences at the University of Vaasa (294/00.10.01/2022). Following the Finnish ethical principles of research within social sciences (Finnish National Board on Research Integrity TENK Guidelines, 2019), an invitation to the study was sent to prospective participants by the market research agency via email with reference to the study objectives, research consortium, funding body, the organization responsible for the research, estimated answering time and responsible researchers' contact information. Based on the above-mentioned information, prospective participants with minimum age of 18 years were able to either accept or reject the study invitation. Participants who accepted the invitation gave their informed consent and were admitted to the study by clicking the survey link. Responses were given anonymously. The questionnaire used in the study can be found in the supplementary material section (S1).

Samples for each study country are described in Table 1. With regards to gender, male and female participants were roughly equal in all countries. In terms of age, UK participants aged 18–35 outnumbered Germans. The share of Finnish participants aged 36–50 was significantly lower than in other countries, while the share of Germans aged 51–64

Table 1
Characteristics of the Finnish, UK and German samples including relative shares of the sample by gender, age group, education, self-reported income, and place of residence. Differences between the countries were tested with Chi-square – test with Bonferroni correction. Significant differences between the countries are denoted with different superscript letters.

Sample characteristics (%)	Finland (N = 800)	UK (N = 800)	Germany (N = 800)	Total (N = 2400)	Chi-square	df	p
Gender					7.366	4	0.118
Female	52.3^{a}	50.6^{a}	51.2^{a}	51.4			
Male	47.4^{a}	48.6^{a}	48.8^{a}	48.3			
Other	0.3^{ab}	0.8^{b}	0.0^{a}	0.3			
Age group					51.430	6	<0.001
18–35	28.1^{ab}	29.5^{b}	24.0^{a}	27.2			
36–50	22.4^{a}	30.0^{b}	27.9^{b}	26.8			
51–64	19.1^{a}	16.8^{a}	27.1^{b}	21.0			
65+	30.4^{a}	23.7^{b}	21.0^{b}	25.0			
Education					79.522	6	<0.001
Higher education	49.6^{a}	65.3^{b}	54.8^{a}	56.6			
Secondary education	39.4^{a}	26.9^{b}	41.3^{a}	35.8			
Compulsory education	10.4^{a}	6.4^{b}	3.5^{c}	6.8			
Something else	0.6^{a}	1.4^{a}	0.4^{a}	0.8			
Self-reported income					33.380	4	<0.001
High income	2.8^{a}	3.3^{a}	6.3^{b}	4.1			
Middle income	54.2^{a}	57.7^{ab}	62.3^{b}	58.1			
Low income	43.0^{a}	39.0^{a}	31.4^{b}	37.8			
Residence					79.641	4	<0.001
Capital	22.9^{a}	17.8^{b}	20.0^{ab}	20.2			
Other urban area	57.8^{a}	58.2^{a}	42.9^{b}	53.0			
Rural area	19.3^{a}	24.0^{a}	37.1^{b}	26.8			

was significantly higher than in Finnish and UK sample. For the participants aged 65 and above, the Finnish sample had higher share than in the other two countries. Regarding education, the share of highly educated participants in UK was significantly larger than in the other countries. For secondary education, the share of German participants was significantly higher as compared to the other two countries and, as for compulsory education, Finnish sample was significantly higher than UK and Germany. Regarding self-reported income levels, the share of German participants differed from the other countries for high income and from Finland for middle income. For low income levels, the share of Finnish sample was higher than in UK sample. Regarding residential area, the share of Finnish participants living in capital area was significantly higher from UK sample. For other urban areas, the share of those participants in UK was higher than in German sample and for rural areas the share of German participants was the highest.

3.2. Survey design

As consumers might be unfamiliar with reusable packaging, a brief description in layman language was developed in order to minimize misunderstanding/misinterpretation of the concept. In line with the reusable packaging definition provided by the European Union (1994) (European Parliament and Council, 94/62/EC), the following text was developed for the study and remained visible to the participants throughout the entire study:

"The idea of reusable packaging is that packages of frequently bought products continue to be used for long periods of time for the same purpose that they were originally designed and produced. The reusable packages are refilled or returned multiple times. Between the uses, packages are cleaned, refurbished and put back to use."

The survey's items were developed by following previous literature and tailored according to the needs of this study (all scales and individual items are presented in Table 2). Intention scale consisted of three items, all adapted from Zerbini et al. (2019) and measured participants' intentions to test, buy, and recommend products in reusable packaging. Participants gave their responses on a 5-point Likert scale (1 = completely disagree, 5 = completely agree).

Attitude scale measured participants' degree of (un)favorable evaluations towards the reusable packaging use. Participants gave their responses on a 5-point semantic differential scale (e.g. 1 = very bad, 5 = very good), with all three items adapted from Ertz et al. (2017).

Perceived Behavioral Control (PBC) scale measured participants' perceptions over a set of factors that can facilitate or hinder the use of reusable packaging: availability of own resources, information and solutions in frequently visited retail shops, and the ability to use and control the usage of reusable packaging. The scale consisted of five items developed for this study, adapted from other sustainable behavior studies (e.g. Paul et al., 2016) measured on a 5-point Likert scale (1 = completely disagree, 5 = completely agree).

Subjective Norms (SN) scale measured participants' beliefs on the extent that close others (family, friends, co-workers) would approve the usage of reusable packaging (i.e. injunctive normative beliefs) and would use reusable packaging themselves (i.e. descriptive normative beliefs), in line with recommendations made by Ajzen (2020). The scale consisted of four items developed for the purposes of this study, with two items referring to injunctive normative beliefs and two items referring to descriptive normative beliefs. The scale applied 5-point semantic differential items (e.g. 1 = would not appreciate at all if I use reusable packaging, 5 = would appreciate a lot if I use reusable packaging).

Participants' positive and negative emotional responses towards reusable packaging were measured with three items each: fear, guilt, and irritation for negative emotions and pride, hope, and joy for positive emotions. Except irritation, all other emotions used in this study have been proposed to be relevant for pro-environmental behaviors (White et al., 2019). Irritation was included here based on the assumption that consumers' involvement to reusable packaging through actions of refill and return of packaging may be perceived burdensome in comparison to treatment of conventional packaging (e.g. throw to general trash, recycle). Participants were asked to give their responses on a 5-point Likert scale (1 = not at all, 5 = extremely).

Items for the perceived value were adapted from Walsh et al. (2014) to measure the functional, emotional, price, and social value dimensions of reusable packaging. Items for measuring the environmental value dimension were adapted from Koenig-Lewis et al. (2014). For all perceived value dimensions two or more items were used and measured on a 5-point Likert scale (1 = completely disagree, 5 = completely agree).

The questionnaire was initially designed in English and then back-translated into Finnish and German. Potential method bias issues concerning participants' ability to respond accurately were addressed by

Table 2
Constructs, items, descriptive statistics, item loadings, Cronbach's Alpha (CA), construct reliability (CR), convergent validity (AVE) and variance inflation factor (VIF) scores for each country. All values referring to latent variable means, standard deviations, reliability and convergent validity indicators are without the items removed from the analyses.

Construct/item	Finland						Germany						UK					
	Mean (SD)	Item loading	CA	CR	AVE	VIF	Mean (SD)	Item loading	CA	CR	AVE	VIF	Mean (SD)	Item loading	CA	CR	AVE	VIF
Intentions	3.86 (0.98)		0.92	0.93	0.87	3.06	4.11 (0.90)		0.89	0.89	0.81	1.50	3.94 (0.92)		0.88	0.89	0.81	2.73
INT1: I intend to test products in reusable packaging	3.96 (1.02)	0.93					4.16 (0.96)	0.90					3.83 (1.05)	0.86				
INT2: I am interested in buying products in reusable packaging	3.93 (1.05)	0.95					4.15 (0.98)	0.93					4.11 (0.99)	0.92				
INT3: I would recommend products in reusable packaging to my friends	3.70 (1.10)	0.92					4.02 (1.04)	0.88					3.90 (1.05)	0.91				
Attitude	3.93 (1.13)		0.83	0.85	0.75	1.46	4.19 (1.08)		0.82	0.82	0.73	1.01	4.12 (1.06)		0.83	0.84	0.75	1.28
ATT1: Is very bad /good idea	3.94 (1.30)	0.88					4.18 (1.29)	0.83					4.14 (1.23)	0.86				
ATT2: Is unwise/wise	4.05 (1.22)	0.89					4.18 (1.25)	0.87					4.03 (1.27)	0.87				
ATT3: I am against/ in favor of it	3.82 (1.40)	0.83					4.22 (1.26)	0.86					4.21 (1.18)	0.87				
Subjective Norms	3.65 (0.91)		0.90	0.90	0.78	1.83	3.93 (0.90)		0.87	0.87	0.71	1.34	3.91 (0.95)		0.90	0.90	0.77	1.93
SN1: Would not appreciate at all/appreciate a lot if I use reusable packaging	3.69 (1.01)	0.88					4.06 (1.06)	0.85					3.87 (1.07)	0.88				
SN2: Would not support me at all/strongly support me if I use reusable packaging	3.69 (1.05)	0.88					3.88 (1.11)	0.86					3.96 (1.10)	0.87				
SN3: Would not even/ absolutely try using reusable packaging at all	3.67 (1.05)	0.89					3.91 (1.05)	0.85					3.98 (1.07)	0.88				
SN4: Would not regularly/ would regularly use reusable packaging	3.53 (1.04)	0.88					3.88 (1.04)	0.82					3.82 (1.08)	0.89				
Perceived Behavioral Control	3.72 (0.83)		0.83	0.86	0.66	1.70	3.94 (0.78)		0.79	0.82	0.61	1.32	3.75 (0.89)		0.85	0.86	0.68	1.45
PBC1: I have the resources to use reusable packaging	3.76 (1.00)	0.85					3.97 (0.96)	0.84					3.70 (1.05)	0.86				
PBC2: I can find reusable packaging solutions in the shops where I usually do my shopping. *This item was dropped from the analysis*	3.20 (1.07)	0.61					3.35 (1.20)	0.61					3.06 (1.21)	0.65				
PBC3: I am fully informed on how to use reusable packaging	3.38 (1.11)	0.75					3.56 (1.11)	0.70					3.44 (1.13)	0.77				
PBC4: I have the ability to use reusable packaging	4.04 (0.93)	0.85					4.23 (0.92)	0.83					4.02 (1.01)	0.83				
PBC5: It is totally within my control to use reusable packaging	3.69 (1.04)	0.74					4.02 (1.00)	0.74					3.82 (1.12)	0.81				
Positive Emotions	3.27 (1.03)		0.90	0.90	0.83	1.94	3.34 (1.04)		0.85	0.87	0.77	1.05	3.44 (1.03)		0.87	0.87	0.79	2.29
PE1: Pride	3.08 (1.15)	0.90					3.00 (1.25)	0.84					3.43 (1.18)	0.88				
PE2: Hope	3.40 (1.13)	0.92					3.63 (1.16)	0.88					3.59 (1.13)	0.89				
PE3: Joy	3.32 (1.10)	0.92					3.40 (1.13)	0.92					3.30 (1.15)	0.90				
Negative Emotions	1.70 (0.79)		0.79	0.86	0.70	1.19	1.56 (0.79)		0.82	0.86	0.73	1.17	1.63 (0.87)		0.85	1.08	0.76	1.27
NE1: Fear	1.71 (0.97)	0.83					1.51 (0.87)	0.88					1.63 (1.01)	0.85				
NE2: Guilt	1.60 (0.86)	0.77					1.62 (0.95)	0.79					1.55 (0.92)	0.82				
NE3: Irritation	1.78 (1.00)	0.91					1.56 (0.94)	0.89					1.73 (1.04)	0.94				
Functional value	3.90 (0.83)		0.81	0.83	0.72	1.84	4.00 (0.80)		0.80	0.83	0.72	1.07	3.94 (0.80)		0.78	0.79	0.69	2.77
FV1: Sounds convenient	3.84 (0.99)	0.86					4.07 (0.99)	0.86					3.83 (1.05)	0.83				
FV2: Seems well thought	4.14 (0.98)	0.89					3.98 (0.91)	0.90					4.09 (0.89)	0.87				
FV3: Would protect the product	3.72 (0.96)	0.80					3.95 (0.94)	0.78					3.92 (0.93)	0.79				
Emotional value	3.39 (0.97)		0.85	0.85	0.87	1.18	3.87 (0.87)		0.75	0.77	0.80	1.89	3.87 (0.93)		0.78	0.79	0.82	2.73
EV1: Would be something that I enjoy	3.34 (1.04)	0.94					3.67 (1.00)	0.87					3.78 (1.03)	0.91				
EV2: Would make me feel good	3.44 (1.04)	0.93					4.10 (0.95)	0.92					3.95 (1.01)	0.91				
Price value	3.71 (0.98)		1.00	1.00	1.00	2.02	3.86 (0.93)		1.00	1.00	1.00	1.17	3.94 (0.99)		1.00	1.00	1.00	1.79
PV1: Seems expensive (REV.) *This item was dropped from the analysis*	2.95 (0.94)	0.61					3.07 (0.99)	0.46					3.01 (1.02)	0.41				
PV2: Could offer value for money	3.71 (0.98)	1.00					3.86 (0.93)	1.00					3.94 (0.99)	1.00				

(*continued on next page*)

Table 2 (*continued*)

Construct/item	Finland						Germany						UK					
	Mean (SD)	Item loading	CA	CR	AVE	VIF	Mean (SD)	Item loading	CA	CR	AVE	VIF	Mean (SD)	Item loading	CA	CR	AVE	VIF
Social value	3.21 (0.90)		0.77	0.77	0.81	1.76	3.32 (0.93)		0.68	0.83	0.74	1.60	3.51 (0.93)		0.76	0.81	0.80	1.87
SV1: Would improve the way I am perceived by others	3.03 (1.01)	0.89					3.03 (1.12)	0.78					3.32 (1.07)	0.86				
SV2: Would make a good impression on other people	3.41 (0.98)	0.91					3.60 (1.02)	0.94					3.71 (1.02)	0.93				
Environmental sustainability value	4.15 (0.92)		0.82	0.83	0.85	2.11	4.36 (0.87)		0.86	0.86	0.88	1.45	4.34 (0.84)		0.79	0.80	0.83	1.84
ESV1: Would be an environmentally friendly option	4.28 (0.95)	0.91					4.37 (0.92)	0.94					4.45 (0.85)	0.90				
ESV2: Would help to fight against climate change	4.01 (1.03)	0.93					4.34 (0.93)	0.94					4.24 (0.99)	0.92				

CA = Cronbach's alpha, CR = Composite reliability, AVE = Average variance extracted, VIF = Variance inflation factor, REV. = Reversed item.

following suggestions made by MacKenzie and Podsakoff (2012). For instance, double-barreled questions were avoided and possible ambiguity of survey items was addressed by the use of simple syntax. Participants' potential unfamiliarity with reusable packaging was addressed through a short description written in layman language. In order to avoid participants' potential memory challenges, the description remained visible to them when answering all survey questions related to reusable packaging topic (see S1, questions Q1-Q6). Potential social desirability bias (i.e. participants' response to survey by providing socially acceptable answers rather than their true beliefs or intentions) was addressed at study admission phase and during survey design. Prior to study admission and consent provision, prospective participants were informed by the data collection agency that researchers responsible for the study will receive the data in anonymized form, with no names or contact information included in the data (see S1 in Supplementary information). In survey phase, a neutral tone was adopted for the formulation of all questions and the description of reusable packaging in layman language so to avoid any leads that participants could perceive as "correct" responses.

3.3. Data analysis

The data analysis was conducted following the logic by Hair et al. (2017a): 1) measurement model evaluation, 2) structural model evaluation and hypotheses testing (path co-efficient strength and significance, effect sizes) through bootstrapping with 5000 subsamples and 95 % confidence interval, and 3) evaluation of the predictive validity of the model via PLSpredict algorithm with 10 folds and 10 repetitions. Evaluations of the measurement and structural model were conducted for each country, separately. Due to large sample size ($N = 800$ per country), effect sizes along with path significance were considered in hypotheses testing to rule out correlations without any actual relevance. Following the evaluation of the measurement model, a measurement invariance of composite models (MICOM) procedure was performed in order to evaluate whether multigroup analysis (PLS-MGA) to evaluate the country differences could be carried out. All statistical analyses were performed with SmartPLS 4 software (version 4.0.8.4) (Ringle et al., 2022).

4. Results

This section presents the results of the study, including the evaluation of the measurement model in Section 4.1. The main results of the structural model evaluation, along with the validation or rejection of the developed hypotheses are presented in Section 4.2.

4.1. Measurement model evaluation

The measurement model evaluation was based on the loadings of the individual items to the constructs, the internal consistency of the constructs, convergent validity, and discriminant validity. Except for two items, all individual items were acceptable, as their outer loadings were either close to or >0.70 (Hair et al., 2017a). Item PBC2 from Perceived Behavioral Control construct and item PV1 from Price Value construct showed lower than 0.70 loadings to their respective constructs. Before deciding whether to retain or omit the items, their influence on the constructs' convergent validity (AVE) was examined. Dropping PBC2 improved the AVEs in all countries (Finland: 0.59 to 0.66, Germany: 0.56 to 0.61 and the UK: 0.62 to 0.68). For the Price value measurement, the AVEs were 0.61 for Finland, 0.56 for Germany, and 0.56 for the UK. All of the AVEs with original items are within acceptable limits, but since Perceived behavioral control construct had better convergent validity without PBC2, it was dropped. Also, PV1 was dropped as the loadings were poor especially in the German and the UK data. Dropping PV1 resulted in a single-item measurement for price value. In principle, single-item measures are not advisable in PLS-SEM (Hair et al., 2017a),

but can be applied in cases when the measurement is unambiguous and lacks true dimensionality potentially leading to homogeneous multi-item construct as is the case with price value (cf. Diamantopoulos et al., 2012).

The latent variables were considered reliable since all Cronbach's alpha values (CA) exceeded 0.60, and composite reliabilities (CR) were above 0.70 (Hair et al., 2017a). The average variance extracted (AVE) was higher than 0.50 for all constructs, indicating acceptable convergent validity (Hair et al., 2017a).

In order to detect common method bias issues, a full collinearity assessment was conducted. As suggested by Kock and Lynn (2012), variance inflation factor (VIF) scores were obtained by applying the random variable technique. Since all VIFs resulting from the full collinearity test were lower than 3.3, the model was considered free of common method bias (Kock and Lynn, 2012; Kock, 2015).

The constructs, items, descriptive statistics, item loadings, construct reliability, convergent validity and variance inflation factor (VIF) scores are reported in Table 2.

The discriminant validity was assessed through Heterotrait-Monotrait Ratio for each country (HTMT) (Tables 3–5). HTMT evaluation indicated a proper discriminant validity since majority of the variables received a score below the value of 0.90 (Hair et al., 2017a). In two countries (Germany and the UK) the score between functional value and emotional value variables marginally exceeded the 0.90 threshold. As variables are conceptually different from one another (see Table 2), a possible merging of the constructs was deemed unfeasible and possible elimination of items was avoided due to a potential negative effect of this action to the content validity of the constructs (Hair et al., 2017a).

4.2. Measurement invariance of composite models (MICOM)

The measurement invariance of composite models (MICOM) procedure was conducted in order to examine the configural and compositional invariance of the constructs included in the model (Henseler et al., 2016; Hair et al., 2017a; Cheah et al., 2023). Configural invariance was achieved since the same scales were used and the same analytical procedures were followed for the evaluation of the measurement models for all groups (i.e. Finland, Germany and the UK). Compositional invariance was assessed by performing a pairwise evaluation with permutation technique (Cheah et al., 2023). Compositional invariance was not achieved (Table 6) since the original correlation value for Attitude construct fell outside the upper and lower bounds of confidence intervals in two comparisons (Finland vs. Germany and UK vs. Finland). According to Henseler et al. (2016, p. 423), if measurement invariance problems occur in configural and compositional invariance, a multi-group analysis cannot be conducted and models must be estimated and interpreted for each group separately. Following the above recommendation, structural models were estimated and reported separately for each country and no comparisons were made.

4.3. Structural model evaluation and hypotheses testing

The main results of the structural model evaluation are presented in Table 7. The hypotheses were validated or rejected according to the significance of the path beta coefficient and the effect size. The results show that TPB constructs (i.e. Attitude, SN and PBC) had expected relationships with intentions to test, buy and recommend products in reusable packaging. Effect sizes of PBC were high in all countries, while effect sizes of Attitudes were small in Finland and non-significant in Germany and the UK. Effect sizes of SN were medium in Finland, small in Germany, and non-significant in the UK. Thus, H1 was accepted in Finland and rejected in Germany and the UK, H2 was accepted in Finland and Germany and was rejected in the UK, and H3 was accepted in all countries. Positive emotions and negative emotions had expected relationships with all TPB constructs (i.e. intentions, attitudes, subjective norms and perceived behavioral control). Effect sizes of positive emotions to SN, PBC and intentions were high whereas non-significant for attitudes, in all countries. Thus, H4a, H5b and H5c were confirmed in all countries and H5a was rejected in all countries. With regards to effect sizes of negative emotions, in Finland they were medium to intentions and high to PBC, SN and attitude, in Germany they were non-significant to attitude, medium to SN and intentions, and high to PBC whereas in UK they were non-significant to attitude, small to PBC, medium to intentions and high to SN. Thus H4b, H6b and H6c were confirmed in all countries, and H6a was confirmed only in Finland.

Hypothesis 7a, which stated that perceived functional value of reusable packaging has a positive relationship with attitude towards products in reusable packaging, was not confirmed in any country. Hypothesis 7b, postulating that perceived emotional value of reusable packaging has a positive relationship with attitude towards products in reusable packaging was not confirmed in any country. The hypothesized positive relationships of price value (H7c) and social value (7d) of reusable packaging with attitudes towards products in reusable packaging were rejected in all countries. Finally, hypothesis 7e, which assumed a positive relationship between environmental sustainability value of reusable packaging and attitude towards products in reusable packaging was not confirmed in any country. With regards to H7a-e, all effect sizes were non-significant.

Finally, the predictive power and relevance of the model were assessed. According to the R^2 value, the model was able to explain 58 % of the variance in Finland, 48 % in Germany, and 54 % in the UK regarding intentions to test, buy, and recommend products in reusable

Table 3
Discriminant validity. Heterotrait-Monotrait Ratio (HTMT). Finland.

	Functional value	Emotional value	Price value	Social value	Environmental sustainability value	Intentions	Attitude	Subjective norms	Perceived behavioral control	Positive emotions	Negative emotions
Functional value	–										
Emotional value	0.809	–									
Price value	0.799	0.653	–								
Social value	0.653	0.766	0.592	–							
Environmental sustainability value	0.899	0.652	0.651	0.597	–						
Intentions	0.842	0.77	0.65	0.645	0.733	–					
Attitude	0.554	0.48	0.41	0.379	0.46	0.581	–				
Subjective norms	0.571	0.573	0.498	0.496	0.483	0.64	0.581	–			
Perceived behavioral control	0.627	0.565	0.46	0.448	0.524	0.669	0.514	0.606	–		
Positive emotions	0.586	0.741	0.534	0.681	0.523	0.676	0.425	0.552	0.537	–	
Negative emotions	0.529	0.342	0.363	0.232	0.406	0.469	0.457	0.395	0.486	0.201	–

Table 4
Discriminant validity. Heterotrait-Monotrait Ratio (HTMT). Germany.

	Functional value	Emotional value	Price value	Social value	Environmental sustainability value	Intentions	Attitude	Subjective norms	Perceived behavioral control	Positive emotions	Negative emotions
Functional value	–										
Emotional value	0.908	–									
Price value	0.677	0.628	–								
Social value	0.664	0.748	0.48	–							
Environmental sustainability value	0.814	0.799	0.558	0.475	–						
Intentions	0.708	0.807	0.49	0.578	0.574	–					
Attitude	0.412	0.455	0.279	0.211	0.391	0.446	–				
Subjective norms	0.471	0.493	0.304	0.394	0.35	0.561	0.524	–			
Perceived behavioral control	0.542	0.506	0.339	0.41	0.389	0.575	0.385	0.495	–		
Positive emotions	0.517	0.694	0.333	0.638	0.362	0.615	0.293	0.443	0.392	–	
Negative emotions	0.293	0.256	0.178	0.139	0.323	0.286	0.255	0.186	0.312	0.103	–

Table 5
Discriminant validity. Heterotrait-Monotrait Ratio (HTMT). The UK.

	Functional value	Emotional value	Price value	Social value	Environmental sustainability value	Intentions	Attitude	Subjective norms	Perceived behavioral control	Positive emotions	Negative emotions
Functional value	–										
Emotional value	0.922	–									
Price value	0.721	0.639	–								
Social value	0.728	0.832	0.507	–							
Environmental sustainability value	0.825	0.767	0.631	0.612	–						
Intentions	0.826	0.874	0.612	0.676	0.758	–					
Attitude	0.515	0.454	0.295	0.323	0.455	0.478	–				
Subjective norms	0.622	0.589	0.415	0.491	0.506	0.633	0.58	–			
Perceived behavioral control	0.604	0.546	0.437	0.45	0.457	0.586	0.358	0.561	–		
Positive emotions	0.675	0.81	0.446	0.739	0.545	0.719	0.374	0.597	0.513	–	
Negative emotions	0.286	0.195	0.138	0.094	0.335	0.288	0.258	0.236	0.15	0.086	–

packaging. Therefore, the in-sample predictive power of the model was confirmed. Regarding the out-of-sample predictive relevance, as the Q^2predict was greater than zero (0.50 in Finland, 0.38 in Germany and 0.47 in the UK), the predictive relevance of the model was established (cf. Hair et al., 2017a).

5. Discussion

The discussion section is organized as follows: Section 5.1 draws on the results of this study and discusses their implications in understanding consumers' intentions to test, buy and recommend FMCGs in reusable packaging. Section 5.2 suggests potential areas for future consumer research in the reusable packaging domain. Section 5.3 addresses practitioners, policymakers and consumers by suggesting how the results of this study can support them to engage consumers in reuse of FMCG packaging. Section 5.4. discusses the limitations of this study.

5.1. Implications for research

This study examined factors connected with consumers' intentions to test, buy and recommend products in reusable packaging. The study applied the Theory of Planned Behavior model and extended it with concepts of positive and negative emotions and perceived value. The proposed model was validated and the hypotheses tested with large datasets from Finland, Germany, and the UK. The study results show that positive emotions play a multiple role in consumers' evaluative assessment of reusable FMCG packaging through 1) a direct and strong influence on intentions to test, buy and recommend FMCGs in reusable packaging and 2) an influence on perceived behavioral control and subjective norms.

To elaborate the results further, attitudes did not have connection to intentions in other study countries than Finland, despite it being the main predictor of intentions in the original TPB (Ajzen, 1991). Although this is surprising, similar results are found in earlier studies focusing on environmentally sustainable behaviors. For instance, Carrus et al. (2008) in their study dealing with recycling and use of public transportation found that attitudes did not correlate with intentions towards these actions. More recent examples are by Russel et al. (2017) in food waste behavior context and by Lam et al. (2022) in the context of using air conditioning. The common denominator for these examples is the addition of an emotional construct among the other TPB determinants of consumers' intentions. With regards to the present study, which focuses on consumers' decision-making with unfamiliar objects (e.g. Shiv and Fedorikhin, 1999), it can be speculated that consumers based their evaluations on the positive and negative emotional “gut feelings”, thus making the more cognitive attitudinal evaluations redundant in shaping their intentions. In addition, buying FMCGs in reusable packaging may make consumers to feel responsible towards the environment and that their choices can have a positive impact resulting in positive emotional state. Indeed, these types of positive emotional reactions have been

Table 6
Assessment of compositional invariance between groups (i.e. countries) involved in the study.

Country pairs under assessment	Construct	Compositional invariance	
		Original correlation	Confidence interval
Finland vs. Germany			
	Negative emotions	0.999	[0.999; 0.995]
	Positive emotions	1.000	[1.000; 1.000]
	Attitude	0.997	[1.000; 0.999]
	Intentions	1.000	[1.000; 1.000]
	Perceived behavioral control	1.000	[1.000; 0.998]
	Subjective norm	1.000	[1.000; 0.999]
	Emotional value	0.998	[1.000; 0.998]
	Environmental sustainability value	1.000	[1.000; 0.999]
	Functional value	1.000	[0.999; 0.998]
	Price value	1.000	[1.000; 1.000]
	Social value	0.993	[0.998; 0.999]
UK vs. Finland			
	Negative emotions	0.998	[0.999; 0.994]
	Positive emotions	1.000	[1.000; 1.000]
	Attitude	0.997	[1.000; 0.999]
	Intentions	1.000	[1.000; 1.000]
	Perceived behavioral control	1.000	[1.000; 0.999]
	Subjective norm	1.000	[1.000; 1.000]
	Emotional value	1.000	[1.000; 0.999]
	Environmental sustainability value	1.000	[1.000; 0.998]
	Functional value	1.000	[0.999; 0.998]
	Price value	1.000	[1.000; 1.000]
	Social value	0.999	[0.999; 0.995]
Germany vs. UK			
	Negative emotions	0.995	[0.998; 0.992]
	Positive emotions	0.999	[1.000; 0.999]
	Attitude	0.999	[1.000; 0.998]
	Intentions	1.000	[1.000; 1.000]
	Perceived behavioral control	1.000	[0.999; 0.998]
	Subjective norm	1.000	[1.000; 0.999]
	Emotional value	0.999	[0.999; 0.997]
	Environmental sustainability value	1.000	[1.000; 0.998]
	Functional value	1.000	[0.999; 0.997]
	Price value	1.000	[1.000; 1.000]
	Social value	0.998	[0.997; 0.985]

reported by studies in the field (e.g. Miao et al., 2023; Keller et al., 2021).

Meanwhile, the PBC and SN remained as significant predictors of the intentions (except for the SN in the UK). In contrast to attitudes, this might be explained by the fact that PBC and SN evaluations do not directly focus on reusable packaging as such. Instead, they refer to one's own skills to apply packaging reuse (PBC) and to other people's approval and use (SN) related to reusable packaging. These evaluations might be easier for the consumers to make. Overall, when comparing the determinants' explanatory power towards intentions, especially the positive emotional response dominated as seen in the effect sizes of small for PBC, SN, and negative emotions and medium for positive emotions (cf. Hair et al., 2017a, 2017b).

This study analyzed the role of emotional reactions in shaping other TPB constructs than just intentions. The results show that positive and negative emotions have a significant influence on subjective norm and perceived behavioral control, but no influence on the attitudes (except for the negative emotions in Finland). When the effect sizes are observed, the influence of positive emotions was stronger than negative emotions. In general, it might be that the positive emotional response towards the reusable packaging could make consumers to feel more confident in their skills applying it, contributing to PBC evaluations.

Table 7
Results of the structural model evaluation.

Path (hypothesis)	Finland	Germany	The UK	Decision
Attitude → Intention to test, buy and recommend products in reusable packaging (H1+)	0.14 [5.03] ***	0.11 [3.51] ***	0.10 [3.20] ***	Accept in Finland. Reject in Germany and the UK
f^2	0.03 [2.44] *	0.02 [1.67] ns	0.02 [1.57] ns	
Subjective norms → Intention to test, buy and recommend products in reusable packaging (H2+)	0.17 [5.15] ***	0.19 [5.45] ***	0.16 [3.73] ***	Accept in Finland and Germany. Reject in the UK.
f^2	0.04 [2.45] *	0.04 [2.60] **	0.03 [1.74] ns	
Perceived behavioral control → Intention to test, buy and recommend products in reusable packaging (H3+)	0.22 [6.36] ***	0.21 [5.55] ***	0.19 [5.57] ***	Accept in all countries
f^2	0.07 [3.01] **	0.07 [2.60] **	0.06 [2.72] **	
Positive emotions → Intention to test, buy and recommend products in reusable packaging (H4a+)	0.35 [11.15] ***	0.38 [10.96] ***	0.42 [12.34] ***	Accept in all countries
f^2	0.20 [5.04] ***	0.22 [4.66] ***	0.26 [5.41] ***	
Negative emotions → Intention to test, buy and recommend products in reusable packaging (H4b-)	−0.15 [5.74] ***	−0.16 [5.92] ***	−0.16 [5.93] ***	Accept in all countries
f^2	0.04 [2.64] **	0.04 [2.79] **	0.05 [2.87] **	
Positive emotions → Attitude (H5a+)	0.16 [3.89] ***	0.12 [2.79] **	0.12 [2.25] *	Reject in all countries
f^2	0.02 [1.83] ns	0.01 [1.33] ns	0.01 [1.06] ns	
Positive emotions → Subjective norms (H5b+)	0.45 [14.80] ***	0.39 [11.13] ***	0.52 [17.51] ***	Accept in all countries
f^2	0.28 [5.71] ***	0.19 [4.60] ***	0.39 [6.21] ***	
Positive emotions ➔ Perceived behavioral control (H5c+)	0.41 [12.89] ***	0.34 [10.17] ***	0.43 [13.14] ***	Accept in all countries
f^2	0.24 [0.548] ***	0.14 [4.47] ***	0.24 [5.28] ***	
Negative emotions → Attitude (H6a-)	−0.24 [7.21] ***	−0.13 [3.75] ***	−0.13 [4.02] ***	Accept in Finland. Reject in Germany and the UK
f^2	0.07 [3.37] ***	0.02 [1.78] ns	0.02 [1.88] ns	
Negative emotions → Subjective norms (H6b-)	−0.26 [8.62] ***	−0.18 [5.70] ***	−0.22 [7.77] ***	Accept in all countries
f^2	0.10 [3.84] ***	0.04 [2.62] **	0.07 [3.51] ***	

(*continued on next page*)

Table 7 (*continued*)

Path (hypothesis)	Finland	Germany	The UK	Decision
Negative emotions → Perceived behavioral control (H6c-)	−0.34 [10.93] ***	−0.27 [8.29] ***	0.13 [4.07] ***	Accept in all countries
f^2	0.16 [4.93] ***	0.09 [3.72] ***	0.02 [1.93] *	
Functional value → Attitude towards reusable packaging (H7a+)	0.18 [2.88] ***	0.09 [1.69] ns	0.23 [3.92] ***	Reject in all countries
f^2	0.01 [1.33] ns	0.00 [0.77] ns	0.02 [1.85] ns	
Emotional value → Attitude towards reusable packaging (H7b+)	0.08 [1.64] ns	0.16 [2.92] **	0.06 [0.95] ns	Reject in all countries
f^2	0.00 [0.75] ns	0.01 [1.37] ns	0.00 [0.37] ns	
Price value → Attitude towards reusable packaging (H7c+)	0.01 [0.14] ns	0.03 [0.62] ns	−0.04 [1.02] ns	Reject in all countries
f^2	0.00 [0.01] ns	0.00 [0.20] ns	0.00 [0.41] ns	
Social value → Attitude towards reusable packaging (H7d+)	0.00 [0.08] ns	−0.07 [1.98] *	−0.03 [0.68] ns	Reject in all countries
f^2	0.00 [0.00] ns	0.00 [0.98] ns	0.00 [0.25] ns	
Environmental sustainability value → Attitude towards reusable packaging (H7e+)	0.06 [1.23] ns	0.10 [2.05] *	0.13 [2.85] **	Reject in all countries
f^2	0.00 [0.53] ns	0.01 [0.91] ns	0.01 [1.36] ns	
R^2 (Intention to test, buy and recommend products in reusable packaging)	0.58 [19.00] ***	0.48 [14.15] ***	0.54 [19.20] ***	

[] = T statistics. * = $p \leq .05$, *** = $p \leq .001$, *ns* = not significant, β = Beta coefficient, f^2 = Effect size.

Similar rationale applies to SN as well. It is logical that once consumer perceives something positive, it contributes positively to considerations on how other would view the behavior, especially when the object is generally socially acceptable. This phenomena can be emphasized in sustainable consumption domain as there are findings that some consumers even use green consumption as a vehicle to elevate their own social status (Babutsidze and Chai, 2018).

Perceived values were hypothesized to have connections to consumers' attitudes towards the reusable packaging in FMCGs. No significant connections, even with small effect sizes, were discovered. This is surprising as it has been considered that specific value evaluations of the object contribute highly to attitude formation (Boksberger and Melsen, 2011; Roh et al., 2022). Overall, these results might be explained in a similar manner as was the case with the attitude-intention relationship. Consumers might have not been able to perform proper value evaluation as the topic is novel to them, thus the shallow evaluation has no contribution to the attitude formation.

Further explanations can be given to the lack of significant correlations between specific value types and attitudes. For the price value, one explanation could be that consumers were uncertain about the impact of reusable packaging to the price of FMCGs due to the general level of description provided to them. In previous research, concerns and expectations over price have been observed for reusable packaging solutions applied to certain FMCGs, including home cleaning (e.g. Kunamaneni et al., 2019; Bashir et al., 2020), personal care (e.g. Lofthouse et al., 2017) and food (e.g. Miao et al., 2023) products. Thus, price might become more relevant to consumers when reference is made to certain products. In this study, consumers faced a generic description of the packaging reuse. Regarding the relationship between social value and attitude, it might be that the novelty of reusable packaging might have challenged participants to associate it with intangible value aspects, such as social status and self-image. However, if more concrete example of packaging reuse would have been offered to the study participants, the situation might have been different. For instance, a recent study found that some Swedish consumers associated the return of beverage containers to vending machines and redemption of deposit fee with being low economic status and greed (Kremel, 2023). Environmental sustainability is the key driver of reusable packaging initiatives. Although the descriptive statistics showed that consumers in this study rated the environmental sustainability value relatively high (above 4 on a 5-point scale), it did not connect with attitudes. This means that consumers' see the value but it has no relevance to their attitudes. This has been found in other studies as well. For instance, a study by Lee and Park (2020) on sustainable beauty product packaging found that environmental sustainability value had the least positive effect on consumers' evaluations, among self-expression, emotional aesthetic, functional values. Moreover, moderate effects of sustainability perceptions have been observed for consumers' attitudes towards sustainable food packaging (Steenis et al., 2017). When it comes to functional and emotional value, participants in all countries scored relatively high in their descriptive value perceptions but no connection to their attitudes were established. Again, due to the lack of knowledge and experience, these evaluations might have been made on a shallow basis, thus no effect on the attitude formation. Interestingly, the emotional value perception did not function similarly as the positive emotional response in its connection to the intentions. This might be explained how the emotional value was measured in comparison to positive emotions. The items used referred to more concrete issues such as it would be something to enjoy, which might have complicated consumers' evaluations due to the lack of reference experiences in the past, simultaneously inflating the effect on attitude formation.

This study extended the standard TPB model with positive and negative emotions and the concept of perceived value. Emotions have been applied in connection with TPB in earlier studies focusing on pro-environmental behaviors (Yuriev et al., 2020). To the authors' knowledge, this is the first study to connect emotions to TPB constructs other than intentions, include perceived value in the model, and apply it in the reusable packaging domain. Our results corroborated some of the findings from the earlier TPB or TPB-inspired studies in the reusable packaging domain (Ertz et al., 2017; Song et al., 2023). The main difference in our study was that the connection between attitudes and intentions was absent, which is most likely due to the inclusion of the emotional constructs in the model. This is an important issue as it bears different implications to the research. First, it highlights the importance of considering the affective concepts while trying to delve into the reasons behind consumers' intentions and potential behavioral responses towards packaging reuse. This is in line with results from other fields of environmentally sustainable consumption, such as food (Onwezen et al., 2022). Second, as the environmental sustainability is often used to justify the development of new innovations, the results of our study highlight that consumers might not find it as the main driver for their intentions. Therefore, research focusing on consumers should place greater emphasis on the affective side of decision-making to develop effective communication strategies that encourage consumers to choose the environmentally sustainable option over less sustainable alternatives.

5.2. Implications for future research

Understanding consumers' intentions towards reusable FMCG packaging contributes to a research agenda aimed at supporting consumers in moving away from a 'single-use culture' and towards embracing the sustained value of goods and their packaging (e.g. Greenwood et al., 2021; Muranko et al., 2021). The results of this study show that consumers' intentions are shaped by affect (e.g. positive emotions), cognition (e.g. behavioral control) and social expectations (e.g. subjective norms). These findings align with the understanding of factors driving consumers' sustainable consumption (White et al., 2019) and serve as a building block for further research on promoting packaging reuse, a topic yet untouched in the literature. As minimum cognitive effort and habit drive consumers' choices of FMCGs (Kunamaneni et al., 2019), packaging and its design serve as important mediums to communicate reuse benefits to consumers. This can be done, for instance, through packaging labels. As environmental sustainability seems inherently linked to consumers' views on packaging reuse, one way to promote reuse could be to emphasize these aspects on packaging labels. On the other hand, as the results of this study and others (Lee and Park, 2020; Steenis et al., 2017; Bashir et al., 2020) show, environmental sustainability may neither be the only nor the most effective content for the communication. Instead, emphasizing multiple benefits, embracing positive emotional experiences and highlighting control potential over central aspects of reuse behavior (e.g. disposal) may work better. The concepts of warm glow and psychological ownership might offer some support in facilitating positive emotional experiences by emphasizing different benefits. For instance, warm glow could be used to facilitate feelings of pleasure and satisfaction in connection to the contribution of packaging reuse to the common good and the planet (Hartmann et al., 2017). Psychological ownership theory could be used to increase consumers' feelings of emotional attachment to reusable packaging (Tari and Trudel, 2024). Both concepts could be applied by means of packaging design. For instance, psychological ownership could be activated by prompting consumers to give a nick name to the packages or demonstrate through graphic design how reuse can increase consumers' control over packaging disposal and waste management matters.

Consumers' interest and product experiences can be further influenced through packaging design. For instance, visual packaging design elements (e.g. font style, graphics, color, texture, labeling) could be used to communicate benefits associated to reusable packaging from different angles (e.g. environmental sustainability in cognitive, affective, or social terms). Depending on the availability of solutions to the markets, the effect of such designs could be tested online or in real-life settings. For instance, an online study could reveal which designs varying in depiction of benefits lead to increased hypothetical choices and willingness to pay for reusable packaging solutions (e.g. take-away salad boxes). Moving closer to real-life settings, focus could be on consumers' experience and real choices. For instance, controlled experiments with products could show whether packaging design influences product evaluations (e.g. taste for foods and effectiveness for home cleaning or personal hygiene) and experiments in retail or food service environments contexts could be used to study the potential effect of packaging design on actual choices.

The study took place in three European countries. In future research, it would be advisable to carry out studies in wider geographical and cultural settings. For instance, studies could compare consumer views in industrialized countries (e.g. EU, Japan, South Korea, US, Canada, Australia). Often the sustainable innovations emerge first in those areas with sufficient purchasing power, but cultural differences might exist (e.g. Ertz et al., 2017). On the other hand, plastic packaging waste problem is worsein developing countries, so need for new solutions is critical there. It could be expected that consumers' views gathered from developed countries could be applied in developing countries. Thus, adding more cultural variety in the future studies would be beneficial.

5.3. Implications for the industry, policymakers, and consumers

Reusable FMCG packaging is an important topic for product manufacturers, packaging producers and retailers because consumers become increasingly aware of the negative impact of single-use packaging and are on the lookout for sustainable alternatives. Offering FMCGs in reusable packaging may support consumers to permanently reconcile with some of their concerns (e.g. increasing household packaging waste, environmental impact) and support interested value chain actors to build a competitive advantage over conventional approaches, which might be environmentally threatening (e.g. single-use plastic packaging). Overall, study results show that reusable FMCG packaging idea is positively viewed by consumers. More specifically, feelings of joy, pride and hope highly contribute to their intentions to test, buy, and recommend such solutions. The main message of such result to companies interested in implementing reusable FMCG packaging solutions is that attention should be paid to all aspects that may facilitate a support a positive emotional experience for consumers, instead of just focusing on the environmental sustainability aspect.

Consumers' adoption of reusable FMCG packaging depends on the availability of such solutions in mass retail settings (e.g. supermarkets) along with effective marketing strategies. The results of this study hint that the content of the marketing strategies should be emotional by tense, i.e. associating the marketing communication towards the consumers with positive emotions. To be more concrete, White et al. (2019) propose that emotions joy and pride can trigger consumers' sustainable consumption. This could be done through product labelling with visual content indicating e.g. joy extended with congruent narrative such as "Choice of a happy day". Further, subjective norms had positive connection to consumers' intentions in Finland and Germany; consumers seem to care about the others' views on their use of reusable packaging. The social meanings can be integrated with affective ones through the concept warm glow. Briefly, warm glow refers to a positive affective state resulting from a good deed to others such as a nearby person, local environment, or the planet (Hartmann et al., 2017). In earlier studies, warm glow has been found to contribute to sustainable consumption (e.g. Bazaraa et al., 2022). As with emotions, the concept could be harnessed in marketing communication related to reusable packaging. The message could include socially charged visuals (e.g. a person hugging a planet) boosted with a suitable narrative (e.g. "Do good for others - Feel good yourself"). While the above proposition touches consumers' affective side, their cognitive side also matters. Marketing strategies such as information campaigns, advertising, packaging labels can be used to inform consumers about the general meaning of packaging reuse and validated contributions to environmental sustainability (e.g. reduction of CO2 emissions, avoidance of microplastics). For example, an information campaign with a cognitive content could be designed with the aim to emphasize the environmental impact of reusable packaging from different angles (e.g. single-use packaging waste reduction, resource conservation, greenhouse gas emission reduction). It is to be noted though that this might resonate only with consumers who inherently value environmental aspects in their consumption decisions.

Packaging reuse has gained interest and support among policymakers in the European Union (European Parliament, 2024). Perhaps the main result of this study for policymakers is that the participants' attitudes and intentions towards packaging reuse were leaning towards positive. This signals that consumers do not reject the idea in a first place. On the other hand, the results also showed that positive and negative emotions play a strong role in shaping consumers' attitudes and intentions. This result warrants for careful actions in introducing the packaging reuse. For instance, Sundqvist et al. (2024) propose that consumer campaigns might be one way to accelerate consumers' interest towards packaging reuse. However, the content of the campaign should be carefully designed in such way that consumers' initial reaction towards reusable packaging includes a positive emotional response. In practice, this could be done by including well-known and positively

viewed celebrities or social media influencers in the campaigns. The matter of content applies to other initiatives as well. For instance, the recent EU Packaging and Packaging Waste Regulation initiative caused some negatively-tensed public discussion and confusion among consumers (and other stakeholders) in Finland as it would jeopardize the well-functioning beverage bottle return and deposit system. These kinds of negative connotations to policymakers' actions might harm the general attitudes towards reuse and carry over to specific applications such as reusable packaging to FMCGs or take-away foods.

Consumers are the ones who eventually finance the reusable packaging system. Therefore, their views on the topic are extremely important. Our descriptive results showed that consumers perceived value in packaging reuse and had positive attitudes and intentions towards it. On the other hand, the results hint that consumers might have difficulties in comprehending packaging reuse. This is visible in the non-existing connections between the perceived value and attitudes, suggesting that the value evaluations do not actually shape the attitudes. In addition, the fact that the emotional responses were the dominant predictors of the TPB constructs implies that consumers based their intentions and attitudes on "gut feeling" rather than informed evaluations. This is a typical feature of consumers' initial decision-making concerning new ideas and concepts (e.g. Shiv and Fedorikhin, 1999). The problem is that emotion-based decisions might not lead to constant behavior once the (neutral or negative) experiences contributing to the cognitive elaborations come to play. In order to diversify consumers' decision-making in the initial stages, more information should be provided. This information should not be focused on functional aspects, such as environmental sustainability only, as it might backfire in its capability to attract only those consumers having a congruent view. Rather, the whole spectrum of perceived value could be applied. For instance, packaging reuse could be framed as fun, socially approved, reasonably priced, and as convenient as it ever could be. If the "gut feelings" are positive and the experiences align with the realistic and informed expectations, the chances of making packaging reuse a constant habit would most likely increase.

5.4. Limitations

The study has limitations. Firstly, the sample in all countries is biased towards well-educated consumers with moderate income, who live in urban areas and capital cities. It is possible that such bias had an effect on the results, for instance, reuse of packaging materials increases as education level does (Escario et al., 2020). On the other hand, the first attempts to implement reuse systems most likely take place in densely populated areas for which the results are applicable. Another limitation related to the sample is the reliance of this study on an online survey. Specifically, individuals without Internet access or those less likely to participate in online surveys might have been underrepresented in this study. This limitation may delimit the generalizability of the study's findings, particularly for demographic groups that are less active in online environments. A more diverse sampling method, such as combining online surveys with offline data collection (e.g. paper-pencil and telephone questionnaires) could have ensured more diverse data. Secondly, the examined model was confined to the measurement of intentions to test, buy and recommend reusable FMCG packaging. This is because reusable FMCG packaging solutions are rarely available in retail shops (Greenwood et al., 2021). As known, intentions do not always predict behaviors very accurately and, on average, they account for only about 25 % of the variance in behavior (Ajzen, 2020). Therefore, it is unknown the extent that the study's results may explain actual packaging reuse behavior. Thirdly, the model was able to explain a little >50 % of the variance in intentions to test, buy and recommend reusable FMCG packaging. While its predictive power can be characterized as sufficient for the consumer behavior research (Hair et al., 2017a), it is evident that there are other influential factors unknown for this study. For instance, personal norms (i.e. a person's sense of ethical obligation to act or refrain from acting in a specific way) can be a relevant predictor of behavioral intentions (Song et al., 2023). Fourthly, despite the data was collected from three European countries, the generalizability of the findings to other cultures can be questioned, even within Europe. The three countries included represent wealthy and modern Western European societies with to some extent low cultural distance. The situation might be different for example in Eastern Europe. Kaasa et al. (2016) showed that Poland differs culturally from Germany. This might naturally cause variation in consumers' views. As reusable packaging might often carry food, also food cultures might affect how consumers see reusable packaging. A study including Norwegian and French consumers found that Norwegian consumers appreciated convenience in food while the French pleasure and taste (Varela et al., 2022). It could be speculated that reusable packaging as carrier of food might have effect on the food perceptions. For instance, French might consider that packaging which is used over and over again might indicate lower quality of the food and even a risk of contamination. Consumers' concerns of food contamination as a barrier for packaging reuse have been reported in the literature due to potential wear and tear of the packaging or improper use of the packaging by other consumers (Miao et al., 2023). Finally, there is variation within Europe on how open consumers are for new innovations. A study by Truong (2013) found significant differences between French, German, and UK consumers in the predictors of their attitudes towards technological innovations. The results showed between-country variation in novelty, value, and risk perceptions' correlations with the attitudes. The same might apply to reusable packaging as well. In some countries consumers might be more open to such innovation than in others.

6. Conclusions

The current study focused on understanding the factors connected with consumers' intentions towards reusable FMCG packaging. A conceptual model was developed for the study, by extending the Theory of Planned Behavior with positive (pride, hope, joy) and negative (sadness, guilt, irritation) emotions as facilitators of intentions and perceived value dimensions (functional, emotional, price, social and environmental sustainability) as facilitators of attitudes. The model was empirically tested and validated with survey data from three European countries; Finland, Germany, and the UK (total $N = 2400$). The main results show that positive emotions have a direct and strong influence on consumers' intentions to test, buy, and recommend FMCGs in reusable packaging and also influence perceived behavioral control and subjective norms. Additionally, none of the perceived values had a significant connection with consumers' attitudes towards FMCGs in reusable packaging.

Future consumer research in the packaging reuse domain should support consumers to sustain the value of goods and their packaging through reuse by considering affect (e.g. positive emotions), cognition (e.g. behavioral control), and social expectations (e.g. subjective norms) as influential factors. Packaging itself can serve as an epistemic object as it can support researchers to test and validate the best ways to shift consumers towards reuse. Various design elements (e.g., graphics, color, texture, labeling) offer opportunities to experiment with promoting packaging reuse and enhancing consumers' interest, experiences, and choices.

Companies interested in implementing reusable FMCG packaging solutions should conceive, test, and apply marketing strategies that embrace consumers' positive emotional experiences from multiple angles. These strategies should support positive emotions at general level, a positive affective state (e.g., satisfaction, pleasure) linked to good deeds for humankind, the planet, and the environment, increase confidence in usage and demonstrate validated contributions to environmental sustainability. Such strategies, whether implemented individually or in combination, could be applied through packaging, product, and label design, as well as interventions at physical and digital points of sale, such as information campaigns.

Policymakers can support the introduction and consumer adoption of reusable packaging by carefully selecting spokespersons (e.g., celebrities and influencers with positive social outlooks) who can inspire consumers and embrace their positive feelings and responses.

CRediT authorship contribution statement

Angelos Balatsas-Lekkas: Writing – original draft, Methodology, Investigation, Formal analysis, Conceptualization. **Harri Luomala:** Writing – review & editing, Methodology, Investigation, Conceptualization. **Kyösti Pennanen:** Writing – review & editing, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.spc.2024.10.011.

Data availability

Data will be made available upon request.

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