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CUSTOMER ADOPTION TOWARDS CIRCULAR BUSINESS MODELS

An empirical case analysis of Circular Furniture in the city of Leeuwarden

Sustainable Entrepreneurship Project, M.Sc. Sustainable Entrepreneurship

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JULIA BARBARA KREMER

Student number: S4924487

Ubbo Emmiuslaan 343

8917 JC Leeuwarden

j.b.kremer@student.rug.nl

Supervisor: Dr. Arianna Rotulo

Second supervisor: Prof. dr. Gjalt de Jong

ABSTRACT

Currently, the consumption of resources and waste production within the furniture sector cause a problem which underlines the relevance of circular business models (CBM) offering a viable way to address those problems. For the implementation of CBM it is important to understand the role of the customer. Therefore, this study investigates the CBM of the start-up Circular Furniture in the City of Leeuwarden with the aim to identify which individual determinants foster their customer adoption. The research framework bases on the ethical purchase behaviour by Mostaghel and Chirumalla (2021) adapted to the given case. To answer the research question primary data from 177 students is collected and analysed. Hereby, the aspects willingness to pay premium, general environmental awareness, functional value, and international origin are found to have a positive, significant influence on the intention to adopt CBM. Therefore, a higher willingness to pay, being more environmentally conscious, perceiving a functional value in the system and coming from abroad result in a higher intention and later higher adoption of the Circular Furniture business model. Thus, it is recommended to the start-up to focus on those determinants in its communication and educate customers on the negative ecological impact of the furniture industry.

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INTRODUCTION

Every year, businesses and consumers in EU Member States produce 10 million tons of furniture trash, the majority of which is built to end up in landfills or to be burned (Forrest, Hilton, Ballinger, & Whittaker, 2017). Furthermore, to stay within the 1.5-2.0 degree goal of the Paris Agreement a restructuration of the industry towards a more sustainable approach is required (Sharmina et al., 2021). As opposed to the current linear economy contributing to climate change, environmental pollution and waste of resources, the circular economy (CE) offers a viable way to add value to the sector by addressing resource restrictions, consumer value, and profitability issues all at once (Koch, 2017). As part of a CE circular business models (CBM) need to be implemented. In this study a CBM is defined as "how a company creates, captures, and delivers value with the value creation logic designed to improve resource efficiency through contributing to extending useful life of products and parts (e.g., through long-life design, repair and remanufacturing) and closing material loops" (Nußholz, 2017: 12). However, to improve the adoption of sustainable innovation on a large scale, it is necessary to understand the consumption and purchasing behaviour from the consumer's perspective (Roos & Hahn, 2019). According to Planing (2015) CBM require an existing purchase intention from the customer to be successfully implemented. Moreover, Kirchherr et al. (2017) and Elzinga et al. (2020) remarked a research gap within the customers perspective towards the CE. To not understand the customer needs and behaviour, results in an economic and ecologic loss of potential (Elzinga et al., 2020; Kirchherr et al., 2017; Lewandowski, 2016; Ölander & ThØgersen, 1995; Planing, 2015).

A viable way of capturing sustainable potential are small and medium sized enterprises (Parker, 2017). Thus, this case study focuses on the particular business model of Circular furniture (CF) in the city of Leeuwarden. The start-up tries to solve the problem of furniture overconsumption and waste using a monthly subscription service to provide students

conveniently with second-hand furniture, delivered to furnish their accommodations sustainably. The company purchases the furniture students would otherwise dispose after they leave the city. In addition to other second-hand furniture bought in the region, the furniture is stored as well as repaired and rented out to new incoming students. Those students do not need to buy new but reuse already existing resources and prolong its lifetime. Consequently, this also includes a waste reduction approach which tries to reduce the annual tons of furniture waste. Moreover, the furniture is delivered, assembled, and picked up using route optimization in off-peak hours to be most emission and traffic friendly (Siegfried & Zhang, 2020). The service is offered as a monthly subscription which can be adapted to the individual's needs. This approach relates to the sustainable business model archetypes emphasizing the "deliver functionality rather than ownership" as well as the "create value from waste" archetype (Bocken, Short, Rana, & Evans, 2014). This study targets a business model offering a performance over ownership value proposition, meaning a service and a product as a system in the furniture sector. A system means the combination of a product and a service (Kristensen & Remmen, 2019). Contrarily, the existing studies about the role of the customer in the circular economy (CE) are focusing mainly on products in the retailing sector (Mostaghel & Chirumalla, 2021). The aim of this research is to investigate the target groups' perception of the circular business model and factors who favour their purchase behaviour as well as adoption. Therefore, the research question is:

Which individual determinants foster the customer adoption towards circular business models considering the case 'Circular Furniture' in the city of Leeuwarden?

Moreover, the research is relevant to political actors, other entrepreneurs, and scholars to add more empirical and scientific evidence to the discussion. Additionally, relevant

applicative knowledge is gained for the economical actors in the case study (Frank & Landström, 2016). The structure of this study is as follows: The first part includes a comprehensive literature review and layout of the theoretical framework, followed by the derivation of hypothesis and research model. Later, the used methods are described, and the findings are presented. Finally, the results are discussed, and a conclusion is drawn.

LITERATURE RESEARCH

In the following section the concept and strategies of CBMs, how it creates a customer value proposition and how this relates to the concepts of customer's purchase behaviour are further explored. In the current body of literature the goal of a CBM is to create economical value using circular strategies as the 4R's: reducing, reusing, recycling and recovering (Kirchherr et al., 2017). Thus, to replace the "cradle to grave" with a "cradle to cradle" concept (Braungart, McDonough, & Bollinger, 2007). Hereby, "cradle to grave" refers to the extraction, use and discard of resources. Alternatively, the "cradle to cradle" approach involves procedures in which a drop product of one cycle becomes a resource for another process (McDonough & Braungart, 2010). Additionally, repairing, remanufacturing, refurbishing, rethinking and refusing are mentioned as circular approaches (Potting, Hekkert, Worrell, & Hanemaaijer, 2017). The goal is to focus on value preservation instead of value destruction without using additional resources (Potting et al., 2017). This can happen via an elongation of use duration of products or components as well as closed material circles (Bocken, de Pauw, Bakker, & van der Grinten, 2016; Nußholz, 2017). As Bocken et al. (2016) state there are three fundamental strategies to achieve a CBM: resource efficiency, slowing resource consumption with a long-term design and "closing the loop". The first strategy primarily focuses on lowering the amount of general resources used in the product and manufacturing process. The second strategy aims towards the prolonged use of an item and the third strategy is about recycling the

materials which are put into the process, lowering the extraction of new resources (Bocken et al., 2016). The given business case applies the second strategy focusing primarily on reusing and repairing furniture to elongate its lifetime. Furthermore, concepts of sustainable business model archetypes are mapped out by Bocken et al. (2014). Especially relevant hereby are the "deliver functionality rather than ownership" as well as the "create value from waste" archetype which are applied by the start-up (Bocken et al., 2014). CF offers the customer value proposition (CVP) by fulfilling the buyer's demands without possessing the physical object to maximize customer usage (Bocken et al., 2014). While the value proposition is normally associated with the product and service offering in order to produce economic return, the value proposition in a sustainable firm would also deliver demonstrable ecological and/or social value in addition to economic value (Boons & Lüdeke-Freund, 2013). Furthermore, offering a CVP that emphasizes a "share value logic" as key value creation logic can be seen as the main difference between linear and circular economy (Ranta, Keränen, & Aarikka-Stenroos, 2020).

Moreover, the start of a major turn in consumer behaviour can be witnessed leading to a mentality that values performance over ownership increasing the usage of capacity and, as a result, the efficiency of deployed resources (Planing, 2015). However, there are still multiple reasons to refuse the adoption of such innovations: First, psychological factors which oppose novelty such as habitual purchase behaviour and routines (Danner, Aarts, & de Vries, 2008). Lewandowsky (2016) even states that a prior change of customer habits is needed to sell within a circular approach. Second, neoclassical theory expects customers to make their choices most cost efficient (Planing, 2015). Those theories are one of many explaining why customers don't change habits and stick to cheap as well as convenient options, which the big success of IKEA has shown (Clifford, 2019). Hence, an innovation or new (circular) business model is only adopted if it provides a certain value proposition to the customer. This value relates to the consumer's overall perception of the utility of a product or service, based on the assessment

between perceived benefits and perceived costs, which originated from the theory of consumer behaviour (Zeithaml, 1988). The theory of consumer behaviour lays out individual behaviour during the purchase. Purchase behaviour and how it evolves from individual is implemented in the theory of planned behaviour (TPB) (Ajzen, 1991). This theory originates in the field of psychology and the behavioural sciences aiming to predict and explain human behaviour in a certain context also in terms of sustainability (Zhang, Fan, Zhang, & Zhang, 2019). In the sustainable context it is used to predict the behaviour of collaborative consumption, bike sharing, sustainable waste management, green purchases and many more (Elzinga et al., 2020; Heidari et al., 2018; Roos & Hahn, 2019; Sharma & Foropon, 2019; Si, Shi, Tang, Wu, & Lan, 2020). Originally, the concept is based on the three independent variables: attitude, subjective norm, and perceived behaviour control (PBC) which influences the purchase intention related to the purchase behaviour. Intention is the motivation of an individual to behave accordingly after a conscious decision has been made (Ajzen, 1991). The extent to which a person evaluates something, for example a product, favourably or unfavourably is called an attitude. Attitudes develop from the beliefs, tendencies, entity and evaluation that people have (Ajzen, 1991; Eagly & Chaiken, 2007). In order to succeed with CBM, Mentink (2014) stated that consumers' attitudes are crucial. They need to be excited and involved (Mentink, 2014). Subjective norms on the other hand are the motivation to align with normative beliefs meaning the potential approval or disapproval of important reference groups regarding the behaviour (Ajzen, 1991). Simplified, the subjective norm expresses how much an individual cares about the opinion of its peers and how much this motivates the individual to think and act a certain way. Contrary, the PBC is defined as the perceived difficulty or ease of performing the behaviour as well as the perceived barriers or enablers considering the personal resources (Ajzen, 1991). In terms of sustainability the variables environmental awareness, value based personal norms or

willingness to pay a premium (WPP) are often included (Mostaghel & Chirumalla, 2021; Roos & Hahn, 2019; Yadav & Pathak, 2017; Zhang et al., 2019).

As values and customer awareness play an important role in CBM, Mostaghel and Chirumalla (2021) analysed the existing literature introducing a framework for ethical purchase intentions for CBM in the retail sector. This framework was derived from former studies which used the TPB or its earlier version the theory of resonate action (Fishbein & Ajzen, 1975; Madden, Ellen, & Ajzen, 1992; Mostaghel & Chirumalla, 2021). Hence, the framework for ethical purchase intentions for CBM serves as basis for this research adapted to the given case and is displayed in Appendix A. The main building blocks of the model are awareness, attitude, perceived value, and personal characteristics which are related to the ethical purchase intention in the first step. In the second step the ethical purchase intention is connected to the ethical purchase behaviour towards CBM's. An overview of all concept definitions can be found in Appendix B.

Environmental awareness

The construct awareness includes environmental awareness, ethical product awareness, and brand awareness. As the given case study uses second-hand furniture and therefore doesn't produce the end product, the variable ethical product awareness is dismissed. Additionally, the start-up did not create any brand awareness so far, hence this variable is not taken into account as well. Environmental awareness relates to the propensity of how an individual replies to environmental circumstances in a particular way and can be described as attitude towards human made environmental consequences (Ham, Mrčela, & Horvat, 2016). The construct is described as two dimensional and includes the attitude towards nature and its value in general as well as the motivation towards pro-environmental actions and protection (Gagnon Thompson & Barton, 1994; Ham et al., 2016). As environmental awareness can be seen as

attitude and knowledge regarding the environment, the relation towards the intention needs to be tested. Because even if individuals are aware of the negative impact, they do not necessarily create a relevant behavioural intention (Carlson & Van Staden, 2006). However, Minton and Rose (1997) show the strong contribution of the consumers attitude of environmental protection towards intention. Furthermore, Bamberg and Möser (2007) revealed that next to habits, problem awareness related to environmental matters has a significant influence on intention. Thus, for measuring environmental awareness, the variable needs to be separated into content related and theoretical questions (Van Liere & Dunlap, 1981). As a result, the current study splits the variable in *general environmental awareness* and *case related environmental awareness* which includes the impact of the furniture industry. As environmental awareness can be seen as a first step towards a green behaviour it is hypothesised that a customer with a higher environmental awareness has a higher purchase intention towards CBM (Carlson & Van Staden, 2006).

H_1+: The higher the customer's general environmental awareness the higher the intention to adopt CBMs.

H_2+: The higher the customer's case related environmental awareness the higher the intention to adopt CBMs.

Attitude

In this study, attitude is constructed from the variables *attitude towards CBM* and the *WPP*. An attitude towards a CBM is among other things built by one's beliefs, habits, knowledge, and social norms, which in this case contents the individual evaluation regarding the favourability of business model and perception of the performance over ownership approach. On the other hand, price can be seen as another facet contributing to the attitude

(Fishbein & Ajzen, 2009; Ölander & ThØgersen, 1995). Particularly, price can be the most critical barrier hindering green consumption (Gleim, Smith, Andrews, & Cronin, 2013). Therefore, it is important to look at the willingness to pay a possibly higher price for a green product. WPP in this study is defined as the extent to which a customer is willing to pay the monthly subscription fee, which can be perceived as a premium price. This depends on the duration and the consideration of the total cost of ownership, adding the monetary and non-monetary sum of acquisition, use and disposal costs of second-hand furniture (Ellram, 1995). Mostaghel and Chirumalla (2021) propose that customer's attitude towards CBM and WPP are positively related to ethical purchase intention towards CBM. Leading to the following hypothesis:

H_3+: The higher the customer's attitude the higher the intention to adopt CBMs.

H_4+: The higher the customer's willingness to pay premium the higher the intention to adopt CBMs.

Perceived value

The variable *perceived value* includes three main building blocks: *social value, functional value,* and *epistemic value.* Hereby, the social value construct from Mohd Suki (2016) lays out the adaptation from social norm from the TPB to a sustainable product which is applicable in the case. For that, the customer expects positive social feedback from his peers on his environmentally friendly behaviour. This needs to be clearly separated from the perceived social value proposition in which the company would offer a social dimension regarding the triple-bottom-line within its business model (Kristensen & Remmen, 2019). The functional value can be related to the convenience factor and "functionality over ownership" value which this particular business model offers to the customer. This results in a performance

or benefit which creates a utility for the customer related to the utilitarian value logic.The utilitarian value logic can be related to a way an object performs and the symbolic value the end user perceives (Holbrook & Hirschman, 1982). The epistemic value refers to the value of knowledge and the information a customer would gather before making a purchase (Pritchard, 2009). This allows an informed decision based on the obtained material. It is relevant in the case to see if students who spend more time researching the market and available products are more likely to purchase. As all three building blocks seem to have a positive relation towards the intention the following hypothesises are posed:

H_5+: The higher the customer's social value the higher the intention to adopt CBMs.

H_6+: The higher the customer's functional value the higher the intention to adopt CBMs.

H_7+: The higher the customer's epistemic value the higher the intention to adopt CBMs.

Personal characteristics

Personal characteristics in the model of Mostaghel and Chirumalla (2021) moderate the relation of attitude, awareness, and perceived value. Furthermore, the variable consists of the components age, education, and income. However, the composition of the moderator personal characteristics is thematically adjusted as Zwierzyński (2017) states that one dominant determinant conditioning the customer behaviour in the market of furniture are demographics such as age, gender, location, and household related factors. Location in this study converts to the origin of the customer as the survey is conducted in the same location but with students from the Netherlands and international students. Furthermore, the household related factors are compromised to income. Moreover, the component education or education level is not transferred to the research framework as the sample consists only of students which share a similar education level. This is also the reason why age will not be considered in this study

because of the target group's minor age difference. The determinant gender will not be accounted for as Shin, Jung, Im, and Severt (2020) found that the moderating role of gender applies only to the effect of the perceived behaviour control on the purchase intention which is not part of the ethical purchase behaviour (Mostaghel & Chirumalla, 2021). In this particular case study, the moderation on the perceived value isn't adopted because of the target group's partially international backgrounds, and because the perception of value is individually determined which can be seen as independent from personal characteristics (Petrick, 2002). Moreover, the origin country of a student is hypothesized to have an influence on the adaptation of the business model due to the transportation the student uses to move to Leeuwarden. This means that international students compared to Dutch students might use an airplane to arrive in the city which leads to luggage restrictions, making the transfer of furniture more difficult. Ajzen (2006) proposed the introduction of case related additional factors, as long as they can be measured as an independent variable estimating intention. Therefore, origin is assumed to have an effect on intention. Additionally, the income is assumed to have an influence on the relation between the WPP and the intention as a student might be willing to pay premium but does not have the budget to do so. This means that a higher income reinforces the relationship between the WPP and the intention.

H_8+: International students are more likely than Dutch students to have a higher intention to adopt the particular CBM.

H_9+: The effect of customer's WPP on the intention to adopt CBMs is moderated by the personal characteristic income.

Intention

In this paper, the behaviour is equated with the purchase of a Circular Furniture subscription which results in the adoption of the CBM. The intention to participate in circular consumption corresponds to the intention. Mostaghel and Chirumalla (2021) define ethical purchase intention as "the intention to purchase those services and/ or products that cause minimal or no damage to society and the environment" (Mostaghel & Chirumalla, 2021: 39). Studies which analyse sustainable behaviour found a positive relation between intention and behaviour, meaning that a higher intention is seen as a direct predictor of the performance of the behaviour (Zhang et al., 2019).

H_{10}+: The higher the customer's intention to adopt CBMs the higher the adoption of CBMs.

Research model

The discussed variables result in the following research model displayed in Figure 1. The research model bases on the framework for ethical purchase intentions for CBM with adaptions from the thematically relevant literature. The intention to adopt CBM is considered as the dependent variable of Model 1. The variables of environmental awareness, attitude, WPP, the three perceived value components and origin represent the independent variables. Moreover, the personal characteristic income acts as moderator of the model affecting the relation between the independent variable and the dependent variable. Additionally, behaviour to adopt CBM can be seen as second dependent variable.

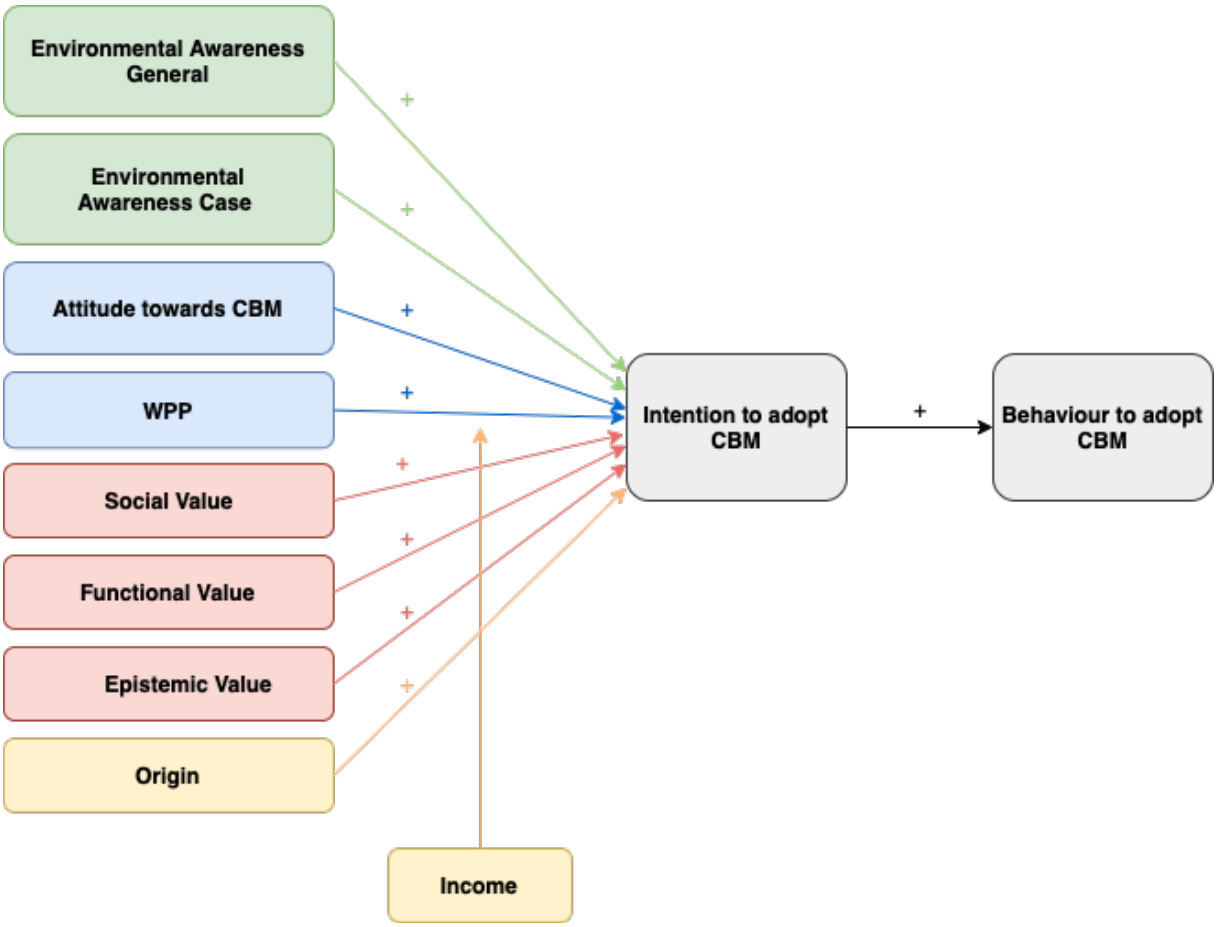

Figure 1: Research model adapted from Mostaghel and Chirumalla (2021)

To answer the research question this research model allows for a quantitative approach because of the mature stage of theory (Edmondson & Mcmanus, 2007). Furthermore, Mostaghel and Chirumalla (2021) build a proper basis to test the role of customers in circular business models quantitatively.

METHODS

This chapter deals with the data collection and data analysis which includes: first the capture of data, survey distribution and questionnaire design and second the filtering process, test for normality, reliability, and validity testing.

Data collection

The research model above was tested conducting a survey to collect primary data. Primary data was necessary as the start-up was in the founding stage which means that no data was available yet. Hence, to benefit the host company a specific target group (students in Leeuwarden) needed to be researched, delivering the latest information.

Data acquisition and survey distribution. The questionnaire was created digitally and conducted online using the web application Qualtrics. This site enabled a professional online survey with precise data collection, a targeted itemization, and the collection of other relevant "external circumstances", such as the processing time of the respondents.

First, a pilot with students from the Sustainable Entrepreneurship Master was conducted in the period from the first until the 13th of April 2022. This had the purpose to review possible inconsistencies of the survey, to allow improvements for the main survey and to ensure a proper measurement of the research model (Hunt, Sparkman, & Wilcox, 1982). Furthermore, it contributed to the reduction of potential bias, errors, and misunderstandings (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Second, the main survey was shared within the period from the 14th of April until the 1st of May 2022 in social media groups of university students in Leeuwarden and within the Circular Furniture “potential consumer” data base. This data base was a collection of contact details from individuals which implied to have an interest in the company’s service during prior events. Furthermore, an active recruiting process on campus within the NHL Stenden Hogeschool and University of Groningen Campus Fryslân was carried out. The study applied a simple random sample of minimum 1% of the target group’s population, meaning students living in Leeuwarden (Bell, Bryman, & Harley, 2019). The total number of students enrolled in the city was 34,060 but only 9,280 were living in Leeuwarden (DUO, 2021; Gemeente

Leeuwarden, 2021). Therefore, the survey aimed for at least 93 validly conducted questionnaires.

The questionnaire design. The questionnaire based on scales from prior studies, which were appropriately adapted to the current research context, to ensure reliability and validity. The preliminary item selection is laid out in Table 1. First, for the variable "general environmental awareness" reference was made to Chen & Tung (2014), Paul et al. (2016), Xu et al. (2020) and the "case related environmental awareness" was self-created using the general scales as a guideline. Second, the variable "attitude" was tested modifying the scale of Kazeminia et al. (2016) for the "WPP" and Malik et al. (2017) for the "attitude towards CBM" to the given case study. Third, "perceived value" was measured using the accustomed questions of Mohd Suki (2016) for the "social" and "epistemic value". For the "functional value" a scale on utilitarian value was adapted due to the task-related customer value the furniture subscription provides (Holbrook & Hirschman, 1982; Picot-Coupey, Krey, Huré, & Ackermann, 2021). Fourth, the "intention" was measured following Malik et al. (2017) and fifth, the "behaviour" referenced to Wei et al. (2017). The above-mentioned scales were tested with three items for a condensed scope. A closed question format with a seven-point Likert scale was chosen as previous studies successfully tested its suitability to TPB-related research (Ajzen, 2015; Elzinga et al., 2020). The labelling of the rating scale was done in accordance with Likert from "Strongly disagree" to "Strongly agree" (Likert, 1932). Finally, personal characteristics were measured using numeric entries for age, a nominal choice scale for gender as well as origin and intervals for income. If an item was not processed by the participant, there was a reminder to do so. If it was still not answered, no data was reported.

Variables	Components	Questions	Adapted from
Environmental awareness	General	EAG1) I am worried about the state of our environment. EAG2) I think human beings should preserve the balance of nature. EAG3) I think individuals have the responsibility to protect the environment.	Chen & Tung (2014), Paul et al. (2016), Xu et al. (2020)
	Case related	EAC1) I am not aware of the extend the furniture industry pollutes the environment. (RC) EAC2) I am aware of the negative impact the emissions of the furniture industry produce. EAC3) I am aware that the amount of waste, the furniture industry produces has a negative impact.	Self-created
Attitude	WPP	WPP1) I am willing to buy a more expensive product to reduce pollution. WPP2) I am willing to rent furniture, because I know the added cost pays for a better environment. WPP3) I am willing to pay more for a sustainable as opposed to a 'regular' product.	Kazeminia et al. (2016)
	Attitude towards CBM	ATT1) I believe that my use of sustainable systems will help reduce pollution and benefit the environment, society, and the economy. ATT2) I feel good about myself when I use sustainable systems. ATT3) I don't need to be the owner of a product as long as it gives me the same performance.	Malik et al. (2017)
Perceived value	Social value	SV1) Buying the sustainable system would help me to feel accepted. SV2) Buying the sustainable system would improve the way that I am perceived. SV3) Buying the sustainable system would make a good impression on other people.	Mohd Suki (2016)
	Functional value	FV1) Getting a furniture subscription wouldn't fulfil my need of furnishing my accommodation. (RC) FV2) Renting furniture with a subscription would be more convenient than buying it. FV3) The performance of the furniture subscription is what I am looking for to fulfil my need of furnishing my accommodation.	Picot-Coupey, Krey, Huré, & Ackermann (2021)
	Epistemic value	EV1) Before renting furniture, I would obtain substantial information about the different options to furnish my accommodation. EV2) I would acquire a great deal of information about the different makes and models before subscribing to a furniture subscription. EV3) I would enjoy searching for new and different solutions to fulfil my need of furniture.	Mohd Suki (2016)
Intention		INT1) I would prefer to rent furniture over buying furniture for the duration of my study. INT2) I am willing to purchase a sustainable system to benefit the environment, society, and the economy. INT3) I would purchase the CF subscription to cover my need for furniture.	Malik et al. (2017)
Behaviour		BH1) I will use the CF subscription. BH2) I will switch from my usual way of buying furniture and use the CF subscription. BH3) I will switch products for sustainable reasons.	Wei et al. (2017)

Table 1: Item overview

The questionnaire design was based on a common approach regarding the structure as well as order of questions (Podsakoff et al., 2003). The survey was conducted in English and can be found in Appendix C. On the first page, the respondent was welcomed and introduced to the survey, including an information regarding the anonymised treatment and request for data processing allowance. The second page was an introduction to the business model and the definition of "sustainability" and "system" in terms of a service-product combination. Page 3 served as a filter question regarding the current status of the respondents to make sure only the targeted group was used for the data analysis. This was followed up on page 4 which tested the independent and dependent variables. Questions on sensitive topics that may make respondents uncomfortable are usually allocated at the end of the questionnaire (Krosnick, 2018). Therefore, the personal characteristics were asked on page 5.

Data analysis

The data analysis was conducted using IBM SPSS. For the transformation from text to code the Likert scale items were coded as 1 for "Strongly disagree" ascending up to 7 for "Strongly agree". The personal characteristics were coded as dummy variable: origin applied 0 for non-international students containing exclusively Dutch students and 1 for international students.

Reliability and validity testing of the pre-test. A qualitative and quantitative pre-test with a small sample size (N=10) was conducted. The cases were not used for the main sample. The means analysis and a test for normality were performed. Due to the small sample size ($n < 50$), the significance test of Shapiro-Wilk was used to check the normal distribution as this was a basic requirement for the following regression (Shapiro & Wilk, 1965). In addition, an optical test via histogram, as well as the test of skewness (excess) and kurtosis was carried out (Razali & Wah, 2011). The descriptive statistics showed left skewed results which could be

explained due to the choice of participants, as they had a background in sustainability and represented the ideal customer of the company, which might influence environmental awareness, attitude, intention, and behaviour. This was not expected for the main analysis and was no reason for further concern. The scale reliability was analysed by means of the Cronbach alpha value (Fornell & Larcker, 1981). The results of the analysis as well as the qualitative feedback showed that the questions for EAG2, EAC2, WPP2, ATT3, EV1 needed to be changed or further clarified. The reliability testing of the scales using Cronbach's alpha resulted for the behaviour, intention and attitude in values between 0.718 and 0.908 which could be seen as acceptable (Fornell & Larcker, 1981). The environmental awareness scored 0.6. Within the perceived value variable SV had a value of 0.703 and the FV and EV scored 0.391 and 0.451. Therefore, the low scoring items were rephrased and an explanation what a sustainable system represents was added to remind the reader. Finally, as a result of the factor analysis it was decided to split up the variables from Mostaghel and Chirumalla (2021) to its individual factors for the data analysis of the main data set. Furthermore, face validity for the final scales was obtained by consulting the academic supervisor (Bell et al., 2019). This procedure was conducted to ensure the right test selection, reliability and to check if the items needed rephrasing. The results of the pre-test were taken into consideration for the design and formulations of the main survey for the best possible research results.

Reliability testing of the main survey. The filtering process, scan of normality, and reliability testing of the main survey is laid out in the following paragraph. In the main survey the data set was initially purged with the following filters as recommended by Baumgartner and Homburg (1996). First, regarding a low processing time. Surveys conducted under 200 seconds were erased as the participant could not have had enough time to read the questions and explanations properly. Second, surveys with missing values and incomplete surveys were

not taken into consideration (Hulland, Chow, & Lam, 1996). Third, reverse coded (RC) items were used for the question EAC1 and FV1 to ensure the sincerity of participation. Hence, participants which only selected the same answer for every item could be screened for to minimize response biases (Peer & Gamliel, 2019). For the analysis the RC items were turned. The main sample had a size of 177 participants. It needs to be mentioned that 57 cases were filtered out due to missing values. Those missing cases filled in nothing or lacked to complete item three of the case related environmental awareness ("EAC3: I am aware that the amount of waste, the furniture industry produces has a negative impact."). Hence, 120 cases were relevant after the filtering process, thus the aimed participant number of 93 was reached.

The next step was the means analysis and the test for goodness of fit regarding a normal distribution using the Kolmogorov-Smirnov test. Hereby, normality can be assumed if the test does not reject H_0 at a significance level of 0.01 (Massey, 1951). H_0 for this test is: "The dataset is normally distributed.". However, the Kolmogorov-Smirnov test for normality showed only significant results rejecting H_0 in this study, as a matter of fact, normal distribution was not supported (Massey, 1951). Additionally, the mean, median, standard deviation, skewness, and kurtosis of all items were calculated and reviewed. A table with the descriptive statistics can be found in Appendix F, as it is recommended for skewed data to list medians and the additional values (Elzinga et al., 2020). To sum up the results, the items seemed to be slightly left skewed and tailed. In conclusion, the dataset in this study did not show a perfect normal distribution. Nevertheless, the central limit theorem allowed to move on with the analysis as the sample size was bigger than 30 (Kwak & Kim, 2017).

To ensure the internal reliability of scales the Cronbach's alpha coefficient and the corrected item-to-total correlation (CITTC) were used as measures of internal consistency and homogeneity of selected items of a scale (Bell et al., 2019; Cronbach, 1951; Peter, 1979). The calculated values vary between 0 and 1, but only values greater than or equal to 0.7 for the

Cronbach's alpha and higher than 0.5 for the CITTC are considered acceptable (Bearden, Netemeyer, & Mobley, 1993; Heale & Twycross, 2015; Nunnally, 1978; Zinnbauer & Eberl, 2004). The reliability analysis with Cronbach's alpha had the following results: The variables environmental awareness general and case specific scored 0.706 and 0.790. The values for attitude and WPP were 0.713 and 0.735. The social value reached the highest result with 0.838. Compared, the functional value's Cronbach's alpha result was 0.588, notably the item FV1 improved the score to 0.777 if removed. The epistemic value scored 0.752. Another result was 0.808 for the intention items. Finally, the behaviour was 0.787 hereby the removal of the item BH3 would result in an increased value of 0.885. As all factors were bigger than 0.7 the items could be evaluated as reliable (Fornell & Larcker, 1981). For the CITTC all values were higher than the expected value of 0.5 except EAG3, ATT3, WPP2, FV2 and BH3 which were all higher than 0.4. The indicators developed were therefore suited to reliably measure the constructs (Bearden et al., 1993; Zinnbauer & Eberl, 2004).

Validity testing of the main survey. As the next step, the validity was quantified using the Pearson's correlation coefficient measuring the strength of the relationship between two variables (Bell et al., 2019). Additionally, a confirmatory factor analysis - unifactorial and multifactorial – was performed (Zinnbauer & Eberl, 2004). The factor analysis was conducted to check if the items represent one factor to ensure discriminant validity (Bell et al., 2019). Thus, it was used in conjunction with multiple-indicator measurements to assess whether sets of indicators tend to cluster together to form unique and single factors (Bell et al., 2019). Within the factor analysis the indicator reliability, meaning communalities and factor loadings, and average variance recorded (AVR) were obtained (Bagozzi & Yi, 1988; Hair et al., 2017; Peter, 1979). Hereby, the communalities extracted all scored higher than 0.5 except the items FV1 and BH3. The factor loadings were all higher than 0.7 except the same two items (Backhaus,

Erichson, Gensler, Weiber, & Weiber, 2021). These analyses showed that FV1 and BH3 should be excluded for the final factor of the regression analysis because of their poor results (Hair et al., 2017). When removed the AVR could be improved so that all variables reached values higher than 65% (Bagozzi & Yi, 1988). Therefore, FV1 and BH3 were dismissed as they were already conspicuous in the reliability analysis. A comprehensive overview of the results from the reliability and factor analysis is stated in Appendix G & H. Those individual factors tested, create the basis for the Fornell-Larcker criterion (Fornell & Larcker, 1981). The criterion is used to acquire discriminant validity, if the squared variable correlations (H^2) are smaller than the AVR (Bell et al., 2019; Fornell & Larcker, 1981). This could be accomplished and was a requirement for the next step. As a next step the final variables which showed to be a single factor were computed for the regression analysis averaging the items per variable (Fornell & Larcker, 1981). Herein, the variables environmental awareness (general & case related), attitude, WPP, social and epistemic value as well as the intention included three items and the variables functional value and behaviour only two items due to the prior results of reliability testing. The tests above support the solidity of data and factors used for the regression models.

Regression Models. Finally, three models were performed for the regressions. The first model tested the relation of the independent variables: environmental awareness (general and case related), attitude, WPP, social value, functional value, epistemic value, and origin to the intention. The second model equalled the first model with the additional testing of the moderator income on the effect of WPP on intention. The third model analysed the relation between intention and behaviour. The three models are described in the following three equations:

Model 1:
$$\hat{y}_{INT} = Intercept + b_1 \cdot x_{EAG} + b_2 \cdot x_{EAC} + b_3 \cdot x_{ATT} + b_4 \cdot x_{WPP} + b_5 \cdot x_{SV} + b_6 \cdot x_{FV} + b_7 \cdot x_{EV} + b_8 \cdot x_{Origin}$$

Model 2:
$$\hat{y}_{INT} = Intercept + b_1 \cdot x_{EAG} + b_2 \cdot x_{EAC} + b_3 \cdot x_{ATT} + b_4 \cdot x_{WPP} + b_5 \cdot x_{SV} + b_6 \cdot x_{FV} + b_7 \cdot x_{EV} + b_8 \cdot x_{Origin} + b_9 \cdot (x_{WPP} \cdot x_{Income})$$

Model 3:
$$\hat{y}_{BH} = Intercept + b_1 \cdot x_{INT}$$

Figure 3: Regression model equations

Furthermore, those equations can be laid out graphically to visualise the regression models referring to the research framework.

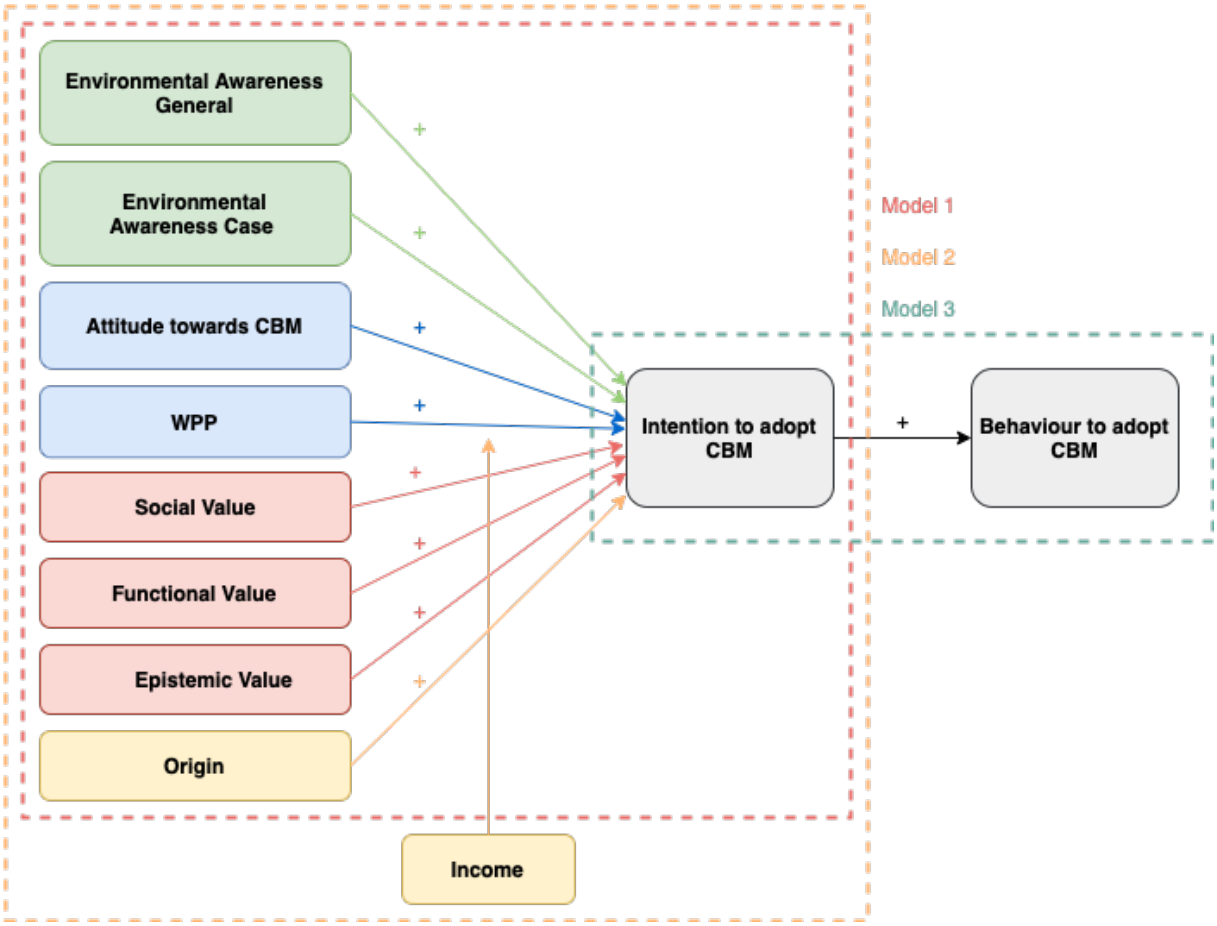

Figure 4: Visualisation of the three regression models

FINDINGS

The findings of the main survey are shown in this section. The sample showed the following demographics: The average age was 22.27 years. The main age range was between 17 and 27 years (see Appendix D). Furthermore, 68.3% classified as female, 28.3% male, and 3.3% as non-binary. The origin range was very broad as 29 nationalities were recorded (see Appendix E). Hereby, 39.2% were Dutch students and 60.8% international students, among which the largest group were German students (37 %). 90% of the participants had a monthly income between 0 and 1500€ per month (0-500€ = 35.83%; 501-1000€ = 48.33%; 1001-1500€ = 10.83%).

The three multilinear regression analyses executed yielded the following results. Their results can be found in Table 2. All models were significant on a 0.01 level and explained nearly 60% of variance which represented strong models (Cohen, 1988). Furthermore, the Durbin-Watson values were close to 2 meaning no autocorrelation of the residuals could be found (Durbin & Watson, 1951). The variance inflation factors (VIF) were close to 1 and always lower than 2 therefore multicollinearity could be precluded (Hair, Anderson, Tatham, & Black, 1998).

	Model 1	Model 2	Model 3
Unstandardised	Coefficients	Coefficients	Coefficients
(Intercept)	-0.008	0.002	-0.092
Environmental Awareness General	0.218**	0.216*	
Environmental Awareness Case	-0.041	-0.042	
Attitude	0.039	0.039	
Willingness to pay premium	0.378***	0.386***	
Social value	0.013	0.012	
Functional value	0.364***	0.363***	
Epistemic value	-0.030	-0.029	
Origin	0.481***	0.480***	
Interaction term (WPP x Income)		-0.003	
Intention			0.819***
Adjusted R^2	0.585***	0.582***	0.571***
F	21.987	19.377	159.667
P values	*< 0.1	**< 0.05	***< 0.01

Table 2: Model summary

Model 1 indicated that H_1 could be supported ($b = 0.218$, $p < 0.05$), confirming the significant effect of the general environmental awareness on the intention to adopt CBM. Contrarily, H_2 which hypothesised the positive effect of the case related environmental awareness on the intention, H_3 which included the attitude towards CBM, H_5 which covered the positive effect of the social value and H_7 which stated the influence of the epistemic value could not be supported on a $p < 0.1$-level due to the non-significant coefficients. This implies that the case related environmental awareness, attitude, social, and epistemic value do not have a statistical relevant effect on the intention. Hence, H_4 showed clear statistical support ($b = 0.378$, $p < 0.01$) pinpointing the significant effect of the WPP on the intention of the customer.

Further, the functional value was found to have a significant effect suggesting the support for H_6 ($b = 0.364$, $p < 0.01$). Concluding, the origin turned out to have the highest statistically relevant effect and supported H_8 ($b = 0.481$, $p < 0.01$). Moving on to Model 2, particularly H_9 could not be statistically validated in the moderator analysis, showing that Income has no significant moderating effect on the relation between WPP and intention. Lastly, the relation between the customer's intention and behaviour was substantiated in Model 3 significantly confirming H_{10} ($b = 0.819$, $p < 0.01$).

The results of the Pearson correlation indicated statistically significant, positive relationships between all the independent variables and the intention, except of the case related environmental awareness. Hereby, environmental awareness ($r = 0.472$***), attitude ($r = 0.548$***), WPP ($r = 0.595$***) and functional value ($r = 0.655$***) showed the strongest correlation with the intention variable, reaching values close to or higher than 0.5. Other interesting findings from the correlation matrix (see Appendix I) like the strong positive relation between attitude and functional value ($r = 0.552$***) can be observed. The general environmental awareness additionally correlated quite highly with the attitude ($r = 0.529$***) and WPP ($r=0.439$***). Furthermore, the origin of students correlates significantly with values of $r = 0.266$*** with the functional value and $r = 0.339$*** with attitude, suggesting that international students perceive the business model as more positive and useful. Finally, the correlation between intention and behaviour reached the highest number with $r = 0.758$***.

DISCUSSION AND CONCLUSION

Discussion

The obtained findings are further summarised and discussed. In addition, limitations, recommendations, and future research potential is laid out, followed by the conclusion. The four significant predictors for the intention to adopt CBM are general environmental awareness,

willingness to pay premium, functional value, and origin. Furthermore, the results suggest that age matters in the subscription decision as all the participants were students who showed a broad interest in adopting the CF business model. This can be related to the general environmental awareness as a lower age usually refers to a higher environmental concern (Buttel, 1979). Hence, students seem to be aware of the general state of the environment and agree with conservational attempts which the left skewed results and median of 6 (out of 7) show. Their consciousness is reflected in a heightened intention to participate in CBM as an increase of one unit in the general environmental awareness variable causes a significant increase of 0.218 units of intention.

Additionally, age and environmental concern in this case seem to be thematically related to functional value because students seem to seek for the convenient and practical option of renting furniture. Functional value in this decision seems to be more important than attitude, as the independent variable attitude was not found to be significant. This means that attitude does not statistically explain the intention to participate in CBM which could originate from multiple reasons. First, it might be the case that students build their attitudes based on the functional value as furniture is seen as a necessity which only must functionally work. Furthermore, this is supported by the correlation between attitude and functional value ($r = 0.552^{***}$). Functional value has a significant causal influence of 0.364 on intention and correlates stronger with it than attitude ($r = 0.655^{***}$). That shows that for students the benefits obtained by functionality matter more in terms of forming an intention to adopt this specific CBM. Second, renting furniture independent from a room or apartment might not be established and could hence lower the perceived CVP as possessing could make the value appear higher psychologically speaking (Schönherr-Mann, 2010). Especially, if the product has a relevant intangible value which makes the customer emotionally attached to the product, ownership is preferred (Lewandowski, 2016). This can be related to the emotional value of

building a long-term home for oneself. That is why it is interesting that students with an international origin seem to have a higher attitude towards the CF offer and lowered interest in ownership which the correlation (r = 0.339***) indicates. They seem to perceive a benefit in renting instead of buying to decrease the amount of stress in the already time intensive moving process as they are less likely to bring their own furniture along to Leeuwarden. Further, International students might not focus on building a long-term home and therefore do not see a reason to buy new furniture because they perceive it as complex, cost-intensive and unsustainable for a short-term stay. Revealingly, this demonstrates the significant influence of origin on intention.

So, what keeps students from subscribing to the CF offer? This is where Income and WPP become relevant, as the system might be perceived as too expensive. Even if Kazeminia (2016) argues that customers with a pro-environmental attitude tend to be led by intrinsic motives and therefore perceive the rational cost-benefit ratio more emotionally, which leads them to evaluate a sustainable product more favourable even if it's more expensive. The results in fact indicate that an increase in WPP increases the intention (r = 0.595; b1 = 0.378; b2 = 0.386; $p < 0.01$). However, the moderating effect of income investigated in the second model was not found to be significant but indicated a decrease of 0.003. A possible explanation for this finding is that students already earn very little (80% between 0-1000€/month) which implies that income matters if one would compare it to a broader income range. In the first-place students need to spend their money on necessities such as rent and food which might make them prefer furnished apartments where the price of furniture is already included in the rental price.

After the first two models the third model presents the relation between intention and behaviour because if costumer behaviour does not result from the intention all prior discussed predictors fade into the negligible. In this study, particularly in Model 3, the data shows that an

increase of one unit in the participants intention leads to a plus of 0.819 units in the behaviour to adopt CBM. Revealingly, if students intend to get a subscription, they most likely will. Even if this is a strong result a slight intention-behaviour gap can be spotted (Sheeran & Webb, 2016). An intention behaviour gap occurs if individuals intend to behave a certain way but ultimately do not execute the behaviour. To overcome this gap Sheeran and Webb (2016) propose in a first step to better understand the reasons which cause the gap, so to understand opportunities and obstacles and in a second step to work towards removing them. To say so, it is necessary to clarify and promote the advantages of innovative service oriented CBMs to the potential customer base (Elzinga et al., 2020). Generally, if behaviour and consumer preferences are not discovered comprehensively and included, the full potential of CBM is under explored which results in a waste of sustainable opportunity (Elzinga et al., 2020; Kirchherr et al., 2017; Lewandowski, 2016; Ölander & ThØgersen, 1995; Planing, 2015). That is why this result is so important.

Limitations and future research

Regarding limitations of this research, Hassan, Shiu, and Shaw (2016) argue that additional elements as well as situational factors have an impact on the link between intention and a behaviour when it is not performed immediately. Thus, it can be seen as limitation that this study was a one-time study and not a repeated experiment which therefore examined a predictive behaviour (Sutton, 1998). This can be seen as invitation for future research to repeat this study and to see if people who indicated to get a CF subscription behaved accordingly.

A second limitation grounds in the small income range of the participants. Even if the students in this sample might consider the little money they have, to be wisely spent on a functional system additionally aligning with their sustainable values. It needs to be mentioned that no price for the CF subscription was shared with the participant. Nevertheless, further

studies should investigate this phenomenon with a higher variance in income and the indication of price. On top future research in the field of CBM should also investigate the influence of age using a cross-generational sample because also middle-aged seem to have a high environmental awareness and might therefore be open to adopt CBM (Morrison & Beer, 2017).

The third limitation can be spotted in the case related environmental awareness variable as this one was not found to be significant. This could be interconnected with the self-creation of item questions as the first item was a reversed coded item, and the negation might have caused confusion or misunderstanding. The discrepancy becomes clear in a comparison of means also with the general environmental awareness (see Appendix F). Otherwise, the items indicate that the participants seem to have too little specific knowledge about the impact of the furniture industry.

As final limitation it needs to be acknowledged that the researcher is a Co-founder of CF and therefore has a certain interest in the findings of this study. This might create some type of bias. Therefore, an external revision of this study is welcome. However, it is declared that the research process has been as transparent and neutral as possible.

Practical implication and recommendation

Ultimately, the practical implication for CF is to target international students which are environmentally aware, perceive a functional value in the furniture subscription and are willing to pay a premium price. Therefore, their marketing and general communication should make the attributes of being sustainable and offering a useful as well as convenient service stand out. As money matters the price should be promoted as low and payable in small instalments. Additionally, the missing cases of item three of the case related environmental awareness imply that an awareness creation for the environmental impact of the furniture industry should be adopted in easy and clear language in the communication of the start-up to create awareness

and increase customer adoption. For CF it is therefore recommended to create case related and industry related awareness. Supplementary, to close the Intention behaviour gap it is recommended to make the purchase process as easy as possible and to reduce risk. This means to offer the website in English, allow several international payment methods, provide simple but detailed explanations plus visualisations of the process and furniture and to show a transparent pricing scheme.

Conclusion

This study investigated the CBM of the start-up Circular Furniture with the aim to identify which individual determinants foster their customer adoption. While answering the research question, this study added to the current literature in the field of circular economy and consumer behaviour. The research model was based on the ethical purchase behaviour framework by Mostaghel and Chirumalla (2021) and as a result of the literature research adapted to the given case. Primary data from 177 students was collected and a quantitative analysis conducted. Hereby, the aspects willingness to pay premium, general environmental awareness, functional value, and international origin have a positive, significant influence on the intention to adopt CBM. Therefore, a higher willingness to pay, being more environmentally conscious, perceiving a functional value in the system and coming from abroad result in a higher intention and later higher adoption of CBM. The start-up should focus on those determinants in its communication and educate customers on the negative ecological impact of the furniture industry.

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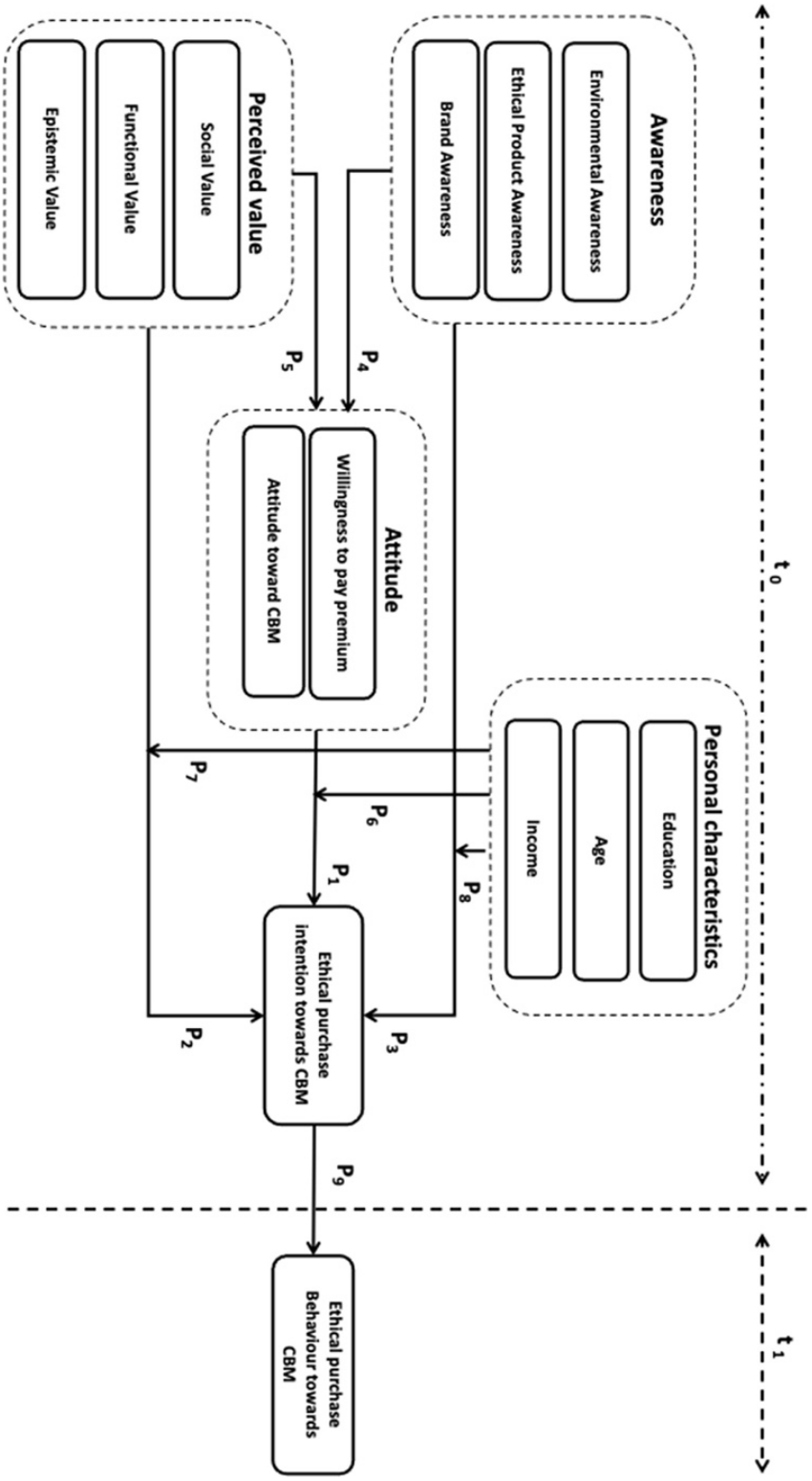
APPENDIX

Appendix A: Ethical purchase behaviour towards circular business models framework by Mostaghel & Chirumalla (2021)



Appendix B: Overview of all important concept definitions

Concept	Definition	Reference
Circular Business Model	How a company creates, captures, and delivers value with the value creation logic designed to improve resource efficiency through contributing to extending useful life of products and parts (e.g., through long-life design, repair and remanufacturing) and closing material loops	Nußholz, 2017
Intention	Intention is the motivation of an individual to behave accordingly after a conscious decision has been made.	Ajzen, 1991
Environmental awareness	Attitude towards human made environmental consequences	Ham, Mrčela, & Horvat, 2016
Attitude	The extent to which a person evaluates something, for example a product, favourably or unfavourably is called an attitude.	Ajzen, 1991
Willingness to pay premium	WPP in this study is defined as the extent to which a customer is willing to pay the monthly subscription fee, which can be perceived as a premium price.	Kazeminia et al., 2016
Subjective Norm	Subjective norms are the motivation to align with the potential approval or disapproval of important reference groups regarding one's behaviour.	Ajzen, 1991
Social Value	Social value relates to the value a product creates for the end user related to the potential approval or disapproval of important reference groups.	Ajzen 1991; Mohd Suki, 2016
Functional Value	Functional value relates to a way an object performs and the symbolic value the end user perceives.	Holbrook & Hirschman, 1982
Epistemic value	The epistemic value refers to the value of knowledge and the information a customer would gather before making a purchase.	Pritchard, 2009

Appendix C: Survey Design

Introduction/Consent

Dear Participant,

Thank you for taking the time to participate. This survey is conducted as part of my master's thesis at University of Groningen Campus Fryslân and will take **approximately 10 minutes**. The aim is to analyse your attitude towards circular business models. This questionnaire will be filled out completely anonymously and will be treated confidentially.
The data is analysed by myself as well as shared with my supervisor and the university. By clicking "next" you agree that your anonymized data will be used without withdrawal.
It is important that you answer the questionnaire honestly and express your personal views. There are no right or wrong answers!
In the course of the questionnaire, questions will be asked that may seem identical to you. This is for methodological reasons and serves a more concrete evaluation. Please do not let this unsettle you.

Please fill out the questionnaire completely. If you have any further questions, please don't hesitate to contact me at **j.b.kremer@student.rug.nl** .

Thank you very much for your support.

Julia Kremer

Case explanation

This study explores the purchase intention towards circular business models.
Circular business models focus on value preservation instead of value destruction. Maybe you already know some examples like Swapfiets or carsharing services.

The start-up **Circular Furniture (CF)** in Leeuwarden uses such a circular approach. It buys furniture which would otherwise be wasted and rents those second-hand items to students for the time of their study. Hereby, the customers choose a monthly subscription depending on their needs. For example, 6 months for an Erasmus or 12 months for a master study. The furniture is then delivered to the accommodation of the student, assembled, and picked up after the stay. The customer pays a monthly subscription fee and deposit which is refunded after the pickup.

In this study the words **system** and **sustainability** are used. Hereby, **system** means the combination of a product and service. Please don't be irritated if it occurs in the questions. If it helps you just think about renting a product. **Sustainable** refers to less harmful for the environment and the avoidance of exhaustion plus wastefulness of natural resources.

Filter

What is your current status?

- ○ Prospect student in the city of Leeuwarden. (1)
- ○ Student in the city of Leeuwarden. (2)
- ○ Former student in the city of Leeuwarden. (3)
- ○ None of the above. Elaborate: (4) _____

Main Body

Q1 Please choose the one answer that best represents your views by ticking the appropriate box.

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
I am worried about the state of our environment. (1)	○	○	○	○	○	○	○
I think human beings should conserve the balance of nature. (2)	○	○	○	○	○	○	○
I think individuals have the responsibility to protect the environment. (3)	○	○	○	○	○	○	○
I am not aware of the extend the furniture industry pollutes the environment. (4)	○	○	○	○	○	○	○
I am aware of the negative impact the emissions of the furniture industry produce. (5)	○	○	○	○	○	○	○
I am aware that the amount of waste, the furniture industry produces has a negative impact. (6)	○	○	○	○	○	○	○

Q2 Please choose the one answer that best represents your views by ticking the appropriate box. Just to recap, sustainable system in this case means to rent a sustainable product.

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
I believe that my use of sustainable systems will help reduce pollution and benefit the environment, society, and the economy. (1)	○	○	○	○	○	○	○
I feel good about myself when I use sustainable systems. (2)	○	○	○	○	○	○	○
I don't need to be the owner of a product as long as it gives me the same performance. (3)	○	○	○	○	○	○	○
I am willing to buy a more expensive product to reduce pollution. (4)	○	○	○	○	○	○	○
I am willing to rent furniture, because I know the added cost pays for a better environment. (5)	○	○	○	○	○	○	○
I am willing to pay more for a sustainable as opposed to a 'regular' product. (6)	○	○	○	○	○	○	○

Q3 Please choose the one answer that best represents your views by ticking the appropriate box. Just to recap a furniture subscription includes the delivery, assemble, rent and pick-up of a set of furniture.

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
Buying the sustainable system would help me to feel accepted. (1)	○	○	○	○	○	○	○
Buying the sustainable system would improve the way that I am perceived. (2)	○	○	○	○	○	○	○
Buying the sustainable system would make a good impression on other people. (3)	○	○	○	○	○	○	○
Getting a furniture subscription wouldn't fulfil my need of furnishing my accommodation. (4)	○	○	○	○	○	○	○
Renting furniture with a subscription would be more convenient than buying it. (5)	○	○	○	○	○	○	○

The performance of the furniture subscription is what I am looking for to fulfil my need of furnishing my accommodation. (6)	○	○	○	○	○	○	○
Before renting furniture, I would obtain substantial information about the different way of furnishing my accommodation. (7)	○	○	○	○	○	○	○
I would acquire a great deal of information about the different makes and models before subscribing to a furniture subscription. (8)	○	○	○	○	○	○	○
I would enjoy searching for new and different solutions to fulfil my need of furniture. (9)	○	○	○	○	○	○	○

Q4 Please choose the one answer that best represents your views by ticking the appropriate box.

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
I would prefer to rent furniture over buying furniture for the duration of my study. (1)	○	○	○	○	○	○	○
I am willing to purchase a sustainable system to benefit the environment, society, and the economy. (2)	○	○	○	○	○	○	○
I would purchase the CF subscription to cover my need for furniture. (3)	○	○	○	○	○	○	○

Q5 Please choose the one answer that best represents your views by ticking the appropriate box.

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
I will use the CF subscription. (1)	○	○	○	○	○	○	○
I will switch from my usual way of buying furniture and use the CF subscription. (2)	○	○	○	○	○	○	○
I will switch products for sustainable reasons. (3)	○	○	○	○	○	○	○

Demographics

Q6 How old are you?

_____

Q7 How do you describe yourself?

- ○ Male (1)
- ○ Female (2)
- ○ Non-binary / third gender (3)

Q8 What is your country of origin?

▼ Afghanistan (1) ... Zimbabwe (1357)

Q9 What is your current total net income (including all payments you get form a job, parents, e.g.)?

- ○ 0€-500€ (1)
- ○ 501€-1000€ (2)
- ○ 1001€-1500€ (3)
- ○ 1501€-2000€ (4)
- ○ 2001€-2500€ (5)
- ○ more than 2501€ (6)

Appendix D: Age distribution

Age	N	%
17	3	2.5
18	6	5.0
19	17	14.2
20	14	11.7
21	21	17.5
22	12	10.0
23	14	11.7
24	9	7.5
25	9	7.5
26	8	6.7
27	4	3.3
28	1	0.8
29	1	0.8
69	1	0.8
	120	100

Appendix E: Origin distribution

	N	%
Austria	2	1.7
Bolivia	1	0.8
Bulgaria	1	0.8
Canada	1	0.8
China	1	0.8
Croatia	2	1.7
Fiji	1	0.8
Finland	1	0.8
France	4	3.3
Germany	27	22.5
Greece	1	0.8
Haiti	1	0.8
Hungary	3	2.5
Italy	7	5.8
Latvia	2	1.7
Mexico	2	1.7
Netherlands	47	39.2
Poland	1	0.8
Portugal	1	0.8
Qatar	1	0.8
Romania	2	1.7
Russian Federation	2	1.7
South Africa	2	1.7
Spain	1	0.8
Switzerland	1	0.8
Turkey	1	0.8
Uganda	1	0.8
UK & Northern Ireland	2	1.7
Zimbabwe	1	0.8
	120	100

Appendix F: Descriptive statistics

Variable	Item	Mean	Median	Standard deviation	Skewness	Kurtosis
Environmental awareness general	EAG1	6.06	6	1.087	-1.355	2.125
	EAG2	6.26	6	0.893	-1.686	4.493
	EAG3	5.90	6	1.299	-1.636	2.951
Environmental awareness Case	EAC1 recoded	3.40	3	1.497	0.571	-0.411
	EAC2	4.27	5	1.477	-0.138	-1.055
	EAC3	4.84	5	1.534	-0.598	-0.476
Attitude	ATT1	5.33	6	1.318	-0.997	0.664
	ATT2	5.73	6	1.053	-0.964	0.861
	ATT3	5.24	6	1.528	-0.762	-0.138
WPP	WPP1	4.90	5	1.253	-0.382	-0.503
	WPP2	4.47	5	1.478	-0.418	-0.350
	WPP3	4.97	5	1.236	-0.831	0.375
Social value	SV1	3.74	4	1.375	-0.114	-0.381
	SV2	3.88	4	1.298	-0.226	-0.300
	SV3	4.48	5	1.263	-1.080	0.940
Functional value	FV1 recoded	4.18	4	1.478	-0.275	-0.789
	FV2	4.29	4	1.642	-0.248	-0.824
	FV3	4.18	4	1.482	-0.260	-0.816
Epistemic value	EV1	5.05	5	1.419	-0.843	0.331
	EV2	5.01	5	1.381	-0.813	0.147
	EV3	4.79	5	1.489	-0.629	-0.492
Intention	EPI1	4.70	5	1.780	-0.589	-0,625
	EPI2	5.43	6	1.228	-1.020	1.332
	EPI3	4.56	5	1.371	-0.313	-0.238
Behaviour	EPB1	3.94	4	1.451	-0.367	-0.209
	EPB2	3.90	4	1.417	-0.199	-0.085
	EPB3	5.19	5	1.169	-0.799	1.096

Appendix G: Reliability analysis

		Pre-test		Main sample		
Variable	Item	Cronbach's alpha	Cronbach's alpha if item deleted	Cronbach's alpha	Cronbach's alpha if item deleted	Corrected Item-Total Correlation
Environ-mental awareness general	EAG1	0.419	0.600	0.706	0.585	0.548
	EAG2		0.188		0.544	0.617
	EAG3		0.270		0.740	0.455
Environ-mental awareness case	EAC1 recoded	-0.011	-0.970	0.790	0.730	0.617
	EAC2		0.789		0.679	0.665
	EAC3		-0.519		0.736	0.612
Attitude	ATT1	0.908	0.797	0.713	0.576	0.569
	ATT2		0.890		0.539	0.642
	ATT3		0.920		0.775	0.440
WPP	WPP1	0.784	0.547	0.735	0.610	0.596
	WPP2		0.940		0.795	0.453
	WPP3		0.473		0.545	0.654
Social value	SV1	0.703	0.635	0.838	0.788	0.689
	SV2		0.594		0.725	0.751
	SV3		0.613		0.809	0.665
Functional value	FV1 recoded	0.391	0.372	0.588	0.777	0.174
	FV2		0.270		0.443	0.426
	FV3		0.304		0.083	0.651
Epistemic value	EV1	0.451	0.556	0.752	0.654	0.594
	EV2		0.351		0.664	0.585
	EV3		0.156		0.690	0.564
Intention	EPI1	0.718	0.857	0.808	0.746	0.682
	EPI2		0.449		0.760	0.651
	EPI3		0.449		0.705	0.693
Behaviour	EPB1	0.780	0.442	0.787	0.582	0.737
	EPB2		0.457		0.575	0.743
	EPB3		0.945		0.885	0.438

Appendix H: Factor analysis

Variable	Item	Communality	Component	AVR in %
Environmental awareness general (3 Items)	EAG1	0.687	0.829	65.107
	EAG2	0.737	0.858	
	EAG3	0.530	0.728	
Environmental awareness Case (3 Items)	EAC1 recoded	0.690	0.831	70.507
	EAC2	0.741	0.861	
	EAC3	0.684	0.827	
Attitude (3 Items)	ATT1	0.717	0.847	65.996
	ATT2	0.762	0.873	
	ATT3	0.501	0.708	
WPP (3 Items)	WPP1	0.721	0.849	66.679
	WPP2	0.509	0.713	
	WPP3	0.770	0.878	
Social value (3 Items)	SV1	0.744	0.863	75.602
	SV2	0.805	0.897	
	SV3	0.719	0.848	
Functional value (3 Items)	FV1 recoded	0.172	0.415	57.200
	FV2	0.707	0.841	
	FV3	0.837	0.915	
Functional value (2 Items)	FV2	0.819	0.905	81.926
	FV3	0.819	0.905	
Epistemic value (3 Items)	EV1	0.684	0.827	66.947
	EV2	0.675	0.822	
	EV3	0.649	0.806	
Intention (3 Items)	EPI1	0.742	0.862	73.686
	EPI2	0.713	0.845	
	EPI3	0.755	0.869	
Behaviour (3 Items)	EPB1	0.820	0.905	70.203
	EPB2	0.823	0.905	
	EPB3	0.463	0.681	
Behaviour (2 Items)	EPB1	0.897	0.947	89.714
	EPB2	0.897	0.947	

Appendix I: Correlations matrix

Person Correlation	BH	INT	EAG	EAC	ATT	WPP	SV	FV	EV	Origin	WPP x Income
BH	1.000	0.758***									
INT	0.758***	1.000	0.472***	0.097	0.548***	0.595***	0.296***	0.655***	0.291***	0.384***	0.201**
EAG		0.472***	1.000	0.142*	0.529***	0.439***	0.071	0.379***	0.414***	0.118*	0.102
EAC		0.097	0.142*	1.000	0.167**	0.171**	0.288***	0.058	0.036	0.163*	-0.018
ATT		0.548***	0.529***	0.167**	1.000	0.531***	0.281***	0.522***	0.364***	0.339***	0.173*
WPP		0.595***	0.439***	0.171**	0.531***	1.000	0.330***	0.398***	0.324***	0.201**	0.445***
SV		0.296***	0.071	0.288***	0.281***	0.330***	1.000	0.253***	0.145*	0.376***	0.024
FV		0.655***	0.379***	0.058	0.522***	0.398***	0.253***	1.000	0.281***	0.266***	0.114
EV		0.291***	0.414***	0.036	0.364***	0.324***	0.145*	0.281***	1.000	0.132*	0.142*
Origin		0.384***	0.118*	0.163**	0.339***	0.201**	0.376***	0.266***	0.132*	1.000	0.010
WPP x Income		0.201**	0.102	-0.018	0.173*	0.445***	0.024	0.114	0.142*	0.010	1.000

* $p \leq 0.1$; ** $p \leq 0.05$; *** $p \leq 0.01$

Appendix J: Dataset and Analysis

The following link contains the data set of the pre-test, the original data set, the filtered working data, and analysis and can be entered by members of the university of Groningen:

https://drive.google.com/drive/folders/1A1uvmEVnveHVI3k7aR_eGt-nZdZGE1rt?usp=sharing