FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION

THE IMPACT OF SHARING BUSINESS DIMENSIONS ON USER ENGAGEMENT

A CONJOINT ANALYSIS IN THE FASHION INDUSTRY

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Abstract

Purpose – In the transition to a circular economy, sharing businesses emerge. After identifying the dimensions along which sharing businesses vary – professional involvement, resource transfer, compensation, digitalization and openness – this master's dissertation investigates their influence on user engagement in the fashion industry. More specifically, the relative importance of the sharing business dimensions and dimension levels on user preferences is examined.

Design/methodology/approach – The empirical investigation of user preferences in the fashion industry with regard to sharing business dimensions and dimension levels is the result of a discrete choice conjoint experiment (n = 383).

Findings – For the sharing business dimension levels, we find that users have a preference for ownership of goods over access to goods, monetary compensation over no compensation, substitution of human interaction by a digital platform over no digital platform and local communities over worldwide communities. We also observe that these preferences vary according to gender, primary residence and sustainability orientation, but not according to age. For the sharing business dimensions, we uncover that the involvement of professionals has the least influence on user engagement and openness of the communities has the most influence on user engagement.

Originality/value – The sharing economy literature remains silent about the impact of sharing business dimensions on user engagement, even though sharing businesses vary between and within sectors and industries. By unraveling sharing business dimensions along with their impact on user engagement, this research contributes to a better understanding of how businesses can improve their potential to engage users, which facilitates the transition to a circular economy.

Keywords – Sustainability, Sharing economy, Collaborative consumption, User engagement, Systematic literature review, Business models, Conjoint analysis, Fashion industry

Paper type – Master's dissertation

Preface

This master's dissertation is submitted to obtain the degree of Master in Business Engineering at Ghent University. During my five university years, I developed a particular interest in the omni-present topic of the circular economy and sustainability in its entirety. Therefore, I decided to write my master's dissertation on rather new circular business models, i.e. sharing business models.

This dissertation would not have been possible without the help of many people and institutions.
First of all, I would like to thank my promotor Prof. Dr. Katrien Verleye for giving me the opportunity to write this master's dissertation and for challenging me to push my limits. It was a real pleasure to discuss this domain with you.

To my family and friends, I want to say thank you for being there for me, for the endless support and the powerful encouragements.

Last but in no way least, I would like to thank my survey respondents for taking the time to answer the questionnaire thoroughly. Without them, it would not have been possible to fulfill the purpose of this master's dissertation.

I hope that you, dear reader, are as excited about the topic as I am because "the circular economy will without a doubt come to pass — if not out of choice, out of necessity" (Esposito, Tse, & Soufani, 2017, p. 13).

Marie-Julie De Bruyne

Ghent, June 2020

Preamble

I wrote this master's dissertation during the corona pandemic where studying and working from home was the norm and not an option. It took some energy from all people involved to adapt to this new situation and to wade through constantly changing information. I was lucky that my promotor took the time to connect with me online through email and digital meetings and to give me the adequate attention. The online talks were very valuable for me.

In like manner, the oral defense will be organized remotely and will be a new challenging experience. The presentation (ten minutes) is replaced by a short explanation/elevator pitch (five minutes).

Because of the vast effort I already made before the outbreak of the COVID-19 virus and the careful proactive planning of the workload, I stayed on track and the predetermined work schedule could be maintained.

I really do hope that the virus can soon be restrained and that our (postponed) graduation ceremony, a milestone for every student, can be celebrated with the usual pomp and circumstance.

This preamble is drawn up in consultation between the student and the supervisor and is approved by both.

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1. Introduction

The current linear economy with "take-make-dispose" business models has become unsustainable at global scale (Esposito, Tse, & Soufani, 2017). Indeed, these business models are at the heart of several negative phenomena, ranging from social inequality to environmental pollution and global climate change (Esposito et al., 2017). In this context, circular business models are on the rise (e.g., Böcker & Meelen, 2017), but several researchers, policymakers and practitioners point out that actively engaging users with circular business models is a key challenge (European Commission, 2019; Vijverman, Henkens, & Verleye, 2019; Wagner, Kuhndt, Lagomarsino, & Mattar, 2015). Despite its importance, however, user engagement with circular business models received limited research attention (e.g., Hamari, Sjöklint, & Ukkonen, 2016; Tussyadiah, 2014).

The present research focuses on user engagement with circular business models oriented towards sharing underutilized resources (hereafter, sharing businesses)(Lüdeke-Freund, Gold, & Bocken, 2019). These circular business models are of utmost importance, as several resources – such as cars, clothes and accommodations – are most of the time left unused (Frenken & Schor, 2017). User engagement – both from the perspective of the consumer as from the perspective of the provider – with sharing businesses also deserves further investigation, because only a few of these businesses – such as ride sharing services offered by BlaBlaCar, homestay services offered by Couchsurfing and the second-hand clothing swapping initiative Vinted – were found to attract millions of users (Möhlmann, 2015). The majority of sharing businesses, however, ceased to operate due to – among others – an insufficient consumer base and/or a lack of providers (Chasin, von Hoffen, Hoffmeister, & Becker, 2018).

To date, it is unclear how sharing businesses can improve their potential to engage users, which is an important driver of not only their business performance (Chathoth, Ungson, Harrington, & Chan, 2016; Hsu, King, Wang, & Buhalis, 2016) but also their environmental and social impact (Vijverman et al., 2019). As sharing businesses vary between and within sectors and industries (Ganapati & Reddick, 2018), the present research investigates how sharing business dimensions – that is, characteristics along which sharing businesses differ from one another – affect user engagement with sharing businesses that serve the transition to a circular economy. Here, we define user engagement – in line with the engagement literature (e.g., Brodie, Hollebeek, Jurić, & Ilić, 2011; Harrigan, Evers, Miles, & Daly, 2018; Hollebeek, Glynn, & Brodie,

2014) – as a psychological or motivational state reflecting cognitive, affective and behavioral experiences with sharing businesses. Specifically, we address the following research questions:

> *Research question 1: What is the relative importance of the sharing business dimension levels for user engagement with sharing businesses?*
>
> *Research question 2: What is the relative importance of the sharing business dimensions for user engagement with sharing businesses?*

As basis for this research, we have engaged in a systematic review of the literature on sharing businesses with circular potential. Based upon an inductive analysis of the selected articles (n = 36 articles), we define the sharing economy and identify five dimensions along which sharing businesses may vary from low to high: (1) the level of professional involvement, (2) the level of resource transfer from provider to consumer, (3) the level of compensation for providers, (4) the level of digitalization of consumer-provider interactions and (5) the level of openness of communities. Next, the literature set is meticulously screened to gain understanding of what is already known about user engagement with sharing businesses. Ultimately, this study aims to assess the relative importance of the sharing business dimension levels (research question 1) and the sharing business dimensions (research question 2) for user engagement with these sharing businesses, using a discrete choice conjoint experiment. In other words, we investigate what trade-offs are being made between the dimensions and levels when deciding upon engagement with a sharing business, by which user engagement with sharing businesses reflects the cognitive, emotional and behavioral experiences with sharing businesses.

This master's dissertation thus enriches existing research by bridging the gap between sharing business dimensions and user engagement. The inclusion of business model dimensions, the analysis technique (i.e., conjoint analysis) and the focus on variation in sharing businesses within one specific industry (i.e., the fashion industry) are new to the field of empirical user engagement research in the sharing economy context. This research furthermore responds to calls for "more theory and research surrounding issues of ownership, access, and sharing" (Price & Belk, 2016, p. 193). Additionally, because sharing business models are a category of circular business models, this research contributes to a better understanding of engagement with circular business models, which is proposed as a key avenue for future research among

researchers, policymakers and practitioners (e.g., Fehrer & Wieland, 2020; Khitous, Strozzi, Urbinati, & Alberti, 2020).

This master's dissertation is organized as follows. In section 2, the systematic literature review is performed to introduce the circular transition together with dimensions and dimension levels of sharing businesses. The same section identifies what is already known in the literature regarding the implications of sharing businesses for user engagement. In section 3, a choice-based conjoint analysis is constructed to empirically quantify the relative importance of the identified sharing business dimension levels (research question 1) and the sharing business dimensions (research question 2) for user engagement, linking business aspects to consumer aspects. In section 4, the results of the conjoint analyses are presented and interpreted. Section 5 discusses the implications and limitations of this research. Finally, the master's dissertation is concluded in section 6.

2. Literature review

As background to this research, we conducted a thorough systematic literature review of the literature on sharing businesses with circular potential. Following Booth, Papaioannou, & Sutton (2012), our review method consists of two stages: literature search and selection (subsection 2.1.) and article analysis and synthesis (subsection 2.2.). After engaging in these stages, we propose the conceptual framework for our research (subsection 2.3.).

2.1. Literature search and selection

The literature search and selection was done systematically, using electronic databases (Figure 1). Electronic databases are advantageous as they can be accessed easily at any place and any time, cover a broad range of scientific publications, offer built-in search and filter functions and can even make relevant suggestions based on other users' search behavior (Mustak, Jaakkola, Aino, & Kaartemo, 2016).

First, the Web of Science Core Collection was scrutinized. Hundreds of papers dealing with the sharing economy are available, so a well-defined search string was crucial. The following topic searches[1] (TS) and inclusion criteria resulted in 239 articles (August 27, 2019)[2]:

TS = (sharing OR collaborative) AND TS = (business model) AND TS = (sustainab* OR green OR circular)

- Language: English;
- Document type: Article;
- Research areas: Business Economics.

From this vast set of 239 articles, the most suitable papers were manually identified based on title and abstract using keywords such as "facilitating", "enabling", "adopting", "upside", "downside", "motivation", "barrier", "value". When in doubt, region and sector specific journals were excluded. This exclusion criterion was imposed to retain generic articles. The manual selection resulted in 21 articles to be read. As can be seen in Appendix A, the retained set of papers includes publications from 2007 till 2019.

[1] Topic searches look for matching terms in the Abstract, Title and/or Keywords fields of a record.

[2] The research terms used for this systematic literature review are in line with the research terms used in Camacho-Otero, Boks, & Pettersen (2018), Curtis & Lehner (2019) and Plewnia & Guenther (2018).

Several articles could be consulted through the ScienceDirect database. For those accessed via its website, ScienceDirect suggests related articles. These papers were also reviewed and selected based on their title and abstract (cf., supra). This resulted in nine additional articles to be considered. This supplementary set of papers ranges from 2014 till 2019 (Appendix B).

For each of the articles of the Web of Science and ScienceDirect databases (i.e., 30 articles), the reference list was manually reviewed and catalogued based on title, using the appearance of "sharing" or "collaborative" as inclusion criterium. Frequency analysis was performed in Excel and references that appeared more than seven times were also included in the literature set. This onerous approach is termed snowball sampling. Snowball sampling resulted in an additional six valuable articles to be read, ranging from 2012 until 2016 (Appendix C).

In total, the systematic literature search and selection resulted in 36 articles originating from quality journals with comparable research goals, published between 2007 and 2019. Each of these articles was submitted to an in-depth analysis (cf., next subsection).

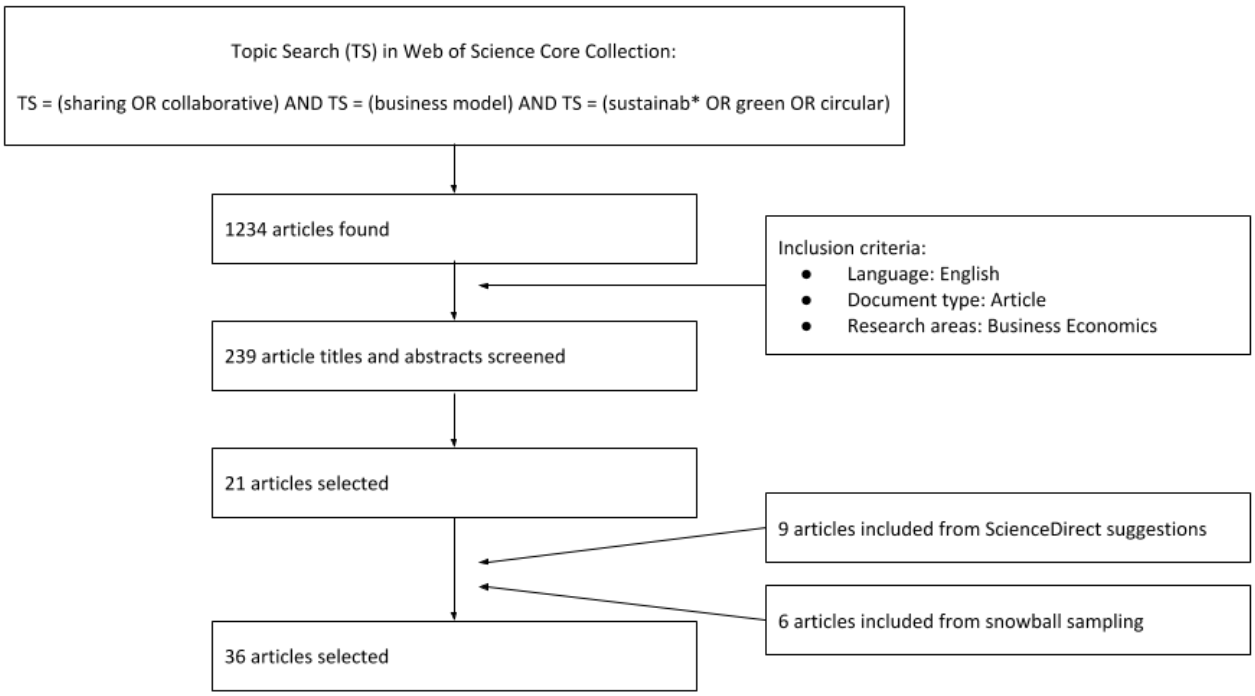

Figure 1 - Overview of literature search and selection

2.2. Synthesizing and analyzing the articles

This subsection starts with an introduction to the circular transition (2.2.1.) and then goes on defining the sharing economy and deriving dimensions of sharing businesses (2.2.2.). Finally, this subsection explores what is already known about user engagement with sharing businesses (2.2.3.).

2.2.1. The circular transition

"The circular economy will undoubtedly come to pass — if not out of choice, out of necessity."

Esposito et al., 2017, p. 13

For many years, the traditional linear economic model has resulted in high economic growth. However, population remains growing, consumption keeps increasing and the need for resources keeps growing so this take-make-waste model (Ellen MacArthur Foundation, n.d.) or take-make-dispose approach (Hopkinson, Zils, Hawkins, & Roper, 2018) is not sustainable as it is based on "the naive assumption of an infinite material supply" (Muranko, Andrews, Newton, Chaer, & Proudman, 2018, p. 132). For long-term sustainability, a new economic model is needed.

Aiming to decouple economic activity from a dependence on natural resources and to eliminate waste (Ellen MacArthur Foundation, n.d.; Esposito et al., 2017), the circular economy has been introduced as a sustainable alternative to the take-make-dispose model (Ranta, Aarikka-Stenroos, Ritala, & Mäkinen, 2018). After extensive literature research, Kirchherr, Reike, & Hekkert (2017, p. 229) provide the following comprehensive definition of the circular economy: "an economic system that replaces the 'end-of-life' concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes. It operates at the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond), with the aim to accomplish sustainable development, thus simultaneously creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations. It is enabled by novel business models and responsible consumers." As mentioned in the definition, shifting from a linear economic model to a circular economic model requires radical changes in both production and consumption activities.

On the one hand, the circular transition calls for a radical reform in production systems. The shift from a linear economy to a circular economy requires both the adaptation of existing business models and the emergence of new business models (Brennan, Tennant, & Blomsma, 2015), i.e., circular business models. As confirmed by Bocken, Mugge, Bom, & Lemstra (2018), there is a lot of non-peer reviewed literature on business models for a circular economy. Accenture (2014) clearly identifies five circular business models. They are widely-accepted and considered the headline business models for circularity by the Organisation for Economic Co-operation and Development (2018):

- Sharing Platforms: sharing underutilized products;
- Product as a Service: marketing services rather than products;
- Product Life Extension: extending the use period of products;
- Resource Recovery: turning waste into secondary materials or products;
- Circular Supplies: using renewable or recovered materials.

On the other hand, the circular transition calls for a radical reform in consumption systems (consumers' attitudes and behaviors)(Camacho-Otero, Boks, & Pettersen, 2018; Kemp & van Lente, 2011; Yuan, Bi, & Moriguichi, 2006). Even more, the consumer is considered the most vital enabler of the circular economy (European Commission, 2019). Therefore, when developing circular business models and platforms, the consumer perspective should not be left behind.

2.2.2. The sharing economy and sharing business dimensions

This master's dissertation focuses on sharing businesses within the circular economy. The sharing of goods and services between peers is an old custom (e.g., families, tribes, communes)(Acquier, Daudigeos, & Pinkse, 2017). However, globalization and digitalization expanded its scope disproportionately. Today, sharing is soaring. The sharing economy involves numerous businesses and millions of users (Belk, 2014b; Möhlmann, 2015). Many sectors (e.g., mobility, hospitality) are heavily affected by this phenomenon. The sharing economy simultaneously offers business opportunities and challenges existing businesses. PricewaterhouseCoopers (2015) expects that five key sharing sectors — travel, car sharing, finance, staffing and music and video streaming — will potentially bring about $335 billion global revenues by 2025. Considering that a third of household waste is shareable goods (Grinevich, Huber, Karatas-Özkan, & Yavuz, 2017) and the average car in North America and Western Europe is only 8% of the time in use (Belk, 2014b), the sharing economy indeed has a lot of potential. The sharing economy operationalizes sustainable development because next to having economic effects, the sharing economy is claimed to have positive environmental and social effects, including diminishing resource needs, reducing waste, stimulating social cohesion and lowering income inequality (Böcker & Meelen, 2017; Munoz & Cohen, 2017; Parguel, Lunardo, & Benoit-Moreau, 2017).

To define the sharing economy and the dimensions of sharing businesses, the synthesis and analysis of the selected articles is conducted according to the following procedure (Moeller, Ciuchita, Mahr, Odekerken-Schröder, & Fassnacht, 2013): (1) attaining basic understanding, (2) coding article content, (3) categorizing codes, (4) comparing categorizations and (5) undertaking further analyses. To attain basic understanding, the articles in the literature set were read in-depth and the definitions, descriptions and typologies of the sharing economy, collaborative consumption and sharing businesses were listed (step 1). Next, coding was applied onto the definitions and descriptions of the sharing economy, collaborative consumption and sharing businesses to reveal similarities and differences (step 2). Similarities and differences regarding business model dimensions were categorized (step 3) and the resulting categories were compared with existing classifications of circular and sharing business models in the literature set (step 4). For this review, the dimensions of Boons & Bocken (2018), Lüdeke-Freund et al. (2019), and Plewnia & Guenther (2018) are particularly relevant for comparison. Thus, it can be said that inductive reasoning was performed for step 3 and abductive reasoning was performed for step 4. The final step involved additional web searches, readings, discussions (step 5). The results are listed in Table 1 and Table 3.

The sharing economy concept is heavily contested, as there does not exist a single definition of the sharing economy that is universally accepted. Additionally, several authors use the terms “sharing economy” and “collaborative consumption” interchangeably (e.g., Barbu, Florea, Ogarcă, & Barbu, 2018). As shown in Table 1, sixteen definitions in the literature set of this research use the term “sharing economy” and six use the term “collaborative consumption”. In two papers (Hamari et al., 2016; Taeuscher & Kietzmann, 2017), the exact same definition is used for both the sharing economy and collaborative consumption. As noted by Ganapati & Reddick (2018) academics use the umbrella term “sharing economy” while acknowledging the existence of parallel terms or other dimensions (e.g., Grinevich et al., 2017).

According to the definitions of “to share” in the Cambridge English Dictionary (n.d.) and the Oxford Learner’s Dictionary of Academic English (n.d.), sharing always involves “someone” and “something”. Overall, extant literature suggests that sharing cannot be done by one entity on its own. Except for two definitions (Cohen & Kietzmann, 2014; Kathan, Matzler, & Veider, 2016), all definitions explicitly mention the involvement of two or more entities in sharing activities (Table 1). Furthermore, all definitions in Table 1 mention the involvement of resources. In fact, almost half of the definitions (11 out of 24 definitions) mention the involvement of underutilized resources or idle capacity.

Based upon the aforementioned evidence, this master dissertation defines the sharing economy as a socioeconomic system in which two or more entities collaborate in increasing the utilization rate of resources. By its focus on underutilized resources or idle capacity, resource loops are slowed down and as a result the burden on limited natural resources is reduced. Therefore, we propose sharing businesses are part of the circular economy.

Table 1 - Literature review sharing economy articles

Article	Sharing economy	Collaborative Consumption	Two or more entities	Resources	Increasing the utilization rate
Acquier, Carbone, & Massé (2019)	X		X	X	X
Acquier et al. (2017)	X		X	X	X
Bardhi & Eckhardt (2012)	X		X	X	
Barnes & Mattsson (2017)		X	X	X	
Belk (2014)	X		X	X	
Belk (2014)		X	X	X	
Böcker & Meelen (2017)	X		X	X	X
Boons & Bocken (2018)	X		X	X	
Cohen & Kietzmann (2014)	X			X	X
Dreyer, Lüdeke-Freund, Hamann, & Faccer (2017)		X	X	X	
Frenken & Schor (2017)	X		X	X	X
Ganapati & Reddick (2018)	X		X	X	
Grinevich et al. (2017)	X		X	X	X
Hamari et al. (2016)	X	X	X	X	
Kathan et al. (2016)	X			X	
Martin (2016)	X		X	X	
Möhlmann (2015)		X	X	X	
Munoz & Cohen (2017)	X		X	X	X
Onete, Doru, & Budz (2018)		X	X	X	X
Parente, Geleilate, & Rong (2018)	X		X	X	X
Parguel et al. (2017)		X	X	X	
Plewnia & Guenther (2018)	X		X	X	
Taeuscher & Kietzmann (2017)	X	X	X	X	X
Zhang, Gu, & Jahromi (2019)	X		X	X	X

Based on the definitions and descriptions of the sharing economy and collaborative consumption in the selected literature in combination with existing typologies of circular and sharing business models in the literature set (e.g., Boons & Bocken, 2018; Lüdeke-Freund et al., 2019; Plewnia & Guenther, 2018), we supplement the above introduced broad definition of the sharing economy with five dimensions along which sharing businesses may vary from low to high : (1) professional involvement, (2) resource transfer, (3) compensation, (4) digitalization and (5) openness (Table 2).

Professional involvement

The first sharing business dimension refers to the extent to which the sharing business involves professional users. This dimension partly follows Plewnia & Guenther (2018), who state that sharing activities can be performed in consumer to consumer (C2C, often referred to as peer-to-peer), business to consumer (B2C), consumer to business (C2B), business to business (B2B) and government to consumer (G2C) contexts. Here, also the contexts consumer to government (C2G), government to government (G2G), business to government (B2G) and government to business (G2B) are added for the completeness of the typology. The majority of the definitions (18 out of 24 descriptions in Table 3) states that the sharing economy only involves peer-to-peer activities. This, however, excludes companies such as Zipcar and Rent the Runway (B2C) – companies often mentioned as part of the sharing economy – from the sharing economy.

Resource transfer

The second sharing business dimension, resource transfer, represents the extent to which the consumption of offerings goes along with transfer of ownership from provider to consumer. Both Lüdeke-Freund et al. (2019) and Plewnia & Guenther (2018) make the distinction between tangible offerings (goods or products) and intangible offerings (services). Additionally, we contend that the resource transfer of tangible offerings can be based on access or ownership. As a result, the dimension resource transfer has three subcategories: access to a service (e.g., couch surfing), access to a good (e.g., renting a car) and ownership of a good (e.g., swapping clothes, buying second-hand clothes). The majority of the definitions (15 out of 24 descriptions in Table 3) emphasizes access over ownership. This excludes bartering, swapping and gifting from the sharing economy. However, also these activities can contribute to increase the utilization rate of resources and thus slow down the resource loops. Therefore, these activities are considered as sharing business activities in this paper, which is in line with what Botsman & Rogers (2010) argue. Furthermore, 3 out of 24 descriptions (Böcker & Meelen, 2017; Frenken & Schor, 2017; Parente et al., 2018) specify that the involved resources should be physical, thereby excluding resources such as time and knowledge. However, it can be argued that

these resources have a positive impact on a more sustainable reality in an indirect way. For example, by accessing "unused" knowledge, new circular solutions can be developed.

Compensation

This sharing business dimension refers to the extent to which providers get a monetary compensation for sharing their offerings. Plewnia & Guenther (2018) distinguish between sharing on a for-profit basis and sharing on a non-profit basis. Here, an additional distinction is made based upon the type of compensation that is involved: non-monetary compensation (e.g., swapping clothes) versus monetary compensation (e.g., buying second-hand clothes). One article (Acquier et al., 2017) explicitly includes only non-reciprocal activities (i.e., no compensation). Two articles (Parente et al., 2018; Zhang et al., 2019) only consider activities that involve monetary compensation as part of the sharing economy (Table 3). Furthermore, one third of the descriptions (8 out of 24 descriptions) does not mention compensation at all and one third of the descriptions (8 out of 24 descriptions) includes all types of compensations. Therefore, compensation is considered a business dimension and not an element of the definition of the sharing economy.

Digitalization

Several authors pose that the sharing economy is enabled by Internet-based technologies (e.g., Grinevich et al., 2017; Taeuscher & Kietzmann, 2017). Indeed, more recent sharing businesses make use of Internet-based platforms, often offered by a third-party platform provider, to match providers of resources (supply) and users of resources (demand)(e.g., Vinted). A small majority of the descriptions (13 out of 24 descriptions in Table 3) considers the use of digital technologies a prerequisite of the sharing economy thereby excluding more traditional sharing businesses that do not make use of Internet-based platforms to match providers of resources (supply) and users of resources (demand)(e.g., a second-hand clothing store). However, in this paper the latter group of sharing businesses is also recognized as part of the sharing economy. Almost half of the descriptions in the literature set of this research (11 out of 24 descriptions) do not mention anything about how providers of resources and users of resources are linked (i.e., digital or not). Indeed, also in this paper, it is acknowledged that different types of value delivery occur in the sharing economy (e.g., second-hand shop, online community platform) and so digitalization is considered a business dimension and not an element of the definition of the sharing economy.

Openness

The final sharing business dimension, openness, represents the extent to which sharing businesses are open to broad communities. Based on Boons & Bocken (2018) and Crucke & Slabbinck (2019), a

distinction is made between sharing businesses that are operating locally, sharing businesses that are operating regionally and sharing businesses that are operating worldwide. Only one article (Boons & Bocken, 2018) in the literature set of this research uses this dimension to construct a typology of sharing.

By combining levels of these dimensions, activities that are part of the sharing economy such as bartering, swapping, lending, renting and gifting (Botsman & Rogers, 2010) can be identified. Bartering can be considered to be a combination of low (in case of a service) or high level (in case of a good) for resource transfer and medium level for compensation. Swapping can be considered to be a combination of high level for resource transfer and medium level for compensation. Lending is a combination of medium level for resource transfer and low level for compensation. Renting is medium level for resource transfer and high level for compensation. Gifting is low level (in case of a service) or high level (in case of a good) resource transfer and low level compensation.

Table 2 - Sharing business dimensions and levels

Sharing business model dimension	Description	Levels	Illustrative references
Professional involvement	The extent to which the sharing business involves professional users	Low: C2C Medium: B2C, C2B, G2C, C2G High: B2B, G2G, B2G, G2B	Boons & Bocken (2018); Grinevich et al. (2017)
Resource transfer	The extent to which the sharing of offerings goes along with transfer of ownership from provider to consumer	Low: access to services Medium: access to goods High: ownership of goods	Acquier et al. (2019); Böcker & Meelen (2017)
Compensation	The extent to which providers get a monetary compensation for sharing their offerings	Low: no compensation Medium: non-monetary compensation High: monetary compensation	Cohen & Kietzmann (2014); Frenken & Schor (2017)
Digitalization	The extent to which human interaction for sharing is substituted by digital platform technologies	Low: no digital platform Medium: digital platform complements human interaction High: digital platform substitutes human interaction	Boons & Bocken (2018); Ganapati & Reddick (2018); Grinevich et al. (2017)
Openness	The extent to which the sharing business is open to broad communities without geographical boundaries	Low: local community Medium: regional community High: worldwide community	Boons & Bocken (2018); Crucke & Slabbinck (2019)

Table 3 - Literature review sharing economy articles with regard to sharing business dimensions and levels

Article	Professional involvement			Resource transfer			Compensation			Digitalization			Openness		
	C2C	B2C, C2B, G2C, C2G	B2B, G2G, B2G, G2B	Access to services	Access to goods	Ownership of goods	No compensation	Non-monetary compensation	Monetary compensation	No digital platform	Digital platform complements human interaction	Digital platform substitutes human interaction	Local community	Regional community	Worldwide community
Acquier et al. (2019)	X	X		X	X	X	X	X	X						
Acquier et al. (2017)	X			X	X		X				X	X			
Bardhi & Eckhardt (2012)	X			X	X										
Barnes & Mattsson (2017)	X			X	X			X	X						
Belk (2014)	X			X	X						X	X			
Belk (2014)	X			X	X			X	X		X	X			
Böcker & Meelen (2017)	X				X		X	X	X						
Boons & Bocken (2018)	X			X	X	X	X	X	X				X	X	X
Cohen & Kietzmann (2014)				X	X		X	X	X						
Dreyer et al. (2017)	X			X	X			X	X		X	X			
Frenken & Schor (2017)	X				X		X	X	X						
Ganapati & Reddick (2018)	X			X	X						X	X			

Table 3 - Literature review sharing economy articles with regard to sharing business dimensions and levels (continued)

Article	Professional involvement			Resource transfer			Compensation			Digitalization			Openness		
	C2C	B2C, C2B, G2C, C2G	B2B, G2G, B2G, G2B	Access to services	Access to goods	Ownership of goods	No compensation	Non-monetary compensation	Monetary compensation	No digital platform	Digital platform complements human interaction	Digital platform substitutes human interaction	Local community	Regional community	Worldwide community
Grinevich et al. (2017)	X	X	X	X	X	X	X	X	X		X	X			
Hamari et al. (2016)	X			X	X	X	X	X	X		X	X			
Kathan et al. (2016)				X	X	X					X	X			
Martin (2016)	X										X	X			
Möhlmann (2015)	X			X	X			X	X						
Munoz & Cohen (2017)	X	X	X	X	X	X									
Onete et al. (2018)	X			X	X	X					X	X			
Parente et al. (2018)	X				X				X		X	X			
Parguel et al. (2017)	X			X	X			X	X						
Plewnia & Guenther (2018)	X	X	X	X	X	X	X	X	X						
Taeuscher & Kietzmann (2017)	X			X	X	X					X	X			
Zhang et al. (2019)	X			X	X				X		X	X			

2.2.3. User engagement with sharing businesses

Drawing from the engagement literature, we contend that user engagement is a psychological or motivational state reflecting cognitive, affective and behavioral experiences with sharing businesses (e.g., Brodie et al., 2011; Harrigan et al., 2018; Hollebeek et al., 2014). Here, cognitive manifestations entail a user's mental processing related to interactions with businesses. Affective manifestations encompass the degree of emotions a user may experience when interacting with businesses. Behavioral manifestations involve a user's time and effort allocated to interactions with businesses (Hollebeek et al., 2014). Although researchers, practitioners and policymakers call for actively engaging users with business models with circular potential like sharing businesses (e.g., Böcker & Meelen, 2017), very few studies explore users' behavioral engagement towards sharing businesses with circular potential.

First, there is evidence that users' motivations to participate in sharing initiatives vary between sectors and sociodemographic characteristics of users (Böcker & Meelen (2017). Extant research also suggests that users' intention to access a sharing option and their sharing mindset is dependent upon their satisfaction with a sharing economy initiative, which is a function of the utility, ease of use, trust and savings associated with the sharing initiative (Barbu et al., 2018). Next, Hamari et al. (2016) contend that behavioral intentions to participate in sharing initiatives depend on users' attitude towards sharing businesses, thereby showing that these attitudes are shaped by the expected economic gains, the perceived sustainability and the perceived enjoyment. In a similar vein, Barnes & Mattsson (2017) find that perceived enjoyment and usefulness are the main drivers for renting intention in the context of car sharing and these factors are – together with trust – also significant drivers of intention to recommend. Möhlmann (2015) validates that utility, trust, familiarity and cost savings contribute positively to satisfaction with a B2C car sharing service and a C2C accommodation marketplace. Service quality also has a significant and positive influence on satisfaction, but only in the case of B2C car sharing. Moreover, several of the aforementioned factors were found to contribute positively to the likelihood of choosing a sharing option again in the future. Building upon the previously mentioned evidence, Zhang et al. (2019) explore the relative importance of different drivers of users' repurchase intentions and demonstrate that social and emotional drivers (such as trust) have a larger positive effect than technical and economic drivers (such as cost-savings).

Despite the variation in sharing businesses between and within sectors and industries (Botsman & Rogers, 2010; Ganapati & Reddick, 2018), none of the aforementioned papers analyses behavioral engagement with sharing businesses in relation to sharing business dimensions. Hence, it is unclear how sharing

businesses can deploy these dimensions to improve user engagement which is an important driver of their business performance (Chathoth et al., 2016; Hsu et al., 2016) and their environmental and social impact (Vijverman et al., 2019). The next section presents a conceptual framework to gain more insight into the impact of sharing business dimension levels (research question 1) and the sharing business dimensions in general (research question 2) on behavioral intentions to use sharing businesses (hereafter, user engagement).

2.3. Conceptual framework

To answer our research questions about the impact of sharing business dimension levels and the sharing business dimensions in general on user engagement, this research relies on Social Exchange Theory. With roots in Reinforcement Theory and Utility Theory (Auld & Case, 1997), Social Exchange Theory assumes that "based on subjective cost benefit analysis and comparison of alternatives, individuals intend to choose the relationship that maximizes their benefits" (Kim, Yoon, & Zo, 2015, p. 4). In other words, if the expected benefits of a sharing initiative outweigh the expected costs, users will show engagement. Social Exchange Theory thus suggests that user engagement is a function of the expected returns, which go beyond pure economic or functional benefits (Blau, 2017). By acknowledging the importance of other – more social – benefits, Social Exchange Theory is broader than Utility Theory. This difference makes Social Exchange Theory more suitable to sharing economy contexts (Kim et al., 2015). Indeed, extant research suggests – as mentioned in section 2.2.3. – that users of sharing businesses expect to get not only economic benefits – such as cost savings, utility and better experiences – but also social and/or environmental benefits – such as perceived sustainability – in return for their engagement with sharing businesses (Barnes & Mattsson, 2017; Hamari et al., 2016; Zhang et al., 2019).

Based upon the abovementioned evidence, we contend that expectations in terms of the environmental and/or social benefits – as reflected in the sustainability orientation – determine the impact of sharing business dimensions on user engagement. Indeed, several studies show that not all users care about the environmental and/or social benefits and may even be reluctant to buying and/or producing sustainable products and services (e.g., Haws, Winterich, & Naylor, 2014). Therefore, the empirical study investigates not only the direct impact of sharing business dimensions on user engagement but also the moderating role of the sustainability orientation of users (i.e., the extent to which users expect environmental and social

benefits). Figure 2 depicts the resulting conceptual framework, in which we add – in line with the evidence from Böcker & Meelen (2017) – the sociodemographics as control variables.

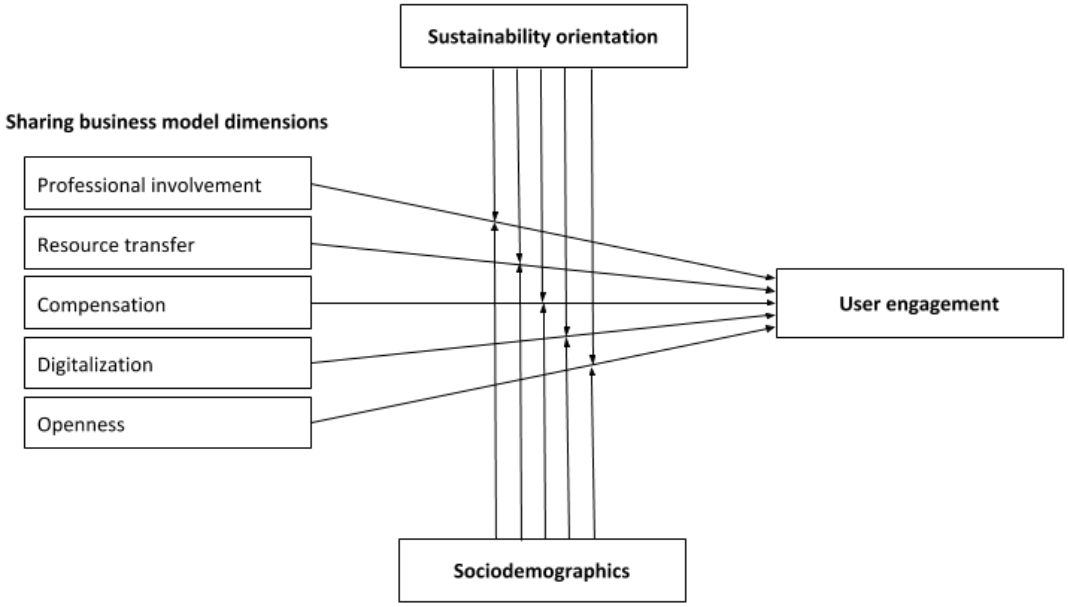

Figure 2 - Conceptual framework

3. Research methodology

The third section of this master's dissertation first elaborates on the study design that is applied for the empirical investigation of user engagement with sharing businesses in the fashion industry (subsection 3.1.). Next, the data collection approach is outlined (subsection 3.2.). Finally, subsection 3.3. details the data analyses that are applied on the collected survey data.

3.1. Study design

To empirically investigate the relative importance of the sharing business dimension levels (research question 1) and the relative importance of the sharing business dimensions in general (research question 2), we adopted a stated preference approach using a discrete choice-based conjoint experiment (Hauser, Eggers, & Selove, 2019). This quantitative approach – which is becoming more popular in psychology and marketing research – is a promising tool to identify what attributes and attribute levels are of importance for users' decisions (Kelley, Hyde, & Bruwer, 2015; Stöckigt, Schiebener, & Brand, 2018).

Conjoint analysis allows to implicitly assess the trade-offs users make when choosing between different product or service alternatives (Chowdhury, Salam, & Tay, 2016; Prell, Zanini, Caldieraro, & Migueles, 2020). These trade-offs are investigated in the fashion industry because "clothing is massively underutilized" (Ellen MacArthur Foundation, 2017, p. 19). Furthermore, the concept of sharing is relatively well-known in this industry and many forms of sharing are active in the market (e.g., swapping initiatives, second-hand stores and fashion libraries).

In the discrete choice conjoint experiment, participants are presented a series of (hypothetical) choice sets, each consisting of two sharing businesses in the fashion industry that vary along the five sharing business dimensions. For each choice set, participants are asked to indicate the preferred sharing business profile, which reflects their engagement with the sharing business. Respondents are forced to choose between the two distinct sharing businesses in the choice task, so an opt-out option is excluded. An example of a choice set is given in Figure 3.

To generate sharing business profiles for the conjoint experiment, attributes and attribute levels first have to be identified. The attributes and attribute levels of the offerings immediately stem from the derived sharing business dimensions (cf., Table 2). However, as this research only considers the implications of

sharing businesses on engagement of individual end users, only the levels low and medium are taken into account for the dimension professional involvement. Furthermore, transactions in fashion always involve the transfer of physical assets (i.e., clothing), so a situation with low resource transfer cannot occur. As a result, only the levels medium and high of the dimension resource transfer remain in the design.

The sharing business profiles that are constructed for the survey are – potentially hypothetical – combinations of the dimensions and their levels originating from a full factorial design. The full factorial design in this setting consists of 108 configurations (= 2*2*3*3*3 profiles). To limit respondent fatigue while still obtaining accurate estimates, the number of combinations that each respondent has to evaluate according to the full factorial design is reduced by using an orthogonal design (a sample based upon the full factorial design). This orthogonal design is created according to the mix-and-match method (Kelley et al., 2015). Using the mix-and-match method for the construction of the experimental design, the number of choice sets each respondent has to evaluate is equal to 36. Considering the recommendation of Bridges et al. (2011) to include 8–16 choice sets in a conjoint experiment, this amount of choice tasks is still too high. Given the explanatory nature of this research, one solution to this problem is to exclude the medium levels of the dimensions with three levels. For the dimension compensation, the levels are so fundamentally different, so the idea of excluding the medium levels is only applied to the dimensions digitalization and openness. This results in a full factorial design consisting of 48 configurations, based upon which the mix and match method generates 12 choice sets per respondent. This number of choice sets is considered to be attainable and to limit the cognitive burden for respondents. An alternative way to reduce the number of choice sets is to work with blocks. Using three blocks, each respondent also has to evaluate 12 choice sets, however, the number of respondents then triples. Applying the formula for aggregate-level full-profile choice-based conjoint analysis of Orme (1998), the minimum number of respondents in this experimental setting is equal to 63. For very large populations – which is the case in this study – the rule of thumb in conjoint states that a minimum of 200 to 300 completed surveys is needed to perform analyses on aggregate level (Lee, Rothenberg, & Xu, 2020; Orme, 2010). According to the formula, the first scenario needs a minimum of 63 respondents and the second scenario requires a minimum of 189 respondents. According to the rule of thumb, the first scenario requires a minimum of 200 respondents and the second scenario needs a minimum of 600 respondents. Even more, when aiming to segment, these recommended minima has to be met per subgroup for the segmentation analysis. As this dissertation will segment the sample in two distinct subgroups according to the moderating variables, the minimum number of respondents in both scenarios doubles. Given the explanatory nature of this research, the more

pronounced differences between the low level and the high level of the dimensions digitalization and openness and the need for a much larger number of respondents, the first option is chosen. An overview of the attributes and attribute levels is given in Table 4. It can be noted that the final number of attributes and number of attribute levels is in line with the guidelines of Orme (2002, 2010).

Which option do you prefer?

A **local** sharing business that does **not** use a digital platform where professional providers get a **non-monetary compensation** for temporarily transferring their clothing to consumers	A **worldwide** sharing business that uses a digital platform to substitute all human interaction where professional providers get **no compensation** for temporarily transferring their clothing to consumers

Figure 3 - Example of a discrete choice experiment question

Table 4 - Sharing business dimensions and levels that are included in the experimental design

Attribute	Attribute levels
Professional involvement	Low: C2C Medium: B2C, G2C
Resource transfer	Medium: access to goods High: ownership of goods
Compensation	Low: no compensation Medium: non-monetary compensation High: monetary compensation
Digitalization	Low: no digital platform High: digital platform substitutes human interaction
Openness	Medium: local community High: worldwide community

In our empirical investigation of user engagement, we account for the influence of sociodemographic variables because "the outcome of the decision-making process is not only influenced by characteristics of the situation but also by characteristics of the deciding individual" (Stöckigt et al., 2018, p. 189). Böcker & Meelen (2017), for example, find that the importance of economic, social and environmental motivations to participate in the sharing economy varies – among others – according to gender and age. Furthermore, Basselier, Langenus, & Walravens (2018) contend that the majority of sharing economy participants is of

young ages and living in cities. Hence, gender, age and primary residence[3] are expected to influence the relationship between the sharing business dimensions and user engagement with sharing businesses.

3.2. Data collection

Data is collected using an online Qualtrics survey. The survey is in Dutch and consists of eight blocks. In each block, the respondents are asked to take the perspective of the consumer (as opposed to the provider) of the sharing fashion initiative.

The questionnaire starts with an introduction to the research topic (block 1). This block addresses – among others – the purpose of the study, the expected completion time of the survey and privacy issues. Afterwards, introductory questions about respondents' clothing transactions are included (block 2). Next, the sharing business dimensions and dimension levels are presented and explained (block 3). This third block is included because we felt that respondents would have little knowledge about the range of sharing businesses in the fashion sector (Bojković, Jeremić, Petrović, & Tica, 2019). To avoid biasing respondents, we did not mention particular sharing initiatives (e.g., second-hand store, Vinted, eBay, Rent the Runway) as examples of the dimensions and dimension levels in block 3. Thus, the first three blocks aim at familiarizing the respondent with the topic of sharing in the fashion industry. Following block 3 are the twelve choice sets, each consisting of two distinct sharing business profiles (block 4). The generation of the conjoint questions is explained in section 3.1. To make the choice tasks easier for participants, the differences between the pairwise presented options are highlighted in bold. In the subsequent block, attention is given to the influence of the corona crisis on the respondent's answers on the conjoint questions (block 5). At the time of finalizing the survey, the corona crisis escalated and as a result the Belgian government declared the state of lock-down. Therefore, we took the opportunity to ask respondents to indicate whether the corona crisis had influenced their answers on the conjoint questions (yes/no). Furthermore, respondents were obliged to answer an open-ended question to indicate how the corona crisis had affected their decisions between sharing businesses. Next, as conjoint studies aim at identifying respondent's preferences in an indirect way, slider questions directly asking the respondents for their preferences regarding sharing businesses are included for validation (block 6). The assessment of preferences using slider questions requires few cognitive effort in comparison with assessment of preferences using conjoint questions. Therefore, also the medium levels for the sharing business

[3] Ranging from rural to urban

dimensions digitalization and openness are included in this block. Responses are measured on an interval scale, ranging from 0 to 10 to give the respondent the feeling of rating the business model dimension level. A score of 0 means that the respondent does not at all desire that particular level of the business model dimension. A score of 10 means that the respondent very much desires the level of the business model dimension. The next block (block 7) aims at measuring the sustainability orientation of the respondent using a validated multi-item scale (Haws et al., 2014). These questions relate to the overall consumer behavior of the respondent, so the answers to these questions are not restricted to consumption in fashion. A 7-point Likert scale ranging from "Strongly disagree" (= 1) to "Strongly agree" (= 7) is used to measure the responses. To correctly convert this scale from English to Dutch (the survey is in Dutch), we translated the original items from English to Dutch and asked an English literature student, two family members and five friends to express the items in English. As the translations from Dutch to English always turned out to be very close to the original formulation of the items, the Dutch translation was included in the questionnaire. The survey ends with sociodemographic questions (block 8).

It was opted to omit a control question in the questionnaire. The manner in which the respondents preferences are gauged (i.e., the conjoint part of the questionnaire) is new to the respondents and requires significant effort, so we do not want to annoy the respondents by asking questions that do not improve the quality of the data for analysis (Vannette, 2017). Furthermore, research indicates that control questions do not significantly affect responses to a validated scale (e.g., sustainability orientation)(Kung, Kwok, & Brown, 2018). Within block randomization is applied to the blocks with the conjoint questions and the slider questions as these are the largest blocks in the survey and are the most important elements for the data analysis.

The survey can be found in Appendix D. The estimated response time of the questionnaire is ten to fifteen minutes. Pretesting was performed by a doctoral student at the department of Marketing, Innovation and Organisation of Ghent University, an English literature student, two family members and five friends.

This research only considers the implications of sharing businesses on engagement of individual end users in the role of consumers, so no businesses are contacted to fill out the survey. Both people familiar with sharing businesses in fashion as well as people not familiar with sharing businesses in fashion are targeted. The only restrictions on respondents is that they need to be older than 18 years, understand the Dutch language (as the survey is in Dutch) and have access to the Internet. The Qualtrics survey was distributed

from April 8th 2020 until April 22th 2020. The respondents were approached online via direct messages, e-mail and posts on social media platforms such as Facebook and LinkedIn. A snowball effect originated as some participants shared the questionnaire with their network. The sampling procedure is thus a combination of convenience sampling and snowball sampling.

3.3. Data analysis

For the statistical analyses of the questionnaire results, we made use of the tools SPSS Statistics 26 and the statistical programming language R. The R script can be consulted in Appendix E.

3.3.1. Descriptive statistics

In the questionnaire, respondents are given the options “Male”, “Female” and “X” as answer to the question “What is your gender?”. Next, respondents are asked to specify their age. These ages are then categorized into distinct groups based on a median split. Furthermore, in the survey, respondents are asked to indicate how they perceive their primary residence on a bipolar scale from rural (= 1) to urban (= 7). Also these answers are split into two groups using median split. Regarding education, respondents are given the options “High school degree”, “Bachelor’s degree”, “Master’s degree”, “PhD” and “None” as answer to the question “What is your highest level of education?”. With regard to occupation, participants were given the options “Student”, “Halftime employed”, “Fulltime employed”, “Unemployed” and “Other – please specify…” as answer to the question “What is your current employment status?”.

To measure the sustainability orientation of the respondents, the multi-item validated scale of Haws et al. (2014) is used. This scale is composed of six items, each measured on a 7-point Likert scale. To assess the internal consistency of the items in the scale, Cronbach’s alpha is calculated. Afterwards, the six items measuring the sustainability orientation of the respondent can be combined into one sustainability measure by taking the average of the six items’ scores. Using a median split for sustainability orientation, respondents are divided into two distinct groups: low sustainability orientation (an average score lower than the median average score) and high sustainability orientation (an average score higher than or equal to the median average score).

Finally, to assess the consumption behavior of respondents with regard to clothes, the question “which of the following transactions have you ever performed? You can select multiple options”, listing the options

"Buying new clothes", "Buying second-hand clothes", "Renting/lending clothes", "Swapping clothes" and "Other – please specify…" was included in the survey. Absolute and relative frequency analyses are performed on the answers to this question.

3.3.2. Discrete choice experiments

To analyze the discrete choice experiment, regression is applied to the answers on the conjoint questions (cf., block 4 in the survey). Utility Theory is underlying this approach (McFadden, 1974). This economic theory assumes that when users choose between distinct choice alternatives, they act rationally and choose the alternative that maximizes their utility (Hauber et al., 2016; Kjaer, 2005). Utility denotes the value someone attaches to a product or service. Considering that users attach utility values to choice alternatives (Hauber et al., 2016), utility models can be set up for each choice alternative. Utility models relate the utility of a product or a service configuration to its characteristics (i.e., attributes and attribute levels). Models that relate the expected utilities to the characteristics of the choice alternatives rather than to the characteristics of the individuals are termed conditional logit models (McFadden, 1974; Rodrígez, 2007). The utility of choice alternative 1 in a choice set and the utility of choice alternative 2 in the same choice set can be represented by respectively (Benoit, 2018):

$$U_1 = \beta_{1,0} + \beta_1 X_{1,1} + \beta_2 X_{1,2} + \cdots + \beta_k X_{1,k} + \epsilon_1$$
$$U_2 = \beta_{2,0} + \beta_1 X_{2,1} + \beta_2 X_{2,2} + \cdots + \beta_k X_{2,k} + \epsilon_2$$

with
- U_i the utility of choice alternative i,
- $\beta_{i,0}$ the intercept of the utility model for choice alternative i,
- β_k the model coefficients of the k attribute levels,
- $X_{i,k}$ the k attribute levels of choice alternative i,
- ϵ_i the random error term

The absolute value of the utility attached to a sharing business profile, however, is not relevant. Only the difference in utility is of importance, based on which respondents make choices. Therefore, a differenced utility model is estimated (Benoit, 2018):

$$U_1 - U_2 = (\beta_{1,0} - \beta_{2,0}) + (\beta_1 X_{1,1} - \beta_1 X_{2,1}) + (\beta_2 X_{1,2} - \beta_2 X_{2,2}) + \cdots + (\beta_k X_{1,k} - \beta_k X_{2,k}) + \varepsilon$$

The intercept in a differenced utility model tells something about the deviation in utility between the choice alternatives when the pairwise differences of the predictors are all equal to zero. However, when the pairwise differences of the predictors are all equal to zero, the two choice alternatives are exactly the same and the difference in total utility should be equal to zero. Therefore, the difference of the intercepts becomes zero and thus the differenced regression models to estimate do not have an intercept. As such, a preference for one of the two choice options even if the choice options are exactly the same is not allowed. The error term $\varepsilon = \epsilon_1 - \epsilon_2$ follows a logistic distribution with $\mu = 0$ and $\sigma = 1$.

In a conjoint experiment, utilities are latent because choices instead of utilities are observed. Consequently, the binary response variable of the model is the choice made by the respondents. A 1 for the dependent variable indicates that the respondent has chosen sharing business profile 1 over sharing business profile 2 of the choice set. Alternatively, a 0 for the dependent variable means that the participant has chosen alternative 2 over alternative 1. The predictors of the model are the attributes and attribute levels of the sharing business profiles. Given the categorical nature of the predictor variables, dummy coding is used to construct the predictors. As a result, the model consists of six dummy variables to account for all levels of all attributes included in this experiment (cf., Table 4). The independent variables are input in the model in the form of a design matrix. Because the dependent variable captures the relative choice of the respondent, the input matrix should capture the difference in attribute levels of the alternatives in the choice set. For example, if choice alternative 1 in choice set 1 involves access to goods (reference category of the attribute resource transfer) and choice alternative 2 in choice set 1 involves ownership of goods, then the design matrix records a value -1 (= 0 – 1) for the dummy variable ownership of goods in choice set 1. This reasoning is followed for all choice sets and afterwards the matrix is repeated for each respondent.

In this study, the logistic regression estimates allow to identify users' preferences with regard to the sharing business dimensions (i.e., attributes) and dimension levels (i.e., attribute levels). Overall model significance is tested using the p-value of the Pearson's Chi-Square test for goodness of fit. Next, significance is assessed for the individual model coefficients. The estimated regression coefficients are of particular interest in conjoint studies because they quantify the effect of an attribute level on utility and – relying on Utility Theory – on choice. A discrete choice experiment consequently allows to detect which attribute levels users prefer (preference weights, research question 1) and which attributes are of importance (attribute importances, research question 2) when users decide between sharing businesses.

Preference weights (or partworth utilities or attribute level partworths) represent the contribution of an attribute level to the total utility, compared to the reference level of that attribute. The total utility of a sharing business profile is considered to be equal to the sum of the partworths of the attribute levels that result in that profile. This assumption is property of additive preference models. Attribute level partworths directly stem from the coefficient estimates of the logistic regression model. Attribute partworths should always be interpreted relatively to the baseline level of the attribute (i.e., peer-to-peer, access to goods, no compensation, no digital platform or local community)(Hauber et al., 2016). A positive coefficient estimate means that the attribute level is preferred over the level of that attribute in the reference sharing business. The more positive the attribute level coefficient, the more value this level adds to the sharing business. A negative preference weight indicates that the attribute level is preferred less than the level of that attribute in the baseline sharing business. The more negative the preference weight, the more this level takes away value from the sharing business (Kelley et al., 2015). A negative partworth utility, however, does not indicate that this attribute level is undesirable (Chowdhury et al., 2016). In other words, preference weights are calculated to know which attribute levels drive users' preferences for sharing businesses.

Relying on a conditional logit model, both the utility assigned to a certain sharing business and the probability of choosing a certain sharing business are considered to be a function of the attributes and attribute levels that define those sharing businesses. Indeed, the model coefficients are the log odds ratios of preference for the attribute levels (Decalf et al., 2017; Hauber et al., 2016).

Also based on the estimated logistic regression model, attribute importances (or attribute importance scores or attribute partworths) can be assessed. Attribute importances represent the relative importance of an attribute. These scores are thus calculated over all levels of this attribute in the experiment (Hauber et al., 2016). To calculate the importance of an attribute, first the range of partworth utilities of this attribute is determined. Next, this range is divided by the sum of the ranges of all attributes in the conjoint experiment. Finally, the obtained decimal value is multiplied by 100 to obtain a percentage value (Kelley et al., 2015). The attribute importance scores thus sum up to 100% (Stöckigt et al., 2018). The larger the range of partworth utilities of an attribute, the more sensitive respondents are to this attribute when deciding between sharing businesses (Ewing & Sarigöllü, 2000). In other words, attribute importances measure how much each sharing business dimension influences the choice between sharing businesses.

Next to estimating the logistic regression model at aggregate level (using data from all respondents), we also estimate separate logistic regression models for each subgroup of the moderating variables in our analysis (De Meulenaer, Dens, & De Pelsmacker, 2015): female respondents, male respondents, respondents aged below the median age, respondents of median age or higher, respondents that live in rural areas, respondents that consider their primary residence to be urban, respondents with low sustainability orientation and respondents with high sustainability orientation. In total, nine logistic regression models are run in R. To detect significant differences in preference weights between the subgroups of a moderating variable, the confidence intervals of the preference weights are compared in a pairwise manner. For example, if the confidence interval of the level access to goods in the model with female respondents partly or entirely overlaps with the confidence interval of the attribute level access to goods in the model with only male respondents, then these two coefficients are not significantly different from each other. If there is no overlap between the two confidence intervals, it can be concluded that these two coefficients are significantly different from each other. Also the importances of the sharing business dimensions are assessed for all subgroups of all moderating variables.

4. Results

This section first reports on descriptive statistics (subsection 4.1.) with regard to sociodemographic moderating variables, sustainability orientation and consumption behavior in the fashion industry. The next subsection (subsection 4.2.) deals with the results of the conjoint experiments. This subsection starts by listing sample size requirements, then reports on the results of the discrete choice experiment at aggregate level and then reports on the discrete choice experiments while distinguishing between subgroups for the four moderating variables. Subsection 4.2. afterwards includes a model with the moderating variables included as interaction terms and a robustness check at aggregate level respectively. The Results section ends with exploratory insights regarding the effect of the corona crisis on user engagement with sharing businesses in the fashion industry (subsection 4.3.).

4.1. Descriptive statistics

During the two-week period of data collection, responses were obtained from 605 respondents. Unfortunately, 222 (almost 40%) of the participants ceased to fill in the questionnaire. This group consists for the largest part of people that opened the survey merely out of curiosity, people that opened the survey more than once and people who stopped filling in the questionnaire because of the cognitive difficulty typical for conjoint experiments (Bridges et al., 2011). The answers of these 222 respondents were removed from the dataset, thus the final dataset for analysis contains the answers of the 383 respondents who fully completed the survey. Table 5 summarizes the characteristics of the participants in the final sample.

The majority of the respondents (65%) is female. 4 participants did not wish to specify their gender. The median of the variable age in the sample is equal to 32. Given the recency of the emergence of sharing businesses within the circular economy, this low median age was to be expected. 49% of the sample consists of respondents aged below age 32 and 51% of the sample consists of respondents that are 32 years old or more. The median of the variable primary residence is equal to 4, exactly the center point of the bipolar scale that was used to measure this variable. 46% of the respondents consider their primary residence as rural and 54% of the respondents consider their primary residence as urban. With regard to education, the vast majority (86%) attained a bachelor's or master's degree. With regard to occupation, the 46% of the respondents are fulltime employed and 36% of the respondents are students. The category "Other – please specify…", mainly consists of retired people and disabled people.

For the six items that measure the respondents' sustainability orientation, the sample's Cronbach's alpha is equal to 0.91. Given this high internal consistency value, the six items measuring the sustainability orientation of the respondents are allowed to be combined into one sustainability measure by taking the average of the six items' scores. The median of the variable sustainability orientation is equal to 5.17. The final data set is composed out of 181 people with low sustainability orientation (47%) and 202 people with high sustainability orientation (53%).

Table 5 - Sample composition

	Frequency (N)	**Percentage (%)**
Gender		
Female	249	65.01%
Male	130	33.94%
Not specified	4	0.01%
Age		
<32	189	49.35%
≥32	194	50.65%
Primary residence		
Rural	176	45.95%
Urban	207	54.05%
Education (highest degree)		
High school graduate or equivalent	37	9.66%
Bachelor's degree or equivalent	136	35.51%
Master's degree or equivalent	193	50.39%
Doctoral degree or equivalent	15	3.92%
None of the above	2	0.52%
Occupation		
Student	137	35.78%
Halftime employed	29	7.57%
Fulltime employed	175	45.69%
Unemployed	16	4.18%
Other	26	6.79%
Sustainability orientation		
Low	181	47.26%
High	202	52.74%
TOTAL	**383**	**100.00%**

Table 6 summarizes the analysis of respondents' fashion consumption behavior. The results indicate that almost half of the respondents (40%) has never engaged with sharing businesses to obtain clothing (neither second-hand nor rental nor swap nor gift). In the sample, second-hand is the most popular sharing activity

to obtain clothing (45%), followed by renting (16%) and swapping (13%). The category "Other – please specify…" mainly refers to clothing that was gifted for free by others (e.g., family or friends) to the respondents. This type of activity is also considered to be part of the sharing economy according to the definition and the typology derived in this study (cf., 2.2.2.). Receiving clothing as a gift is the sharing activity that respondents engage in the least (8%). Sharing businesses in the fashion industry thus still do not reach the majority of fashion consumers.

Table 6 - Consumption behavior of respondents with regard to clothes

	Frequency (N)	Percentage (%)
No sharing	155	40.47%
Second hand	172	44.91%
Rental	62	16.19%
Swap	49	12.79%
Gift	32	8.36%
TOTAL	**383**	**100.00%**

4.2. Discrete choice experiments

4.2.1. Sample size requirements

Table 7 indicates whether the sample size requirements are met at aggregate level and at subgroup level. Both the minimum sample size imposed by the sample size formula and the minimum sample size imposed by the rule of thumb for discrete choice experiments are fulfilled at aggregate level. Except for the gender category not specified, the number of respondents for each subgroup is larger than the number recommended by the sample size formula. The rule of thumb, however, is only met for the subgroups female and high sustainability orientation.

Table 7 - Sample size requirements

	Sample size requirement fulfilled (formula)	Sample size requirement fulfilled (rule of thumb)
Aggregate level	Yes	Yes
Gender		
Female	Yes	Yes
Male	Yes	No
Not specified	No	No
Age		
<32	Yes	No
≥32	Yes	No
Primary residence		
Rural	Yes	No
Urban	Yes	No
Sustainability orientation		
Low	Yes	No
High	Yes	Yes

Sample size requirements in conjoint analyses have to be considered with caution. In the utopian scenario, the modeler should already know beforehand the sign of the true model coefficients (e.g., a higher price will result in a lower utility) to precisely calculate the sample size requirements for conjoint analyses. However, in this research setting we do not know beforehand the influence of the sharing business dimensions and dimension levels on user engagement. Therefore, whenever models or coefficients, that are estimated based on a number of respondents that does not meet the sample size requirements, are significant, this significance might be fortuitous. As a consequence, this study will not report on the discrete choice experiment that consists out of the answers of the respondents that do not want to specify their gender.

4.2.2. Discrete choice experiment at aggregate level

Preference weights

The utility that participants' assign to a sharing business can be represented by 0.04 * (involvement of professionals) + 0.48 * (ownership of goods) – 0.06 * (non-monetary compensation) + 0.25 * (monetary compensation) + 0.25 * (substitution of human interaction by digital platform) – 0.74 * (worldwide community)(Table 8). With a p-value < 0.001, the model at aggregate level is significantly different from the

null model. The preference weights and corresponding confidence intervals (at the 5% significance level) are shown graphically in Figure 4. The preference weights for the levels ownership of goods, monetary compensation, substitution of human interaction by digital platform and worldwide community are statistically significant at the 5% significance level.

No significant preference difference is found between sharing businesses that are based on peer-to-peer transactions and sharing businesses that involve professionals. The positive coefficient for the dummy variable ownership of goods indicates that compared to access, ownership is preferred significantly. No significant preference difference is found between sharing businesses that offer no compensation to providers and sharing businesses that offer non-monetary compensation to providers. The positive sign for the dummy variable monetary compensation states that monetary compensation is preferred over no compensation. The positive coefficient for the dummy variable substitution of human interaction by digital platform indicates that users choose sharing businesses that make use of a digital platform that substitutes all human interaction over sharing businesses that do not make use of a digital platform at all. Finally, the negative sign for the coefficient of the dummy variable worldwide community emphasizes that participants value sharing businesses that operate locally significantly more than sharing businesses that operate worldwide.

Table 8 - Parameter estimates of the logistic regression model at aggregate level

Attribute level	Estimate	p-value
Involvement of professionals	0.03842	0.341388
Ownership of goods	0.47670	< 2e-16 ***
Non-monetary compensation	-0.05575	0.386953
Monetary compensation	0.24502	0.000895 ***
Substitution of human interaction by digital platform	0.24812	3.14e-07 ***
Worldwide community	-0.74347	< 2e-16 ***

Note. *** refers to a p- value < 0.001

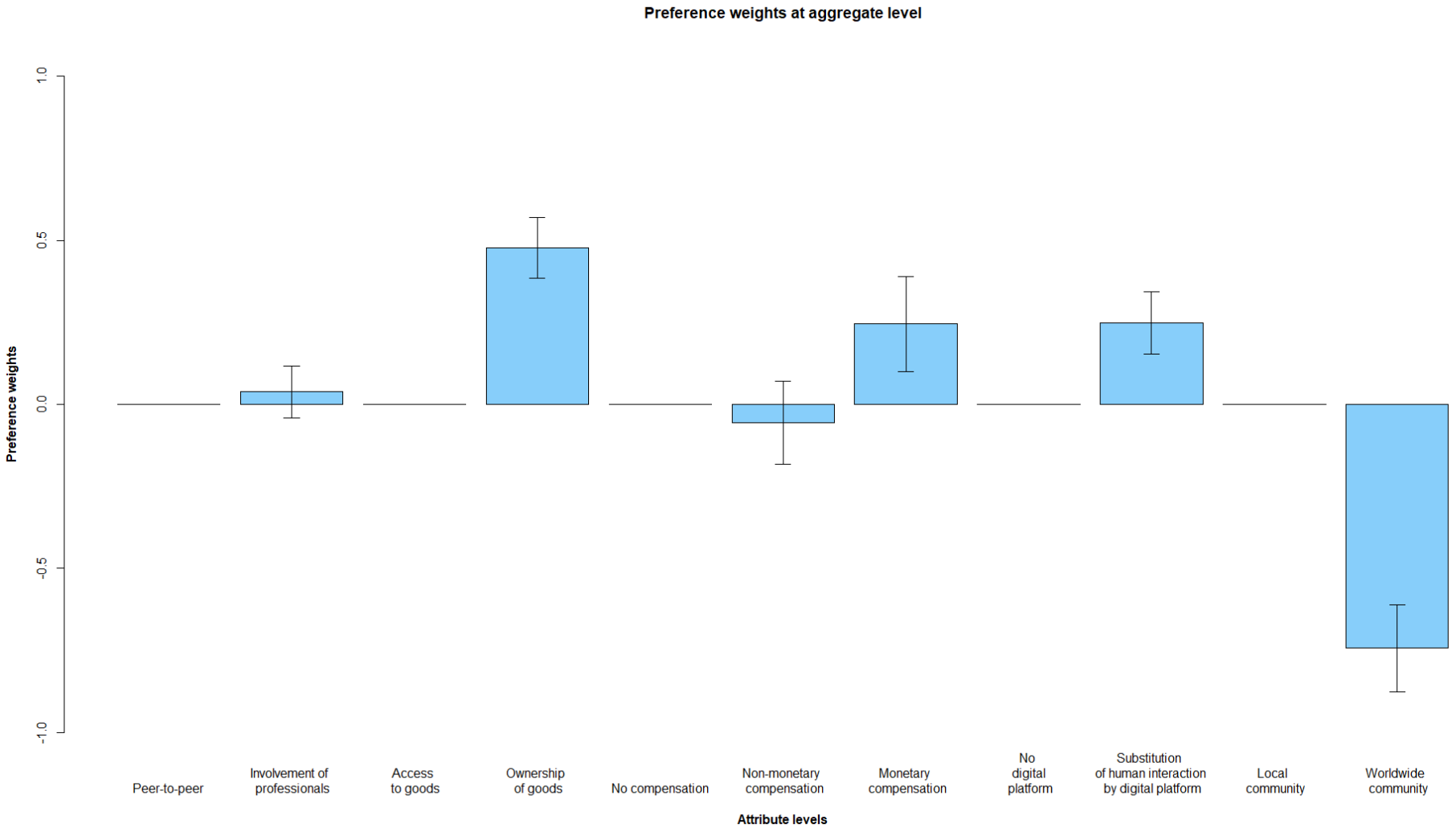

Figure 4 - Preference weights and corresponding confidence intervals at aggregate level

Attribute importances

At aggregate level, the results indicate that respondents give the least weight to the level of professional involvement (2%) and the most weight to the level of openness (41%). The attribute importance scores for each of the five dimensions are shown graphically in Figure 5.

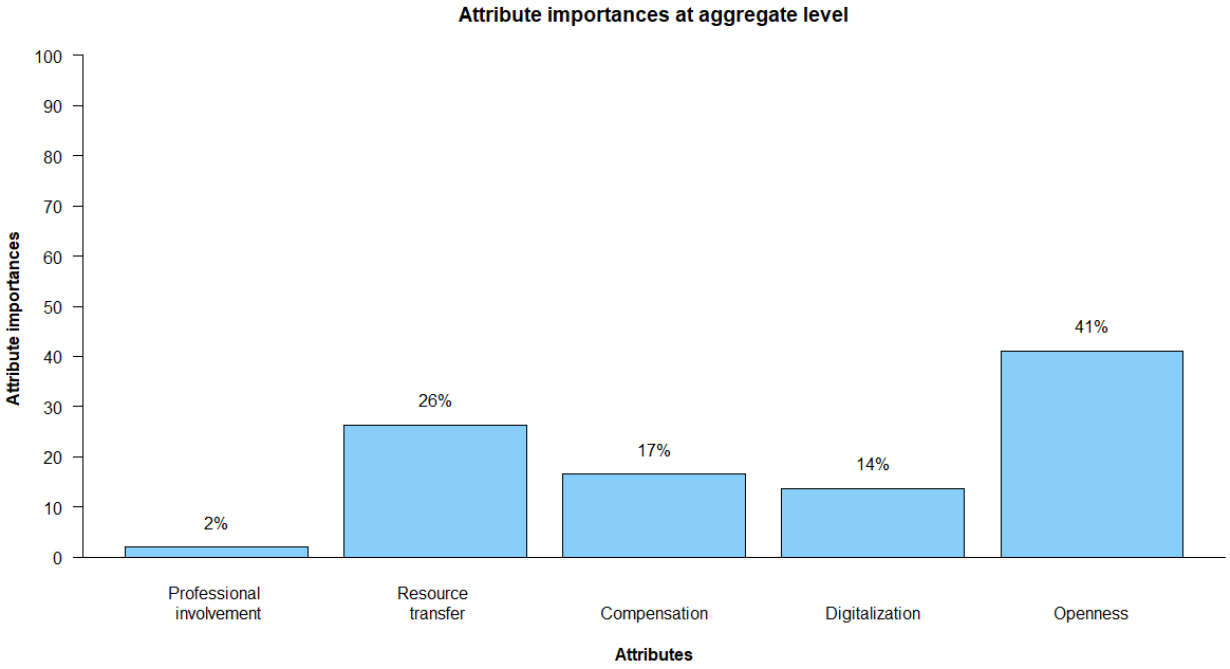

Figure 5 - Attribute importances at aggregate level

4.2.3. Discrete choice experiment and gender

Preference weights

The logistic regression outcomes for both female respondents and male respondents are given in Table 9 and Table 10 respectively and represented visually in Figure 6. Both logistic regression models are significant at the 5% significance level (p-value < 0.001). For both female respondents and male respondents, no significant preference difference is found between sharing businesses that are based on peer-to-peer transactions and sharing businesses that involve professionals. In both models, the dummy variable ownership of goods has a significantly positive coefficient which indicates that ownership of goods is preferred over access to goods. The difference between the preference weights for the attribute level ownership of goods between female and male respondents, however, is neglectable because the confidence intervals of that variable overlap. For both subgroups, no significant preference difference is

found between sharing businesses that offer no compensation to providers and sharing businesses that offer non-monetary compensation to providers. Only male respondents show a significant preference for sharing business models that offer monetary compensation over sharing businesses that offer no compensation. Both female respondents and male users have a significant preference for sharing business models that make use of a digital platform that substitutes all human interaction over sharing business models that do not make use of a digital platform at all. Again, the difference in coefficient estimates of this variable between the subgroups is not significant because the confidence levels overlap. Finally, the negative sign for the coefficient of the dummy variable worldwide community emphasizes that all participants (both female and male) value sharing businesses that operate locally significantly more than sharing businesses that operate worldwide. Also here, the difference in model coefficients between the subgroups is neglectable.

Table 9 - Parameter estimates of the logistic regression model (female)

Attribute level	Estimate	p-value
Involvement of professionals	0.05109	0.311795
Ownership of goods	0.47345	1.34e-15 ***
Non-monetary compensation	0.01468	0.855020
Monetary compensation	0.10893	0.234096
Substitution of human interaction by digital platform	0.21549	0.000357 ***
Worldwide community	-0.75961	< 2e-16 ***

Note. *** refers to a p-value < 0.001

Table 10 - Parameter estimates of the logistic regression model (male)

Attribute level	Estimate	p-value
Involvement of professionals	0.009124	0.894547
Ownership of goods	0.470994	5.79e-09 ***
Non-monetary compensation	-0.202599	0.066023
Monetary compensation	0.500288	8.82e-05 ***
Substitution of human interaction by digital platform	0.293264	0.000404 ***
Worldwide community	-0.721945	4.47e-10 ***

Note. *** refers to a p-value < 0.001

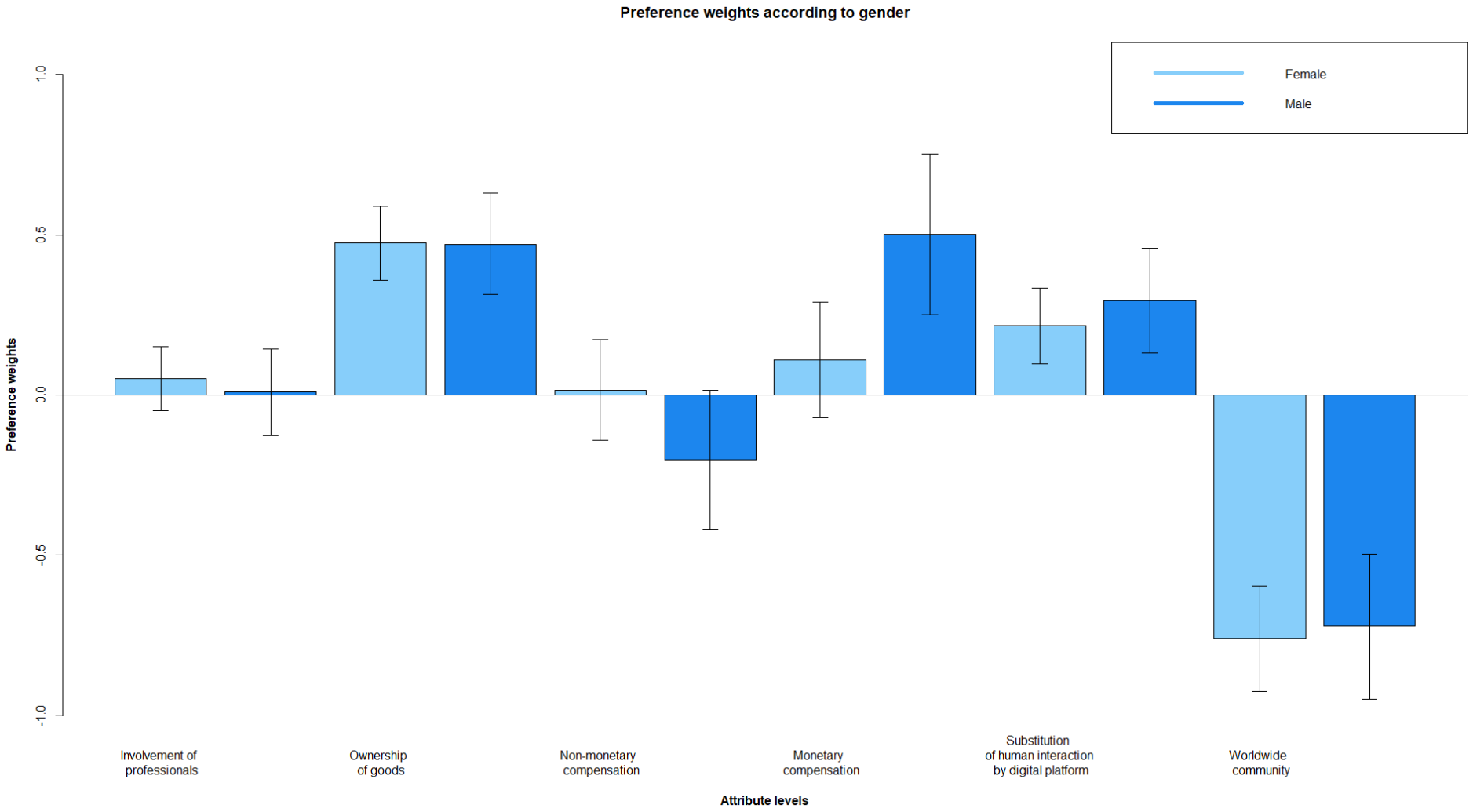

Figure 6 - Preference weights and corresponding confidence intervals according to gender

Attribute importances

Female respondents are least sensitive to the level of professional involvement (3%) and most sensitive to the level of openness (47%). Male respondents give no weight to the level of professional involvement (0%) and almost the same weight to the level of compensation and the level of openness (respectively 32% and 33%). The importance scores of the attribute digitalization are exactly the same for both female and male respondents (13%). Most difference between the two subgroups is detected for the dimension compensation. The importances for each of the five dimensions of both female and male respondents are shown graphically in Figure 7.

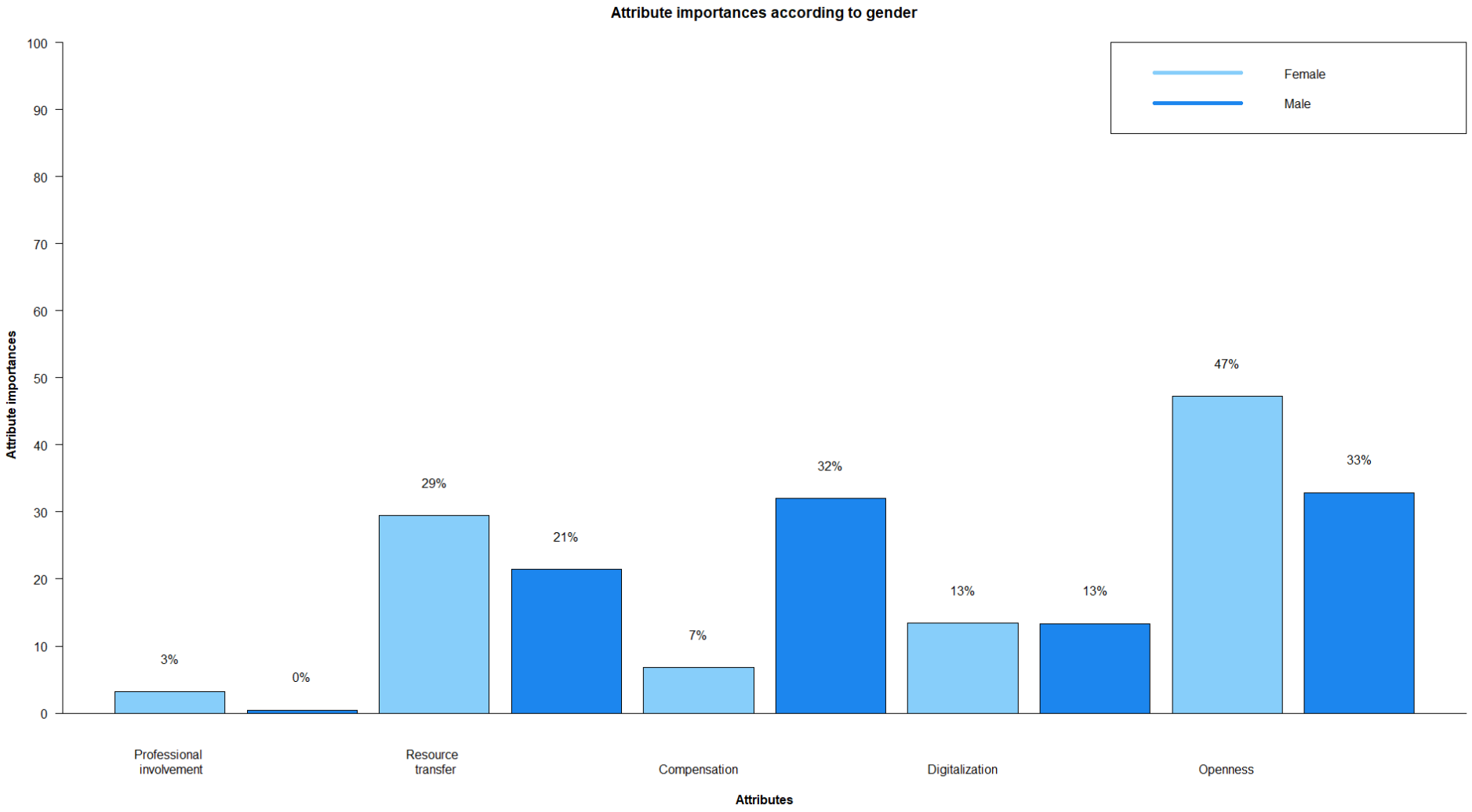

Figure 7 - Attribute importances according to gender

4.2.4. Discrete choice experiment and age

Preference weights

The parameter estimates of the logistic regression models for respondents aged below 32 and respondents aged 32 and above are given in Table 11 and Table 12. Both models have a p-value < 0.001 for the Chi-Square test for model significance. The outcome of the regression models is also presented visually in Figure 8. For all attribute levels, the results are the same for both subgroups of the variable age. No significant preference difference is found between sharing business activities that are based on peer-to-peer transactions and sharing business models that involve professionals. A significantly positive preference is found for sharing businesses that involve ownership of goods over access to goods. For both subgroups, no significant preference difference is found between sharing business models that offer no compensation to providers and sharing businesses that offer non-monetary compensation to providers. Both respondents aged below 32 and respondents aged 32 and above show a preference for the attribute levels monetary compensation and substitution of human interaction by digital platform. With regard to the level of openness, both models deliver a significantly negative coefficient for the dummy variable worldwide community and thus sharing businesses that operate locally are preferred over sharing businesses that operate worldwide. Overall, the differences between users aged below 32 and users aged 32 and above are neglectable.

Table 11 - Parameter estimates of the logistic regression model (< 32 years old)

Attribute level	Estimate	p-value
Involvement of professionals	0.02162	0.7060
Ownership of goods	0.59293	< 2e-16 ***
Non-monetary compensation	-0.04183	0.6484
Monetary compensation	0.25891	0.0136 *
Substitution of human interaction by digital platform	0.35413	3.95e-07 ***
Worldwide community	-0.65488	8.19e-12 ***

Note. * refers to a p-value < 0.05 and *** refers to a p-value < 0.001

Table 12 - Parameter estimates of the logistic regression model (≥ 32 years old)

Attribute level	Estimate	p-value
Involvement of professionals	0.05557	0.3305
Ownership of goods	0.36804	2.7e-08 ***
Non-monetary compensation	-0.06833	0.4513
Monetary compensation	0.23119	0.0263 *
Substitution of human interaction by digital platform	0.14784	0.0294 *
Worldwide community	-0.83299	< 2e-16 ***

Note. * refers to a p-value < 0.05 and *** refers to a p-value < 0.001

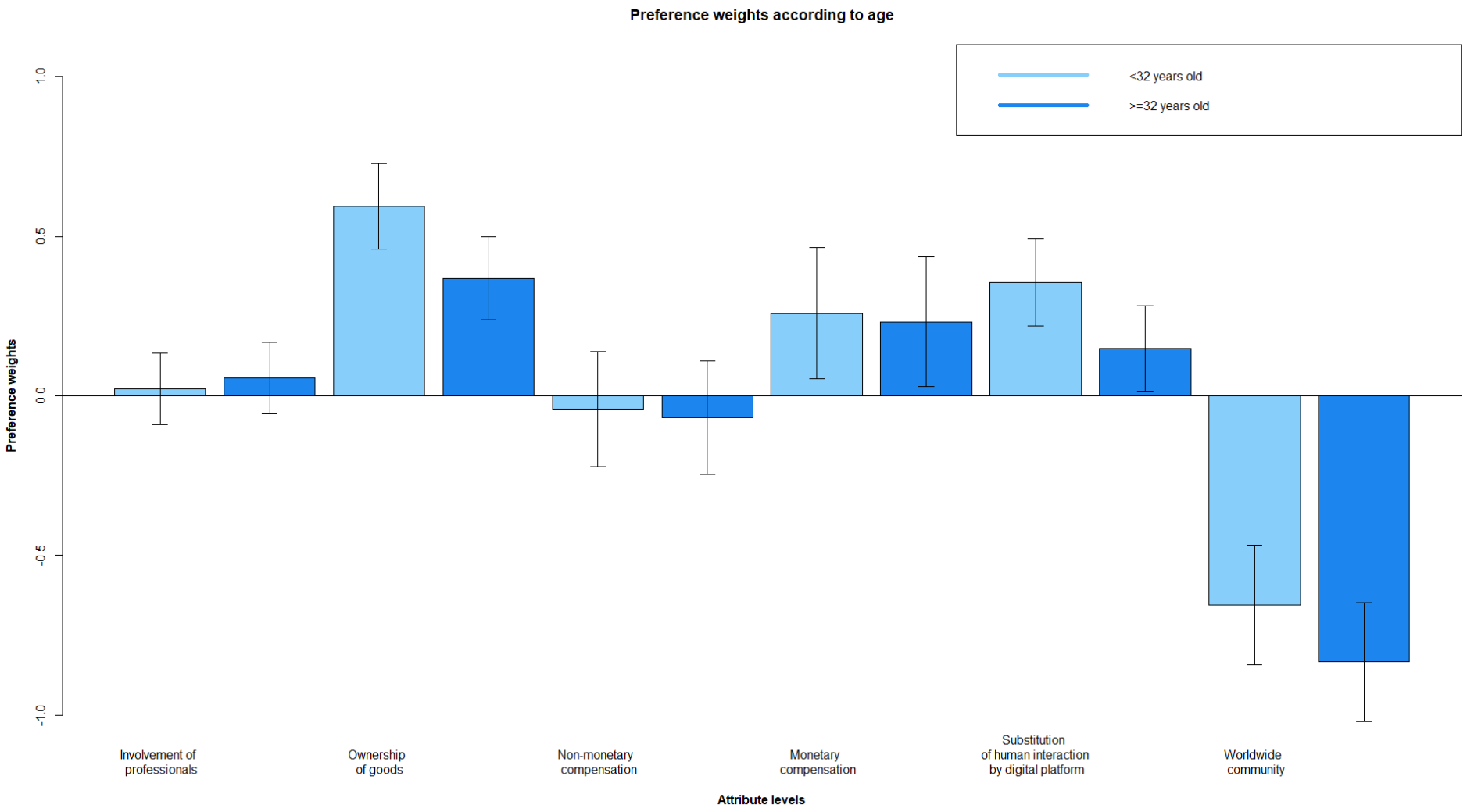

Figure 8 - Preference weights and corresponding confidence intervals according to age

Attribute importances

Both the group of youngest respondents and the group of oldest respondents are least sensitive to the level of professional involvement (respectively 1% and 3%) and most sensitive to the level of openness (respectively 34% and 49%) when deciding between sharing businesses to engage in. The importance scores for all attributes are represented visually in Figure 9.

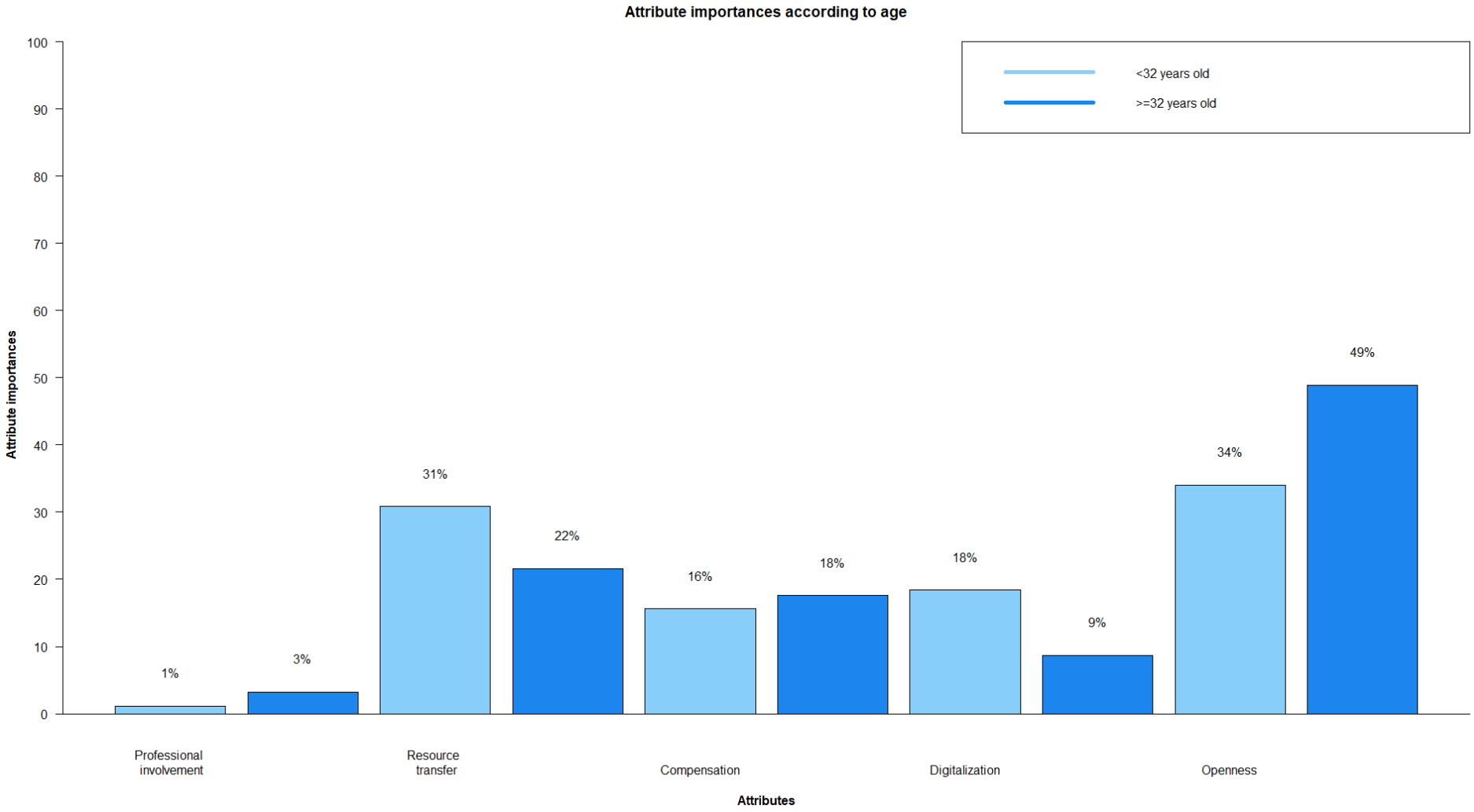

Figure 9 - Attribute importances according to age

4.2.5. Discrete choice experiment and primary residence

Preference weights

The parameter estimates of the logistic regression models according to the variable primary residence are documented in Tables 13 and 14. The regression models of both subgroups are significant at the 5% significance level (p-value < 0.001). Only for the respondents who consider their primary residence to be rural, a significantly positive coefficient is found for the attribute level involvement of professionals. This group of respondents thus prefers sharing businesses that involve professionals over sharing activities that occur between peers. For the dummy variable ownership of goods, both models show a significantly positive coefficient. Regardless of their primary residence, users show higher preference for ownership of goods compared to access to goods. In both models, the coefficient for the dimension level non-monetary compensation is not significantly different than zero. Next, only respondents who consider their primary residence to be rural show a significant preference for monetary compensation over no compensation. Both subgroups of the variable primary residence have a significantly higher preference for sharing businesses that make use of a digital platform that substitutes human interaction compared to sharing businesses that have no a digital platform for their activities. Finally, with regard to the level of openness of the sharing community, both subgroups have a higher preference for sharing businesses that operate locally compared to sharing businesses that operate worldwide. The confidence intervals of the attribute levels ownership of goods, substitution of human interaction by digital platform and worldwide community overlap so the difference in coefficient estimates of these variables in both models is not significant (Figure 10).

Table 13 - Parameter estimates of the logistic regression model (rural)

Attribute level	Estimate	p-value
Involvement of professionals	0.15640	0.008496 **
Ownership of goods	0.45331	8.69e-11 ***
Non-monetary compensation	-0.11624	0.222707
Monetary compensation	0.35903	0.001042 **
Substitution of human interaction by digital platform	0.25921	0.000276 ***
Worldwide community	-0.73865	8.30e-14 ***

Note. * refers to a p-value < 0.05, ** refers to a p-value < 0.01 and *** refers to a p-value < 0.001

Table 14 - Parameter estimates of the logistic regression model (urban)

Attribute level	Estimate	p-value
Involvement of professionals	-0.062870	0.255216
Ownership of goods	0.497516	1.51e-14 ***
Non-monetary compensation	-0.005687	0.948245
Monetary compensation	0.150714	0.133364
Substitution of human interaction by digital platform	0.239217	0.000308 ***
Worldwide community	-0.752615	3.59e-16 ***

Note. *** refers to a p-value < 0.001

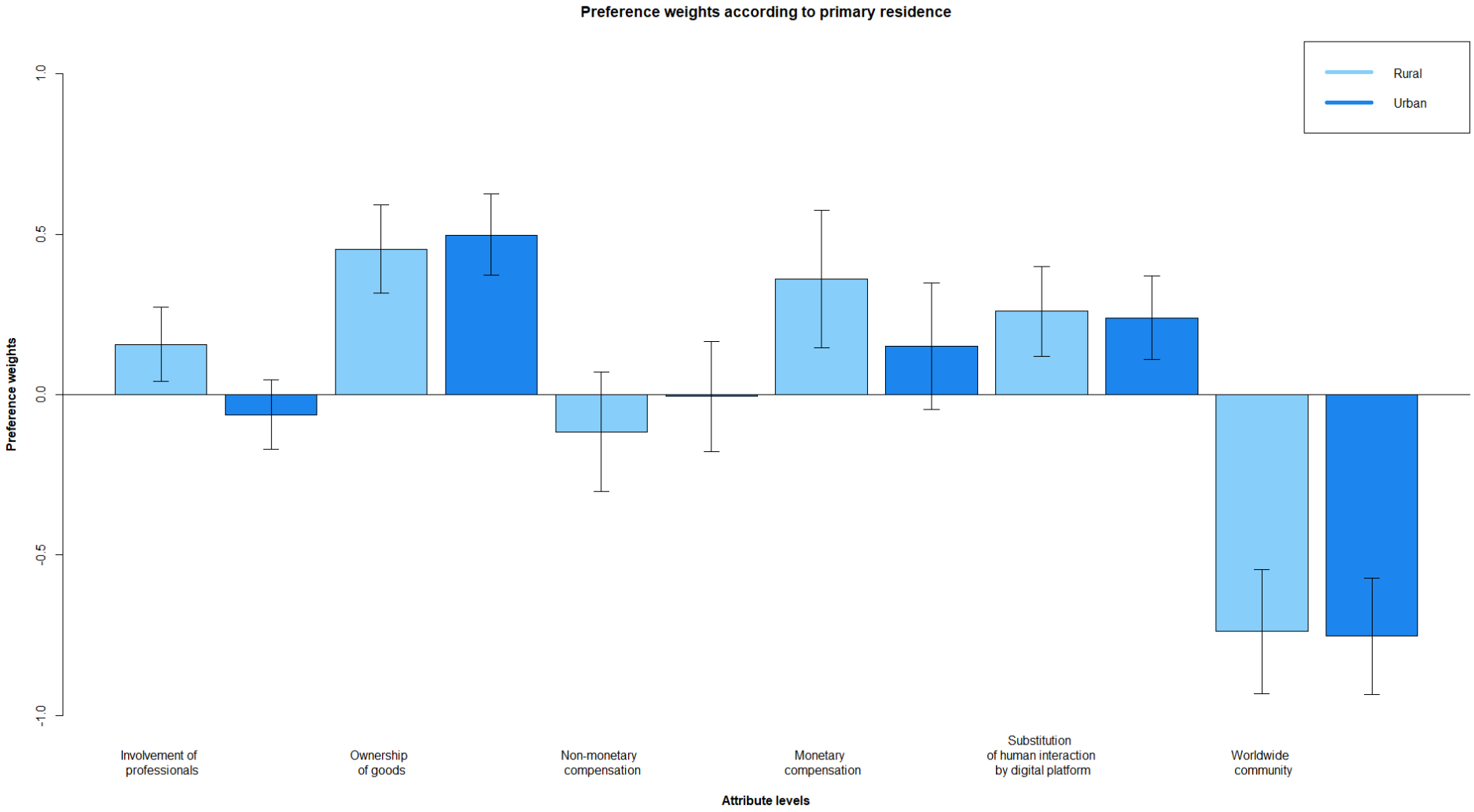

Figure 10 - Preference weights and corresponding confidence intervals according to primary residence

Attribute importances

Respondents that consider their primary residence to be rural are least sensitive to the dimension professional involvement (8%) and most sensitive to the dimension openness (35%) when choosing between distinct sharing businesses. For respondents who consider themselves residing in urban areas, professional involvement is the least important attribute (4%) and openness (44%) is the most important attribute. The attribute importance scores for each of the five dimensions are shown graphically in Figure 11.

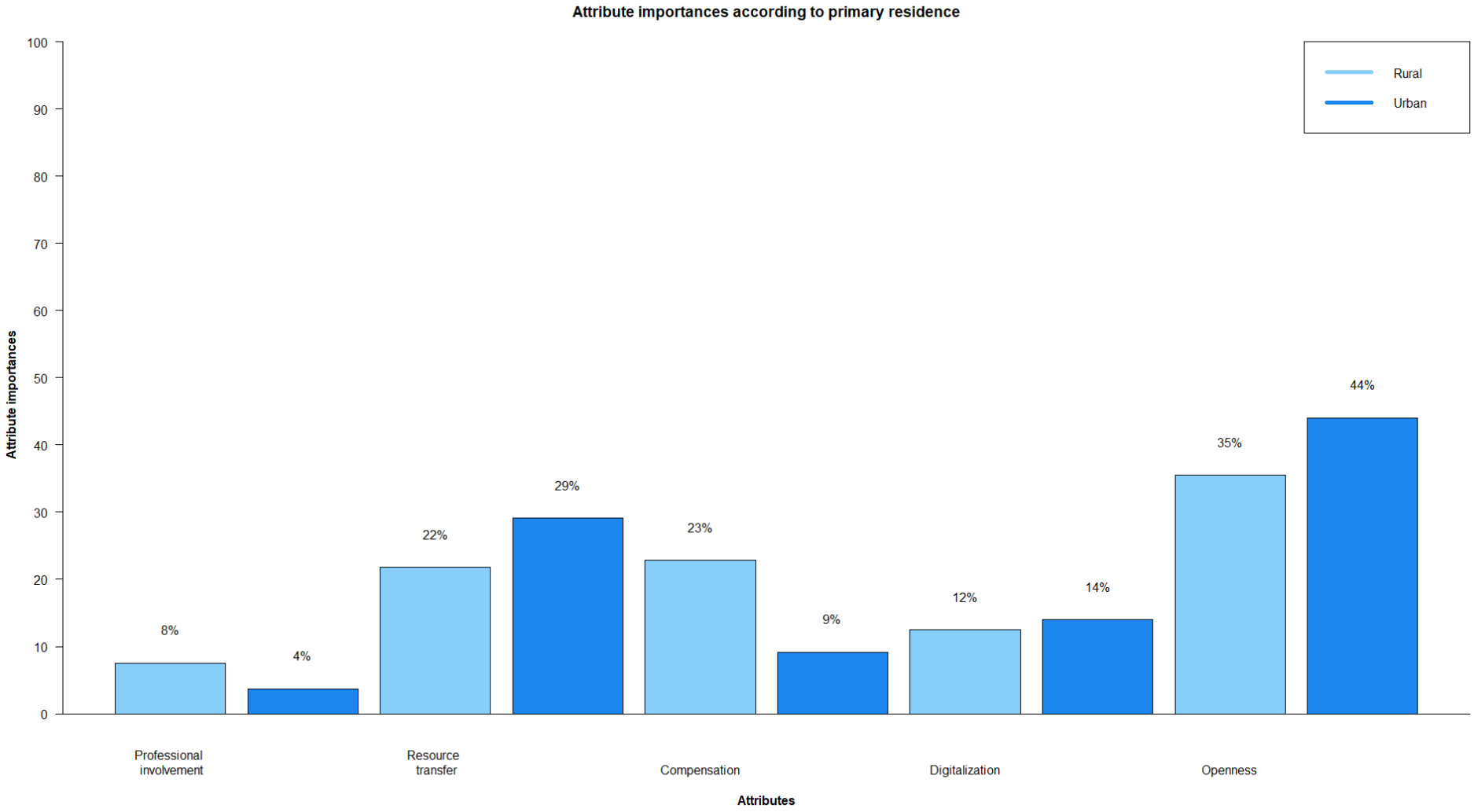

Figure 11 - Attribute importances according to primary residence

4.2.6. Discrete choice experiment and sustainability orientation

Preference weights

The utility that participants with low and high sustainability orientation assign to a sharing business can be represented by the addition of the model coefficients that are detailed in Table 15 and Table 16 respectively. With a p-value < 0.001, both the model including only respondents with a below median sustainability orientation and the model including only respondents with a sustainability orientation higher than or equal to the median sustainability orientation are significantly different from the null model. The preference weights and corresponding confidence intervals (at the 5% significance level) are shown graphically in Figure 12.

Regarding the attribute level involvement of professionals, a significant coefficient is only detected for the respondents with low sustainability orientation. The coefficient estimate of the variable involvement of professionals is positive, which indicates that these respondents prefer sharing activities in which professional actors are involved over sharing activities that occur in a peer-to-peer context. For both subgroups of respondents, a significantly positive effect of ownership of goods on utility is detected. However, the coefficients of the subgroups are not significantly different from each other at the 5% significance level. The results indicate that the attribute level non-monetary compensation has no significant influence on user preferences, neither for the respondents with low sustainability orientation and nor for the respondents with high sustainability orientation. Next, the results indicate that monetary compensation is preferred significantly over no compensation and that substitution of human interaction by digital platform is preferred significantly over no digital platform but only by respondents with low sustainability orientation. For the last dimension, openness, both groups of respondents assign significantly less utility to worldwide communities compared to local communities. However, here again, the difference in coefficient estimates between the two models is not significant at the 5% significance level.

Table 15 - Parameter estimates of the logistic regression model (low)

Attribute level	Estimate	p-value
Involvement of professionals	0.13145	0.024329 *
Ownership of goods	0.44501	1.19e-10 ***
Non-monetary compensation	-0.06424	0.493523
Monetary compensation	0.38948	0.000308 ***
Substitution of human interaction by digital platform	0.39050	3.39e-08 ***
Worldwide community	-0.65560	1.93e-11 ***

Note. * refers to a p-value < 0.05 and *** refers to a p-value < 0.001

Table 16 - Parameter estimates of the logistic regression model (high)

Attribute level	Estimate	p-value
Involvement of professionals	-0.04337	0.4424
Ownership of goods	0.51184	6.88e-15 ***
Non-monetary compensation	-0.05138	0.5641
Monetary compensation	0.11523	0.2586
Substitution of human interaction by digital platform	0.11735	0.0804
Worldwide community	-0.83593	< 2e-16 ***

Note. *** refers to a p-value < 0.001

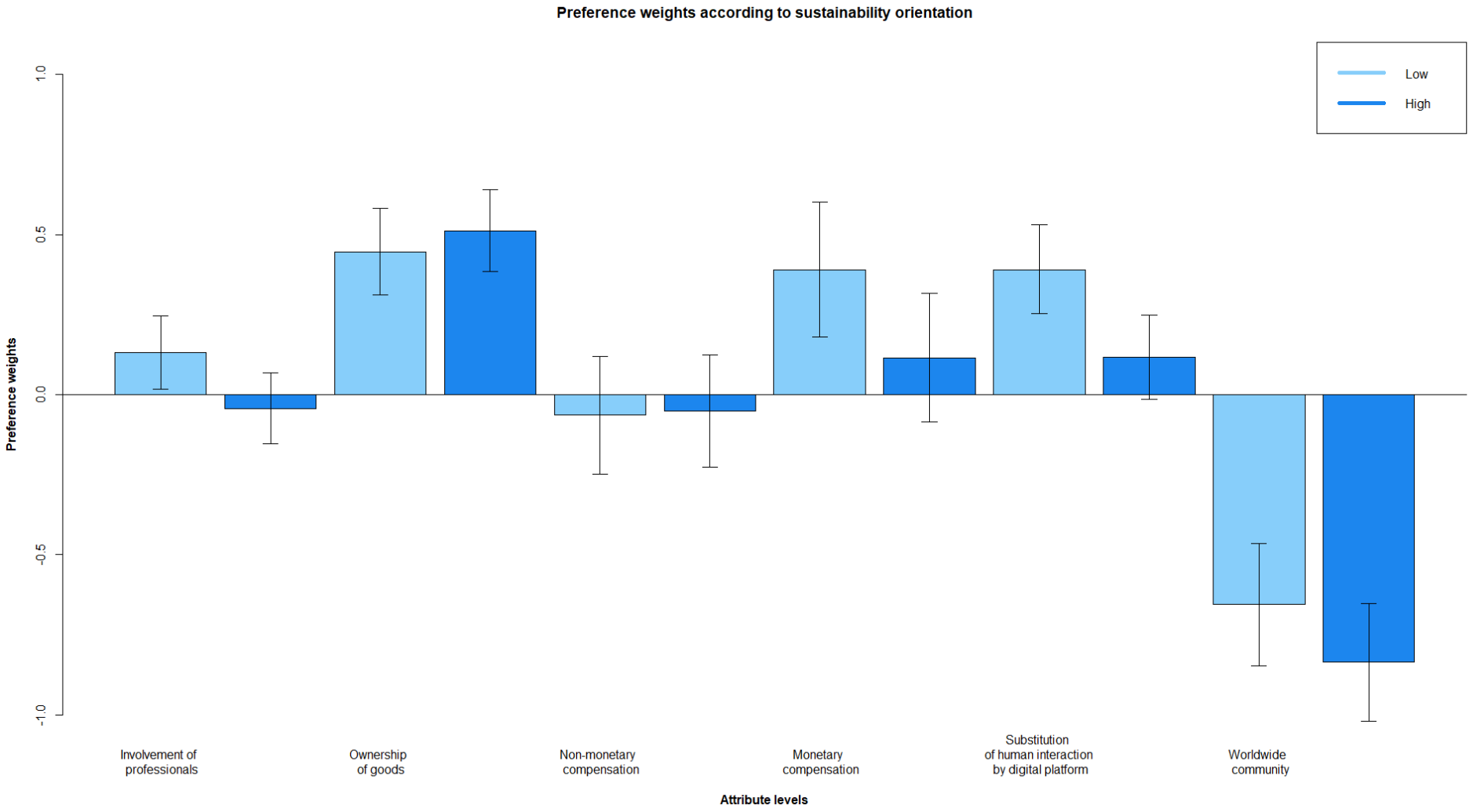

Figure 12 - Preference weights and corresponding confidence intervals according to sustainability orientation

Attribute importances

Respondents with low sustainability orientation give the least weight to the level of professional involvement (6%) and the most weight to the level of openness (32%). The attribute importance scores for each of the five dimensions are shown graphically in Figure 13. Among respondents with high sustainability orientation, the order in relative importance of dimensions (from low to high) is: professional involvement (3%), digitalization (7%), compensation (10%), resource transfer (31%) and openness (50%). The attribute importances for each of the five dimensions are also shown graphically in Figure 13.

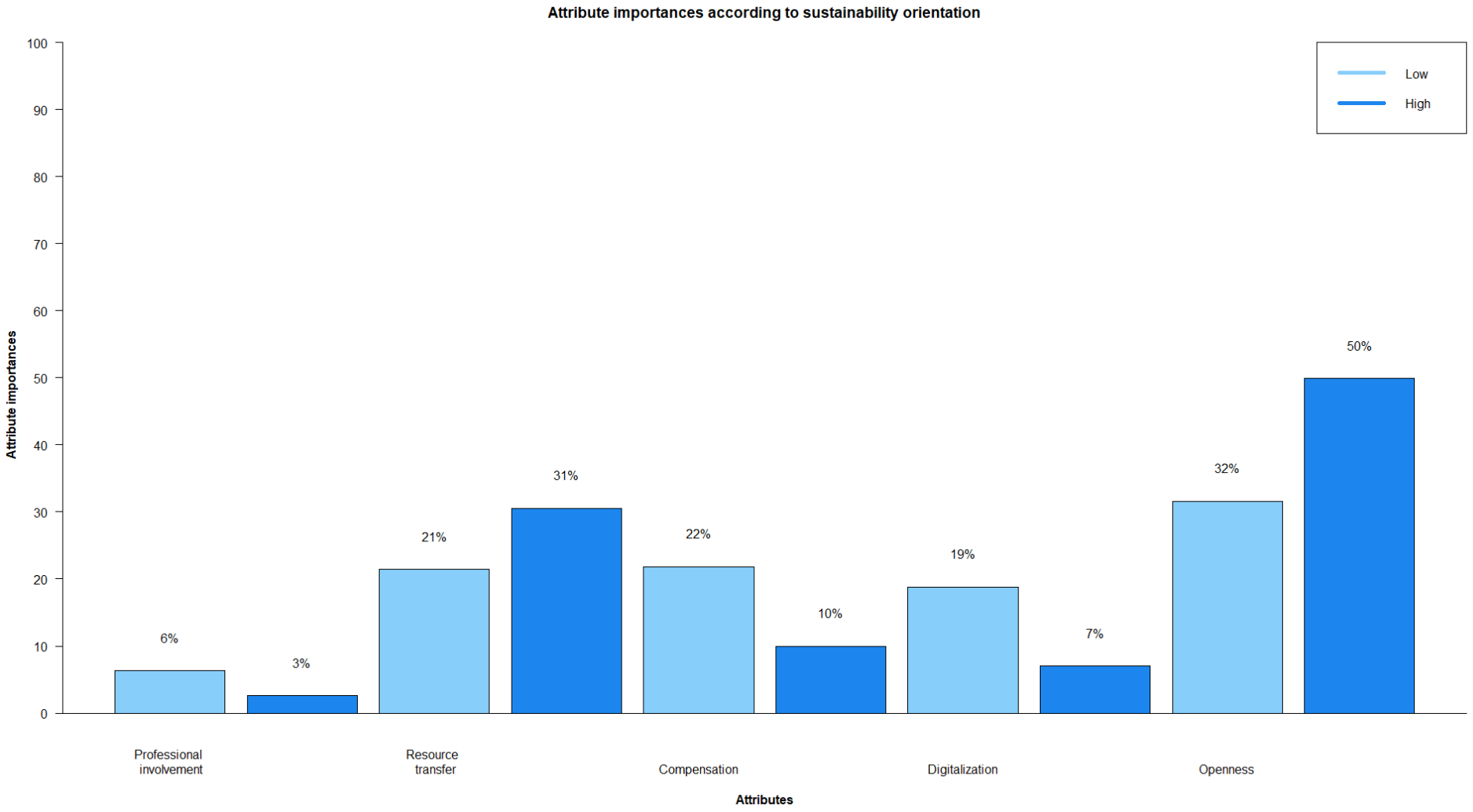

Figure 13 - Attribute importances according to sustainability orientation

4.2.7. Moderation included in the model using interaction terms

Following Zanoli, Naspetti, Janssen, & Hamm (2015), we also estimate a logistic regression model that includes all moderating variables as interaction effects. The coefficient estimates of this model are given in Table 17. Based upon Akaike's Information Criterion, we find that the model that includes all moderating variables as interaction effects, performs better than the model at aggregate level that does not take into account the moderating variables. This approach finds that next to ownership of goods, monetary compensation, substitution of human interaction by digital platform and worldwide community, the attribute level involvement of professionals is also desired by all respondents. It can be noted that male respondents are more affected by monetary compensation which is in line with previous findings. With regard to the moderating variable age, this model does find a difference in preference weights between the two subgroups of this variable (< 32 years old and ≥ 32 years old). Respondents belonging to the higher age category have a lower preference for ownership of goods. Next, regarding the moderating variable primary residence, we once again find that respondents residing in urban areas have a lower preference for involvement of professionals compared to respondents residing in rural areas. Finally, for the moderating variable sustainability orientation, we again find that respondents with a high sustainability orientation prefer the attribute level substitution of human interaction by digital platform less than respondents with a low sustainability orientation.

Table 17 - Parameter estimates of the logistic regression model with interaction effects

Attribute level	Estimate	p-value
Involvement of professionals	0.194001	0.01624 *
Ownership of goods	0.531515	2.75e-08 ***
Non-monetary compensation	-0.059002	0.64796
Monetary compensation	0.354601	0.01704 *
Substitution of human interaction by digital platform	0.418591	1.77e-05 ***
Worldwide community	-0.626219	3.21e-06 ***
Involvement of professionals * Gender	-0.010957	0.89990
Ownership of goods * Gender	0.002253	0.98237
Non-monetary compensation * Gender	-0.235762	0.08857
Monetary compensation * Gender	0.448128	0.00523 **
Substitution of human interaction by digital platform * Gender	0.112098	0.28244
Worldwide community * Gender	0.062628	0.66676
Involvement of professionals * Age	0.041903	0.61431
Ownership of goods * Age	-0.238392	0.01445 *
Non-monetary compensation * Age	-0.010389	0.93729
Monetary compensation * Age	-0.020154	0.89454
Substitution of human interaction by digital platform * Age	-0.163705	0.10000
Worldwide community * Age	-0.160092	0.24717
Involvement of professionals * Primary residence	-0.193229	0.02176 *
Ownership of goods * Primary residence	0.028834	0.77005
Non-monetary compensation * Primary residence	0.149720	0.26327
Monetary compensation * Primary residence	-0.204228	0.18486
Substitution of human interaction by digital platform * Primary residence	0.005916	0.95316
Worldwide community * Primary residence	0.023490	0.86678
Involvement of professionals * Sustainability orientation	-0.130955	0.12202
Ownership of goods * Sustainability orientation	0.097316	0.32701
Non-monetary compensation * Sustainability orientation	0.004458	0.97358
Monetary compensation * Sustainability orientation	-0.271851	0.07918
Substitution of human interaction by digital platform * Sustainability orientation	-0.255637	0.01167 *
Worldwide community * Sustainability orientation	-0.159278	0.25840

Note. * refers to a p-value < 0.05, ** refers to a p-value < 0.01 and *** refers to a p-value < 0.001

4.2.8. Robustness check at aggregate level

A discrete choice experiment allows to assess user preferences in an indirect way. By forcing respondents to choose between sharing businesses that vary among a limited number of dimensions, the importance values of the attributes and the preference values of the attribute levels can be detected. To demonstrate that conjoint analysis succeeds to identify user preferences, we opted to perform a robustness check at aggregate level. For this reason, additional slider questions were included in the questionnaire (cf., block 6 in the survey). These slider questions directly ask the respondents to rate each level of the sharing business dimensions on a scale ranging from 0 to 10, so that the respondents are given the feeling of merely scoring a sharing business dimension level according to their preferences. As mentioned in section 3.2., also the medium levels for the dimensions digitalization and openness are included in the slider questions because slider questions require less effort from respondents than conjoint questions. By including the medium levels in the analysis, comparison can also be made between preference for the medium level and the higher level, which is not an outcome of the regression model used to analyze the conjoint questions. Paired-samples T tests and Repeated Measures ANOVA were applied to the slider scores in SPSS (at the 5% significance level).

The results of the tests on aggregate level (all respondents in the final dataset) confirm that respondents have no significant desire for involvement of professionals over peer-to-peer transactions. The results also indicate that users indeed have a significant preference for ownership of goods over access to goods. Conjoint analysis did not find a significant preference for non-monetary compensation over no compensation but did find a significant desire for monetary compensation over no compensation. The analysis based on the slider questions, however, indicates that respondents like monetary compensation over non-monetary compensation, but also non-monetary compensation over no compensation. This difference in significance might be due to the fact that respondents' feel that any transaction should receive some compensation (reciprocity). Hence, it might be more socially acceptable to choose non-monetary compensation over no compensation at all. With regard to the different levels of the dimension digitalization, it holds that users have a higher desire for complementation of human interaction by digital platform compared to sharing initiatives that make no use of a digital platform but also compared to sharing businesses that use a digital platform to substitute human interaction. The difference in preference between no digital platform and substitution of human interaction by digital platform, however, is not significant. This deviation from the results of the conjoint analysis at aggregate level might be caused by the fact that respondents want to indicate preference for a digital platform in the conjoint questions, but they do not want to entirely replace social interactions with that platform. With regard to the preferences for the levels of the dimension openness, the following order was found (high to low preference): local communities,

regional communities, worldwide communities. Thus, the findings from the conjoint questions are confirmed for the dimension openness.

4.3. The impact of the coronavirus on user engagement

During the time of writing this master's dissertation, the coronavirus broke out in China. This outbreak has far-reaching – literally and figuratively – consequences beyond the spread and the control of the disease itself, including social and economic disruptions. As the situation escalated, the Belgian government declared a national lockdown on the 17th of March. It is highly likely that due to this pandemic, user behavior will be heavily affected. To provide exploratory insights in the influence of the coronavirus outbreak on user engagement in the sharing economy, a few questions where added to the survey to gauge respondents' opinion about this matter. The results indicate that only 7.57% (n = 29) of the participants in the final dataset were influenced by the corona crisis when choosing between sharing businesses. These participants indicated that due to the COVID-19 outbreak, they are more inclined to shop local and/or through digital platforms to avoid human interaction. 92.43% of the respondents (n = 354) stated that the corona crisis did not influence their answers on the conjoint questions. More than 125 of these respondents indicated that they consider the corona crisis a temporary situation that requires temporary adjustments in their consumption behavior. Taking a long-term perspective, these people answered the questions with regard to a "normal" situation. Around 20 respondents indicated that even before the coronavirus outbreak, they preferred to shop local and/or through digital platforms, so the consumption behavior of these people is not influenced by the corona crisis. The remaining respondents who indicated that their answers were not influenced by the corona crisis simply do not see any link between the sharing of clothing and the COVID-19 virus (e.g., some participants are convinced that the transfer of the virus does not occur through clothing). As a result, they will not change their consumption behavior because of it.

Almost a month after the declaration of the national lockdown, on the 14th of April, the Belgian newspaper De Tijd already headlined "Zwaarste test ooit voor deeleconomie" [Hardest test ever for the sharing economy](De Preter, 2020). In the article, the author questions whether users' intention to engage in sharing businesses will be affected by the corona crisis because of fear for contamination. This dissertations' preliminary findings indicate – in line with the statistics published by Statista (2020) – that only a minority of users considers their consumption behavior to be affected by the COVID-19 outbreak.

5. Discussion

5.1. Theoretical implications

Based upon the extensive literature review, this master's dissertation first introduces a definition for the sharing economy as part of the circular economy. To allow for variation in sharing business models, a typology for sharing businesses is constructed, also based upon the systematic literature review. To contribute to a better understanding of circular business models, this master's dissertation explores user engagement with sharing businesses with circular potential. Indeed, user engagement with circular business models like sharing businesses is proposed as a key avenue for future research among researchers, policymakers and practitioners (e.g., Fehrer & Wieland, 2020; Khitous et al., 2020). Specifically, we use a discrete choice experiment to empirically investigate user engagement with sharing businesses. This conjoint analysis enriches the existing literature on user engagement with sharing businesses by determining the relative importance of the sharing business dimensions and the relative utility of the sharing business dimension levels. Table 18 summarizes the results of the discrete choice experiments. In what follows, we further detail the theoretical implications that follow from our results.

In general, users do not have a preference for peer-to-peer sharing or for sharing businesses that involve professionals. On the one hand, research argues that users favor peer-to-peer transactions because of – among others – financial benefits and social interactions (Hawlitschek, Teubner, & Gimpel, 2018). However, users are also considered to be reluctant to peer-to-peer activities because of the uncertainty and risks regarding expected performance (e.g., "stranger danger")(Hawlitschek et al., 2018). Users that reside in rural areas and users with low sustainability orientation, however, prefer involvement of professionals over peer-to-peer transactions. For the former subgroup, this desire might be explained by the fact that peer-to-peer transactions are more effective in densely populated areas. The latter subgroup is considered to be more driven by economic benefits than by social and environmental benefits, which might offer an explanation for this preference.

All experiments conclude that a preference exists for ownership of goods as opposed to access to goods. Lack of ownership is considered a key barrier in the transition to a circular economy (Singh & Giacosa, 2019). For example, a majority of product service systems research concludes that "consumers still prefer to purchase and own products instead of accessing them" (Akbar & Hoffmann, 2018, p. 416). Users' preference for ownership over access might be the result of the barriers to access-based services as identified by Hazée, Delcourt, & Van Vaerenbergh (2017): complexity, reliability, contamination, responsibility, compatibility and image. With regard to contamination, Hazée, Van

Vaerenbergh, Delcourt, & Warlop (2019) conclude that contamination concerns are a prominent issue for access-based services and that contamination concerns are stronger for objects used in proximity to users' bodies (e.g., clothing). Lang (2018) focuses on access-based consumption in the fashion industry and finds that perceived financial, performance and psychological risks impede user engagement with access-based clothing initiatives.

Next, no conjoint experiment detects a significant preference for the attribute level non-monetary compensation. With regard to monetary compensation, a significant influence on user engagement is found on aggregate level and for the subgroups male, rural, low sustainability orientation and for both subgroups of the variable age. Users might be reluctant to non-monetary compensation for offerings because they need to have what the other wants and also, agreeing on the value of the goods and services involved in the transaction might cost considerable effort (e.g., performance risk). The majority of users favors conventional transactions that include reciprocity in the form of monetary compensation.

Except for the subgroup of respondents with a high sustainability orientation, all experiments further indicate a significant preference for sharing businesses that make use of a digital platform that substitutes human interaction over sharing businesses that do not make use of an online platform. This desire for the presence of a digital platform might be because digital technologies reduce transaction costs (Frenken & Schor, 2017; Parente et al., 2018; Plewnia & Guenther, 2018). Indeed, "online shopping allows consumers to save money, effort, and time" (Al-Debei, Akroush, & Ashouri, 2015, p. 708). For example, the availability of a digital platform enables users to more easily search and select products and services. Furthermore, an online platform makes shopping possible at any moment in time and from any location. Next to utilitarian benefits, also hedonic benefits (e.g., enjoyment) are considered key drivers for online shopping (Forsythe, Liu, Shannon, & Gardner, 2006; Sarkar, 2011). Compared to respondents with a high sustainability orientation, respondents with a low sustainability orientation focus more on financial benefits than on social and environmental benefits, which might explain the difference in preference for the dimension digitalization between the subgroups.

We conclude that users desire local initiatives over worldwide communities. Our findings can be positioned in the field of country-of-origin effect research. This domain argues that consumers have a preference for domestic products over foreign products (Bilkey & Nes, 1982; Wang, Siu, & Hui, 2004). Beaudoin, Moore, & Goldsmith (2000, p. 1) find that consumers show "more positive attitudes toward domestic apparel than imported apparel". Research on the country-of-origin effect of stores, however,

is lacking (Chaney & Gamble, 2008). Nonetheless, users of sharing businesses might favor local initiatives because they respect the local culture or they want to support the local economy (Özsomer, 2012; Winit, Gregory, Cleveland, & Verlegh, 2014). Local activities might also be associated with a lower burden on the environment and a higher sense of belonging. Indeed, both environmental benefits and social benefits are – next to financial benefits – often highlighted as motivations to engage in sharing initiatives (Böcker & Meelen, 2017; Tussyadiah, 2014).

For the moderating variable gender, we only find a difference in preference for the attribute level monetary compensation. As such, our results contradict Böcker & Meelen (2017) who find no significant difference between female and male users for the economic motivations to sharing economy participation. Regarding the moderating variable age, we find the same effects for both subgroups. This also contradicts Böcker & Meelen (2017, p. 35) who find that "older people are significantly less economically motivated and significantly more socially motivated". Regarding the moderating variable primary residence, a significant liking difference is found for the attribute levels involvement of professionals and monetary compensation. Our research thus confirms Sharma & Foropon (2019), who find that city impacts the type of green purchase made. Finally, for the moderating variable sustainability orientation, most partworths differ, i.e. the preference weights for involvement of professionals, monetary compensation and substitution of human interaction by digital platform are significantly different, thereby confirming that sustainability orientation does influence user behavior (e.g., Hartmann & Apaolaza-Ibáñez, 2012; Huang, Lin, Lai, & Lin, 2014; Lawson, Gleim, Perren, & Hwang, 2016).

On the level of the dimensions, results indicate that for every performed analysis, the least important attribute is professional involvement and the most important dimension is openness. User might be least sensitive to the level of professional involvement because the boundaries between non-professionals and professionals are blurred in contemporary markets. This is in line with the actor logic in Service Dominant Logic research. In this research field, actors are considered generic, both non-professionals and professionals can fulfill the role of economic and social actors (Ekman, Raggio, & Thompson, 2016). Following the Service Dominant Logic perspective, Vargo & Lusch (2011, p. 1) even argue that "all exchange can be considered B2B". High sensitivity to the level of openness can be linked to the fact that multiple respondents mentioned a preference for local initiatives in the open questions regarding the influence of the corona crisis (cf., subsection 4.3.).

Our analyses indicate that users go through a complex process when making trade-offs between consumption alternatives to engage in. User engagement is not only a function of expected economic or functional benefits but also of other – more social – benefits (cf., Social Exchange Theory). Furthermore, we find that users' sustainability orientation – which we defined as the extent to which users expect environmental and social benefits – influences user engagement. Indeed, in the current socioeconomic setting, sustainability orientation is becoming more and more institutionalized (Buerke, Straatmann, Lin-Hi, & Müller, 2017; Fehrer & Wieland, 2020). As a result, users' sustainability orientation is essential when investigating user engagement, not only in sharing or circular economy contexts.

Taken together, this research – which focuses on the impact of sharing business dimension levels and sharing business dimensions in general on user engagement with sharing businesses in a specific industry (the fashion industry) – advances the user engagement literature, the sharing business literature and the literature on the circular transition.

Table 18 - Overview of conjoint analyses

Attribute level	Aggregate level	Gender		Age		Primary residence		Sustainability orientation	
		Female	Male	< 32 years old	>= 32 years old	Rural	Urban	Low	High
Involvement of professionals						+		+	
Ownership of goods	+	+	+	+	+	+	+	+	+
Non-monetary compensation									
Monetary compensation	+		+	+	+	+		+	
Substitution of human interaction by digital platform	+	+	+	+	+	+	+	+	
Worldwide community	-	-	-	-	-	-	-	-	-

5.2. Practical implications

By pointing out how users make trade-offs between clothing sharing alternatives with circular potential, the described analyses offer valuable insights for both practitioners and policymakers. Regarding sharing business dimension levels, we detect which levels add value to or detract value from fashion sharing activities (cf., preference weights). Furthermore, we uncover how much users focus on each of the dimensions by calculating relative importance scores (cf., attribute importances). Relying upon these insights, clothing sharing initiatives can be optimized by combining the dimension levels that most positively influence user engagement. As a result, new types of sharing businesses might be introduced to the market, but also existing sharing business configurations might be modified to be more appealing to users. With our insights, fashion sharing businesses can enter the market with configurations that are desired by users, which increases their chances for success. Policymakers can support these initiatives by educating practitioners about and guiding practitioners according to our recommendations. Furthermore, policymakers can bolster these initiatives by introducing regulations and measures that facilitate the deployment of the most desired attribute levels. Overall, our insights give evidence-based directions to both practitioners and policymakers for attracting users and eliciting user engagement in the fashion sharing economy, which ultimately contributes to slowing down the resource loops in this sector.

5.3. Limitations and suggestions for future research

This study has limitations and avenues for future research. First of all, the conceptual framework builds upon the contention that the expected benefits determine the relative importance of the sharing business dimensions and their levels for users. Indeed, extant research suggests that user engagement with sharing businesses is – in line with Social Exchange Theory (Blau, 2017) – a unique function of the perceived benefits (e.g., Hamari et al., 2016; Möhlmann, 2015; Zhang et al., 2019). However, research does not clarify how the perceived benefits are shaped by the sharing business dimensions and their levels. To date, the link between the sharing business dimensions and dimension levels and perceived economic, social and environmental benefits has not yet been explored. In other words, the mechanisms through which different types of sharing businesses may generate user engagement are unclear.

Several limitations are related to the discrete choice conjoint experiment. First, in a conjoint experiment, respondents can only handle a limited number of attributes and attribute levels (Bojković et al., 2019). This led to the exclusion of the medium levels of the dimensions digitalization and openness (cf., 3.1.). The trade-offs that users make when deciding upon alternatives in a choice

experiment are less complex than the trade-offs users make in reality (Stöckigt et al., 2018). Second, the survey used is a stated preference survey. Actual behavior of users, however, might differ from users' stated preferences (Bojković et al., 2019; Prell et al., 2020). This is the so-called attitude-behavior gap (Prell et al., 2020). Third, conjoint surveys are considered to be cognitive intensive for respondents. This can result in low response rates and data quality issues because of fatigue (Bojković et al., 2019).

Limitations also result from the experimental setting. This research focuses on users in the role of consumers. However, it might be interesting to investigate whether the results vary for providers because not only consumers are a prerequisite for a sharing business to succeed, also providers are indispensable. Here, we contend that the expected benefits determine the relative importance of the sharing business dimensions for users. Böcker & Meelen (2017), for example, find that in the sharing economy, users are more economically motivated than providers. Therefore, the relative importance of the sharing business dimensions and levels might be different for users and providers. Furthermore, the empirical investigation of user engagement focuses on sharing businesses in the fashion industry. However, Böcker & Meelen (2017) and Möhlmann (2015) both find different results for user engagement in different sharing economy sectors and so it is highly likely that also the relative importance of the sharing business dimensions and their levels varies across industries. Finally, limitations because of data collection mechanisms and sample composition are also present. Even though the sample is quite heterogenous, the respondents all have Belgian nationality and thus they may be culturally biased. To respond to this limitation, the same study should be repeated in different countries. As a result of the limitations that were mentioned in this paragraph, findings cannot be generalized to all users in all industries.

Several authors (e.g., Frenken & Schor, 2017; Möhlmann, 2015) argue that trust with sharing businesses is of extreme importance. Therefore, we encourage that future research investigates trust-mechanisms in the sharing economy. Next to investigating trust, investigating failure recovery in the sharing economy also holds promises for future research. Furthermore, in a 2019 article of Harvard Business Review (White, Hardisty, & Habib, 2019), it is argued that social influence is an effective approach to overcome the intention-action gap in sustainability contexts. We thus motivate researchers to investigate to what extent social network influences users' attitude and behavior with regard to sharing initiatives. Finally, several researchers contend that the branding of sharing businesses is a particularly important, yet ignored challenge facing managers, resulting in many calls for linking the branding literature with the sharing business literature (e.g., Hopkinson et al., 2018). On the one hand, researchers contend that sharing businesses have to promote all sustainable circular economy principles (Epure & Bucea-Manea-Tonis, 2017), while other studies point out that some users

opt for sharing businesses because of their economic rather than their environmental or social benefits (Hamari et al., 2016; Zhang et al., 2019). Thus, research still has to provide insight into the conditions under which signaling benefits contributes to user engagement with sharing businesses, as existing research is ambiguous with regard to the relevance of promoting the economic, environmental and/or social benefits of sharing businesses (e.g., Epure & Bucea-Manea-Tonis, 2017; Hamari et al., 2016; Zhang et al., 2019).

6. Conclusion

The sharing economy is a heavily contested concept. Given the overload of definitions and overlapping or competing terms, this master's dissertation first of all wants to provide clarity by defining the sharing economy as part of the circular economy. After a systematic review of the literature, this research broadly defines the sharing economy as a socioeconomic system in which entities collaborate in increasing the utilization rate of resources.

Within the sharing economy different business models emerge. Therefore, the introduced broad definition of the sharing economy is supplemented with five sharing business dimensions along which sharing businesses may vary from low to high. The first sharing business dimension, professional involvement, denotes the extent to which the sharing business involves professional users. The next dimension, resource transfer, refers to the extent to which the sharing of offerings goes along with transfer of ownership from provider to consumer. The third sharing business dimension, compensation, represents the extent to which providers get a monetary compensation for sharing their offerings. The fourth sharing business dimension, digitalization, refers to the extent to which human interaction for sharing is substituted by digital platform technologies. The final dimension, openness, denotes the extent to which sharing businesses are open to broad communities without geographical boundaries.

Next, this paper synthesizes the articles in the literature set that empirically investigate user engagement with sharing businesses. It is concluded that these articles focus on aspects of user engagement such as intention to use and intention to recommend. Furthermore, this dependent variable of user engagement is related to explanatory variables such as utility, enjoyment, and trust. Thus, none of the in-depth investigated articles hypothesize that sharing business dimensions and dimension levels influence user engagement.

Therefore, we construct a conjoint experiment to answer our research questions about the impact of sharing business dimension levels and the sharing business dimensions in general on user engagement relying on Social Exchange Theory. Specifically, we identify the preferences of users in the sharing economy with regard to the introduced sharing business dimensions and levels. We find that users have a preference for ownership of goods over access to goods, monetary compensation over no compensation, substitution of human interaction by a digital platform over no digital platform and local communities over worldwide communities. We also observe that preferences for the sharing business dimension levels varies according to gender, primary residence and sustainability orientation,

but not according to age. For the sharing business dimensions, we uncover that the involvement of professionals has the least influence on user engagement and the openness of the communities has the most influence on user engagement.

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Appendices

Appendix A. Articles from the Web of Science database

Author (Year)	Title
Aboulamer (2018)	Adopting a Circular Business Model Improves Market Equity Value
Acquier et al. (2019)	How to Create Value(s) in the Sharing Economy: Business Models, Scalability, and Sustainability
Agrawal & Bellos (2017)	The Potential of Servicizing as a Green Business Model
Agyemang et al. (2019)	Drivers and Barriers to Circular Economy Implementation
Andreassen et al. (2018)	Business Model Innovation and Value-Creation: The Triadic Way
Barbu et al. (2018)	From Ownership to Access: How the Sharing Economy is Changing the Consumer Behavior
Boons & Bocken (2018)	Towards a Sharing Economy - Innovating Ecologies of Business Models
Breuer, Fichter, Lüdeke-Freund, & Tiemann (2018)	Sustainability-Oriented Business Model Development: Principles, Criteria and Tools
Canning & Hanmer-Lloyd (2007)	Trust in Buyer-Seller Relationships: The Challenge of Environmental (Green) Adaptation
Cohen & Kietzmann (2014)	Ride On! Mobility Business Models For The Sharing Economy
Dreyer et al. (2017)	Upsides and Downsides of the Sharing Economy: Collaborative Consumption Business Models' Stakeholder Value Impacts and Their Relationship to Context
Esposito et al. (2017)	Is the Circular Economy New Fast-Expanding Market?
Grinevich et al. (2017)	Green Entrepreneurship in the Sharing Economy: Utilising Multiplicity of Institutional Logics
Kathan et al. (2016)	The Sharing Economy: Your Business Model's Friend or Foe?
Kim (2013)	Under What Conditions Will Social Commerce Business Models Survive?
Munoz & Cohen (2017)	Mapping Out the Sharing Economy: A Configurational Approach to Sharing Business Modeling
Onete et al. (2018)	Sharing Economy: Challenges and Opportunities in Tourism
Plewnia & Guenther (2018)	Mapping the Sharing Economy for Sustainability Research

Author (Year)	Title
Sehnem, Campos, Julkovski, & Cazella (2019)	Circular Business Models: Level of Maturity
Sousa-Zomer & Cauchick-Miguel (2019)	Exploring Business Model Innovation for Sustainability: An Investigation of Two Product-Service Systems
Taeuscher & Kietzmann (2017)	Learning from Failures in the Sharing Economy

Appendix B. Articles from the ScienceDirect database

Author (Year)	Title
Acquier et al. (2017)	Promises and Paradoxes of the Sharing Economy: An Organizing Framework
Barnes & Mattsson (2017)	Understanding Collaborative Consumption: Test of a Theoretical Model
Belk (2014)	You Are What You Can Access: Sharing and Collaborative Consumption Online
Böcker & Meelen (2017)	Sharing for People, Planet or Profit? Analysing Motivations for Intended Sharing Economy Participation
Frenken & Schor (2017)	Putting the Sharing Economy into Perspective
Ganapati & Reddick (2018)	Prospects and Challenges of Sharing Economy for the Public Sector
Parente et al. (2018)	The Sharing Economy Globalization Phenomenon: A Research Agenda
Parguel et al. (2017)	Sustainability of The Sharing Economy in Question: When Second-Hand Peer-To-Peer Platforms Stimulate Indulgent Consumption
Zhang et al. (2019)	What Makes the Sharing Economy Successful? An Empirical Examination of Competitive Customer Value Propositions

Appendix C. Articles from snowball sampling

Author (Year)	Title
Bardhi & Eckhardt (2012)	Access-Based Consumption: The Case of Car Sharing
Belk (2014a)	Sharing versus Pseudo-Sharing In Web 2.0
Hamari et al. (2016)	The Sharing Economy: Why People Participate in Collaborative Consumption
Martin (2016)	The Sharing Economy: A Pathway to Sustainability or A Nightmarish Form of Neoliberal Capitalism?
Möhlmann (2015)	Collaborative Consumption: Determinants of Satisfaction and the Likelihood of Using a Sharing Economy Option Again
Schor (2014)	Debating the Sharing Economy

Appendix D. Survey (in Dutch)

User engagement in sharing businesses (Marie-Julie De Bruyne)

Start of Block: Introduction

Beste respondent

Ik ben een laatstejaarsstudent Handelsingenieur aan de Universiteit Gent en in het kader van mijn masterproef stel ik u graag enkele vragen over deelinitiatieven, i.e., initiatieven die inzetten op het delen van onderbenutte goederen. Het doel van dit wetenschappelijk onderzoek is om inzicht te krijgen in de **voorkeuren van gebruikers van deelinitiatieven die focussen op het delen van kleding** (variërend van bijvoorbeeld lokale tweedehandswinkels tot online kledingruil).

Het invullen van deze vragenlijst zal **ongeveer 10 minuten** duren. De vragenlijst is **anoniem** en de resultaten worden op anonieme wijze bewaard, gerapporteerd en verwerkt. U kan op elk moment uw deelname aan het onderzoek stopzetten zonder consequenties.

Door op onderstaande blauwe pijl te klikken, bevestigt u dat:

- u bovenstaande informatie gelezen hebt,
- u weet dat u deelneemt aan wetenschappelijk onderzoek,
- u ouder dan 18 jaar bent,
- u uit vrije wil deelneemt aan het onderzoek,
- u toestemming geeft aan de onderzoekers om de resultaten op anonieme wijze te bewaren, te verwerken en te rapporteren,
- u op de hoogte bent van de mogelijkheid om de deelname aan het onderzoek op ieder moment stop te zetten zonder consequenties,
- u het doel van de vragenlijst begrijpt.

Mocht u nog vragen of opmerkingen hebben over het onderzoek, neem dan gerust contact met mij op via MarieJulie.DeBruyne@UGent.be.

Hartelijk dank voor uw deelname aan dit onderzoek!

Marie-Julie De Bruyne
2e Master Handelsingenieur – Data Analytics

Contactinformatie hoofdonderzoeker UGent
Prof. Dr. Katrien Verleye
Vakgroep Marketing, Innovatie en Organisatie
Tweekerkenstraat 2 – 9000 Gent
Katrien.Verleye@UGent.be

End of Block: Introduction

Start of Block: Introduction questions

Welke van de volgende transacties hebt u ooit gedaan om kleding te verkrijgen? U kan meerdere opties aanduiden.

- ☐ Nieuwe kleding kopen
- ☐ Tweedehands kleding kopen
- ☐ Kleding huren/lenen
- ☐ Kleding swappen/ruilen
- ☐ Zelf kleding maken
- ☐ Andere – specificeer… _____

Uit hoeveel procent van elk soort kleren bestaat uw kleerkast ongeveer? Het totaal moet gelijk zijn aan 100.

Nieuwe kleding : _____

Tweedehands kleding : _____

Gehuurde/geleende kleding : _____

Geswapte/geruilde kleding : _____

Zelfgemaakte kleding : _____

Andere – specificeer… : _____

Total : _____

End of Block: Introduction questions

Start of Block: Introduction to conjoint

Op volgende pagina zal u kunnen kiezen uit verschillende kledingdeelinitiatieven. Elk initiatief is een combinatie van 5 eigenschappen, gelieve deze vijf eigenschappen aandachtig te lezen:

(1) Betrokkenheid van professionele verdelers:

- Peers bieden kleding aan (i.e., peer-to-peer). Bij peer-to-peer initiatieven bieden mensen elkaar kleding aan. Dit kunnen vrienden, kennissen, onbekenden... zijn.
- Professionele verdelers bieden kleding aan (i.e., bedrijven, organisaties)

(2) Eigendomsoverdracht:

- Tijdelijke eigendomsoverdracht (i.e., uitlenen van kleding)
- Permanente eigendomsoverdracht (i.e., overdragen van kleding)

(3) Vergoeding:

- Aanbieders krijgen geen vergoeding voor het delen van kleding (i.e., een gift)
- Aanbieders krijgen een vergoeding zonder tussenkomst van geld voor het delen van kleding (i.e., in ruil voor een product of dienst)
- Aanbieders worden betaald voor het delen van kleding

(4) Aanwezigheid van een digitaal platform:

- Er is geen digitaal platform
- Er wordt gebruik gemaakt van een digitaal platform dat alle menselijke interactie vervangt

(5) Territorium van het deelinitiatief:

- Een lokaal deelinitiatief
- Een wereldwijd deelinitiatief

End of Block: Introduction to conjoint

Start of Block: Conjoint questions

Klik op de optie die u verkiest als consument.

○ Een **lokaal** deelinitiatief dat **geen** gebruik maakt van een digitaal platform waarbij professionele verdelers kleding tijdelijk uitlenen aan consumenten **in ruil voor een vergoeding zonder tussenkomst van geld** (dus in ruil voor een product of dienst).

○ Een **wereldwijd** deelinitiatief dat gebruik maakt van een digitaal platform - dat alle menselijke interactie vervangt - waarbij professionele verdelers kleding tijdelijk uitlenen aan consumenten **zonder daar enige vergoeding voor te krijgen.**

Klik op de optie die u verkiest als consument.

- ○ Een **lokaal** deelinitiatief dat geen gebruik maakt van een digitaal platform waarbij **peers** kleding tijdelijk uitlenen aan consumenten **zonder daar enige vergoeding voor te krijgen.**
- ○ Een **wereldwijd** deelinitiatief dat geen gebruik maakt van een digitaal platform waarbij **professionele verdelers tegen betaling** kleding tijdelijk uitlenen aan consumenten.

Klik op de optie die u verkiest als consument.

- ○ Een lokaal deelinitiatief dat geen gebruik maakt van een digitaal platform waarbij **peers** kleding tegen betaling overdragen aan consumenten.
- ○ Een lokaal deelinitiatief dat geen gebruik maakt van een digitaal platform waarbij **professionele verdelers** tegen betaling kleding overdragen aan consumenten.

Klik op de optie die u verkiest als consument.

- ○ Een **wereldwijd** deelinitiatief dat **geen** gebruik maakt van een digitaal platform waarbij **professionele verdelers** kleding tegen betaling tijdelijk uitlenen aan consumenten.
- ○ Een **lokaal** deelinitiatief dat gebruik maakt van een digitaal platform - dat alle menselijke interactie vervangt - waarbij **peers** tegen betaling kleding tijdelijk uitlenen aan consumenten.

Klik op de optie die u verkiest als consument.

- ○ Een lokaal deelinitiatief dat gebruik maakt van een digitaal platform - dat alle menselijke interactie vervangt - waarbij peers kleding **overdragen** aan consumenten in ruil voor een vergoeding zonder tussenkomst van geld (dus in ruil voor een product of dienst).
- ○ Een lokaal deelinitiatief dat **geen** gebruik maakt van een digitaal platform waarbij peers kleding **tijdelijk uitlenen** aan consumenten in ruil voor een vergoeding zonder tussenkomst van geld (dus in ruil voor een product of dienst).

Klik op de optie die u verkiest als consument.

- ○ Een wereldwijd deelinitiatief dat gebruik maakt van een digitaal platform - dat alle menselijke interactie vervangt - waarbij professionele verdelers kleding overdragen aan consumenten **zonder daar enige vergoeding voor te krijgen.**

- ○ Een wereldwijd deelinitiatief dat gebruik maakt van een digitaal platform - dat alle menselijke interactie vervangt - waarbij professionele verdelers kleding overdragen aan consumenten **in ruil voor een vergoeding zonder tussenkomst van geld** (dus in ruil voor een product of dienst).

Klik op de optie die u verkiest als consument.

- ○ Een **wereldwijd** deelinitiatief dat gebruik maakt van een digitaal platform - dat alle menselijke interactie vervangt - waarbij **peers tegen betaling** kleding **tijdelijk uitlenen** aan consumenten.

- ○ Een **lokaal** deelinitiatief dat **geen** gebruik maakt van een digitaal platform waarbij **professionele verdelers** kleding **overdragen** aan consumenten **zonder daar enige vergoeding voor te krijgen.**

Klik op de optie die u verkiest als consument.

- ○ Een **lokaal** deelinitiatief dat gebruik maakt van een digitaal platform - dat alle menselijke interactie vervangt - waarbij **professionele verdelers** kleding **tijdelijk uitlenen** aan consumenten **zonder daar enige vergoeding voor te krijgen.**

- ○ Een **wereldwijd** deelinitiatief dat gebruik maakt van een digitaal platform - dat alle menselijke interactie vervangt - waarbij **peers tegen betaling** kleding **overdragen** aan consumenten.

Klik op de optie die u verkiest als consument.

○ Een wereldwijd deelinitiatief dat gebruik maakt van een digitaal platform - dat alle menselijke interactie vervangt - waarbij peers kleding **tijdelijk uitlenen** aan consumenten in ruil voor een vergoeding zonder tussenkomst van geld (dus in ruil voor een product of dienst).

○ Een wereldwijd deelinitiatief dat **geen** gebruik maakt van een digitaal platform waarbij peers kleding **overdragen** aan consumenten in ruil voor een vergoeding zonder tussenkomst van geld (dus in ruil voor een product of dienst).

Klik op de optie die u verkiest als consument.

○ Een **wereldwijd** deelinitiatief dat **geen** gebruik maakt van een digitaal platform waarbij **peers** kleding **overdragen** aan consumenten **zonder daar enige vergoeding voor te krijgen.**

○ Een **lokaal** deelinitiatief dat gebruik maakt van een digitaal platform - dat alle menselijke interactie vervangt - waarbij **professionele verdelers** kleding **tijdelijk uitlenen** aan consumenten **in ruil voor een vergoeding zonder tussenkomst van geld** (dus in ruil voor een product of dienst).

Klik op de optie die u verkiest als consument.

○ Een lokaal deelinitiatief dat gebruik maakt van een digitaal platform - dat alle menselijke interactie vervangt - waarbij **professionele verdelers tegen betaling** kleding overdragen aan consumenten.

○ Een lokaal deelinitiatief dat gebruik maakt van een digitaal platform - dat alle menselijke interactie vervangt - waarbij **peers** kleding overdragen aan consumenten **zonder daar enige vergoeding voor te krijgen.**

Klik op de optie die u verkiest als consument.

○ Een wereldwijd deelinitiatief dat geen gebruik maakt van een digitaal platform waarbij **professionele verdelers** kleding **overdragen** aan consumenten **in ruil voor een vergoeding zonder tussenkomst van geld** (dus in ruil voor een product of dienst).

○ Een wereldwijd deelinitiatief dat geen gebruik maakt van een digitaal platform waarbij **peers** kleding **tijdelijk uitlenen** aan consumenten **zonder daar enige vergoeding voor te krijgen.**

End of Block: Conjoint questions

Start of Block: Corona

Hebt u zich bij het maken van de keuzes laten beïnvloeden door de Coronacrisis?

○ Ja

○ Nee

End of Block: Corona

Start of Block: Corona IIa

Display This Question:

If Hebt u zich bij het maken van de keuzes laten beïnvloeden door de Coronacrisis? = Ja

Hoe heeft de Coronacrisis uw keuzes beïnvloed?

_____

_____

_____

_____

_____

End of Block: Corona IIa

Start of Block: Corona IIb

Display This Question:

If Hebt u zich bij het maken van de keuzes laten beïnvloeden door de Coronacrisis? = Nee

Waarom heeft de Coronacrisis uw keuzes niet beïnvloed?

_____

_____

_____

_____

_____

End of Block: Corona IIb

Start of Block: Validation questions

Op een schaal van 0 tot 10, beoordeel volgende eigenschappen naargelang uw voorkeur als consument.

	Helemaal niet gewenst 0 1 2 3 4 5 6 7 8 9 10 Helemaal wel gewenst
Een deelinitiatief voor kleding tussen peers	
Een deelinitiatief voor kleding met professionele verdelers	

Op een schaal van 0 tot 10, beoordeel volgende eigenschappen naargelang uw voorkeur als consument.

Helemaal niet gewenst 0 1 2 3 4 5 6 7 8 9 10 Helemaal wel gewenst

Een deelinitiatief voor kleding waarbij kleding tijdelijk wordt uitgeleend	
Een deelinitiatief voor kleding waarbij kleding wordt overgedragen	

Op een schaal van 0 tot 10, beoordeel volgende eigenschappen naargelang uw voorkeur als consument.

Helemaal niet gewenst Helemaal wel gewenst

0 1 2 3 4 5 6 7 8 9 10

Een deelinitiatief voor kleding waarbij aanbieders geen vergoeding krijgen voor het delen van hun kleding	
Een deelinitiatief voor kleding waarbij aanbieders een niet-monetaire vergoeding krijgen voor het delen van hun kleding (dus in ruil voor een product of dienst)	
Een deelinitiatief voor kleding waarbij aanbieders een monetaire vergoeding krijgen voor het delen van hun kleding	

Op een schaal van 0 tot 10, beoordeel volgende eigenschappen naargelang uw voorkeur als consument.

Helemaal niet gewenst Helemaal wel gewenst

0 1 2 3 4 5 6 7 8 9 10

Een deelinitiatief voor kleding dat geen gebruik maakt van een digitaal platform	
Een deelinitiatief voor kleding dat gebruik maakt van een digitaal platform dat alle menselijke interactie niet vervangt maar aanvult/complementeert	
Een deelinitiatief voor kleding dat gebruik maakt van een digitaal platform dat alle menselijke interactie vervangt	

Op een schaal van 0 tot 10, beoordeel volgende eigenschappen naargelang uw voorkeur als consument.

	Helemaal niet gewenst 0 1 2 3 4 5 6 7 8 9 10 Helemaal wel gewenst
Een lokaal deelinitiatief voor kleding	
Een regionaal deelinitiatief voor kleding	
Een wereldwijd deelinitiatief voor kleding	

End of Block: Validation questions

Start of Block: Sustainability orientation questions

Geef aan in welke mate u (niet) akkoord gaat met onderstaande stellingen. Deze stellingen hebben betrekking op uw algemeen consumptiegedrag, dus niet enkel op het verkrijgen van kleding.

	Helemaal niet akkoord						Helemaal wel akkoord
Ik vind het belangrijk dat de producten die ik gebruik geen schade toebrengen aan het milieu.	○	○	○	○	○	○	○
Ik hou rekening met potentiële milieu-impact van mijn acties bij het nemen van veel van mijn beslissingen.	○	○	○	○	○	○	○
Mijn aankoopgewoonten worden beïnvloed door mijn bezorgdheid om ons milieu.	○	○	○	○	○	○	○
Ik maak me zorgen over het verspillen van de bronnen van onze planeet.	○	○	○	○	○	○	○
Ik zou mezelf omschrijven als milieuvriendelijk.	○	○	○	○	○	○	○
Ik ben bereid ongemak te ondervinden om acties te nemen die milieuvriendelijker zijn.	○	○	○	○	○	○	○

End of Block: Sustainability orientation questions

Start of Block: Socio-demographic questions

Wat is uw geslacht?

- ○ Man
- ○ Vrouw
- ○ X

Wat is uw leeftijd in jaren?

_____

Hoe zou u uw hoofdverblijfplaats omschrijven?

	1	2	3	4	5	6	7	
Landelijk	○	○	○	○	○	○	○	Stedelijk

Wat is uw hoogste opleidingsniveau?

- ○ Middelbaardiploma of gelijkwaardig
- ○ Bachelordiploma of gelijkwaardig
- ○ Masterdiploma of gelijkwaardig
- ○ Doctoraat of gelijkwaardig
- ○ Geen van bovenstaande

Wat is uw beroepsstatuut?

- ○ Ik studeer nog
- ○ Ik heb een deeltijdse betrekking
- ○ Ik heb een voltijdse betrekking
- ○ Ik werk momenteel niet
- ○ Andere – specificeer... _____

Klik op de blauwe pijl om de vragenlijst af te ronden. Nogmaals bedankt voor uw deelname!

Indien u opmerkingen hebt met betrekking tot deze studie, schrijf deze dan in onderstaand tekstvak.

_____

_____

_____

____

____

End of Block: Socio-demographic questions

Appendix E. R script

```
###################### Survey preparation ######################

# Install packages
install.packages("DescTools")
install.packages("ISwR")
install.packages("matlib")
install.packages("plotrix")
install.packages("support.CEs")
library("DescTools")
library("ISwR")
library("matlib")
library("plotrix")
library("stats")
library("support.CEs")


# Create questionnaire
## Define attributes and levels
atts <- list(prof_inv=c("Peers", "Professionals"),
             own=c("Access","Ownership"),
             comp=c("No","Non-monetary","Monetary"),
             digit=c("No","Substitution"),
             open=c("Local","Worldwide"))

## Create design
des <- rotation.design(attribute.names=atts,
                       nalternatives=2,
                       nblocks=1,
                       randomize=TRUE,
                       seed=345)

## Print design as questionnaire
questionnaire(des)
```

```
###################### Data preparation ######################

# Set directory
setwd("C:/Users/marie/OneDrive/Documenten/Marie-Julie De Bruyne/UGent 1e
master/Masterproef")

# Read data exported from Qualtrics
dat <- read.csv("User+engagement+in+sharing+businesses+(Marie-
Julie+De+Bruyne)_April+25,+2020_02.44.csv")

# Only keep the survey records distributed with the anonymous link
dat <- dat[dat$DistributionChannel=="anonymous",]

# Only keep the survey records that are completely finished
dat <- dat[dat$Finished=="1",]
```

```r
# Amount of Respondents
n <- nrow(dat)

## Note. Removing outliers (e.g., Duration, Age) does not influence
conjoint analysis coefficients and significances at aggregate level.

# Recode variable Gender
dat$Geslacht <- as.character(dat$Geslacht)
dat$Geslacht[dat$Geslacht==1] <- "Male"
dat$Geslacht[dat$Geslacht==2] <- "Female"
dat$Geslacht[dat$Geslacht==3] <- "X"

# Recode variable Age
dat$Leeftijd <- as.character(dat$Leeftijd)
dat$Leeftijd <- as.numeric(dat$Leeftijd)
dat$Leeftijd_Cat[dat$Leeftijd<=24] <- "Age 18 to 24"
dat$Leeftijd_Cat[dat$Leeftijd>24 & dat$Leeftijd<=34] <- "Age 25 to 34"
dat$Leeftijd_Cat[dat$Leeftijd>34 & dat$Leeftijd<=44] <- "Age 35 to 44"
dat$Leeftijd_Cat[dat$Leeftijd>44 & dat$Leeftijd<=54] <- "Age 45 to 54"
dat$Leeftijd_Cat[dat$Leeftijd>54 & dat$Leeftijd<=64] <- "Age 55 to 64"
dat$Leeftijd_Cat[dat$Leeftijd>64] <- "Age 65 and above"

# Median split variable Age
med_age <- median(dat$Leeftijd)
dat$Leeftijd_Med <- ifelse(dat$Leeftijd>=med_age, "High", "Low")

# Recode variable Primary residence
dat$Verblijf_1 <- as.numeric(as.character(dat$Verblijf_1))

# Median split variable Primary residence
med_prim_res <- median(dat$Verblijf_1)
dat$Verblijf_Cat <- ifelse(dat$Verblijf_1>=med_prim_res, "Urban", "Rural")

# Recode variable Education
dat$Opleiding<-as.character(dat$Opleiding)
dat$Opleiding[dat$Opleiding==1]<-"High school"
dat$Opleiding[dat$Opleiding==2]<-"Bachelor"
dat$Opleiding[dat$Opleiding==3]<-"Master"
dat$Opleiding[dat$Opleiding==4]<-"PhD"
dat$Opleiding[dat$Opleiding==5]<-"None"

# Recode variable Occupation
dat$Beroep<-as.character(dat$Beroep)
dat$Beroep[dat$Beroep==1]<-"Student"
dat$Beroep[dat$Beroep==2]<-"Halftime employed"
dat$Beroep[dat$Beroep==3]<-"Fulltime employed"
dat$Beroep[dat$Beroep==4]<-"Unemployed"
table(dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep==5, as.character(dat$Beroep_5_TEXT),
dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep=="reeds een Bachelordiploma behaald, nu
bezig aan een tweede", as.character("Student"), dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep=="Doctoraatsstudent",
as.character("Student"), dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep=="4/5 in hoofdberoep + een bijberoep",
as.character("Fulltime employed"), dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep=="professionele dopper",
as.character("Unemployed"), dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep=="gepensioneerd", as.character("Other"),
dat$Beroep)
```

```r
dat$Beroep <- ifelse(dat$Beroep=="Ik ben met pensioen",
as.character("Other"), dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep=="Gepensioneerd", as.character("Other"),
dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep=="pensioen", as.character("Other"),
dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep=="gepensioneerd", as.character("Other"),
dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep=="Gepensioneerd met bijberoep",
as.character("Other"), dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep=="zelfstandig", as.character("Other"),
dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep=="ik ben zelfstandige",
as.character("Other"), dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep=="Zaakvoerder", as.character("Other"),
dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep=="zelfstandige", as.character("Other"),
dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep=="Zelfstandige", as.character("Other"),
dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep=="Zelfstander", as.character("Other"),
dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep=="ondernemer", as.character("Other"),
dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep=="SCHILDER", as.character("Other"),
dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep=="Specialist", as.character("Other"),
dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep=="Arbeidsongeschiktheid ",
as.character("Other"), dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep=="invalide", as.character("Other"),
dat$Beroep)
dat$Beroep <- ifelse(dat$Beroep=="Werk-student", as.character("Other"),
dat$Beroep)

# Recode variable Sustainability orientation
dat$Sust_1 <- as.numeric(as.character(dat$Sust_1))
dat$Sust_2 <- as.numeric(as.character(dat$Sust_2))
dat$Sust_3 <- as.numeric(as.character(dat$Sust_3))
dat$Sust_4 <- as.numeric(as.character(dat$Sust_4))
dat$Sust_5 <- as.numeric(as.character(dat$Sust_5))
dat$Sust_6 <- as.numeric(as.character(dat$Sust_6))

## Crohnbach alpha
aa <-
DescTools::CronbachAlpha(dat[,c("Sust_1","Sust_2","Sust_3","Sust_4","Sust_5
","Sust_6")])

## Merge scale
for (i in 1:nrow(dat)){
  dat$Sust_Total[i]= mean(c(dat$Sust_1[i],dat$Sust_2[i], dat$Sust_3[i],
dat$Sust_4[i], dat$Sust_5[i], dat$Sust_6[i]))
}

## Median split variable Sustainability orientation
med_sust <- median(dat$Sust_Total)
dat$Sust_Cat <- ifelse(dat$Sust_Total>=med_sust, "High", "Low")

## Absolute and relative frequencies per variable
table(dat$Geslacht)
prop.table(table(dat$Geslacht))*100
```

```
table(dat$Leeftijd_Cat)
prop.table(table(dat$Leeftijd_Cat))*100
table(dat$Leeftijd_Med)
prop.table(table(dat$Leeftijd_Med))*100
table(dat$Verblijf_1)
prop.table(table(dat$Verblijf_1))*100
table(dat$Verblijf_Cat)
prop.table(table(dat$Verblijf_Cat))*100
table(dat$Opleiding)
prop.table(table(dat$Opleiding))*100
table(dat$Beroep)
prop.table(table(dat$Beroep))*100
table(dat$Sust_Cat)
prop.table(table(dat$Sust_Cat))*100

# Sharing fashion behavior
dat$New <- ifelse(grepl("1", as.character(dat$I1), fixed = TRUE), 1, 0)
dat$Second_Hand <- ifelse(grepl("2", as.character(dat$I1), fixed = TRUE),
1, 0)
dat$Renting <- ifelse(grepl("3", as.character(dat$I1), fixed = TRUE), 1, 0)
dat$Swapping <- ifelse(grepl("4", as.character(dat$I1), fixed = TRUE), 1,
0)
dat$DIY <- ifelse(grepl("5", as.character(dat$I1), fixed = TRUE), 1, 0)
dat$Other <- ifelse(grepl("6", as.character(dat$I1), fixed = TRUE),
as.character(dat$I1_6_TEXT), 0)
dat$Other <- ifelse(dat$Other=="Oma die kleding maakt", 0, dat$Other)
dat$Other <- ifelse(dat$Other=="schoonzus was naaister en maakte mijn
kledij", 0, dat$Other)
dat$Other <- ifelse(dat$Other=="Kleding op maat laten maken", 0, dat$Other)
dat$Other <- ifelse(dat$Other=="gemaakt door mijn mama (gebreid)", 0,
dat$Other)
dat$Other <- ifelse(dat$Other=="Kledij laten maken door een naaister", 0,
dat$Other)
dat$Other <- ifelse(dat$Other=="kleding upcycelen", 0, dat$Other)

## Absolute and relative frequencies
table(dat$New)
prop.table(table(dat$New))*100
table(dat$Second_Hand)
prop.table(table(dat$Second_Hand))*100
table(dat$Renting)
prop.table(table(dat$Renting))*100
table(dat$Swapping)
prop.table(table(dat$Swapping))*100
table(dat$DIY)
prop.table(table(dat$DIY))*100

table(dat$Second_Hand+dat$Renting+dat$Swapping)
prop.table(table(dat$Second_Hand+dat$Renting+dat$Swapping))*100
table(dat$Second_Hand+dat$Renting)
prop.table(table(dat$Second_Hand+dat$Renting))*100
table(dat$Second_Hand+dat$Swapping)
prop.table(table(dat$Second_Hand+dat$Swapping))*100
table(dat$Renting+dat$Swapping)
prop.table(table(dat$Renting+dat$Swapping))*100

sum(ifelse(dat$Second_Hand==0 & dat$Renting==0 & dat$Swapping==0 &
dat$Other==0, 1, 0))
sum(ifelse(dat$Second_Hand==1, 1, 0))
sum(ifelse(dat$Renting==1, 1, 0))
sum(ifelse(dat$Swapping==1, 1, 0))
```

```
sum(ifelse(dat$Other!=0, 1, 0))
sum(ifelse(dat$Second_Hand==0 & dat$Renting==1 & dat$Swapping==0 &
dat$Other==0, 1, 0))
sum(ifelse(dat$Second_Hand==0 & dat$Renting==0 & dat$Swapping==1 &
dat$Other==0, 1, 0))
sum(ifelse(dat$Second_Hand==1 & dat$Renting==1 & dat$Swapping==0 &
dat$Other==0, 1, 0))
sum(ifelse(dat$Second_Hand==1 & dat$Renting==0 & dat$Swapping==1 &
dat$Other==0, 1, 0))
sum(ifelse(dat$Second_Hand==0 & dat$Renting==1 & dat$Swapping==1 &
dat$Other==0, 1, 0))
```

```
###################### Conjoint Analysis ######################

# 1.Aggregate level

## Remove the questions that are not part of the choice design
dat.choice <-
dat[,c("C1","C2","C3","C4","C5","C6","C7","C8","C9","C10","C11","C12")]
dat.choice <- apply(dat.choice, 2, function(x) as.numeric(x))

## Put all the answers to the questions in one column
y <- as.vector(t(as.matrix(dat.choice)))

## The answers in y are 1 or 2 and we want to make it 1 or 0 (substracting
y from 2: 1 stays 1 and 2 becomes 0)
y <- 2-y

## Create design matrix
dm <- make.design.matrix(choice.experiment.design=des,
                         categorical.attributes=c("prof_inv", "own",
"comp","digit", "open"),
                         optout=FALSE,
                         unlabeled=TRUE,
                         binary=TRUE)

## Create design matrix for ALL respondents (n)
dm.n <- do.call(rbind, replicate(n, dm[5:10], simplify=FALSE))

## Estimate the model
out <- glm(y~0+as.matrix(dm.n),family = binomial(logit))
summary(out)

## Model goodness of fit
with(out, pchisq(null.deviance - deviance, df.null - df.residual,
lower.tail = FALSE))

## Confidence intervals
conf <-
confint(out,c('as.matrix(dm.n)Professionals','as.matrix(dm.n)Ownership','as
.matrix(dm.n)Non.monetary','as.matrix(dm.n)Monetary','as.matrix(dm.n)Substi
tution','as.matrix(dm.n)Worldwide'),level=0.95)
```

```
## Get all attributes and attribute levels in one barplot (with confidence
intervals)
coef <- c(0, coef(out)[1],0,coef(out)[2],0, coef(out)[3],coef(out)[4],0,
coef(out)[5],0, coef(out)[6])
b <- barplot(coef, main="Preference weights at aggregate
level",ylab="Preference weights", ylim=c(-1.1,1.1), xlab="Attribute
levels", names.arg = c("Peer-to-peer", "Involvement of \n professionals",
"Access \n to goods", "Ownership \n of goods","No compensation", "Non-
monetary \n compensation","Monetary \n compensation", "No \n digital \n
platform", "Substitution \n of human interaction \n by digital platform",
"Local \n community", "Worldwide \n community"), col=c("lightskyblue"),
font.lab=2)
arrows(b, c(0, conf[1,2],0, conf[2,2],0, conf[3,2],conf[4,2],0,
conf[5,2],0, conf[6,2]),
       b, c(0, conf[1,1],0, conf[2,1],0, conf[3,1],conf[4,1],0,
conf[5,1],0, conf[6,1]),
       code=3, angle=90, length =0.1)

## Relative importances
### Create function to calculate the attribute ranges
calc_range <- function(x){
  x <- c(0,x) #put the dummy variable that is omitted (with value 0) in the
range
  return(max(x)-min(x))
}

### Use function for every attribute
range.professionalism <- calc_range(coef(out)[1])
range.ownership <- calc_range(coef(out)[2])
range.compensation <- calc_range(coef(out)[3:4])
range.digitalization <- calc_range(coef(out)[5])
range.openness <- calc_range(coef(out)[6])

## Normalize to calculate the attribute importances
imp.professionalism <- range.professionalism/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.ownership <- range.ownership/(range.professionalism + range.ownership+
range.compensation + range.digitalization + range.openness)
imp.compensation <- range.compensation/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.digitalization <- range.digitalization/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.openness <- range.openness/(range.professionalism + range.ownership+
range.compensation + range.digitalization + range.openness)

## Plot the attribute importances
b <-
barplot(c(imp.professionalism,imp.ownership,imp.compensation,imp.digitaliza
tion,imp.openness)*100,font.lab=2, ylab="Attribute importances",
xlab="Attributes",names.arg=c("Professional \n involvement","Resource \n
transfer","Compensation","Digitalization","Openness"),col=c("lightskyblue")
,axes=FALSE,ylim=c(-5,100),main="Attribute importances at aggregate level")
axis(2,at=seq(0,100,10),lwd=1,lwd.ticks=1,las=1)
text(x=b, y=
c(imp.professionalism,imp.ownership,imp.compensation,imp.digitalization,imp
.openness)*100+5,
labels=c(paste(round(imp.professionalism,2)*100,"%",sep=""),paste(round(imp
```

```
.ownership,2)*100,"%",sep=""),paste(round(imp.compensation,2)*100,"%",sep="
"),paste(round(imp.digitalization,2)*100,"%",sep=""),paste(round(imp.openne
ss,2)*100,"%",sep="")))
abline(h=0)
```

```
# 2a. Analysis with only female respondents
dat.choice <- dat[dat$Geslacht=="Female",]
(n<-nrow(dat.choice))

## Remove the questions that are not part of the choice design
dat.choice <-
dat.choice[,c("C1","C2","C3","C4","C5","C6","C7","C8","C9","C10","C11","C12
")]
dat.choice <- apply(dat.choice, 2, function(x) as.numeric(x))

## Put all the answers to the questions in one column
y <- as.vector(t(as.matrix(dat.choice)))

## The answers in y are 1 or 2 and we want to make it 1 or 0 (substracting
y from 2: 1 stays 1 and 2 becomes 0)
y <- 2-y

## Create design matrix
dm <- make.design.matrix(choice.experiment.design=des,
                         categorical.attributes=c("prof_inv", "own",
"comp","digit", "open"),
                         optout=FALSE,
                         unlabeled=TRUE,
                         binary=TRUE)

## Create design matrix for ALL respondents (n)
dm.n <- do.call(rbind, replicate(n, dm[5:10], simplify=FALSE))

## Estimate the model
out_female <- glm(y~0+as.matrix(dm.n),family = binomial(logit))
summary(out_female)

## Model goodness of fit
with(out_female, pchisq(null.deviance - deviance, df.null - df.residual,
lower.tail = FALSE))

## Confidence intervals
conf_female <-
confint(out_female,c('as.matrix(dm.n)Professionals','as.matrix(dm.n)Ownersh
ip','as.matrix(dm.n)Non.monetary','as.matrix(dm.n)Monetary','as.matrix(dm.n
)Substitution','as.matrix(dm.n)Worldwide'),level=0.95)

## Get all attributes and attribute levels in one barplot (with confidence
intervals)
coef <- c(0, coef(out_female)[1],0,coef(out_female)[2],0,
coef(out_female)[3],coef(out_female)[4],0, coef(out_female)[5],0,
coef(out_female)[6])
b <- barplot(coef, main="Preference weights - Female",ylab="Preference
weights", ylim=c(-1.1,1.1), xlab="Attribute levels", names.arg = c("Peer-
```

```
to-peer", "Involvement of \n professionals", "Access \n to goods",
"Ownership \n of goods","No compensation", "Non-monetary \n
compensation","Monetary \n compensation", "No \n digital \n platform",
"Substitution \n of human interaction \n by digital platform", "Local \n
community", "Worldwide \n community"), col=c("lightskyblue"), font.lab=2)
arrows(b, c(0, conf_female[1,2],0, conf_female[2,2],0,
conf_female[3,2],conf_female[4,2],0, conf_female[5,2],0, conf_female[6,2]),
       b, c(0, conf_female[1,1],0, conf_female[2,1],0,
conf_female[3,1],conf_female[4,1],0, conf_female[5,1],0, conf_female[6,1]),
       code=3, angle=90, length =0.1)
abline(h=0)

## Relative importances
### Create function to calculate the attribute ranges
calc_range <- function(x){
  x <- c(0,x) #put the dummy variable that is omitted (with value 0) in the
range
  return(max(x)-min(x))
}

### Use function for every attribute
range.professionalism <- calc_range(coef(out_female)[1])
range.ownership <- calc_range(coef(out_female)[2])
range.compensation <- calc_range(coef(out_female)[3:4])
range.digitalization <- calc_range(coef(out_female)[5])
range.openness <- calc_range(coef(out_female)[6])

## Normalize to calculate the attribute importances
imp.professionalism_f <- range.professionalism/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.ownership_f <- range.ownership/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.compensation_f <- range.compensation/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.digitalization_f <- range.digitalization/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.openness_f <- range.openness/(range.professionalism + range.ownership+
range.compensation + range.digitalization + range.openness)

## Plot the attribute importances
b <-
barplot(c(imp.professionalism,imp.ownership,imp.compensation,imp.digitaliza
tion,imp.openness)*100,font.lab=2, ylab="Attribute importances",
xlab="Attributes",names.arg=c("Professional \n involvement","Resource \n
transfer","Compensation","Digitalization","Openness"),col=c("lightskyblue")
,axes=FALSE,ylim=c(-5,100),main="Attribute importances - Female")
axis(2,at=seq(0,100,10),lwd=1,lwd.ticks=1,las=1)
text(x=b, y=
c(imp.professionalism,imp.ownership,imp.compensation,imp.digitalization,imp
.openness)*100+5,
labels=c(paste(round(imp.professionalism,2)*100,"%",sep=""),paste(round(imp
.ownership,2)*100,"%",sep=""),paste(round(imp.compensation,2)*100,"%",sep="
"),paste(round(imp.digitalization,2)*100,"%",sep=""),paste(round(imp.openne
ss,2)*100,"%",sep="")))
abline(h=0)
```

```r
# 2b. Analysis with only male respondents
dat.choice <- dat[dat$Geslacht=="Male",]
(n<-nrow(dat.choice))

## Remove the questions that are not part of the choice design
dat.choice <-
dat.choice[,c("C1","C2","C3","C4","C5","C6","C7","C8","C9","C10","C11","C12
")]
dat.choice <- apply(dat.choice, 2, function(x) as.numeric(x))

## Put all the answers to the questions in one column
y <- as.vector(t(as.matrix(dat.choice)))

## The answers in y are 1 or 2 and we want to make it 1 or 0 (substracting
y from 2: 1 stays 1 and 2 becomes 0)
y <- 2-y

## Create design matrix
dm <- make.design.matrix(choice.experiment.design=des,
                         categorical.attributes=c("prof_inv", "own",
"comp","digit", "open"),
                         optout=FALSE,
                         unlabeled=TRUE,
                         binary=TRUE)

## Create design matrix for ALL respondents (n)
dm.n <- do.call(rbind, replicate(n, dm[5:10], simplify=FALSE))

## Estimate the model
out_male <- glm(y~0+as.matrix(dm.n),family = binomial(logit))
summary(out_male)

## Model goodness of fit
with(out_male, pchisq(null.deviance - deviance, df.null - df.residual,
lower.tail = FALSE))

## Confidence intervals
conf_male <-
confint(out_male,c('as.matrix(dm.n)Professionals','as.matrix(dm.n)Ownership
','as.matrix(dm.n)Non.monetary','as.matrix(dm.n)Monetary','as.matrix(dm.n)S
ubstitution','as.matrix(dm.n)Worldwide'),level=0.95)

## Get all attributes and attribute levels in one barplot (with confidence
intervals)
coef <- c(0, coef(out_male)[1],0,coef(out_male)[2],0,
coef(out_male)[3],coef(out_male)[4],0, coef(out_male)[5],0,
coef(out_male)[6])
b <- barplot(coef, main="Preference weights - Male",ylab="Preference
weights", ylim=c(-1.1,1.1), xlab="Attribute levels", names.arg = c("Peer-
to-peer", "Involvement of \n professionals", "Access \n to goods",
"Ownership \n of goods","No compensation", "Non-monetary \n
compensation","Monetary \n compensation", "No \n digital \n platform",
"Substitution \n of human interaction \n by digital platform", "Local \n
community", "Worldwide \n community"), col=c("lightskyblue"), font.lab=2)
```

```
arrows(b, c(0, conf_male[1,2],0, conf_male[2,2],0,
conf_male[3,2],conf_male[4,2],0, conf_male[5,2],0, conf_male[6,2]),
       b, c(0, conf_male[1,1],0, conf_male[2,1],0,
conf_male[3,1],conf_male[4,1],0, conf_male[5,1],0, conf_male[6,1]),
       code=3, angle=90, length =0.1)
abline(h=0)

## Relative importances
### Create function to calculate the attribute ranges
calc_range <- function(x){
  x <- c(0,x) #put the dummy variable that is omitted (with value 0) in the
range
  return(max(x)-min(x))
}

### Use function for every attribute
range.professionalism <- calc_range(coef(out_male)[1])
range.ownership <- calc_range(coef(out_male)[2])
range.compensation <- calc_range(coef(out_male)[3:4])
range.digitalization <- calc_range(coef(out_male)[5])
range.openness <- calc_range(coef(out_male)[6])

## Normalize to calculate the attribute importances
imp.professionalism_m <- range.professionalism/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.ownership_m <- range.ownership/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.compensation_m <- range.compensation/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.digitalization_m <- range.digitalization/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.openness_m <- range.openness/(range.professionalism + range.ownership+
range.compensation + range.digitalization + range.openness)

## Plot the attribute importances
b <-
barplot(c(imp.professionalism,imp.ownership,imp.compensation,imp.digitaliza
tion,imp.openness)*100,font.lab=2, ylab="Attribute importances",
xlab="Attributes",names.arg=c("Professional \n involvement","Resource \n
transfer","Compensation","Digitalization","Openness"),col=c("lightskyblue")
,axes=FALSE,ylim=c(-5,100),main="Attribute importances - Male")
axis(2,at=seq(0,100,10),lwd=1,lwd.ticks=1,las=1)
text(x=b, y=
c(imp.professionalism,imp.ownership,imp.compensation,imp.digitalization,imp
.openness)*100+5,
labels=c(paste(round(imp.professionalism,2)*100,"%",sep=""),paste(round(imp
.ownership,2)*100,"%",sep=""),paste(round(imp.compensation,2)*100,"%",sep="
"),paste(round(imp.digitalization,2)*100,"%",sep=""),paste(round(imp.openne
ss,2)*100,"%",sep="")))
abline(h=0)
```

```r
# 2c. Comparison of respondents according to Gender
coef<-
c(coef(out_female)[1],coef(out_male)[1],coef(out_female)[2],coef(out_male)[
2],coef(out_female)[3],coef(out_male)[3],coef(out_female)[4],coef(out_male)
[4],coef(out_female)[5],coef(out_male)[5],coef(out_female)[6],coef(out_male
)[6])
b<-barplot(coef, main= "Preference weights according to
gender",ylab="Preference weights", ylim=c(-1.1,1.1), xlab="Attribute
levels", names.arg = c("Involvement of \n professionals", "", "Ownership \n
of goods", "","Non-monetary \n compensation", "","Monetary \n
compensation","", "Substitution \n of human interaction \n by digital
platform", "", "Worldwide \n community", ""), col=c("lightskyblue",
"dodgerblue2", "lightskyblue", "dodgerblue2","lightskyblue",
"dodgerblue2","lightskyblue", "dodgerblue2","lightskyblue",
"dodgerblue2","lightskyblue", "dodgerblue2"), font.lab=2)
legend(x="topright",legend=c("Female", "Male"), col=c("lightskyblue",
"dodgerblue2"),lty=1:1, cex=1,lwd=5)
arrows(b, c(conf_female[1,2], conf_male[1,2],conf_female[2,2],
conf_male[2,2],conf_female[3,2], conf_male[3,2],conf_female[4,2],
conf_male[4,2],conf_female[5,2], conf_male[5,2],conf_female[6,2],
conf_male[6,2]),
       b, c(conf_female[1,1], conf_male[1,1],conf_female[2,1],
conf_male[2,1],conf_female[3,1], conf_male[3,1],conf_female[4,1],
conf_male[4,1],conf_female[5,1], conf_male[5,1],conf_female[6,1],
conf_male[6,1]),
       code=3, angle=90, length =0.1)
abline(h=0)

gender <- c("Female", "Male", "Female", "Male", "Female", "Male", "Female",
"Male", "Female", "Male")
gender <- as.factor(gender)
imps <- c(c(imp.professionalism_f,imp.professionalism_m, imp.ownership_f,
imp.ownership_m, imp.compensation_f,imp.compensation_m,
imp.digitalization_f,imp.digitalization_m, imp.openness_f,
imp.openness_m)*100)
test <- data.frame(gender,imps)

b <- barplot(test$imps, fill = test$gender, font.lab=2, ylab="Attribute
importances", xlab="Attributes",names.arg=c("Professional \n
involvement","","Resource \n
transfer","","Compensation","","Digitalization","","Openness",""),col=c("li
ghtskyblue", "dodgerblue2"),axes=FALSE,ylim=c(-5,100),main="Attribute
importances according to gender")
axis(2,at=seq(0,100,10),lwd=1,lwd.ticks=1,las=1)
text(x=b, y= test$imps+5, labels=c(paste(round(test$imps,0),"%",sep="")))
legend(x="topright",legend=c("Female", "Male"), col=c("lightskyblue",
"dodgerblue2"),lty=1:1, cex=1,lwd=5)
abline(h=0)

# 3a. Analysis with only respondents aged below 32
```

```
dat.choice <- dat[dat$Leeftijd_Med=="Low",]
(n<-nrow(dat.choice))

## Remove the questions that are not part of the choice design
dat.choice <-
dat.choice[,c("C1","C2","C3","C4","C5","C6","C7","C8","C9","C10","C11","C12
")]
dat.choice <- apply(dat.choice, 2, function(x) as.numeric(x))

## Put all the answers to the questions in one column
y <- as.vector(t(as.matrix(dat.choice)))

## The answers in y are 1 or 2 and we want to make it 1 or 0 (substracting
y from 2: 1 stays 1 and 2 becomes 0)
y <- 2-y

## Create design matrix
dm <- make.design.matrix(choice.experiment.design=des,
                         categorical.attributes=c("prof_inv", "own",
"comp","digit", "open"),
                         optout=FALSE,
                         unlabeled=TRUE,
                         binary=TRUE)

## Create design matrix for ALL respondents (n)
dm.n <- do.call(rbind, replicate(n, dm[5:10], simplify=FALSE))

## Estimate the model
out_younger <- glm(y~0+as.matrix(dm.n),family = binomial(logit))
summary(out_younger)

## Model goodness of fit
with(out_younger, pchisq(null.deviance - deviance, df.null - df.residual,
lower.tail = FALSE))

## Confidence intervals
conf_younger <-
confint(out_younger,c('as.matrix(dm.n)Professionals','as.matrix(dm.n)Owners
hip','as.matrix(dm.n)Non.monetary','as.matrix(dm.n)Monetary','as.matrix(dm.
n)Substitution','as.matrix(dm.n)Worldwide'),level=0.95)

## Get all attributes and attribute levels in one barplot (with confidence
intervals)
coef <- c(0, coef(out_younger)[1],0,coef(out_younger)[2],0,
coef(out_younger)[3],coef(out_younger)[4],0, coef(out_younger)[5],0,
coef(out_younger)[6])
b <- barplot(coef, main="Preference weights - <32 years
old",ylab="Preference weights", ylim=c(-1.1,1.1), xlab="Attribute levels",
names.arg = c("Peer-to-peer", "Involvement of \n professionals", "Access \n
to goods", "Ownership \n of goods","No compensation", "Non-monetary \n
compensation","Monetary \n compensation", "No \n digital \n platform",
"Substitution \n of human interaction \n by digital platform", "Local \n
community", "Worldwide \n community"), col=c("lightskyblue"), font.lab=2)
arrows(b, c(0, conf_younger[1,2],0, conf_younger[2,2],0,
conf_younger[3,2],conf_younger[4,2],0, conf_younger[5,2],0,
conf_younger[6,2]),
       b, c(0, conf_younger[1,1],0, conf_younger[2,1],0,
conf_younger[3,1],conf_younger[4,1],0, conf_younger[5,1],0,
conf_younger[6,1]),
       code=3, angle=90, length =0.1)
abline(h=0)
```

```
## Relative importances
### Create function to calculate the attribute ranges
calc_range <- function(x){
  x <- c(0,x) #put the dummy variable that is omitted (with value 0) in the
range
  return(max(x)-min(x))
}

### Use function for every attribute
range.professionalism <- calc_range(coef(out_younger)[1])
range.ownership <- calc_range(coef(out_younger)[2])
range.compensation <- calc_range(coef(out_younger)[3:4])
range.digitalization <- calc_range(coef(out_younger)[5])
range.openness <- calc_range(coef(out_younger)[6])

## Normalize to calculate the attribute importances
imp.professionalism_f <- range.professionalism/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.ownership_f <- range.ownership/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.compensation_f <- range.compensation/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.digitalization_f <- range.digitalization/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.openness_f <- range.openness/(range.professionalism + range.ownership+
range.compensation + range.digitalization + range.openness)

## Plot the attribute importances
b <-
barplot(c(imp.professionalism,imp.ownership,imp.compensation,imp.digitaliza
tion,imp.openness)*100,font.lab=2, ylab="Attribute importances",
xlab="Attributes",names.arg=c("Professional \n involvement","Resource \n
transfer","Compensation","Digitalization","Openness"),col=c("lightskyblue")
,axes=FALSE,ylim=c(-5,100),main="Attribute importances - <32 years old")
axis(2,at=seq(0,100,10),lwd=1,lwd.ticks=1,las=1)
text(x=b, y=
c(imp.professionalism,imp.ownership,imp.compensation,imp.digitalization,imp
.openness)*100+5,
labels=c(paste(round(imp.professionalism,2)*100,"%",sep=""),paste(round(imp
.ownership,2)*100,"%",sep=""),paste(round(imp.compensation,2)*100,"%",sep="
"),paste(round(imp.digitalization,2)*100,"%",sep=""),paste(round(imp.openne
ss,2)*100,"%",sep="")))
abline(h=0)




# 3b. Analysis with only respondents aged 32 or older
dat.choice <- dat[dat$Leeftijd_Med=="High",]
(n<-nrow(dat.choice))
```

```
## Remove the questions that are not part of the choice design
dat.choice <-
dat.choice[,c("C1","C2","C3","C4","C5","C6","C7","C8","C9","C10","C11","C12
")]
dat.choice <- apply(dat.choice, 2, function(x) as.numeric(x))

## Put all the answers to the questions in one column
y <- as.vector(t(as.matrix(dat.choice)))

## The answers in y are 1 or 2 and we want to make it 1 or 0 (substracting
y from 2: 1 stays 1 and 2 becomes 0)
y <- 2-y

## Create design matrix
dm <- make.design.matrix(choice.experiment.design=des,
                         categorical.attributes=c("prof_inv", "own",
"comp","digit", "open"),
                         optout=FALSE,
                         unlabeled=TRUE,
                         binary=TRUE)

## Create design matrix for ALL respondents (n)
dm.n <- do.call(rbind, replicate(n, dm[5:10], simplify=FALSE))

## Estimate the model
out_older <- glm(y~0+as.matrix(dm.n),family = binomial(logit))
summary(out_older)

## Model goodness of fit
with(out_older, pchisq(null.deviance - deviance, df.null - df.residual,
lower.tail = FALSE))

## Confidence intervals
conf_older <-
confint(out_older,c('as.matrix(dm.n)Professionals','as.matrix(dm.n)Ownershi
p','as.matrix(dm.n)Non.monetary','as.matrix(dm.n)Monetary','as.matrix(dm.n)
Substitution','as.matrix(dm.n)Worldwide'),level=0.95)

## Get all attributes and attribute levels in one barplot (with confidence
intervals)
coef <- c(0, coef(out_older)[1],0,coef(out_older)[2],0,
coef(out_older)[3],coef(out_older)[4],0, coef(out_older)[5],0,
coef(out_older)[6])
b <- barplot(coef, main="Preference weights - >=32 years
old",ylab="Preference weights", ylim=c(-1.1,1.1), xlab="Attribute levels",
names.arg = c("Peer-to-peer", "Involvement of \n professionals", "Access \n
to goods", "Ownership \n of goods","No compensation", "Non-monetary \n
compensation","Monetary \n compensation", "No \n digital \n platform",
"Substitution \n of human interaction \n by digital platform", "Local \n
community", "Worldwide \n community"), col=c("lightskyblue"), font.lab=2)
arrows(b, c(0, conf_older[1,2],0, conf_older[2,2],0,
conf_older[3,2],conf_older[4,2],0, conf_older[5,2],0, conf_older[6,2]),
       b, c(0, conf_older[1,1],0, conf_older[2,1],0,
conf_older[3,1],conf_older[4,1],0, conf_older[5,1],0, conf_older[6,1]),
       code=3, angle=90, length =0.1)
abline(h=0)

## Relative importances
### Create function to calculate the attribute ranges
calc_range <- function(x){
```

```
  x <- c(0,x) #put the dummy variable that is omitted (with value 0) in the
range
  return(max(x)-min(x))
}

### Use function for every attribute
range.professionalism <- calc_range(coef(out_older)[1])
range.ownership <- calc_range(coef(out_older)[2])
range.compensation <- calc_range(coef(out_older)[3:4])
range.digitalization <- calc_range(coef(out_older)[5])
range.openness <- calc_range(coef(out_older)[6])

## Normalize to calculate the attribute importances
imp.professionalism_m <- range.professionalism/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.ownership_m <- range.ownership/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.compensation_m <- range.compensation/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.digitalization_m <- range.digitalization/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.openness_m <- range.openness/(range.professionalism + range.ownership+
range.compensation + range.digitalization + range.openness)

## Plot the attribute importances
b <-
barplot(c(imp.professionalism,imp.ownership,imp.compensation,imp.digitaliza
tion,imp.openness)*100,font.lab=2, ylab="Attribute importances",
xlab="Attributes",names.arg=c("Professional \n involvement","Resource \n
transfer","Compensation","Digitalization","Openness"),col=c("lightskyblue")
,axes=FALSE,ylim=c(-5,100),main="Attribute importances - >=32 years old")
axis(2,at=seq(0,100,10),lwd=1,lwd.ticks=1,las=1)
text(x=b, y=
c(imp.professionalism,imp.ownership,imp.compensation,imp.digitalization,imp
.openness)*100+5,
labels=c(paste(round(imp.professionalism,2)*100,"%",sep=""),paste(round(imp
.ownership,2)*100,"%",sep=""),paste(round(imp.compensation,2)*100,"%",sep="
"),paste(round(imp.digitalization,2)*100,"%",sep=""),paste(round(imp.openne
ss,2)*100,"%",sep="")))
abline(h=0)
```

```
# 3c. Comparison of respondents according to Age
coef<-
c(coef(out_younger)[1],coef(out_older)[1],coef(out_younger)[2],coef(out_old
er)[2],coef(out_younger)[3],coef(out_older)[3],coef(out_younger)[4],coef(ou
t_older)[4],coef(out_younger)[5],coef(out_older)[5],coef(out_younger)[6],co
ef(out_older)[6])
b<-barplot(coef, main= "Preference weights according to
age",ylab="Preference weights", ylim=c(-1.1,1.1), xlab="Attribute levels",
```

```
names.arg = c("Involvement of \n professionals", "", "Ownership \n of
goods", "","Non-monetary \n compensation", "","Monetary \n
compensation","", "Substitution \n of human interaction \n by digital
platform", "", "Worldwide \n community", ""), col=c("lightskyblue",
"dodgerblue2", "lightskyblue", "dodgerblue2","lightskyblue",
"dodgerblue2","lightskyblue", "dodgerblue2","lightskyblue",
"dodgerblue2","lightskyblue", "dodgerblue2"), font.lab=2)
legend(x="topright",legend=c("<32 years old", ">=32 years old"),
col=c("lightskyblue", "dodgerblue2"),lty=1:1, cex=1,lwd=5)
arrows(b, c(conf_younger[1,2], conf_older[1,2],conf_younger[2,2],
conf_older[2,2],conf_younger[3,2], conf_older[3,2],conf_younger[4,2],
conf_older[4,2],conf_younger[5,2], conf_older[5,2],conf_younger[6,2],
conf_older[6,2]),
       b, c(conf_younger[1,1], conf_older[1,1],conf_younger[2,1],
conf_older[2,1],conf_younger[3,1], conf_older[3,1],conf_younger[4,1],
conf_older[4,1],conf_younger[5,1], conf_older[5,1],conf_younger[6,1],
conf_older[6,1]),
       code=3, angle=90, length =0.1)
abline(h=0)

age <- c("<32 years old", ">=32 years old", "<32 years old", ">=32 years
old", "<32 years old", ">=32 years old", "<32 years old", ">=32 years old",
"<32 years old", ">=32 years old")
age <- as.factor(age)
imps <- c(c(imp.professionalism_f,imp.professionalism_m, imp.ownership_f,
imp.ownership_m, imp.compensation_f,imp.compensation_m,
imp.digitalization_f,imp.digitalization_m, imp.openness_f,
imp.openness_m)*100)
test <- data.frame(age,imps)

b <- barplot(test$imps, fill = test$age, font.lab=2, ylab="Attribute
importances", xlab="Attributes",names.arg=c("Professional \n
involvement","","Resource \n
transfer","","Compensation","","Digitalization","","Openness",""),col=c("li
ghtskyblue", "dodgerblue2"),axes=FALSE,ylim=c(-5,100),main="Attribute
importances according to age")
axis(2,at=seq(0,100,10),lwd=1,lwd.ticks=1,las=1)
text(x=b, y= test$imps+5, labels=c(paste(round(test$imps,0),"%",sep="")))
legend(x="topright",legend=c("<32 years old", ">=32 years old"),
col=c("lightskyblue", "dodgerblue2"),lty=1:1, cex=1,lwd=5)
abline(h=0)
```

```
# 4a. Analysis with only respondents with rural primary residence
dat.choice <- dat[dat$Verblijf_Cat=="Rural",]
(n<-nrow(dat.choice))

## Remove the questions that are not part of the choice design
dat.choice <-
dat.choice[,c("C1","C2","C3","C4","C5","C6","C7","C8","C9","C10","C11","C12
")]
dat.choice <- apply(dat.choice, 2, function(x) as.numeric(x))

## Put all the answers to the questions in one column
y <- as.vector(t(as.matrix(dat.choice)))
```

```
## The answers in y are 1 or 2 and we want to make it 1 or 0 (substracting
y from 2: 1 stays 1 and 2 becomes 0)
y <- 2-y

## Create design matrix
dm <- make.design.matrix(choice.experiment.design=des,
                         categorical.attributes=c("prof_inv", "own",
"comp","digit", "open"),
                         optout=FALSE,
                         unlabeled=TRUE,
                         binary=TRUE)

## Create design matrix for ALL respondents (n)
dm.n <- do.call(rbind, replicate(n, dm[5:10], simplify=FALSE))

## Estimate the model
out_rural <- glm(y~0+as.matrix(dm.n),family = binomial(logit))
summary(out_rural)

## Model goodness of fit
with(out_rural, pchisq(null.deviance - deviance, df.null - df.residual,
lower.tail = FALSE))

## Confidence intervals
conf_rural <-
confint(out_rural,c('as.matrix(dm.n)Professionals','as.matrix(dm.n)Ownershi
p','as.matrix(dm.n)Non.monetary','as.matrix(dm.n)Monetary','as.matrix(dm.n)
Substitution','as.matrix(dm.n)Worldwide'),level=0.95)

## Get all attributes and attribute levels in one barplot (with confidence
intervals)
coef <- c(0, coef(out_rural)[1],0,coef(out_rural)[2],0,
coef(out_rural)[3],coef(out_rural)[4],0, coef(out_rural)[5],0,
coef(out_rural)[6])
b <- barplot(coef, main="Preference weights - Rural",ylab="Preference
weights", ylim=c(-1.1,1.1), xlab="Attribute levels", names.arg = c("Peer-
to-peer", "Involvement of \n professionals", "Access \n to goods",
"Ownership \n of goods","No compensation", "Non-monetary \n
compensation","Monetary \n compensation", "No \n digital \n platform",
"Substitution \n of human interaction \n by digital platform", "Local \n
community", "Worldwide \n community"), col=c("lightskyblue"), font.lab=2)
arrows(b, c(0, conf_rural[1,2],0, conf_rural[2,2],0,
conf_rural[3,2],conf_rural[4,2],0, conf_rural[5,2],0, conf_rural[6,2]),
       b, c(0, conf_rural[1,1],0, conf_rural[2,1],0,
conf_rural[3,1],conf_rural[4,1],0, conf_rural[5,1],0, conf_rural[6,1]),
       code=3, angle=90, length =0.1)
abline(h=0)

## Relative importances
### Create function to calculate the attribute ranges
calc_range <- function(x){
  x <- c(0,x) #put the dummy variable that is omitted (with value 0) in the
range
  return(max(x)-min(x))
}

### Use function for every attribute
range.professionalism <- calc_range(coef(out_rural)[1])
range.ownership <- calc_range(coef(out_rural)[2])
range.compensation <- calc_range(coef(out_rural)[3:4])
range.digitalization <- calc_range(coef(out_rural)[5])
```

```
range.openness <- calc_range(coef(out_rural)[6])

## Normalize to calculate the attribute importances
imp.professionalism_f <- range.professionalism/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.ownership_f <- range.ownership/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.compensation_f <- range.compensation/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.digitalization_f <- range.digitalization/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.openness_f <- range.openness/(range.professionalism + range.ownership+
range.compensation + range.digitalization + range.openness)

## Plot the attribute importances
b <-
barplot(c(imp.professionalism,imp.ownership,imp.compensation,imp.digitaliza
tion,imp.openness)*100,font.lab=2, ylab="Attribute importances",
xlab="Attributes",names.arg=c("Professional \n involvement","Resource \n
transfer","Compensation","Digitalization","Openness"),col=c("lightskyblue")
,axes=FALSE,ylim=c(-5,100),main="Attribute importances - Rural")
axis(2,at=seq(0,100,10),lwd=1,lwd.ticks=1,las=1)
text(x=b, y=
c(imp.professionalism,imp.ownership,imp.compensation,imp.digitalization,imp
.openness)*100+5,
labels=c(paste(round(imp.professionalism,2)*100,"%",sep=""),paste(round(imp
.ownership,2)*100,"%",sep=""),paste(round(imp.compensation,2)*100,"%",sep="
"),paste(round(imp.digitalization,2)*100,"%",sep=""),paste(round(imp.openne
ss,2)*100,"%",sep="")))
abline(h=0)
```

```
# 4b. Analysis with only respondents with only respondents with urban
primary residence
dat.choice <- dat[dat$Verblijf_Cat=="Urban",]
(n<-nrow(dat.choice))

## Remove the questions that are not part of the choice design
dat.choice <-
dat.choice[,c("C1","C2","C3","C4","C5","C6","C7","C8","C9","C10","C11","C12
")]
dat.choice <- apply(dat.choice, 2, function(x) as.numeric(x))

## Put all the answers to the questions in one column
y <- as.vector(t(as.matrix(dat.choice)))

## The answers in y are 1 or 2 and we want to make it 1 or 0 (substracting
y from 2: 1 stays 1 and 2 becomes 0)
y <- 2-y
```

```
## Create design matrix
dm <- make.design.matrix(choice.experiment.design=des,
                         categorical.attributes=c("prof_inv", "own",
"comp","digit", "open"),
                         optout=FALSE,
                         unlabeled=TRUE,
                         binary=TRUE)

## Create design matrix for ALL respondents (n)
dm.n <- do.call(rbind, replicate(n, dm[5:10], simplify=FALSE))

## Estimate the model
out_urban <- glm(y~0+as.matrix(dm.n),family = binomial(logit))
summary(out_urban)

## Model goodness of fit
with(out_urban, pchisq(null.deviance - deviance, df.null - df.residual,
lower.tail = FALSE))

## Confidence intervals
conf_urban <-
confint(out_urban,c('as.matrix(dm.n)Professionals','as.matrix(dm.n)Ownershi
p','as.matrix(dm.n)Non.monetary','as.matrix(dm.n)Monetary','as.matrix(dm.n)
Substitution','as.matrix(dm.n)Worldwide'),level=0.95)

## Get all attributes and attribute levels in one barplot (with confidence
intervals)
coef <- c(0, coef(out_urban)[1],0,coef(out_urban)[2],0,
coef(out_urban)[3],coef(out_urban)[4],0, coef(out_urban)[5],0,
coef(out_urban)[6])
b <- barplot(coef, main="Preference weights - Urban",ylab="Preference
weights", ylim=c(-1.1,1.1), xlab="Attribute levels", names.arg = c("Peer-
to-peer", "Involvement of \n professionals", "Access \n to goods",
"Ownership \n of goods","No compensation", "Non-monetary \n
compensation","Monetary \n compensation", "No \n digital \n platform",
"Substitution \n of human interaction \n by digital platform", "Local \n
community", "Worldwide \n community"), col=c("lightskyblue"), font.lab=2)
arrows(b, c(0, conf_urban[1,2],0, conf_urban[2,2],0,
conf_urban[3,2],conf_urban[4,2],0, conf_urban[5,2],0, conf_urban[6,2]),
       b, c(0, conf_urban[1,1],0, conf_urban[2,1],0,
conf_urban[3,1],conf_urban[4,1],0, conf_urban[5,1],0, conf_urban[6,1]),
       code=3, angle=90, length =0.1)
abline(h=0)

## Relative importances
### Create function to calculate the attribute ranges
calc_range <- function(x){
  x <- c(0,x) #put the dummy variable that is omitted (with value 0) in the
range
  return(max(x)-min(x))
}

### Use function for every attribute
range.professionalism <- calc_range(coef(out_urban)[1])
range.ownership <- calc_range(coef(out_urban)[2])
range.compensation <- calc_range(coef(out_urban)[3:4])
range.digitalization <- calc_range(coef(out_urban)[5])
range.openness <- calc_range(coef(out_urban)[6])

## Normalize to calculate the attribute importances
```

```
imp.professionalism_m <- range.professionalism/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.ownership_m <- range.ownership/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.compensation_m <- range.compensation/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.digitalization_m <- range.digitalization/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.openness_m <- range.openness/(range.professionalism + range.ownership+
range.compensation + range.digitalization + range.openness)

## Plot the attribute importances
b <-
barplot(c(imp.professionalism,imp.ownership,imp.compensation,imp.digitaliza
tion,imp.openness)*100,font.lab=2, ylab="Attribute importances",
xlab="Attributes",names.arg=c("Professional \n involvement","Resource \n
transfer","Compensation","Digitalization","Openness"),col=c("lightskyblue")
,axes=FALSE,ylim=c(-5,100),main="Attribute importances - Urban")
axis(2,at=seq(0,100,10),lwd=1,lwd.ticks=1,las=1)
text(x=b, y=
c(imp.professionalism,imp.ownership,imp.compensation,imp.digitalization,imp
.openness)*100+5,
labels=c(paste(round(imp.professionalism,2)*100,"%",sep=""),paste(round(imp
.ownership,2)*100,"%",sep=""),paste(round(imp.compensation,2)*100,"%",sep="
"),paste(round(imp.digitalization,2)*100,"%",sep=""),paste(round(imp.openne
ss,2)*100,"%",sep="")))
abline(h=0)
```

```
# 4c. Comparison of respondents according to Primary residence
coef<-
c(coef(out_rural)[1],coef(out_urban)[1],coef(out_rural)[2],coef(out_urban)[
2],coef(out_rural)[3],coef(out_urban)[3],coef(out_rural)[4],coef(out_urban)
[4],coef(out_rural)[5],coef(out_urban)[5],coef(out_rural)[6],coef(out_urban
)[6])
b<-barplot(coef, main= "Preference weights according to primary
residence",ylab="Preference weights", ylim=c(-1.1,1.1), xlab="Attribute
levels", names.arg = c("Involvement of \n professionals", "", "Ownership \n
of goods", "","Non-monetary \n compensation", "","Monetary \n
compensation","", "Substitution \n of human interaction \n by digital
platform", "", "Worldwide \n community", ""), col=c("lightskyblue",
"dodgerblue2", "lightskyblue", "dodgerblue2","lightskyblue",
"dodgerblue2","lightskyblue", "dodgerblue2","lightskyblue",
"dodgerblue2","lightskyblue", "dodgerblue2"), font.lab=2)
legend(x="topright",legend=c("Rural", "Urban"), col=c("lightskyblue",
"dodgerblue2"),lty=1:1, cex=1,lwd=5)
arrows(b, c(conf_rural[1,2], conf_urban[1,2],conf_rural[2,2],
conf_urban[2,2],conf_rural[3,2], conf_urban[3,2],conf_rural[4,2],
conf_urban[4,2],conf_rural[5,2], conf_urban[5,2],conf_rural[6,2],
conf_urban[6,2]),
```

```
       b, c(conf_rural[1,1], conf_urban[1,1],conf_rural[2,1],
conf_urban[2,1],conf_rural[3,1], conf_urban[3,1],conf_rural[4,1],
conf_urban[4,1],conf_rural[5,1], conf_urban[5,1],conf_rural[6,1],
conf_urban[6,1]),
       code=3, angle=90, length =0.1)
abline(h=0)

age <- c("Rural", "Urban", "Rural", "Urban", "Rural", "Urban", "Rural",
"Urban", "Rural", "Urban")
age <- as.factor(age)
imps <- c(c(imp.professionalism_f,imp.professionalism_m, imp.ownership_f,
imp.ownership_m, imp.compensation_f,imp.compensation_m,
imp.digitalization_f,imp.digitalization_m, imp.openness_f,
imp.openness_m)*100)
test <- data.frame(age,imps)

b <- barplot(test$imps, fill = test$age, font.lab=2, ylab="Attribute
importances", xlab="Attributes",names.arg=c("Professional \n
involvement","","Resource \n
transfer","","Compensation","","Digitalization","","Openness",""),col=c("li
ghtskyblue", "dodgerblue2"),axes=FALSE,ylim=c(-5,100),main="Attribute
importances according to primary residence")
axis(2,at=seq(0,100,10),lwd=1,lwd.ticks=1,las=1)
text(x=b, y= test$imps+5, labels=c(paste(round(test$imps,0),"%",sep="")))
legend(x="topright",legend=c("Rural", "Urban"), col=c("lightskyblue",
"dodgerblue2"),lty=1:1, cex=1,lwd=5)
abline(h=0)
```

```
# 5a. Analysis with only respondents with low sustainability orientation
dat.choice <- dat[dat$Sust_Cat=="Low",]
(n<-nrow(dat.choice))

## Remove the questions that are not part of the choice design
dat.choice <-
dat.choice[,c("C1","C2","C3","C4","C5","C6","C7","C8","C9","C10","C11","C12
")]
dat.choice <- apply(dat.choice, 2, function(x) as.numeric(x))

## Put all the answers to the questions in one column
y <- as.vector(t(as.matrix(dat.choice)))

## The answers in y are 1 or 2 and we want to make it 1 or 0 (substracting
y from 2: 1 stays 1 and 2 becomes 0)
y <- 2-y

## Create design matrix
dm <- make.design.matrix(choice.experiment.design=des,
                         categorical.attributes=c("prof_inv", "own",
"comp","digit", "open"),
                         optout=FALSE,
                         unlabeled=TRUE,
                         binary=TRUE)

## Create design matrix for ALL respondents (n)
```

```
dm.n <- do.call(rbind, replicate(n, dm[5:10], simplify=FALSE))

## Estimate the model
out_low <- glm(y~0+as.matrix(dm.n),family = binomial(logit))
summary(out_low)

## Model goodness of fit
with(out_low, pchisq(null.deviance - deviance, df.null - df.residual,
lower.tail = FALSE))

## Confidence intervals
conf_low <-
confint(out_low,c('as.matrix(dm.n)Professionals','as.matrix(dm.n)Ownership'
,'as.matrix(dm.n)Non.monetary','as.matrix(dm.n)Monetary','as.matrix(dm.n)Su
bstitution','as.matrix(dm.n)Worldwide'),level=0.95)

## Get all attributes and attribute levels in one barplot (with confidence
intervals)
coef <- c(0, coef(out_low)[1],0,coef(out_low)[2],0,
coef(out_low)[3],coef(out_low)[4],0, coef(out_low)[5],0, coef(out_low)[6])
b <- barplot(coef, main="Preference weights - Low",ylab="Preference
weights", ylim=c(-1.1,1.1), xlab="Attribute levels", names.arg = c("Peer-
to-peer", "Involvement of \n professionals", "Access \n to goods",
"Ownership \n of goods","No compensation", "Non-monetary \n
compensation","Monetary \n compensation", "No \n digital \n platform",
"Substitution \n of human interaction \n by digital platform", "Local \n
community", "Worldwide \n community"), col=c("lightskyblue"), font.lab=2)
arrows(b, c(0, conf_low[1,2],0, conf_low[2,2],0,
conf_low[3,2],conf_low[4,2],0, conf_low[5,2],0, conf_low[6,2]),
       b, c(0, conf_low[1,1],0, conf_low[2,1],0,
conf_low[3,1],conf_low[4,1],0, conf_low[5,1],0, conf_low[6,1]),
       code=3, angle=90, length =0.1)
abline(h=0)

## Relative importances
### Create function to calculate the attribute ranges
calc_range <- function(x){
  x <- c(0,x) #put the dummy variable that is omitted (with value 0) in the
range
  return(max(x)-min(x))
}

### Use function for every attribute
range.professionalism <- calc_range(coef(out_low)[1])
range.ownership <- calc_range(coef(out_low)[2])
range.compensation <- calc_range(coef(out_low)[3:4])
range.digitalization <- calc_range(coef(out_low)[5])
range.openness <- calc_range(coef(out_low)[6])

## Normalize to calculate the attribute importances
imp.professionalism_f <- range.professionalism/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.ownership_f <- range.ownership/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.compensation_f <- range.compensation/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
```

```
imp.digitalization_f <- range.digitalization/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.openness_f <- range.openness/(range.professionalism + range.ownership+
range.compensation + range.digitalization + range.openness)

## Plot the attribute importances
b <-
barplot(c(imp.professionalism,imp.ownership,imp.compensation,imp.digitaliza
tion,imp.openness)*100,font.lab=2, ylab="Attribute importances",
xlab="Attributes",names.arg=c("Professional \n involvement","Resource \n
transfer","Compensation","Digitalization","Openness"),col=c("lightskyblue")
,axes=FALSE,ylim=c(-5,100),main="Attribute importances - Low")
axis(2,at=seq(0,100,10),lwd=1,lwd.ticks=1,las=1)
text(x=b, y=
c(imp.professionalism,imp.ownership,imp.compensation,imp.digitalization,imp
.openness)*100+5,
labels=c(paste(round(imp.professionalism,2)*100,"%",sep=""),paste(round(imp
.ownership,2)*100,"%",sep=""),paste(round(imp.compensation,2)*100,"%",sep="
"),paste(round(imp.digitalization,2)*100,"%",sep=""),paste(round(imp.openne
ss,2)*100,"%",sep="")))
abline(h=0)
```

```
# 5b. Analysis with only respondents with high sustainability orientation
dat.choice <- dat[dat$Sust_Cat=="High",]
(n<-nrow(dat.choice))

## Remove the questions that are not part of the choice design
dat.choice <-
dat.choice[,c("C1","C2","C3","C4","C5","C6","C7","C8","C9","C10","C11","C12
")]
dat.choice <- apply(dat.choice, 2, function(x) as.numeric(x))

## Put all the answers to the questions in one column
y <- as.vector(t(as.matrix(dat.choice)))

## The answers in y are 1 or 2 and we want to make it 1 or 0 (substracting
y from 2: 1 stays 1 and 2 becomes 0)
y <- 2-y

## Create design matrix
dm <- make.design.matrix(choice.experiment.design=des,
                         categorical.attributes=c("prof_inv", "own",
"comp","digit", "open"),
                         optout=FALSE,
                         unlabeled=TRUE,
                         binary=TRUE)

## Create design matrix for ALL respondents (n)
dm.n <- do.call(rbind, replicate(n, dm[5:10], simplify=FALSE))

## Estimate the model
out_high <- glm(y~0+as.matrix(dm.n),family = binomial(logit))
```

```
summary(out_high)

## Model goodness of fit
with(out_high, pchisq(null.deviance - deviance, df.null - df.residual,
lower.tail = FALSE))

## Confidence intervals
conf_high <-
confint(out_high,c('as.matrix(dm.n)Professionals','as.matrix(dm.n)Ownership
','as.matrix(dm.n)Non.monetary','as.matrix(dm.n)Monetary','as.matrix(dm.n)S
ubstitution','as.matrix(dm.n)Worldwide'),level=0.95)

## Get all attributes and attribute levels in one barplot (with confidence
intervals)
coef <- c(0, coef(out_high)[1],0,coef(out_high)[2],0,
coef(out_high)[3],coef(out_high)[4],0, coef(out_high)[5],0,
coef(out_high)[6])
b <- barplot(coef, main="Preference weights - High",ylab="Preference
weights", ylim=c(-1.1,1.1), xlab="Attribute levels", names.arg = c("Peer-
to-peer", "Involvement of \n professionals", "Access \n to goods",
"Ownership \n of goods","No compensation", "Non-monetary \n
compensation","Monetary \n compensation", "No \n digital \n platform",
"Substitution \n of human interaction \n by digital platform", "Local \n
community", "Worldwide \n community"), col=c("lightskyblue"), font.lab=2)
arrows(b, c(0, conf_high[1,2],0, conf_high[2,2],0,
conf_high[3,2],conf_high[4,2],0, conf_high[5,2],0, conf_high[6,2]),
       b, c(0, conf_high[1,1],0, conf_high[2,1],0,
conf_high[3,1],conf_high[4,1],0, conf_high[5,1],0, conf_high[6,1]),
       code=3, angle=90, length =0.1)
abline(h=0)

## Relative importances
### Create function to calculate the attribute ranges
calc_range <- function(x){
  x <- c(0,x) #put the dummy variable that is omitted (with value 0) in the
range
  return(max(x)-min(x))
}

### Use function for every attribute
range.professionalism <- calc_range(coef(out_high)[1])
range.ownership <- calc_range(coef(out_high)[2])
range.compensation <- calc_range(coef(out_high)[3:4])
range.digitalization <- calc_range(coef(out_high)[5])
range.openness <- calc_range(coef(out_high)[6])

## Normalize to calculate the attribute importances
imp.professionalism_m <- range.professionalism/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.ownership_m <- range.ownership/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.compensation_m <- range.compensation/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.digitalization_m <- range.digitalization/(range.professionalism +
range.ownership+ range.compensation + range.digitalization +
range.openness)
imp.openness_m <- range.openness/(range.professionalism + range.ownership+
range.compensation + range.digitalization + range.openness)
```

```
## Plot the attribute importances
b <-
barplot(c(imp.professionalism,imp.ownership,imp.compensation,imp.digitaliza
tion,imp.openness)*100,font.lab=2, ylab="Attribute importances",
xlab="Attributes",names.arg=c("Professional \n involvement","Resource \n
transfer","Compensation","Digitalization","Openness"),col=c("lightskyblue")
,axes=FALSE,ylim=c(-5,100),main="Attribute importances - High")
axis(2,at=seq(0,100,10),lwd=1,lwd.ticks=1,las=1)
text(x=b, y=
c(imp.professionalism,imp.ownership,imp.compensation,imp.digitalization,imp
.openness)*100+5,
labels=c(paste(round(imp.professionalism,2)*100,"%",sep=""),paste(round(imp
.ownership,2)*100,"%",sep=""),paste(round(imp.compensation,2)*100,"%",sep="
"),paste(round(imp.digitalization,2)*100,"%",sep=""),paste(round(imp.openne
ss,2)*100,"%",sep="")))
abline(h=0)
```

```
# 5c. Comparison of respondents according to Sustainability orientation
coef<-
c(coef(out_low)[1],coef(out_high)[1],coef(out_low)[2],coef(out_high)[2],coe
f(out_low)[3],coef(out_high)[3],coef(out_low)[4],coef(out_high)[4],coef(out
_low)[5],coef(out_high)[5],coef(out_low)[6],coef(out_high)[6])
b<-barplot(coef, main= "Preference weights according to sustainability
orientation",ylab="Preference weights", ylim=c(-1.1,1.1), xlab="Attribute
levels", names.arg = c("Involvement of \n professionals", "", "Ownership \n
of goods", "","Non-monetary \n compensation", "","Monetary \n
compensation","", "Substitution \n of human interaction \n by digital
platform", "", "Worldwide \n community", ""), col=c("lightskyblue",
"dodgerblue2", "lightskyblue", "dodgerblue2","lightskyblue",
"dodgerblue2","lightskyblue", "dodgerblue2","lightskyblue",
"dodgerblue2","lightskyblue", "dodgerblue2"), font.lab=2)
legend(x="topright",legend=c("Low", "High"), col=c("lightskyblue",
"dodgerblue2"),lty=1:1, cex=1,lwd=5)
arrows(b, c(conf_low[1,2], conf_high[1,2],conf_low[2,2],
conf_high[2,2],conf_low[3,2], conf_high[3,2],conf_low[4,2],
conf_high[4,2],conf_low[5,2], conf_high[5,2],conf_low[6,2],
conf_high[6,2]),
       b, c(conf_low[1,1], conf_high[1,1],conf_low[2,1],
conf_high[2,1],conf_low[3,1], conf_high[3,1],conf_low[4,1],
conf_high[4,1],conf_low[5,1], conf_high[5,1],conf_low[6,1],
conf_high[6,1]),
       code=3, angle=90, length =0.1)
abline(h=0)

age <- c("Low", "High", "Low", "High", "Low", "High", "Low", "High", "Low",
"High")
age <- as.factor(age)
imps <- c(c(imp.professionalism_f,imp.professionalism_m, imp.ownership_f,
imp.ownership_m, imp.compensation_f,imp.compensation_m,
imp.digitalization_f,imp.digitalization_m, imp.openness_f,
imp.openness_m)*100)
test <- data.frame(age,imps)
```

```
b <- barplot(test$imps, fill = test$age, font.lab=2, ylab="Attribute
importances", xlab="Attributes",names.arg=c("Professional \n
involvement","","Resource \n
transfer","","Compensation","","Digitalization","","Openness",""),col=c("li
ghtskyblue", "dodgerblue2"),axes=FALSE,ylim=c(-5,100),main="Attribute
importances according to sustainability orientation")
axis(2,at=seq(0,100,10),lwd=1,lwd.ticks=1,las=1)
text(x=b, y= test$imps+5, labels=c(paste(round(test$imps,0),"%",sep="")))
legend(x="topright",legend=c("Low", "High"), col=c("lightskyblue",
"dodgerblue2"),lty=1:1, cex=1,lwd=5)
abline(h=0)
```

```
# 6. Moderation incorporated in the glm model using interaction terms
dat <- dat[dat$Geslacht!="X",]
dat.Geslacht <- dat$Geslacht
dat.Leeftijd <- dat$Leeftijd_Med
dat.Verblijf <- dat$Verblijf_Cat
dat.Sust <- dat$Sust_Cat
table(dat.Geslacht)
(n<-nrow(dat.choice))

dat.choice <-
dat[,c("C1","C2","C3","C4","C5","C6","C7","C8","C9","C10","C11","C12")]
dat.choice <- apply(dat.choice, 2, function(x) as.numeric(x))
n <- nrow(dat.choice)

## Put all the answers to the questions in one column
y <- as.vector(t(as.matrix(dat.choice)))

## The answers in y are 1 or 2 and we want to make it 1 or 0 (substracting
y from 2: 1 stays 1 and 2 becomes 0)
y <- 2-y

## Create design matrix
dm <- make.design.matrix(choice.experiment.design=des,
                         categorical.attributes=c("prof_inv", "own",
"comp","digit", "open"),
                         optout=FALSE,
                         unlabeled=TRUE,
                         binary=TRUE)

## Create design matrix for ALL respondents (n)
dm.n <- do.call(rbind, replicate(n, dm[5:10], simplify=FALSE))

moderation_Geslacht <- c()
moderation_in_model_Geslacht <- c()

for (i in 1:n){
  moderation_Geslacht <- rep(ifelse(dat.Geslacht[i]=="Male", 1, 0),12)
  moderation_in_model_Geslacht <- append(moderation_in_model_Geslacht,
moderation_Geslacht)
}
```

```
moderation_Leeftijd <- c()
moderation_in_model_Leeftijd <- c()

for (i in 1:n){
  moderation_Leeftijd <- rep(ifelse(dat.Leeftijd[i]=="High", 1, 0),12)
  moderation_in_model_Leeftijd <- append(moderation_in_model_Leeftijd,
moderation_Leeftijd)
}

moderation_Verblijf <- c()
moderation_in_model_Verblijf <- c()

for (i in 1:n){
  moderation_Verblijf <- rep(ifelse(dat.Verblijf[i]=="Urban", 1, 0),12)
  moderation_in_model_Verblijf <- append(moderation_in_model_Verblijf,
moderation_Verblijf)
}

moderation_Sust <- c()
moderation_in_model_Sust <- c()

for (i in 1:n){
  moderation_Sust <- rep(ifelse(dat.Sust[i]=="High", 1, 0),12)
  moderation_in_model_Sust <- append(moderation_in_model_Sust,
moderation_Sust)
}

moderation_in_model_Geslacht
moderation_in_model_Leeftijd
moderation_in_model_Verblijf
moderation_in_model_Sust

out_moderation <-
glm(y~0+as.matrix(dm.n)+as.matrix(dm.n):moderation_in_model_Geslacht+as.mat
rix(dm.n):moderation_in_model_Leeftijd+as.matrix(dm.n):moderation_in_model_
Verblijf+as.matrix(dm.n):moderation_in_model_Sust, family =
binomial(logit))
summary(out_moderation)

with(out_moderation, pchisq(null.deviance - deviance, df.null -
df.residual, lower.tail = FALSE))
```