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**Identifying the motivational factors for using
car-sharing services in the Netherlands and Korea
through qualitative system dynamics**

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Abstract: The purpose of this research is to broaden the understanding of the dynamic processes of the car-sharing developments and expose differences in motivational factors. Specifically, this research looked into the car-sharing participation motives of users in the Netherlands and Korea by using the qualitative system dynamics methodology. Exploring the differences in motivational factors has been realized through the establishment of a Causal Loop Diagram, based on propositions from theory. This model has been validated by interviews with eleven car-sharing service users. The findings of this study show that Dutch users are strongly motivated by environmental sustainability reasons and Korean users are strongly motivated by financial benefits. Moreover, Korean users perceived environmental sustainability as a nice byproduct of car-sharing rather than the main motive for using the service. In general, the younger generations were found to be more economically motivated to use car-sharing services than the older generations. The provider of a car-sharing valued social aspects more than the user group.

Keywords: Sharing Economy, Car-Sharing, Participation Motives, Motivational Factors, Qualitative System Dynamics

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감사합니다.

이수연

Nijmegen, 2020

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1. Introduction

1.1. Background

In recent years, the concept of the sharing economy in which “peer-to-peer-based activity of obtaining, giving, or sharing the access to goods and services, organized through community-based online services” (Hamari, Sjöklint & Ukkonen, 2016, p. 2047) has rapidly developed globally. The exponential growth of peer-to-peer based activity is making a significant impact on social, environmental and economic aspects. Consumers get access to products and pay for the experience of using them temporarily, instead of purchasing and owning items (Bardhi & Eckhardt, 2012). This alternative mode of purchasing and consumption is expected to mitigate societal issues such as overproduction and pollution by reducing the cost of economic coordination within communities (Hamari et al., 2016). However, despite recent attention on the sharing economy, there is yet a lack of studies on the motivations of the people to participate (Böcker & Meelen, 2017; Tussyadiah, 2015). A study on motivational factors for consumers to participate in sharing economy is needed as it facilitates the growth of the sharing economy (Joo, 2017). This research aims to give a systematic understanding of the motivations of people to participate in sharing economy, through the case of car-sharing. As car-sharing is one of the most prominent examples of the sharing economy (Hartl, Sabitzer, Hofmann & Penz, 2018), car-sharing is considered the appropriate case to look into. Thus, by reviewing the literature covering the topic of sharing economy and car-sharing, this paper will be able to identify the dynamic processes of the development of car-sharing and the leading motivational factors of people for using car-sharing services.

This research is much inspired by the paper of Davidson, Habibi and Laroche (2018). The study of Davidson et al. (2018) is the first paper that looked into the participation in the sharing economy cross-culturally. Davidson et al. (2018) did a cross-cultural study of American and Indian consumers to find out “whether/how materialism does influence participation in the sharing programs of the sharing economy and whether this effect exists/differs cross-culturally” (p. 365). The findings of Davidson et al. (2018) showed that people in different cultures have different reasons for participating in the sharing economy programs. In their study, Americans and Indians adopted different reasons that are likely to influence their participation in the sharing programs. Americans are motivated by “experiential and transformative experiences that can improve their self-image and well-being” (p. 365). On the contrary, Indians are

motivated by “increased perceived utility” (p. 365), mainly for utilitarian motives to participate in sharing programs. The paper of Davidson et al. (2018) inspired this research to explore the difference in motivational factors of using car-sharing in two countries, the Netherlands and Korea. Davidson et al. (2018) suggested that there is limited cross-cultural research on the sharing economy participation and those limited researches are only focused on American consumers. Therefore, the exploration of Dutch and Korean users’ motives will bring valuable insight into this topic.

1.2. Research objective and questions

This research has a theory-oriented focus. This paper aims to broaden the understanding of the dynamic processes of the development of car-sharing and differences in motivational factors. By researching the user’s motives and how they differ in the Netherlands and Korea, this paper makes two core contributions. First, the paper establishes a dynamic model of users’ motivations in participating in car-sharing activities, thereby illustrating the usage of car-sharing activities as a socio-economic system. Second, by looking at the motivations of users from the Netherlands and Korea, this research can contribute to the further development of theories regarding the cross-cultural variation in motives. The research findings are expected to provide insight for practitioners to understand what the most important motives for users for each country are. To reach this objective, this research paper addresses the following research questions. The main research question of this paper is:

What are the dynamic processes of car-sharing development and how do motivational factors differ in the Netherlands and Korea?

The following sub-questions have been formulated, to answer the main research question. The particular sub-questions for this paper are:

- *Research question 1: What are the dynamic processes of the development of car-sharing in general?*
- *Research question 2: How do the motivational factors of using car-sharing differ in the Netherlands and Korea?*

1.3. Research design

This research is composed of three parts and follows the steps of Soft System Dynamics Methodology (SSDM) that Rodriguez-Ulloa and Paucar-Caceres (2005) proposed. In the paper of Rodriguez-Ulloa and Paucar-Caceres (2005), there are three ‘worlds’ that can describe the SSDM. The three worlds are “(1) the Real World; (2) the Problem-Situation Oriented World; and (3) the Solving-Situation Oriented System Thinking World” (Rodriguez-Ulloa & Paucar-Caceres, 2005). The core idea of each world of SSDM has been adopted in this paper in three steps. First, it is important to describe the real world (Rodriguez-Ulloa & Paucar-Caceres, 2005). In this research, the real world is the phenomenon of car-sharing. To describe the real system, I reviewed the academic literature concerning the motivation to participate in sharing economy and car-sharing services.

Then, the second step is to identify the system-thinking world (Rodriguez-Ulloa & Paucar-Caceres, 2005). To translate the real world into the system's world, I made a causal loop diagram. Figure 2 shows the visual representation of the user's motivation for the use of car-sharing services described in the literature.

Lastly, I conduct semi-structured interviews to compare the real world and the system thinking world. The ‘comparison’ indicates validating the causal loop diagram, whether the model adequately expresses the real world (Rodriguez-Ulloa & Paucar-Caceres, 2005). Interviews are carried out with car-sharing service users. It helped to see whether the model adequately reflects the real system of motives to participate in car-sharing. These interviews served as a ‘confirmatory step’ (Luna-Reyes & Andersen, 2003) and checked if the model covers the essential elements and built confidence in the model (Andersen et al., 2012).

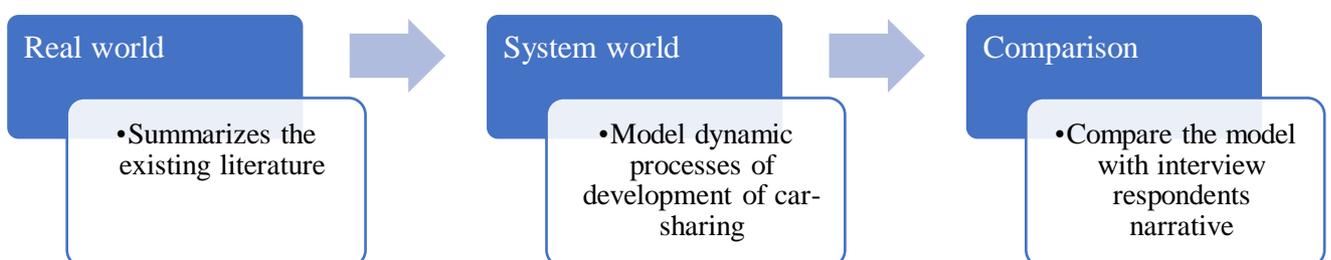


Figure 1: Research design

1.4. System dynamics as a research methodology

Qualitative System Dynamics methods are applied to see the dynamic processes of car-sharing service developments. System Dynamics (SD) is a modelling approach that aimed at explaining the system's behavior through its structure (Forrester, 1961; Sterman, 2000). System Dynamics is a useful method when one is trying to describe "a process in which action and information, in turn, affect each other" (Vennix, 1996, p.31), and the feedback loop can illustrate this process. The feedback mechanism allows us to understand how the system drives its behavior. There are two types of feedback loops in system dynamics, reinforcing and balancing (Sterman, 2000). If the feedback loop is positive, it means that all the variables behave in the same direction, so that the loop is self-reinforcing, whereas, if the feedback loop is negative it means that variables act by self-balancing (Sterman, 2000). A causal loop diagram shows the drivers of the system and how the different parts interconnect. A causal loop diagram is considered the appropriate modelling tool, as this research aims to identify the general dynamic processes of car-sharing developments.

1.5. Relevance of the research

This research will contribute to the knowledge in the following areas. First, this research will improve the understanding of the dynamic processes of the development of car-sharing. By using qualitative system dynamics, the causal relations responsible for a phenomenon, in here the development of car-sharing, will be identified and therefore, a theoretical contribution can be made. Second, this research will deepen the knowledge on motivational factors of people participating in a car-sharing service. Despite growing attention to the sharing economy, little is known about why people participate (Böcker & Meelen, 2017; Tussyadiah, 2015). By reviewing the work of a few early scholars who have suggested motives for participation, I can identify the leading motivational factors and thus broaden the understanding of motivations. Lastly, by exploring the difference in motivations of users in the Netherlands and Korea, the paper can provide some insight into the cross-cultural variation in motives. A few early scholars mainly focused on the motive factors of American consumers (Davidson et al., 2018). The study of the motivations of Dutch and Korean users will thus bring some interesting insight into this subject.

1.6. Outline

The next chapter provides a theoretical background. This includes the literature reviews on the topic of sharing economy and the motivations for participation in sharing services such as car-sharing. The final product of this chapter will be a CLD that visualizes the development of car-sharing services. Moreover, it gives a justification for propositions development. Chapter 3 elaborates on the methodological aspects of this research. Chapter 4 discusses the results and the validated model will be presented. Finally, an answer to the research questions will be given here in chapter 5. The implications and limitations of this research will also be discussed.

2. Theory

This chapter contains the literature review of the sharing economy and the motivations for participating in sharing services such as car-sharing. First, the technology advancement is introduced as the enabler of the sharing economy. Then I look into the literature that reviewed the participation motives on the sharing economy service. After that, I identify three leading social and economic motivational factors that have contributed significantly to the rapid growth of sharing activities: environmental sustainability, financial benefits and social benefits. These three leading motivational factors are visualized in a causal loop diagram as a conceptual model. After this, the development of the proposition is discussed.

2.1. Literature review

2.1.1 The sharing economy as a trend of technology development

The sharing economy is an emerging economic-technological trend caused by information and communications technology (ICT) innovations, growing consumer awareness, a proliferation of shared online communities, and social commerce. (Botsman & Rogers, 2010; Hamari et al., 2016; Kaplan & Haenlein, 2010; Wang & Zhang, 2012). The development of ICT has encouraged the creation of online platforms that promote content, sharing, and collaboration created by users (Kaplan & Haenlein, 2010) and thus accelerate the sharing economy. The rapid growth of the sharing economy has captured attention “in the nature and impacts of the sharing economy amongst entrepreneurs, innovators, incumbent businesses, policy-makers, media commenters and academic researchers alike” (Martin, 2016, p. 149). The researchers have put much interest in analyzing the aspects of the sharing economy and what has enabled the sharing economy. They found that the sharing economy is, in most cases, enabled by the advancement of web and mobile technologies in which power and value production is distributed among users (Bellotti et al., 2015). The development of information and technologies has facilitated the environment where users can create their own content and share with others. One example is introduced in the article of Belk (2014), the Sharehood, founded by Michael Green in a neighborhood in Melbourne, Australia. Green established an online sharing service platform where people can upload their belongings sitting idle and that is ready to be shared with neighbors. People could reserve a thing such as a sewing machine, and bicycle at no cost. This sharing service started with his idea that he needed to use a washing machine

and there were dozens of homes with a washing machine not being in use. This sharing service helped the neighborhood from having underused properties and also encouraged a strong sense of community (Belk, 2014). As can be in the Sharehood example, technology advancement has introduced many new forms of sharing and facilitated older ways of sharing on a wider scale (Belk, 2014).

It is widely accepted among academics that one of the key factors that have facilitated and encouraged the growth of peer-to-peer sharing activities worldwide is an increase in the level of technological development in global societies and economies. Despite recent attention for the sharing economy, little is known about the motivational factors that affect people to participate (Böcker & Meelen, 2017; Tussyadiah, 2015). The enablers of the sharing economy are well identified, but the drivers of the sharing economy are yet ambiguous. It is important to study motivating factors for consumer participation in the sharing economy as it is a crucial aspect that facilitates the growth of the sharing economy (Joo, 2017). Insights in motivations of users would be influential in promoting the general discussion of the sharing economy but also in fostering a better understanding of the decision-making processes of users that were undiscovered (Böcker & Meelen, 2017; Tussyadiah, 2015).

Those few scholars who were interested in the topic of sharing economy in the early years suggested motivation for participation. Several previous studies on the various motivation for participation in the sharing economy are summarized in the following table.

Table 1: Previous studies on motivations to participate in the sharing economy

Author(s) (year)	Sample and Methodology	Motivations	Overview of findings in motivations
Bardhi and Eckhardt (2012)	40 semi-structured interviews with Zipcar users	-	In the case of car sharing platform Zipcar, economic motivations are dominant.
Hamari et al. (2016)	Survey data gathered from 168 people registered onto a collaborative consumption (CC) site	1) sustainability, 2) enjoyment, 3) reputation, and 4) economic benefits	Participation in CC is motivated by sustainability, enjoyment, and economic gains.

Böcker and Meelen (2017)	A survey conducted among 1330 respondents from Amsterdam	1) economic, 2) social and 3) environmental motivations to participate in peer-to-peer sharing	Users appear to be more economically motivated than the providers of goods.
Tussyadiah (2015)	Based on the questionnaire responses from 754 adult travelers residing in the US	1) sustainability, 2) community and 3) economic benefits as motivations to use peer-to-peer accommodation	Economic motives are a significant driver for people to use shared accommodation.
Bellotti et al. (2015)	68 semi-structured interviews of individuals users of providers	1) value/morality 2) social influence 3) status/power 4) emphatic/altruistic 5) social connection 6) intrinsic/autotelic 7) safety 8) instrumental	Users are more economically motivated than providers
Hawllitschek et al. (2018)	Survey with a theoretical model based on a comprehensive set of potential consumer motives was tested among 745 participants	1) financial benefits, 2) uniqueness 3) variety, 4) ubiquitous availability 5) social experience 6) process risk concerns 7) privacy concerns 8) resource scarcity concerns 9) prestige of ownerships 10) independence through ownerships 11) ecological sustainability 12) anti-capitalism 13) sense of belonging 14) modern lifestyle 15) effort expectancy 16) familiarity 17) trust in other users	The five most important drivers of sharing platform usage intentions are financial benefits, trust in other users, modern lifestyle, effort expectancy, and ecological sustainability.
Joo (2017)	Survey among 292 Socar (car-sharing platform) users in South Korea.	1) cost-saving 2) time saving 3) convenience 4) social value as intentions to use car-sharing service	Convenience and time savings as motivations to use the car-sharing service continuously.
Schaefer (2013)	14 in-depth interviews with users of a US car-sharing service	1) value-seeking, 2) convenience, 3) lifestyle and 4) environmental motives.	A symbolic lifestyle motive and the altruistic environmental motive, as well as practical motives of value-seeking and convenience, influence consumers' usage of car-sharing.

Table 1 shows the previous studies on peoples' motivational factors to participate in different forms of sharing economy. Bardhi and Eckhardt (2012) looked into the motivation of car-sharing platform Zipcar users. Tussyadiah (2015) researched the motivation of peer-to-peer accommodation rental service users. Although there is a variation in services and industries of their research focus, there were three distinct motivational factors. In line with my research focus on car-sharing, I elaborate three leading motivational factors to participate in the sharing economy in the following paragraphs: environmental sustainability, financial benefits, and social benefits.

2.1.2 Environmental sustainability driven by a preference for greener consumption

Over the last decades, the environmental problems took a more prominent spot on the worldwide agendas. Growing concerns about climate change and air pollution have affected consumer's choices in like manner. Consumers are worried about climate change and are increasingly aware of the potential negative impact of over-consumption on the environment (Tussyadiah, 2015). A preference for green consumption has a positive effect on the attitude toward shared consumption in this regard (Hamari et al., 2016). For ecologically aware consumers, "collaborative consumption can be considered a manifestation of sustainable behavior" (Tussyadiah, 2015, p. 4). In other words, participation in collaborative consumption is generally expected to be highly sustainable in ecological terms (Prothero et al. 2011). Car-sharing is considered as a more sustainable mobility behavior as individuals share a car with others instead of owning it (Schaefers, 2013). According to Schaefers (2013), environmental awareness is a significant psychological consequence for car-sharing users. The study of Costain, Ardron, and Habib (2012) found car-sharing users are environmentally conscious and even willing to choose environmentally friendly alternatives that are more expensive. Thus, it can be concluded that consumers with environmental concerns are motivated to use a car-sharing service and by using its service, they get to once again think about environmental aspects. It can be said that environmental awareness reinforces by using the car-sharing service. Environmental motivation is an altruistic motive to a certain degree, as users do not experience direct benefits (Schaefers, 2013).

2.1.3 Seeking for financial benefits

Financial benefits are driving user participation. The empirical literature support for economic motivations in sharing economy participation (Böcker & Meelen, 2017). In the research of Tussyadiah (2015), economic motives are an important driver for users to make use of shared goods. Furthermore, Hamari et al. (2016) found that economic benefits facilitate intended sharing economy participation. According to Litman (2000), car-sharing provides consumers with a practical alternative to buying a personal car. The price structure of car-sharing is attractive and affordable, even for families with low income because car-sharing has lower fixed costs than ownership of private-vehicle (Litman, 2000). Owning a car, for example, entails a huge financial burden when purchasing and maintaining the vehicle. If you share a car with other people, however, you only have to pay for the actual use. Therefore, financial savings can be made by using a car-sharing service instead of buying an expensive car (Böcker & Meelen, 2017). According to Hellwig, Morhart, Girardin, and Hauser (2015), saving money is an effective motivation, especially for the sharing pragmatists.

2.1.4 Seeking for social interaction and enjoyment

It is suggested that consumers pursue social interaction (Hawlitschek et al., 2018), based on the notion that social context is important to all beings (Maslow, 1943). Peer-to-peer sharing is often viewed as an instrument for creating new modes of solidarity and social bonding among individuals (Belk, 2010). Botsman and Rogers (2010) found that collaborative consumption is motivated by social motivations such as a desire to engaged and to connect with others. Interactions between users and providers of goods or services form the many modes of sharing economy (Böcker & Meelen, 2017). For example, if you are sharing cars with others, you have to meet up with the user and hand in the key. When you are sharing a ride with other people, it is possible to have a small talk and interact. This kind of social aspect could drive sharing economy participation (Botsman & Roger, 2010). In the study of Bellotti et al. (2015) consumers are drawn to sharing platforms where they can interact and build relationships with other people or simply enjoy others' company. Therefore, peer systems should promote supportive social experiences with specific social benefits for their program users as those benefits are what users are looking for (Bellotti et al., 2015). Users are motivated to use a car-sharing service as it entails enjoyable and social experiences. Therefore, it is implied that it is crucial to let customers have an enjoyable and satisfying experience, then they will use the service again for social benefits.

2.1.5 Cultural embeddedness

This research paper has a great interest in looking for what the motivations for people to participate in car-sharing services are and how these motivation factors differ in the Netherlands and Korea. Therefore, cultural aspects need to be discussed. In the study of Davidson et al. (2018), they found out that people in different cultures adopt different reasons to participate in the sharing-based programs of the sharing economy. Davidson et al. (2018) conducted a cross-cultural study of America and India, and their research showed that materialism predicting willingness to participate in a sharing-based program doesn't differ. "However, the reason why is different for each culture" (Davidson et al., 2018, p. 364).

Culture is a heterogeneous term and no one definition can completely describe it (Guess, 2004). Within the broad aspects of culture, this research paper follows the approach of Triandis (1995) dimension of individualism-collectivism. Specifically, the paper focuses on value orientations in different cultures and their relation to motivation factors of car-sharing. According to the cultural dimension summarized by Guess (2004), "Individualistic cultures are defined by detachment from relationships and community. The individual views himself or herself as relatively independent from others. In contrast, collectivist cultures stress the importance of relationships, roles and status within the social system" (Guess, 2004, p. 6). The group norms, duties and responsibilities are more strongly influenced by individuals within collectivistic cultures. This is also supported by the paper of Shavitt, Torelli, and Riemer (2011), in vertical-collectivist societies (e.g., Korea), people focus on enhancing the cohesion even when that means compromising their personal goals. In the paper of Markus and Kitayama (1991), the dimension of culture and the self is described as 'independent' and 'interdependent'. Many Asian cultures have an emphasis on fitting in, and harmonious interdependence with others. In contrast, in American culture, as well as in many Western European cultures, individuals try to keep themselves independent from others.

Together with Triandis (1995) dimension of Individualism-collectivism and Markus and Kitayama (1991) views of Independent-Interdependent, culture can be organized in two spectrums. The European countries are societies with more individualistic value orientations, with an emphasis on independence. Asian countries' cultures are primarily collectivist value oriented, with an emphasis on interdependence.

2.2 Conceptual model

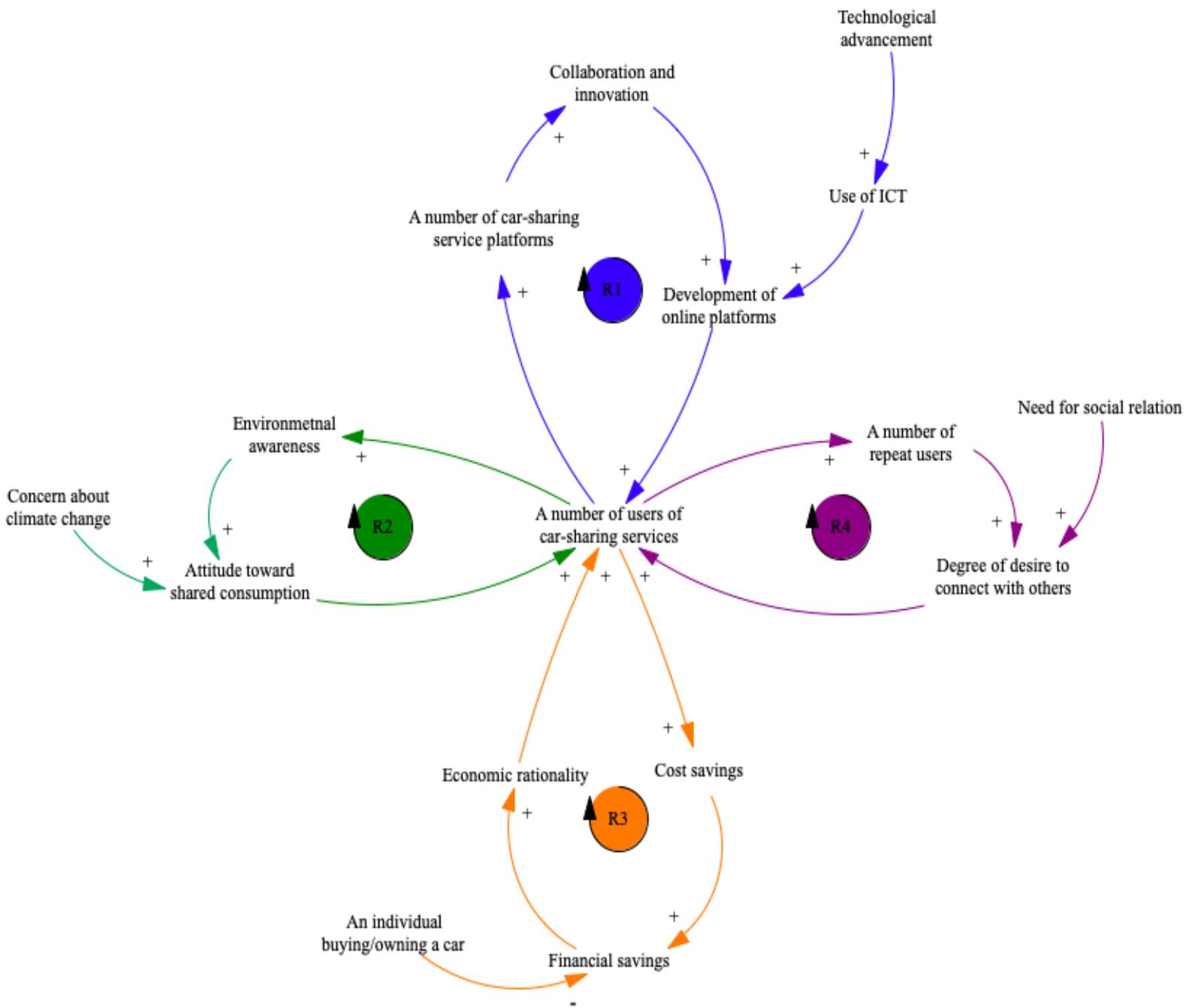


Figure 2: Conceptual model of car-sharing service enablers and motivators

Table 2 The summary of CLD

Conceptual model	Loops	Theme	Enabler & Motivator
Dynamic processes of car-sharing services	Blue (R1)	ICT development	Enabler
	Green (R2)	Environmental sustainability	Motivator
	Orange (R3)	Financial benefits	Motivator
	Purple (R4)	Social benefits	Motivator

In this research, I analyzed multiple academic literature, covering the topic sharing economy and the motivations for participating in sharing services such as car-sharing. I found interconnected causal relationships that are influencing the development of car-sharing services. To illustrate my findings, a CLD was constructed, as can be seen in Figure 2. The CLD shows four reinforcing loops and it depicts the conceptual model of car-sharing services enablers and motivators. To understand the dynamic processes of car-sharing services, I formed the central variable of the CLD as a number of users of car-sharing services. The list of literature that pinpointed the casual relation of CLD can be found in Appendix 2. In the following paragraphs, I will give an explanation of each loop.

Reinforcing loop 1 (R1) shows ICT development as an enabler of car-sharing services. The development of ICT has encouraged the design of online platforms (Kaplan & Haenlein, 2010), and facilitated the condition where the car-sharing business can grow. As a growing number of car-sharing businesses started operating, a number of people tried out the car-sharing services. In response to the increasing demand for using a shared car, the number of the car-sharing platform started to increase. And the continual collaboration and innovation among service platforms improve user's benefits (Botsman & Rogers, 2010). In turn, collaboration and innovation positively affect the development of online platforms again.

Reinforcing loop 2 (R2) exhibits environmental sustainability as a motivator for users to participate in car-sharing services. People who are concerned about climate change have a positive attitude toward shared consumption (Hamari et al., 2016). These environmentally aware consumers manifest sustainable behavior by participating in share consumption (Tussyadiah, 2015), and here through using car-sharing services. Environmental awareness is

a significant psychological consequence for car-sharing users (Schaefer, 2013). By using the service, users get to think about environmental aspects and in turn, this leads to a positive attitude towards shared consumption.

Reinforcing loop 3 (R3) manifests financial benefits as a motivator for users to participate in car-sharing services. An individual acknowledges that buying or owning a car is a big burden and negatively affects that financial savings (Litman, 2000). As car-sharing has lower fixed costs than ownerships of a private car, car-sharing provides a practical alternative (Litman, 2000); hence users get involved in using car-sharing services. Thus, by saving the costs, users can make a financial saving by using a car-sharing service instead of buying a private car (Böcker & Meelen, 2017).

Reinforcing loop 4 (R4) presents social benefits as a motivator for users to participate in car-sharing services. The notion that social relationships are vital to all human beings (Maslow, 1943), relates to users looking for social interaction (Hawlitschek et al., 2018). It supports the idea that the need for social relations positively affects the degree of desire to connect with others. Users looking for social interaction will have a positive attitude towards car-sharing activities because car-sharing entails social experiences. Users that are drawn to use car-sharing services for social relations will reuse the service again.

2.3 Propositions development

I constructed the following five propositions to validate the dynamic conceptual model in Figure 2. Reinforcing loop 1 (R1) is excluded from the propositions, as the development of ICT is not a motivational factor but an enabler of the trend of car-sharing.

Propositions

- Proposition 1: Concern about environmental sustainability has a reinforcing impact on the attitude towards car-sharing activities. (Reinforcing loop 2)
- Proposition 2: Financial benefits have a reinforcing impact on the attitude towards car-sharing activities. (Reinforcing loop 3)
- Proposition 3: Social benefits have a reinforcing impact on the attitude towards car-sharing activities. (Reinforcing loop 4)

Propositions 1, 2, and 3 are related to research question 1 to find out the dynamic processes of the development of car-sharing in general.

- Proposition 4: Financial benefits play a more prominent part for Dutch users to participate in car-sharing services than Korean users.
- Proposition 5: Social benefits play a more prominent part for Korean users to participate in car-sharing services than Dutch users.

Propositions 4 and 5 are related to research question 2, to find out the difference in motivational factors between users in the Netherlands and Korea. In the study of Davidson et al. (2018), they found out that people in different cultures have different reasons for participating in the sharing economy programs. In this research, I will explore the difference between the Netherlands and Korea to find out how motivational factors of the users participating in car-sharing services differ. The propositions are developed based on the theoretical background of Triandis (1995), cultural descriptions of individualism and collectivism. In this research, the extrinsic motivations are related to financial benefits (R3) and the intrinsic motivations are related to social benefits (R4). Based on the cultural description drawn by Triandis (1995), Dutch users in light of their individualistic culture are expected to value extrinsic motivation more. Financial benefits are part of the extrinsic motivation that is attached to the personal desire and individuals of individualistic culture determine their social behavior on the basis of

their own needs. Thus, the financial benefits will play a more prominent part for Dutch users to participate in car-sharing service than Korean users. Also, Korean users from collectivistic cultures are expected to value intrinsic motivations more. Social benefit is part of the intrinsic motivation that has to do with the relationship with others. Moreover, individuals from collectivistic cultures are more strongly guided by group relationships. Therefore, social benefits will play a more prominent motivation for Korean users to participate in car-sharing service than Dutch users. Proposition 4 and 5 are culturally specific propositions that are related to research question 2 and aim to find out the motivational factor differences between users in the Netherlands and Korea.

3. Methodology

The research methodology of the thesis will be introduced in this chapter. First, I'll explain how System Dynamics is relevant to my thesis. Then, I will explain the need for model validation and on how a concept of disconfirmatory interview can increase conceptual model validity. Next, the methodological aspects of data collection and analysis will be discussed. Lastly, the research ethics of my thesis will be covered.

3.1. System dynamics

System Dynamics is a modeling approach that aimed to explain the behavior of the system through its structure (Forrester, 1961; Sterman, 2000). It helps to explain the behavior of events over time by mapping the causal relationships underlying (De Gooyert, 2018). In system dynamics, causal loop diagrams depict the feedback structure of the problem at hand and are particularly useful in communicating its internal dynamic mechanisms (Sterman, 2000). As my master thesis aimed at exploring the trends of the car-sharing phenomena and the interconnectedness of the different motivations of users, the system dynamics methodology is considered as a relevant approach.

The methodology of system dynamics is increasingly applied for the development of dynamic theoretical contributions with a focus on expanding knowledge, although originally developed for practical contributions (De Gooyert, 2018). In the article by De Gooyert (2018), he identified four main research strategies for using system dynamics for theoretical contributions. Among the four different strategies, my research paper is in line with the grounded theory building. I use the grounded theory approach to develop “variables which have significantly explanatory power and are intimately tied to the data” (De Gooyert, 2018, p.658). More specifically, I used the causal loop diagrams to see the causal connection between these variables to identify the motives and consequences of the car-sharing trend. The combination of grounded theory and causal-loop diagram allows us to generate and communicate substantive theories intimately tied to the data (De Gooyert, 2018). With qualitative system dynamics, I aim to expand the knowledge of users' motivation for using the car-sharing service.

3.2. Model validation

According to Barlas (1996, p.184), “judging the validity of a model ultimately involves judging the validity of its purpose too, which is essentially non-technical, informal, qualitative process”. Testing the validity of a model and its purpose is crucial aspects to build confidence in a model. Barlas (1996) emphasized the need to distinguish the type of model before validating it. My model in this research, a CLD, falls into the categorization of a “causal-descriptive” or “theory-like” (Barlas, 1996, p.185). The causal-descriptive models are statements as to “how the real system actually operates in some aspects”, it is important to test the validity of the “internal structure of the model” (Barlas, 1996, p.185). The validation strategy adopted in my research corroborates the model 's quality, based on the structure confirmation test (Barlas, 1996), in a manner that confirms the model's internal structure. This strategy choice enables me to review whether the degree of confidence in portraying the cause and effect links that describe the overall representation of the enabler and motivator for car-sharing service has been sufficiently achieved. A structure confirmation test can be done by taking individual relationships and comparing it with available knowledge about the real system (Barlas, 1996). By confirming each one-to-one relationship detected in the model, it can probe whether the model structure corresponds to the theoretical knowledge of the systems (Barlas, 1996). Precisely, a disconfirmatory interview (Andersen et al., 2012) will serve as a structure confirmation test in my research. This will be further elaborated in the next paragraph.

3.3. Disconfirmatory interview

I developed the CLD describing the causal connections and feedback processes involved with the enabler of a car-sharing service and the motivation of the users. Nevertheless, this model is based only on prevalent literature, and there is no validation of its relations and feedback processes. According to Forrester and Senge (1980), confidence in a model is increased when empirical reality derived from experience or experiment, are identified. Someone who has not been involved in the model constructing process can help to validate the model (Forrester & Senge, 1980). Thus, I invite 11 users of the car-sharing service to validate the theory-based CLD. The experience of car-sharing service users is bringing empirical reality in this research.

I conducted semi-structured interviews with eleven car-sharing service users to validate the CLD. I have employed a concept of disconfirmatory interview as it can help to confirm or

disconfirm the causal relations in the model (Andersen et al., 2012). According to Andersen et al. (2012), a disconfirmatory interview has two main purposes. First, using a systematically constructed disconfirmation process, these interviews can increase user confidence in a model and its behavior (Andersen et al., 2012). Second, disconfirmatory interviews facilitate the improvement of a model structure by giving constructive suggestions (Andersen et al., 2012). By asking respondents' experiences of whether it matches the model structure, the model can be validated and also improved (Andersen et al., 2012). The elements of a disconfirmatory interview allowed me to explore the propositions I constructed and increased confidence in the model. The interview guide can be found in Appendix 1.

3.4. Data collection

I conducted a semi-structured Skype interview with the elements of a disconfirmatory interview to validate the preliminary CLD explaining the causal connections and feedback processes involved with the enabler of a car-sharing service and the motivation of the users. The choice for using Skype as a platform to conduct the interview was because of the COVID-19 pandemic. It was too challenging to organize face-to-face interviews, hence the communication tool for an online call was used. To get in-depth knowledge of users' motivation, I recruited interviewees who have used the car-sharing service beforehand and were willing to share their experiences. Participants were recruited in different ways, including postings announcements on social media such as Facebook, Instagram, Twitter, LinkedIn, and by sending out emails. Participants who were willing to take part in my research replied by sending me an email. Resultingly, I interviewed a total of eleven users, of which six were Dutch and five were South Korean. I managed to get a well-balanced sample of each country's users. Everyone who has participated in my interview used a car-sharing service as a user and three people also had experience as a service provider (car-sharing driver). An overview of interview respondents can be found in Table 3. The interviews were carried out over the Skype video call and all the interviews were recorded. The interview questions were developed based on the CLD derived from the existing literature. First, I asked an open question about their motivation to use the car-sharing service. By doing so, I could gain a broad insight into the user's motivation, which could not have been mentioned in the literature. Then, I introduced the concept of disconfirmatory interview and what I have found during the literature review. I explained three leading motivational factors: environmental sustainability, financial benefits,

and social benefits. Then I asked their opinion if they thought these motivational factors had a positive impact on the attitude towards car-sharing activities. By doing so, I could check if they agreed with the propositions of whether environmental sustainability, financial benefits, or social benefits have a reinforcing impact on the attitude towards car-sharing activities. Furthermore, based on their answer, I could check if their opinion contained the causal connection or variable in that loop. At the final stage of the interview, I asked the ranking question to find out which factors they valued the most.

Table 3: Overview of interview respondents

Name (Age)	Place of residence	Occupation	The platform used & user or/and provider	Date of interview
Ms. SP (27)	Seoul, Korea	University staff	Socar user	May 25th
Ms. MK (29)	Seoul, Korea	Works in the public sector	Socar, Greencar user	May 25th
Ms. HL (26)	Daejeon, Korea	Student	Socar, Poolus user	May 26th
Mrs. NP (39)	Oirschot, Netherlands	Teacher	Greenwheels user	May 26th
Mrs. FC (49)	Groningen, Netherlands	University shop manager	Snappcar provider	May 27th
Mr. AM (51)	Nijmegen, Netherlands	Works in the public sector	Greenwheels user	May 27th
Mr. RL (-)	Rotterdam, Netherlands	Works in IT	Greenwheels, Snappcar user	May 28th
Mr. JA (27)	Seoul, Korea	Works in IT	Socar, Poolus user & provider	May 28th
Ms. MH (28)	Seoul, Korea	Works in IT	Socar, Greencar user	May 30th
Mr. SV (26)	Leiden, Netherlands	Student	Snappcar user & provider	June 1st
Mrs. BH (57)	Nijmegen, Netherlands	CEO of a company	Greenwheels, Snappcar user & provider	June 2 nd

Greenwheels and Snappcar are the Dutch companies, founded in 1995 and 2011 respectively. Greenwheels is the business-to-consumer car-sharing service where users can rent a car owned by the company (Frenken, Waes, Pelzer, Smink & Est, 2019). Snappcar is the peer-to-peer car-sharing platform, where the car owners can decide the available dates and prices for their car (Frenken et al., 2019). Socar, Greencar, and Poolus are car-sharing services in South Korea. Socar and Greencar are business-to-consumer car-sharing services and both companies were founded in 2011 (Joo, 2017). Whereas, Poolus is a ride-sharing service developed by a South

Korean startup in 2016. Poolus is a platform where a rider can find a driver who is heading in a similar direction (Baek, 2018). In terms of the type of service, Dutch company Greenwheels is similar to the Korean companies Socar and Greencar, as they are business-to-consumer car-sharing services. Dutch company Snappcar is similar to the Korean ride-sharing service Poolus as they are peer-to-peer car-sharing services.

3.5. Data analysis

To analyze the data, I refer to the data analysis technique of Diker's introduced in the article by Andersen et al. (2012). I conducted an analysis of the interview data by checking the Skype video recordings of the interviews. As I had a small sample size of eleven people, I could adopt a data analysis of Diker's, which summarizes each of the participant's comments on each loop. After summarizing each interviewee's comments, I grouped similar ideas and discussed their implication for the model structure. This helped to identify whether they confirm or disconfirm the causal relations in the model (Andersen et al., 2012). For instance, I asked respondents if they agreed with proposition 1, proposition 2, and proposition 3. When a majority of participants agreed with a particular proposition, I concluded that the confidence in that specific proposition was established. If I detect that the respondent's narrative does not match the causal connection in CLD, I moved a relation from the model and added another relationship that can portrait a respondent experience in a better way. This concept of disconfirmatory interview helped not only increasing model validity but also improving the model.

3.6. Research ethics

Participation in interviews was entirely voluntary and there was no kind of coercion or any other means of pressuring someone to take part in research against their will (Denscombe, 2012). I received verbal consent from all respondents for Skype video recordings. I provided a sufficient amount of information when informing participants about the possibility of taking interviews anonymously and got verbal consent from all respondents to cite by name. Moreover, I made sure that there was scientific integrity throughout this paper by using suitable research methods, and appropriate techniques to conduct the research (Denscombe, 2012). Plagiarism is fully avoided and all references are presented according to APA style. The findings of this research are shared with Radboud University and will be publicly available.

4. Results

In this chapter, I will answer the first and second research questions. To do so, I'll explore each proposition that I constructed in chapter 2. Proposition 1, 2, and 3 are related to research question 1 to find out the dynamic processes of the development of car-sharing in general. I asked participants if they agreed with propositions 1, 2, 3, and if the majority agreed with propositions given, I concluded that the confidence in the relations were established. Proposition 4 and 5 are related to research question 2, to find out the motivational factor differences between users in the Netherlands and Korea. Based on the propositions that they have confirmed in earlier steps, I asked each participant to prioritize their motivational factors. By checking the participants' prioritization, I could observe which motives were important factors to the Dutch and Korean users. This allowed me to conclude if the confidence in the propositions was established.

4.1. Analysis proposition 1, proposition 2, and proposition 3

The first proposition that I discussed covered the **concern about environmental sustainability having a reinforcing impact on the attitude towards car-sharing activities**. Nine out of the eleven respondents agreed with the proposition that environmental sustainability has a reinforcing impact on the attitude towards car-sharing activities. Moreover, four respondents from the Netherlands answered that environmental sustainability is the strongest motivation.

For instance, Mr. AM (Dutch), a Greenwheels user remarks *“Because of reasons of climates. That’s the main reason. When you don’t have a car, you have to reach another possibility. You have to be mobile in another way. You can cycle, you can go by public transport. So, you are motivating yourselves to use environmental mobility. (...) We made it difficult for ourselves, but in that way, we hope to contribute to the environment. (...) I think this whole car-sharing service is good for the total for the climate.”* (Mr. AM from the Netherlands)

According to Mr. AM (Dutch) narrative, I could find out the causal relationship between concerns about climate change and attitude toward shared consumption. Following remarks made by Mrs. BH (Dutch), a Greenwheels user and Snappcar provider confirmed a positive connection between attitude toward share consumption and using a car-sharing service.

“Yes, I’m very sustainable person. I’m very much into sustainability (...) Not owning the car but just sharing, it reduces the km driven by cars. That’s the sustainability win... And the other one, on the whole, we are going to produce less cars, which is also a big sustainability win. Then there’s also a softer issue, we don’t need that much parking space. We get to have more space for green instead of parking cars. There is so many issues involved. That was my motivation.” (Mrs. BH from the Netherlands)

Mrs. NP (Dutch), a Greenwheels user, likewise discussed how environmental awareness motivates her to use car-sharing services.

“My biggest motivation for getting involved in a car-sharing service is an environmental reason... If you share a car with others, it’s better for the environment... In terms of gasoline, fumes in the air, it is just waste for the earth that everybody has their own car.” (Mrs. NP from the Netherlands)

Mrs. FC (Dutch) is a provider of Snappcar and has shared her car with others for two years. With her answer, I could check the concerns about the environment and attitude toward shared consumption that motivated her to get involved in the car-sharing service.

“We own a car ... it was sitting idle five days a week, at least... So, I thought it was good for the environment. I believe in a circular economy where people share things... and sustainability is really important. When everybody has a car, it would be more even clutter in the street, and it would be harder to find a parking space and there would be more traffic jams. I believe that if you own something that other people can make use of... then that is one of my motives. (...) I like sharing. Because if we buy new stuff every time, and it’s not good for the world.” (Mrs. FC from the Netherlands)

Furthermore, I could find the positive causal connection between a number of users of car-sharing services and environmental awareness. As the users get involved in a car-sharing service, they get to think about environmental aspects even more.

Mrs. NP (Dutch) says, *“When you are actually using the car-sharing service, you are more conscious of environmental impact.”* Mrs. BH (Dutch) adds to this *“So many people own a car, and it’s in their default decision to drive a car. If you do not own it and if you share it, you have to decide on every trip. How should I make the trip? There is a lot of environmental wins.”*

On the other hand, two respondents from Korea answered that they have not considered the environmental impact when using the car-sharing service. Ms. HL (Korean), a Socar and Poolus user, has said, *“I do not think car-sharing is environmentally sustainable option. If you have thought about the environment, I would have used public transportation... I used the car-*

sharing mainly for its convenience and practicality reason.” Ms. MK (Korean), a Socar and Greencar user, also has said, “I have not thought about environmental impact when using this service. If I had a green option in mind, I would have used an electric car or hydrogen vehicle, but I chose a cheaper option car instead for financial reason.”

Two respondents from Korea have not considered environmental sustainability as a reinforcing impact, but, as nine out of the eleven respondents have agreed with the proposition, it can be concluded that the confidence in this proposition has been established.

The second proposition that I discussed is that **financial benefits have a reinforcing impact on the attitude towards car-sharing activities**. All eleven respondents agreed with the proposition that Financial benefits have a reinforcing impact on the attitude towards car-sharing activities. Furthermore, in total five respondents, four respondents from Korea and one from the Netherlands, answered that financial benefits are their main motivation to use the car-sharing service.

Ms. MH (Korean) remarks, “Most of all, my biggest motivation to use the car-sharing was a financial reason. I went to the car dealer shop to buy the car and the car I wanted to buy was 29,000 euros and together with taxes and cost of maintenance, I had to pay 7,350 euros per year. First, the price and costs were a big burden. I also thought about how much I will get to use the car. Seoul is a metropolitan city. You can reach everywhere by public transportation. Even the connection to the suburb is excellent. Then I concluded that my total utility of not owning a car is higher than owning a car. (...) I really like the car-sharing platform that I could use at a remarkably low cost. As I said earlier, there was a lot of promotion and they were providing a 50% coupon, so I could even use the car with even lower cost.” (Ms. MH from Korea)

As Ms. MH (Korean) narrates, her economic rationality led to her decision to use a car-sharing service instead of buying a private car. She could save the cost by using its service and eventually could make financial savings. By her answer, I could check all the causal relationships forming the financial benefits loop (R3).

Ms. SP (Korean) remarks, “Oh that’s (financial benefits) really important to me (...) it definitely was the important reason. Because I use the car-sharing service during my trips, I would rather invest in having delicious food. The transportation was just the mean. The quality of transportation wasn’t so important on my trips.” (Ms. SP from Korea)

As Ms. SP (Korean) indicates, her main motivation to participate in a car-sharing service was derived from the economic rationality to save the costs during her trips.

“If you compare the cost of five friends using public transport and car-sharing service, the car-sharing service is better to use. And of course, it is cheaper than the taxi. Five friends cannot fit in the taxi. And also, it is cheaper than the rental car service.” (Ms. MK from Korea)

Ms. MK (Korean) narrates that saving costs is her main motivation to use the car-sharing service. Subsequently, Mr. SV (Dutch) is a user and also a provider of Snappcar. He answered that financial benefits have a reinforcing impact on his attitude towards car-sharing activities. His remarks show the financial benefits as motivation to rent out his own car.

“The financial reason is the biggest motivation to rent out the car (...) What I have to pay monthly for maintaining my car and all the costs, parking costs, insurance costs and taxes, and together is almost 200 euros a month... and my car is quite old, so it doesn't have a really high value. So, for me, monthly costs are higher than the value of the car. That's why financial reason is my biggest motivation. When someone uses my car for a week, then I earn like 130 to 140 euros.” (Mr. SV from the Netherlands)

Therefore, as all eleven participants agreed, I can conclude that confidence in proposition 2 has been established. All participants confirmed that financial benefits have a reinforcing impact on the attitude towards car-sharing activities.

The third proposition that I discussed is that **social benefits have a reinforcing impact on the attitude towards car-sharing activities**. All eleven respondents agreed with proposition 3. However, there was only one respondent from the Netherlands and one respondent from Korea, who have considered social benefits as their strongest motivation to use a car-sharing service. Everyone who has participated in the interview acknowledged that social benefits have a reinforcing effect on the attitude towards car-sharing activities, but did not see this as a significant motivation.

Mr. JA (Korean) remarks, *“I used the platform called Poolus as a driver on my way home from work. I used to go home around 8 to 10 in the evening (...) I just thought it would be nice to drive with someone who is going the same direction. But on top of that, I did it because I was bored. (...) It was nice to meet all kinds of people and have a small chat is quite fun. Anyway, it is better to drive home with someone and have a chat, you can make your way home from work a little bit more enjoyable. I anyway have to drive home from work, and it's better to go with someone.”* (Mr. JA from Korea)

As Mr. JA's (Korean) said, I could check the positive causal connections between the degree of desire to connect with others and using a car-sharing service. Subsequently, Mr. SV (Dutch) points out the positive social relationship as one of his motivations to let neighbors use his car.

"I think it is good to share something that you don't need always. And you can easily share with your neighbor's, and if they can handle with cautions. Then they deliver back with good states. That's what I like. They sometimes hand me a bottle of wine. And people who use this service are mostly happy people and share their properties if they would want that. So, I think it has a good influence on the neighborhood." (Mr. SV from the Netherlands).

Mrs. FC (Dutch) shared both pleasant and unpleasant social experiences she had while renting out her own car.

"For me, it was also a social experiment because... what type of people use this service? Are they totally different from me? Are they similar? Do they have similar thoughts and beliefs? And with this one guy, I remember at one point that he had to go... a father was sick and he needed a car in the middle of the night... So, you become a personal bond with someone... Okay, you can, of course, get the car, bring it whenever you can. You know you become friendly. That was really nice, but some people also like... you trust them (...) but somebody tried this sunglasses and broke it and didn't tell us. It was 200-euro glasses... So that was a negative aspect of it. People don't treat it with care. One person used it for moving and ... the upholstery was damaged but they didn't even acknowledge that. (...) if you replace it, it would be a thousand euro and you're not going to ask for one little bridge. Still, it bothered me that people don't report this, and the people don't seem to care about it. It's like I pay for it, it's mine." (Mrs. FC from the Netherlands)

Mrs. FC (Dutch) agreed on the proposition that social benefits have a reinforcing effect on the attitude towards car-sharing activities, but she had unpleasant social experiences as well. The bad social experience led to her reason to stop renting out the car and stop getting involved with the car-sharing service.

"Users don't report this (damage). (...) and if they have a fine, traffic fine, for the speed, and they run a red light. Cars in my name so I have to pay 160 euro first, and getting it back. That's the reason, in the end, I decided not to do it anymore. Because it costs too much money and negative energy." (Mrs. FC from the Netherlands)

Mrs. FC's (Dutch) answers are in contrast to the social benefits loop (R4) in CLD. Her remarks did not match the causal connection between a number of users of car-sharing services and a number of repeat users in R4. Thus, based on her idea, I modified the model, which can be found in the 4.2 model validation paragraph. Nevertheless, as everyone agreed with this proposition, I can conclude that confidence in proposition 3 has been established along with some modifications to the social benefits loop (R4) in CLD.

4.2. Analysis proposition 4 and proposition 5

Proposition 4 and 5 were constructed to find out an answer to research question 2: *How do the motivational factors of using car-sharing differ in the Netherlands and Korea?* I constructed the propositions covering motivational factors of users using a car-sharing service that may vary according to the differences in cultures, supported by cultural descriptions of individualism and collectivism drawn from Triandis (1995). Proposition 4 was built to find out whether Dutch users value financial benefits more than Korean users. Additionally, proposition 5 was constructed to find out whether Korean users value social benefits more than Dutch users. I asked each participant to prioritize their motivational factors. This allowed me to find out the ranking order of motivational factors for each country. Table 4 below illustrates the eleven respondents' prioritization of motivation. Based on whether participants agree with earlier propositions, I asked them to rank the order of their motivational factors. Because two respondents from Korea, Ms. MK and Ms. HL did not confirm the proposition 2, the environmental motivation factor got excluded from their ranking. A greater-than sign (>) and equal sign (=) are used in the table for the reader to understand easily.

Table 4 Respondents prioritization of motivational factors

Name	Nationality	Prioritization of motivational factors
Ms. SP	Korean	Financial > Environmental > Social
Ms. MK	Korean	Financial > Social
Ms. HL	Korean	Financial > Social
Mr. JA	Korean	Social > Financial > Environmental
Ms. MH	Korean	Financial > Environmental > Social
Mrs. NP	Dutch	Environmental > Financial > Social
Mrs. FC	Dutch	Environmental > Social > Financial
Mr. AM	Dutch	Environmental > Financial > Social
Mr. RL	Dutch	Social > Financial > Environmental
Mr. SV	Dutch	Financial > Social > Environmental
Mrs. BH	Dutch	Environmental > Financial = Social

From the respondents' remarks, I could find out the ranking order of motivational factors for each country. For Korean users, financial benefits rank as the strongest motivation, followed by social benefits and lastly by environmental sustainability. Four respondents have answered that financial benefits were their main motivation to use the car-sharing service and one respondent said social benefits.

For Dutch users, environmental sustainability was the strongest motivation, followed by financial benefits and then by social benefits. Four respondents have answered that environmental sustainability is their main motivation to use the car-sharing service, one respondent said financial benefits, and another respondent said social benefits.

Overall, the answers given by the respondents suggest the disconfirmation of proposition 4 and proposition 5. Proposition 4 claims that **financial benefits play a more prominent part for Dutch users to participate in car-sharing services than Korean users**. However, financial benefits turned out to be more important to Korean users than Dutch users. The financial benefits loop has a stronger effect on Korean users than Dutch users. In contrast, only one out of six Dutch respondents said the financial benefits are the strongest motivation. Therefore, I can conclude that there is no confidence in proposition 4, thus disconfirmed.

Proposition 5 reasons that **social benefits play a more prominent part for Korean users to participate in car-sharing services than Dutch users**. Nonetheless, there is a lack of evidence that Korean users value social benefits more than Dutch users. For each country, there was only one respondent who ranked the social benefits factors as the strongest motivation for using a car-sharing service. As most Korean users group ranked the financial benefits factors as their strongest motivation and the Dutch users' group prioritized environmental sustainability as their main factors, it is hard to validate this proposition. Therefore, I can conclude that there is no confidence in proposition 5 and hence disconfirmed.

In the previous conceptual model (Figure 2), a number of users of car-sharing services were positively linked to a number of repeat users, as people who are drawn to use car-sharing services for social relations will reuse the service again for social experiences. To get the best representation of Mrs. FC's social experience, I deleted the direct link to a number of car-sharing users to a number of repeat users. Instead, I added two new relationships to differentiate the users' social experience into satisfied and unsatisfied. A new user with a desire to connect with others will try out the car-sharing service for establishing and having social relationships. Here, if that user had a pleasant social experience while using the car-sharing service, he or she will be likely to repeat the service usage. This is represented in the reinforcing loop (R4). However, if that user had an unpleasant social experience, just like what Mrs. FC had, he or she will not use the service again for social benefits. Unsatisfied users will not reuse the service and this will negatively affect the number of users of car-sharing services. This is represented in the balancing loop (B1). The model presented in Figure 3 is the final validated model in this research.

5. Conclusion and discussion

In this chapter, I will provide an answer to the research questions. Hereinafter, I will elaborate theoretical and practical implications. Lastly, I will end by discussing the limitation of this research and recommendation for future research areas.

5.1. Findings

This study aims to find out the dynamic processes of car-sharing development and to explore the difference of motivational factors of using car-sharing in the Netherlands and Korea. To do so, I formulated two research questions. The first research question was aimed at discovering dynamic processes: *What are the dynamic processes of the development of the car-sharing in general?* To answer this question, I reviewed existing literature covering the topic of sharing economy and motivations for participation in sharing services such as car-sharing. Then I constructed a causal loop diagram that illustrates a conceptual model of the car-sharing services enabler and motivator. The development of ICT served as an enabler of car-sharing services and three significant motivational factors - environmental sustainability, financial benefits, and social benefits - facilitated users to participate in car-sharing services. As this model is solely based on literature, I conducted interviews to validate the model. Confidence in a model is increase when empirical reality derived from experience is identified (Forrester & Senge, 1980). From the interviews with eleven respondents, the confidence in proposition 1, proposition 2, and proposition 3 were established.

First, nine out of the eleven respondents agreed with the proposition that environmental sustainability has a reinforcing impact on the attitude towards car-sharing activities. From users' prioritization of motivational factors, I could find out the concern about environmental sustainability played a more prominent part for Dutch users to participate in car-sharing services than to Korean users. Four respondents from the Netherlands said that environmental sustainability is their strongest motivation to use the car-sharing services. However, Korean users responded that environmental sustainability is rather a byproduct of car-sharing services and it is not part of their participation decision. Korean users' opinion on environmental sustainability was in line with the research of Hartl, Sabitzer, Hofmann and Penz (2018), perceiving environmental impact as a positive side effect as a 'nice bonus' than the main argument for car-sharing (Hartl et al., 2018).

Second, all eleven respondents agreed with the proposition that financial benefits have a reinforcing impact on the attitude towards car-sharing activities. Additionally, I have found

that for both Dutch and Korean users, the younger generation is more motivated by financial motivation. A respondent with an age range of 26 to 29, five out of the six respondents said that financial benefits are the most important motivational factors. The respondents who have just started their career and are still studying at University ranked the financial benefits as their strongest motivation. In contrast, from the respondents over the age of 29, no one has chosen financial benefits as their most important motive. This finding is in line with the study of Böcker & Meelen (2017). “Younger and low-income groups are more economically motivated to use and provide share assets” (Böcker & Meelen, 2017, p.36).

Third, all eleven respondents agreed with the proposition that social benefits have a reinforcing effect on the attitude towards car-sharing activities. However, all eleven participants acknowledged that social benefits have a reinforcing effect on the attitude towards car-sharing activities, but did not see this as their main motivation to use a car-sharing service. Moreover, I found out that the provider values social aspects more than the users of the car-sharing service. Respondents who have experience with renting out his or her car was more looking for social benefits than the user group. This finding is in line with the research of Bellotti et al. (2015). While providers value on idealistic motivations, such as creating a better neighborhood, users, on the contrary, are looking mainly for its convenience (Bellotti et al., 2015).

The second research question was aimed at exploring the difference in motivational factors for two countries: *How do the motivational factors of using car-sharing differ in the Netherlands and Korea?* To answer this question, I asked each participant to prioritize their motivational factors and this allowed me to find out the ranking order for each country. For Korean users, financial benefits serve as the strongest motivation, then followed by social benefits and then by environmental sustainability. For Dutch users, environmental sustainability was the strongest motivation, then followed by financial benefits and then by social benefits. The research findings show the difference in motivational factors in two countries, as their strongest motivations to use a car-sharing service was different. However, it was hard to see if cultural aspects played a role in these results. This finding suggests the disconfirmation of proposition 4 and proposition 5. Formerly, I constructed propositions that may alter the motivational factors according to the difference in cultures, supported by cultural descriptions of individualism and collectivism drawn from Triandis (1995). However, as discussed in previous propositions, Dutch users' decisions to use car-sharing service were mainly based on environmental sustainability and Korean users' participation choices were primarily based on financial reasons. Thus, it was difficult to find a cultural aspect of their motives.

5.2. Theoretical and practical implication

This research has contributed to identifying the dynamic processes of car-sharing developments in a systematic way. The feedback structure of the validated CLD improved the understanding of the enabler and motivators for car-sharing services. Moreover, this paper provided some insight into the cross-cultural variation in motives. Dutch users are found to be motivated by environmental sustainability reasons and Korean users are motivated by financial benefits. This paper could not link the motivational factors and cultural aspects, but findings in variation in motives in two countries call for further research in the future.

The research findings bring in practical implications for the business practitioner who intend to promote the car-sharing services. To Dutch users, it would be appealing to advertise environmental sustainability as a merit for using a car-sharing service. The car-sharing business manager should focus on communicating a message on how users can contribute to the environment by using their car-sharing service. Users that are motivated to use a car-sharing service for an environmental reason will be willing to engage with a car-sharing company that cares about the environment. For Korean users, communication messages should focus more on financial benefits. It would be helpful to promote the price rate compared to competitor companies. Moreover, providing a discount coupon would be another way to attract Korean users.

5.3. Limitation of this research and recommendation for future work

This research has some limitations to discuss. The limitations of this paper may provide opportunities and recommendations for future work. First, this research did not have a well-balanced pool of interviewees with regards to age. Except for one Dutch user, respondents from the Netherlands were in the age range of the late thirties to mid-fifties. On the contrary, Korean respondents were all in their late twenties. As younger groups are more economically motivated (Böcker & Meelen, 2017), their economic situation may have greatly influenced their motivation. This made it difficult to see the motivational factors differences in respect to culture.

Second, there were variations in types of car-sharing platforms; therefore, their experience in car-sharing may have differed in several ways. For example, as one used the business-to-

consumer (b2c) type of car-sharing service, in which the company rents out the car for temporary usage, another one used the peer-to-peer car-sharing platform. Some respondents have only experienced the b2c type of car-sharing service platform and thus could not share the social experience. Whereas, respondents who used a peer-to-peer car-sharing service, had many chances to experience the social benefits. For future research, I would like to recommend interviewing the group of people within a similar age range and who have used the same or similar car-sharing service platform to find out the different motivational factors across the two cultures accurately.

Lastly, the final recommendation for future research is to investigate whether the car-sharing service is a sustainable business model. I aimed to find out the dynamic processes of the development of the car-sharing industry. However, the CLD model in this research shows only the casual relationships of enablers and motivators of car-sharing services. As I based on the several different works of literature to find causal relationships, it merely shows the links between variables for now. It was not possible to see how the dynamic processes of car-sharing will develop in the future as all loops strengths were treated equally. It will be interesting to develop a quantified model and run the simulation to check whether the car-sharing service is a sustainable business model.

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Appendix

Appendix 1. Interview guide

Appendix 2. Literature to pinpoint the causal relation of CLD

Appendix 1. Interview guide

Once again, thank you very much for participating in this interview. Let me briefly explain what this interview is about and what you can expect during the interview and after. I'm currently writing a master thesis about the motivation of using a car-sharing service. The purpose of this interview is to check if your personal experience matches the previous studies on user's motivation for using car-sharing services and to investigate usage patterns more accurately. First, I will ask you some more general questions about your background. After that, I will present specific aspects of car-sharing and ask you for your experiences and opinions. If you have any questions during the interview, please do not hesitate to ask them so I can explain more clearly. Furthermore, you can always take your time to answer the question or end the interview if you feel the need to. If certain questions are too difficult to answer, you are also free not to answer. I would like to record the interview with your consent so I can make a transcript of the interview based on that recording. Is that okay with you? I will use this recording only for my research and this recording will be deleted automatically from Skype chat history after 30 days

1. Could you introduce yourself?
 - Name, Occupation, Place of residence (City / Countryside) / whether you own a car.
2. What is your experience with car-sharing?
 - a. Which type of car-sharing platform are you using?
 - b. How often do you use a car-sharing service? (Frequency)
 - c. How many times have you used a car-sharing service? (Roughly estimates of them you have used in total)
3. Why did you choose to use Snappcar / Greenwheels (the brand name), particularly?
What made you decide to use car-sharing than other types of service or transportation?
4. Why did you decide to get involved in this type of car-sharing? (motivation)
5. How was your experience? And would you recommend the service to others?
(if it is a former user - Under what type of condition you are willing to use the service again?)

So far, we have discussed your overall experience in car-sharing services. From now on, I'll present to you a few different aspects of car-sharing services and would like to ask your experience and opinions.

6. To what extent have you considered environmental impacts when using this service?
 - a. Was the environmental impact important to use this service? And why?
 - b. Do you think environmental sustainability has a positive impact on the attitude towards car-sharing activities?

7. To what extent have you considered financial impacts when using this service?
 - a. Was the financial benefit important to use this service? And why?
 - b. Do you think financial benefits have a positive impact on the attitude towards car-sharing activities?

8. To what extent have you considered social impacts when using this service?
 - a. Was the social impact important to use this service? And why?
 - b. Do you think social experience has a positive impact on the attitude towards car-sharing activities?

Which one would you prioritize the most? Which one do you think is the most important aspect when making decisions?

9. (Only when 6, 7, 8 have been confirmed) Among three motives, environmental, financial, and social, which one motivates you most and why?
10. (Only when 7, 8 have been confirmed) Between two motives, financial and social, which one motivates you more and why?
11. (Only when 6, 7 have been confirmed) Between two motives, environmental and financial, which one motivates you more and why?
12. (Only when 6, 8 have been confirmed) Between two motives, environmental and social, which one motivates you more and why?

That was the end of the interview. If there are some parts that you want to reconsider or add, you can always let me know by sending me an email. Furthermore, I would like to ask one more question, would it okay if I cite you by name in the analysis of my research? (Possibility for anonymity) If you are interested in the outcome, I can send you a thesis later on. Thank you very much for your answer and your time.

Appendix 2. Literature to pinpoint the causal relation of CLD

Number	Loop	From	To	Polarity	Based on
1	ICT development as enabler	Technology advancement	Use of ICT	Positive	(Botsman & Rogers, 2010)
2	ICT development as enabler	Use of ICT	Development of online platforms	Positive	(Kaplan & Haenlein, 2010)
3	ICT development as enabler	Development of online platforms	A number of users of car-sharing services	Positive	(Botsman & Rogers, 2010)
4	ICT development as enabler	A number of users of car-sharing services	A number of car-sharing service platforms	Positive	(Botsman & Rogers, 2010)
5	ICT development as enabler	A number of car-sharing service platforms	Collaboration and innovation	Positive	(Belk, 2014)
6	ICT development as enabler	Collaboration and innovation	Development of online platforms	Positive	(Kaplan & Haenlein, 2010)
7	Environmental sustainability as motivator	Concern about climate change	Attitude toward shared consumption	Positive	(Hamari et al., 2016)
8	Environmental sustainability as motivator	Attitude toward shared consumption	A number of users of car-sharing services	Positive	(Hamari et al., 2016)
9	Environmental sustainability as motivator	A number of users of car-sharing services	Environmental awareness	Positive	(Schaefer, 2013).
10	Environmental sustainability as motivator	Environmental awareness	Attitude toward shared consumption	Positive	(Tussyadiah, 2015)
11	Financial benefits as motivator	Economic rationality	A number of users of car-sharing services	Positive	(Litman, 2000)
12	Financial benefits as motivator	A number of users of car-sharing services	Cost savings	Positive	(Böcker & Meelen, 2017)
13	Financial benefits as motivator	Cost savings	Financial savings	Positive	(Hellwig et al., 2015)
14	Financial benefits as motivator	Financial savings	Economic rationality	Positive	(Hellwig et al., 2015)

15	Financial benefits as motivator	An individual buying/owning a car	Financial savings	Negative	(Litman, 2000)
16	Social benefits as motivator	Need for social relation	Desire to connect with others	Positive	(Hawlitschek et al., 2018)
17	Social benefits as motivator	Degree of desire to connect with others	A number of users of car-sharing services	Positive	Adapted from (Belk, 2010).
18	Social benefits as motivator	A number of users of car-sharing services	A number of repeat users	Positive	Adapted from (Bellotti et al., 2015)
19	Social benefits as motivator	A number of repeat users	Degree of desire to connect with others	Positive	Adapted from (Bellotti et al., 2015)