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Abstract: The sharing economy is a fast-growing and heavily debated phenomenon. This study provides an overview of motivations of people willing to participate in different forms of the sharing economy. A survey was held amongst 1,330 respondents from Amsterdam, the Netherlands. Using stated preference data, we investigate the relative importance of (1) economic, (2) social and (3) environmental motivations to participate in peer-to-peer sharing. Hereby we consider differences between (a) sectors of the sharing economy, (b) socio-demographic groups, and (c) users and providers. Results are descriptive as well as based on ordered logit models. Notable differences are observed in the motivations for sharing between sectors. To a lesser extent there is variety in sharing drivers between socio-demographic groups. Finally, users seem more economically motivated than providers of goods.

1. Introduction

The sharing economy has grown in both scale and scope in the past years (Belk, 2014b; Owyang, 2013). In a variety of sectors, internet-facilitated platforms have emerged that enable people to share their underutilized assets. Examples include Airbnb for apartments, Blablacar for cars and Peerby for tools. These sharing platforms increasingly form a threat to existing businesses operating in the respective sectors (Gansky, 2010; Owyang, 2013). Apart from having economic consequences, the sharing economy is claimed to have positive environmental and social effects (Botsman & Rogers, 2011). More efficient use of goods can save scarce resources otherwise needed for production. The act of sharing could bring people together and stimulate social cohesion in neighbourhoods (Agyeman, McLaren, & Schaefer-Borrego, 2013). However, the sharing economy has also caused considerable controversy, for example related to rising rents for local residents because of accommodation sharing (Martin, 2016; Frenken et al, 2015).

Despite a recent surge in attention for the sharing economy, little is known about the motivations for people to participate (Tussyadiah, 2015; Grassmuck, 2012). Insights in motivations would be instrumental in developing a better understanding of the so far underexplored decision-making processes of users (Tussyadiah, 2015; Piscicelli et al., 2014) and can also foster the general discussion around the sharing economy (Martin, 2016; Grasmuck; 2012). Given that the sharing economy is often regarded as an innovation with sustainability benefits, studying the various motivations for adoption also contributes to the emerging debate around the end-user in the literature on sustainable innovations and societal transitions (McMeekin & Southerton, 2012; Kemp & van Lente, 2011). This debate focuses on consumer preferences and practices needed to achieve a transition towards a more

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sustainable society. The sharing economy here is a particularly interesting case, because in contrast to many other sustainable innovations, certain sharing economy sectors are scaling up very rapidly.

A few early sharing economy scholars have suggested drivers for participation. Bardhi & Eckhardt, (2012) claim that economic motivations are dominant in the case of car sharing platform Zipcar. This finding is replicated by Belotti at al. (2015), who study users from a range of peer-to-peer platforms. Other authors, however, argue that environmental motivations underlie sharing economy participation (Botsman & Rogers, 2011; Gansky, 2010). Botsman and Rogers, (2011) suggest social motivations drive sharing economy participation as well. People would for example engage in accommodation sharing, because they want to interact with their local hosts (Tussyadiah, 2015).

Quantitative research into sharing economy motivations is still largely lacking. Most existing studies only consider one form of the sharing economy (Tussyadiah, 2016; 2015; Piscicelli et al., 2014), one of the few exceptions being Möhlmann's (2015) study of both car and accommodation sharers. Other studies assume the existence of one sharing economy and do not distinguish between different forms (Hamari, Sjöklint, & Ukkonen, 2015). However, it is likely that motivations to share for instance a power drill are different from those to share an apartment. Moreover, Hellwig et al. (2015) show that motivations for sharing economy participation can differ for various socio-demographic groups. Finally, users could have other motivations than providers of goods in the sharing economy, given that the activities of providing and using are substantially different (Van de Glind, 2013).

This study aims to provide a more comprehensive understanding of the motivations for participation in the sharing economy. Synthesising from previous sharing economy studies, and in line with a sustainability approach, economic, environmental and social motivations are considered. Expanding current research, the relative importance of these motivations for sharing economy participation is investigated for different types of goods, socio-demographic groups and roles as user or provider. Five forms of sharing are taken into account: car sharing, ride sharing, accommodation sharing, tool sharing and meal sharing. Analyses draw on a stated preference survey held among 1,330 participants in the city of Amsterdam, The Netherlands.

The rest of the paper is structured as follows. Section 2 reviews the literature on sharing economy motivations, and hypothesises the relative importance of these motivations under various circumstances. Section 3 discusses the data collection and analytical strategy. Section 4 presents the results. Section 5 concludes, and discusses limitations of the study as well as implications for the sharing economy and sustainable innovation fields.

2. Theory

Many terms and definitions circulate to describe the so-called "sharing turn" in the economy: the trend that more and more products are shared rather than privately owned (Nesta, 2014; Botsman, 2013; Grassmuck, 2012;). This paper focuses on peer-to-peer exchanges of goods between consumers. We use the term "sharing economy" rather than "access-based consumption" (Bardhi & Eckhardt, 2012) or "collaborative consumption" (Belk, 2014b), because the latter two also refer to large-scale business to consumer services such as Spotify or Zipcar. We define the sharing economy as "consumers granting each other temporary access to their under-utilized physical assets ("idle capacity"), possibly for money" (Meelen & Frenken, 2015). Examples of sharing ventures that fit this definition are Airbnb and Couchsurfing for apartment sharing, Getaround and Relayrides for car sharing, and Blablacar for ride sharing.

In the nascent literature on the sharing economy, there is an increasing interest in the motivations driving participation. Of the many motivation theories that exist Self Determination Theory (SDT) (Deci & Ryan, 2000; Ryan & Deci, 2000) is frequently drawn upon in sharing economy studies (Tussyadiah, 2016; Hamari et al., 2015; Belotti et al., 2015). In this perspective behaviour is driven by intrinsic motivations, which emerge from inherent satisfactions of the activity, and by extrinsic motivations, which relate to outcomes that are separate from the behaviour. Hamari et al. (2015) and Tussyadiah (2016) refer to Lindenberg (2001) to further distinguish between intrinsic motivations coming from enjoyment of the activity and from the internalized value of conforming to the norm. From the latter category, environmental concern has been most prominently related to sharing economy participation (Tussyadiah, 2016; Hamari, et al, 2015; Belotti et al., 2015). People would initiate sharing economy activities to reduce their use of scarce natural resources. As an extrinsic driver of sharing economy participation, monetary rewards have often been mentioned (Tussyadiah, 2016; 2015; Bardhi & Eckhardt, 2012).

Mindful of these categorizations of motivations, in this research we employ a sustainability framework and distinguish between economic, environmental and social motivations. With such a framework we are able to contribute to the current sharing economy debate and the wider literature on environmental innovation and societal transitions. Tussyadiah (2015) categorizes motivations mentioned in the existing sharing economy literature as part of "economic benefits", "sustainability" and "community". Slightly adapting from this, and largely in line with the well-known triple-p (people-planet-profit) framework of sustainability (Elkington, 1997), in this paper a distinction is made between economic, environmental and social drivers of sharing economy behavior. This perspective allows us to systematically assess claims within the ongoing sharing economy debate (Martin, 2016), regarding whether sharing economy growth is driven by more intrinsic environmental and social or extrinsic economic motivations. It also contributes to the wider literature on sustainable innovations and societal transitions. In this field, recently more attention has been given to the importance of consumer preferences for achieving sustainability transitions, particularly as innovations scale up (Kemp & van Lente, 2011). In current transition research a distinction is often only made between a group of niche users, which have a very particular set of motivations, and all other "mainstream" users. Authors have therefore called to acknowledge more heterogeneity in user groups (McMeekin & Southerton, 2012). Our research contributes to both of these issues, by mapping out consumer motivations and exploring differences in these motivations between various socio-demographic groups.

Let us first consider economic drivers for sharing economy participation. In this context, although concrete evidence is lacking, the rise of the sharing economy and financial crisis of 2008 are often linked. Faced with financial difficulties, people would rethink their consumption patterns and the value they attach to ownership (Gansky, 2010). The empirical literature tends to find at least some support for economic motivations in sharing economy behaviour. A survey of members of the online sharing platform Sharetribe shows that economic benefits stimulate intended sharing economy participation (Hamari et al., 2015). On the other hand, in a study comparing renting to ownership, Moeller & Wittkowski (2010) find no evidence of "price consciousness" to drive this decision. It should be noted however that in their study it might not always have been clear which option was cheaper. Regarding specific sharing economy sectors, Tussyadiah (2015; 2016) finds that economic motivations are an important driver for using accommodation sharing in two US surveys. Möhlmann (2015) surveys car and accommodation sharing users, and finds that "cost savings" increase satisfaction, but do not affect intention to use the service again. Finally, Bardhi & Eckhardt (2012), in an interview-based study into motivations of clients of car sharing platform Zipcar, show that utilitarian motivations such as saving money underlie Zipcar participation.

In the sharing economy discourse, its presumed environmental advantages are often stressed (Martin, 2016; Schor, 2014). Potentially, the sharing economy can, as an alternative economic model, make a contribution to environmental sustainability (Heinrichs, 2013). An important mechanism is the increased efficiency in the use of goods, which helps to spare scarce resources that would otherwise have been necessary for the production of new goods. However, it is yet far from clear what the environmental effects of the sharing economy will be. Several motivational studies find a role for environmental drivers of sharing economy participation. Piscicelli et al. (2014) find that 32% of their respondents indicate "to be green" as the main reason to join sharing platform Ecomodo. Also Hamari et al. (2015) show that perceived sustainability has a small indirect effect on intended sharing behaviour. In a US survey Lawson (2010) finds a positive effect of environmental consciousness on intention to engage in "fractional ownership". Contrastingly, in their interview-based study Bardhi & Eckhardt (2012) find environmental concern not to be among the main motivations of Zipcar car-sharing users. In surveys on accommodation sharing (Tussyadiah, 2016) and on accommodation as well as car sharing (Möhlmann, 2015) no influence is found of environmental drivers on the intention to use these services again. Similarly, Moeller & Wittkowski (2010), in a survey among users of an online peer-to-peer network, find no effect of environmentalism on preferring renting instead of owning good. In sum, there is no conclusive evidence regarding the link between environmental motivations and participation in the sharing economy.

Social aspects of sharing could also drive sharing economy participation (Botsman, 2013; Ozanne & Ballantine, 2010). Interactions between users and providers of goods are at the heart of many sharing economy forms. For example, in the case of peer-to-peer car sharing people meet up to exchange the car keys and discuss the exact conditions of the exchange. With accommodation sharing people meet their local hosts, who can introduce them into the local community. The ability to get to know new people and make friends is claimed to stimulate sharing economy participation (Botsman & Rogers, 2011). Ozanne & Ozanne (2011) find that both for children and their parents, socializing is a driver for toy library participation. In their accommodation sharing study, Tussyadiah (2015) show that motivations of getting to know local people and interacting with them are important participation drivers. In another study this result is not replicated, an explanation being that some accommodation sharing users are specifically looking for places to stay that do not involve social interaction (Tussyadiah, 2016).

In the remainder of this paper, we quantitatively assess the relative importance of the aforementioned economic, environmental and social motivations for participation into different sectors of the sharing economy. As shown above, current research is not univocal about the role of these sharing motivations, most notably the environmental one. An important reason for these discrepancies might be that different motivations underlie different forms of sharing, and that motivations differ between participants. Expanding current sharing economy research, we therefore specifically investigate variation in motivations between shared goods, socio-demographic groups, and the role people take up as either a user or provider of goods.

Manifold goods are shared. It is expected here that a relationship exists between the characteristics of the shared good and the importance of different motivations. Shared goods differ largely in terms of their economic value, the (assumed) environmental impacts of sharing them, as well as the degree of social interaction involved in the process of sharing. First, considering the economic value of the good that is shared, accommodation sharing stands out. Because of the high price of accommodation, people can charge a substantial amount of money for letting others stay in their property, especially if it is situated in a popular location. Compared to the alternative of the hotel, this form of sharing also provides a considerable financial benefit to users in absolute terms (Guttentag, 2015). Hence, we expect

that economic motivations are relatively important for accommodation sharing. The car is another expensive good to own, with considerable financial savings to be made by adopting car sharing. In line with this, Bardhi & Eckhardt (2012) find that economic motivations are dominant in the choice to use the car sharing platform Zipcar. With peer-to-peer-sharing – the focus of this study – in addition car owners could potentially earn back (part of) the car ownership costs by providing their car to others (Fraiberger & Sundararajan, 2015). Hence, it is likely that economic motivations play a large role for users and providers of this form of the sharing economy. Second, the different shared goods also differ in the extent to which they contribute to environmental sustainability. Car sharing seems the sharing economy form with the most apparent environmental benefits. The negative environmental impacts of car production and car-ownership are well known. It has also been repeatedly shown that car sharing can contribute to alleviating these problems (Nijland Van Meerkerk & Hoen, 2015; Firnkorn and Müller 2011). As an addition, car sharing historically has many links to the environmental movement (Shaheen & Cohen, 2013; Martin & Shaheen, 2011; Truffer, 2003). Hence, it is expected that environmental motivations are important for car sharing. Third, social motivations may be more prominent for sharing forms that involve clear social interaction. Ride-sharing is a sharing economy form which involves prolonged social interaction (when people are together in a car). Additionally, meal sharing refers to people cooking an extra portion of a meal for their neighbours. It likely involves a discussion between people about the meal and how it was prepared. Moreover, in the Dutch context of this study, meal sharing has been associated in popular media with taking care for elderly or sick people in the neighbourhood that are not able to prepare a meal themselves[2]. To sum up, it is hypothesized that characteristics of the good relate to the importance of economic, social and environmental motivations for sharing economy participation.

Motivations to participate in the sharing economy are likely not uniform across population categories. Hellwig et al. (2015) propose a market segmentation for the sharing economy, in which the identified types of sharers (among other factors) differ in socio-demographic composition and motivations. Considering the relationship between these, first, an influence of age on motivation is expected. Older people have more frequent neighbourhood contacts (Cornwell, Laumann & Schumm, 2008). Given the neighbourhood character of many sharing economy initiatives, it is therefore expected that their use for older people is more embedded in local social activity. Moreover, Cornwell et al. (2008) suggest that to make up for a decrease in interpersonal network connectedness, older people engage in associational networks to develop new social ties. Also involvement in a sharing economy platform can be seen in this light. Hence, it is expected that social motivations for joining the sharing economy are more dominant amongst older as compared to younger people. With regard to gender, environmental psychology studies consistently find that women are more environmentally aware then men (Diamantopoulos et al.,2003). Consequently, it is expected that women show higher environmental motivations for joining the sharing economy. Similarly, Hellwig et al. (2015) find an overrepresentation of women (67%) in the cluster of *sharing idealists,* who are highly intrinsically motivated to share.

Environmental concern is also more prevalent among higher income and highly educated groups (Shen & Saijo, 2008). This finding is often explained by Maslow's (1970) hierarchical needs theory. Environmental concern is then seen as a higher order need, which is only strived for when basic material needs are met. Given their higher environmental concern, it is expected that environmental motivations are more important in the decision-making process of people with high education and income. Furthermore, we expect that lower income groups are more economically driven to join the sharing economy. The sharing economy can

[2] E.g. https://www.nudge.nl/blog/2014/01/16/kook-jij-mee-voor-ouderen-in-je-buurt/

provide this population category access to goods they previously were not able to own. Additionally, sharing may help to avoid high ownership costs or enables to earn on products owned. Accordingly, Fraiberger & Sundararajan (2015) predict that most welfare gains of the sharing economy will be obtained by low income groups. In terms of cultural background, given that non-Western cultures are often more collectivist (Hofstede et al, 2001), people from non-Western origins might show higher social motivations for sharing economy participation. Finally, household types have shown different patterns of social contact (Li, 2005). Hence it might be that certain households, such as those composed of singles, show higher social drivers of sharing economy participation than others. In sum, it is hypothesized that there is a relationship between socio-demographic group and the importance of economic, social and environmental motivations in the sharing economy.

Motivations may also differ between users and providers of the same good. This is expected to concern mainly economic motivations. Asymmetries may exist in the economic benefits of using and providing. Specifically, these asymmetries result from the relatively large economic benefits the user can have if she opts for renting or borrowing instead of buying the good. This mechanism seems most pronounced in the case where the good is relatively expensive, but the use of the good by the sharing economy user is very limited in terms of time or total capacity of the good[3]. Tool sharing is the most relevant example in our study. If a user borrows or rents a drill from a neighbour a large amount of money can be saved compared to the option of buying a drill. However, if a provider lends or rents out a drill to someone, none or only a small amount of money is charged. Accordingly, for tool sharing it is expected that economic motivations are higher for the user than for the provider. In line with this reasoning, Belotti et al. (2015) find that peer-to-peer platform users mention (even) more extrinsic motivations than providers. In contrast to economic motivations, we do not expect differences in social and environmental motivations between users and providers.. Social interaction concerns per definition both the user and the provider. Environmental gains result from the act of sharing, to which both user and provider participate. Summarizing, it is hypothesized that users show higher economic motivations than providers in the sharing economy. No differences are expected in social and environmental motivations between users and providers.

3. Research Design

3.1 Study area

This study explores the motivations to participate in the sharing economy based on an online stated preference survey held in 2013 amongst 1,330 respondents in Amsterdam, The Netherlands. A panel of 2,500 respondents was invited by e-mail, so a response rate of 53.2% was obtained. Amsterdam was selected as a pilot area for exploring motivations to share for two main reasons: First, Amsterdam positions itself as a front-runner in the sharing economy. It was the world's first municipality to develop regulations around Airbnb. Moreover, local politicians and stakeholders promote initiatives in the sharing economy locally, nationally and internationally under the label of Amsterdam Sharing City. This increases the knowledge base regarding the sharing economy amongst the general population, which is required to study the relatively new phenomenon. Second, the area has rich population diversity in terms of age, ethnicity and socio-economic status. This allows for exploring how motivations to share differ between different population categories.

[3] The provider could make up for this by renting out the good many times, but then also faces transactions costs every time the good is rented out.

Table 1 describes the sample composition in relation to the general Amsterdam population according to several key demographics. The sample is diverse and well balanced on several key demographics, such as gender, household income and household type. Young people are under-represented. Although the sharing economy is often linked to younger generations, this sample allows the authors to complement the existing knowledge with specific insights into middle- and older-aged people's motivations to participate in the sharing economy. As with most existing studies also lower educated and non-Western ethnicities are underrepresented. Both groups are nevertheless included in the analyses because little is known about their motivations to participate in the sharing economy.

Table 1: Sample composition and representativeness.

		Sample (N=1,330)	Amsterdam population [a]
Age	15-24	1.1%	13%
	25-44	17.6%	35%
	45-64	58.3%	25%
	65+	23.0%	12%
Gender	Male	47.0%	49%
	Female	53.0%	51%
Ethnicity	Non-Western	4.0%	35%
	Dutch or other Western	96.0%	65%
Education	Lower	11.7%	27%
	Middle	18.9%	34%
	Higher (professional / academic)	32.0% / 37.4%	39% (combined)
Net monthly household income	Lower (< €1,750)	18.9%	-
	Middle (€ 1,750 – 2,999)	26.5%	-
	Higher (≥ €3,000)	29.0%	-
	Unknown	25.5%	-
	Average	-	€31,400
Household type	Single	39.5%	55%
	Couple	33.1%	21%
	Family with children	25.3%	25%
	Other	2.2%	-

a) Data for the municipality of Amsterdam in 2012. Based on (CBS 2015;Van de Glind, 2013)

3.2 Data and modelling techniques

In this study we investigate motivations to participate in five sectors of the sharing economy: car, ride, accommodation, stuff and meal sharing. These five sectors have been selected because they are in line with our definition of the sharing economy as enabling the utilization of some form of idle capacity. Moreover, these were the five sharing economy sectors most easily accessible to Amsterdam inhabitants at the time of survey. With regard to tool sharing, we will investigate one of the most popular items shared in Amsterdam on stuff sharing platform "Peerby": the power drill (Peerby stuff cloud, 2013).

The rationale for utilizing a stated preference research design is threefold: First, stated preferences allow exploring the sharing motivations amongst the general population. This is important to investigate the sharing economy's up-scaling potential. In contrast, the alternative of studying actual revealed sharing practices, would, at this time, only have been possible amongst a specific group of early adopters. This is exemplified by statistics on our respondent sample indicating that, accommodation sharing excluded, only between 0.2% (ride sharing) and 3.2% (meal sharing) of the respondents is a registered sharing economy user. Second, a stated preference technique enables the authors to differentiate between the motivations *to use* and *to supply* shared assets. Both roles are prerequisites for peer-to-peer sharing, but especially the latter is often overlooked. Third, by using stated preferences it is possible to cross-compare respondent's motivations to participate in different sectors of the

sharing economy. This study distinguishes five sectors[4], all involving the sharing of overcapacity of underutilized assets: car, ride, accommodation, tool and meal sharing. To avoid respondent fatigue, each individual respondent is only asked to state his or her motivation to participate in four[5] randomly selected sectors. In total, all five sectors are however sufficiently covered.

Before inquiring respondents about their sharing motivations, they were first asked to state their intention to use or share the asset in question. Table 2 lists the questions used to operationalize this intention. All questions mention a monetary compensation for access to the good. We excluded answers by respondents that indicate with a score of 0, 1 or 2 a neutrality, unlikeliness or highly unlikeliness to use or provide a shared asset. Answers by respondents that indicate with a score of 3 or 4 a likeliness or highly likeness to use or provide an asset in question have been included for further analyses[6]. In a second stage these respondents are asked about the importance of economic, social and environmental motivations underlying their willingness to share. Hereto, they are asked to rate on a 0-4 scale (from negligible to very much) how the following three considerations affect their decision: *financial benefit*, *meeting people*, and *contributing to a healthy natural environment*. The answers to these questions form the dependent variables in our analyses. It should be noted that these three considerations were kept short to avoid respondent fatigue, but do not capture all dimensions of economic, environmental and especially social motivations to possibly participate in the sharing economy. There are several observations per respondent, as they answer questions for multiple sharing economies.

Table 2: Operationalization of willingness to participate

Sector	Respondent question (translated from Dutch)
	How likely on a 0-4 scale would you <u>use</u> the following shared goods/services in the following situations, imagining that insurance issues are all taken care of and the transaction is 100% secure?
Car	Imagine you temporarily need a car and the possibility exists to rent a car in the neighbourhood.
Ride	Imagine you need to go somewhere and someone in your neighbourhood offers you a lift in his/her car for a fee
Accom.	Imagine you are travelling and local residents offer the possibility to rent their home.
Tool	Imagine you need a power drill and it is possible to rent this in the neighbourhood.
Meal	Imagine someone in the neighbourhood is cooking a meal and you can buy a portion.
	How likely on a 0-4 scale would you <u>provide</u> the following shared goods/services in the following situations, imagining that you own the good in question, insurance issues are all taken care of, and the transaction is 100% secure?
Car	Imagine someone in your neighbourhood needs a car and you are able to rent out yours.
Ride	Imagine someone in your neighbourhood needs a ride and you are able to let this person drive with you for a fee
Accom.	Imagine renting out your home in your absence to a tourist.
Tool	Imagine someone in your neighbourhood needs a power drill and you are able to rent out yours.
Meal	Imagine it is possible to sell a portion of a meal cooked by you to someone in your neighbourhood.

In the multivariate analysis we estimate the effects of (1) socio-demographic variables, (2) a set of dummies for different sharing economies, and (3) a user/provider dummy, on the five-point (0, 1, 2, 3, 4) score for each motivation as the dependent variable. This approach is similar to the interactionist approach on motivations as employed by Oreg and Nov (2008), in which both personal (in our case socio-demographics) and context (in our case sector and role) variables are linked to motivations. The relationships between socio-demographics and

[4] Originally seven sharing economy sectors were included. *Skill sharing* was excluded because it does not fit our definition of *sharing overcapacity of an underutilized asset*, but rather is a form of exchange of services. *Garden sharing* was excluded because its data record turned out to be incomplete upon verification.

[5] In the original seven-sector questionnaire each respondent answered questions regarding 4 out of 7 sectors.

[6] After selecting only (highly) likely to share answers, our sample for further analysis constitutes of the following number of cases: 107 answers for drill user; 103 for drill provider; 250 for car user; 160 for car provider;168 for ride user; 196 for ride provider, 201 for meal user; 136 for meal provider; 458 for accommodation user; 104 for accommodation provider. Drill user and provider have a relatively low n because in the original survey fewer respondents had been asked this particular question. The n for accommodation provider is relatively low because fewer respondents are willing to provide this asset for sharing (see Figure 1).

motivations are causally clear. However, this study cannot establish strict causality between motivations and the role of user/provider or the sharing economy sectors. The relationships between these factors and motivations should therefore be interpreted as associations, rather than strict cause and effect.

As statistical modelling technique, use is made of ordered logit models, each with another motivational item as the *dependent variable*. Ordered logit models are preferred over multinomial logit models, to avoid losing valuable information on the order of scores. Ordered logit models are preferred over ordinary OLS regression, because the scores, although ordered, are no continuous outcomes, and neither are they normally distributed. We use a clustered sampling technique, via the Stata software's "vce-cluster" command, to estimate robust standard errors for all (non-independent) answers that belong to one respondent. By correcting for intragroup correlation this technique relaxes the usual requirement that all observations need to be independent (Wooldridge 2002). To verify the models presented in this paper we have also explored whether and how the effects of socio-demographics on motivations differ for different combinations of sectors and roles. We tested for interaction effects between socio-demographics and sharing economy sectors, but these were largely non-significant and led to no new insights. Additionally, separate models were run for the different combinations of sharing economy sectors and roles, but these were ultimately excluded due to the low number of cases and poor model fits.

4 Results

4.1 Descriptive analysis

Before exploring respondents' motivations to share, we first briefly report on the share of respondents who state that they are either likely or highly likely to use or provide different goods for sharing (Figure 1). Considerable differences in sharing potential are identified between different sharing sectors, as well as between users and providers. While the majority of respondents report likeliness to *use* shared power drills, rides and accommodation, fewer are likely to *use* shared cars and meals. A similar picture arises regarding the reported likeliness to *provide* these goods for sharing, with the exception of accommodation, which is least likely to be offered.

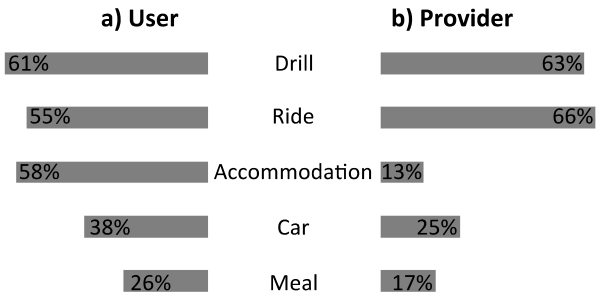

Figure 1: Share of respondents (highly) likely to use (a) and provide in (b) various sharing economy sectors

We continue with motivations to share for those reporting likeliness to do so. Figure 2 maps out the relative importance of economic, social and environmental motivations to participate in the sharing economies as a user (a) or provider (b), for different sharing goods. This relative importance is based on the ratio between the raw 0-4 scores for each of the motivational items. Percentage axes in the triangle indicate the relative importance of

environmental, economic and social motivations. For example, if for "accommodation sharing" the average environmental score is 1, social score is 2 and economic score is 3, the score ratio is 1/6, 2/6 and 3/6, thus 17%, 33 % and 50%. These three percentages determine the location of "accommodation sharing" on the diagonals of the triangle. A central position indicates that for the indicated good all three motivations are equally balanced. Locations close to a corner indicate a higher relative importance of that particular motivation.

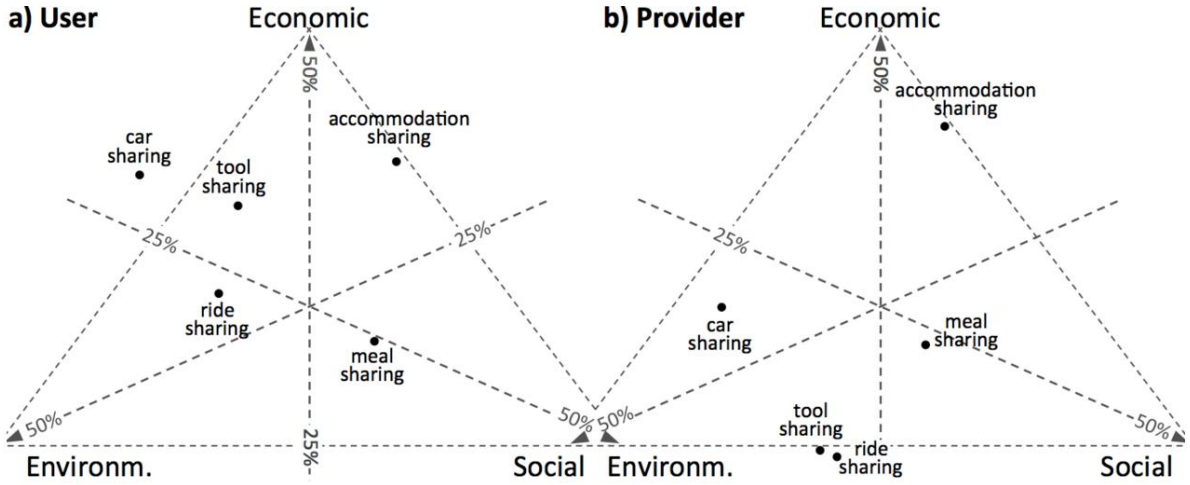

Figure 2: Motivations to participate in different sectors of the sharing economy, per sharing economy sector

Figure 2 presents an overview of the relative importance of economic, social and environmental for the use (a) and provision (b) of different types of goods. Overall, there are pronounced differences between the motivations for sharing the goods. As hypothesized, the sharing of the expensive asset accommodation is predominantly economically motivated. Although secondary to economic motivations, social motivations also seem to play a role in accommodation sharing. Environmental motivations are relatively important in the decision to join car sharing. Finally, the two forms of sharing with a large social interaction component, ride sharing and meal sharing, are indeed relatively strongly driven by social motivations. Some differences can be observed when comparing the motivations for using and providing goods. As hypothesized, the difference is particularly large for tool-sharing. The provision of tools is mostly environmentally and socially motivated. However, the use of shared tools is much more strongly economically motivated. As explained before, this discrepancy could be related to the larger direct financial benefits of sharing this good for users as compared to providers. A similar pattern of stronger economic motivations for users is observed for car and ride sharing, although the differences are smaller. Finally, for accommodation sharing and meal sharing, there is hardly a difference in motivation between users and providers.

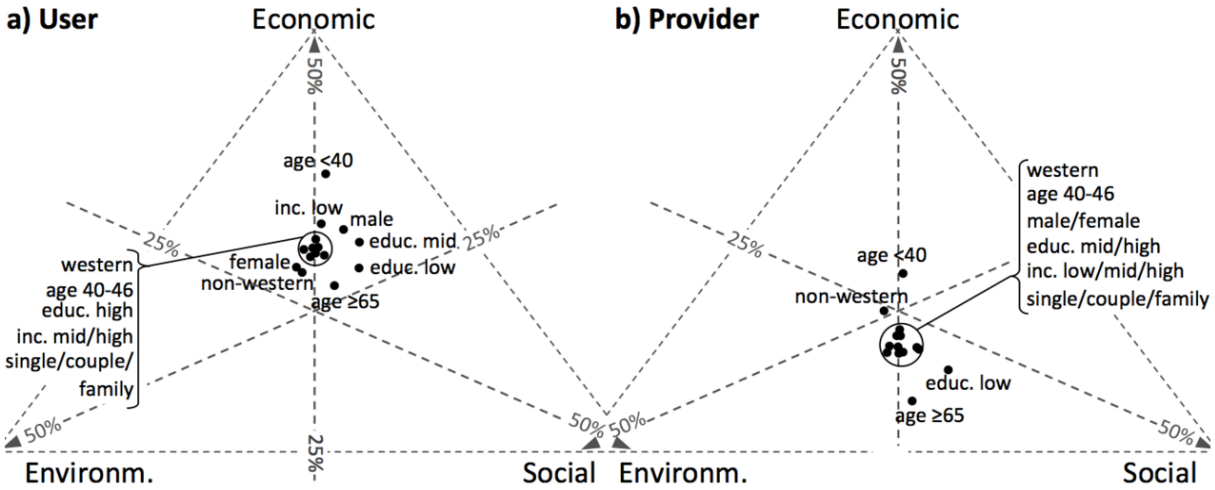

Figure 3: Motivations to participate in different sectors of the sharing economy, per socio-demographic group

Figure 3 presents an overview of the relative importance of economic, social and environmental motives, similar to Figure 2, but this time among different social groups. While the above-documented differences in motivations to use or provide between sectors are relatively large, differences between different socio-demographic groups are smaller. Overall, for each population category the three motivational items are relatively well balanced. Nevertheless, differences between socio-demographic groups can be identified. When looked at the *use* of shared assets (Figure 2a), it seems that men and low or middle educated groups are less environmentally motivated than women or highly educated groups respectively. Additionally, younger age groups (under 40 years old) and, to a lesser extent, low-income groups seem more economically motivated than older and middle- or high-income groups respectively. When looked at motivations to *provide* assets for sharing (Figure 2b), a somewhat similar picture arises, except for that the whole cluster of subgroups shifts downwards on the economic axis. This indicates that, over the board, economic motivations are less important for the provision than for the use of shared assets.

4.2 Multivariate analysis

Table 3 provides an overview of the relationships between socio-demographic backgrounds, sharing economy sectors and the role of user or provider and motivations to participate in the sharing economy. Three separate ordered logit models are estimated: for economic, social and environmental motivations. The parameter estimate (B) indicates the log odds change in the respective motivational score for a one-unit increase of the predictor (in the case of the continuous variable *age*) or for the indicated dummy variable relative to the reference category (for all other categorical variables), considering that all other variables remain constant. The z-statistic indicates the ratio between the parameter estimate and the robust standard errors clustered per respondent (see paragraph 3.2).

Table 3: Model output on motivations to participate in the sharing economy

	Ordered logit: Motivations to use / provided shared assets					
	Economic (N=1,810)		Social (N=1,790)		Environm. (N=1,739)	
	B	z	B	z	B	z
Age	-0.025	-4.54***	0.016	2.57**	0.011	1.73
Male (ref = female)	0.066	0.59	-0.118	-0.93	-0.502	-3.94***
Non-western ethnicity (ref = western)	0.002	0.00	0.016	0.05	0.355	1.07
Education (ref = low)						
Middle	-0.392	-1.61	-0.117	-0.49	0.246	1.05
High professional	-0.165	-0.73	-0.371	-1.78	0.310	1.45

High academic	-0.310	-1.33	-0.617	-2.84**	0.257	1.19
Household income (ref = lower)						
Middle	-0.703	-4.07***	-0.418	-2.32*	-0.304	-1.69
Higher	-1.027	-5.34***	-0.564	-2.75**	-0.399	-1.91
Unknown	-0.945	-4.92***	-0.094	-0.48	-0.236	-1.15
Household type (ref = family)						
Single	-0.186	-1.17	-0.086	-0.54	-0.133	-0.84
Couple	-0.184	-1.17	-0.271	-1.68	-0.318	-1.93
Other	-0.169	-0.45	0.132	0.39	0.174	0.41
Sector (ref = accommodation)						
Car	-0.552	-4.85***	-1.190	-9.85***	1.652	12.29***
Tool	-1.440	-8.60***	-0.963	-6.15***	0.891	5.47***
Ride	-1.531	-10.95***	-0.572	-4.07***	1.460	11.26***
Meal	-1.704	-12.23***	0.303	2.16*	0.638	5.13***
User (ref = provider)	0.935	8.56***	-0.135	-1.49	0.059	0.65
Model fit:						
Wald chi2(df.)		384.7(17)***		210.0(17)***		236.4(17)***
R^2 (McKelvey & Zavoina)		0.245		0.130		0.147

* α=.05; ** α=.01; *** α=.001

The multivariate model results complement the descriptive results presented in the triangles in the figures 2 and 3. Older people are significantly less economically motivated and significantly more socially motivated, even when controlled for aspects such as income level. Considering gender, environmental motivations are significantly more important for women than for men. Unexpectedly, higher educated are significantly less socially driven to join the sharing economy. Instead, it was expected that higher educated would be more environmentally motivated to join the sharing economy. However, no significant relationship can be identified between education level and the importance of environmental motivations. More in line with our hypothesising, both middle and higher-income groups are significantly less economically motivated to participate in the sharing economy than low-income groups. In addition, middle and high-income groups are also less socially motivated. Ethnicity and household type have no significant effect on motivations to participate in the sharing economy. Regarding ethnicity, this may however be related to the low number of non-Western respondents.

Although some of the socio-demographics show important significant effects on motivations to share, most of the statistical variance in the models appears to be explained by differences between the sharing economy sectors. Compared to the reference category of accommodation sharing, in all other sectors economic motivations are less important. This is especially the case for ride, tool and meal sharing. As expected, meal sharing is the most socially motivated sector, followed by the reference category of accommodation sharing and ride sharing. For especially tool and car sharing, social motivations are of lesser importance. As noticed in paragraph 4.1, environmental motivations are especially important for car and ride sharing and least important for accommodation sharing.

Finally, there is a difference in economic motivation between users and providers. Overall, users are more driven by economic motivations than providers. A possible mechanism behind this discrepancy was outlined before: for many objects, users can save a relatively large amount of money by renting instead of buying it. However, for providers the economic gains for renting out their objects are often small in comparison to the purchase price of the object. As hypothesised, no significant differences in social and environmental motivations between users and providers are observed. The environmental benefits result from the act of sharing, to which user and provider together participate. Also the social aspect of sharing concerns per definition both users and providers.

5 Discussion and conclusion

With the recent growth in scale and scope of the sharing economy, scientific, societal and political interest into this phenomenon has increased sharply. However, a deeper understanding of what motivates people to participate in different parts of the sharing economy has been largely lacking. This paper provides a comprehensive quantitative investigation of the relative importance of (1) economic, (2) social and (3) environmental motivations to participate in peer-to-peer sharing, with respect to differences between (a) sectors of the sharing economy, (b) socio-demographic groups, and (c) users and providers. Analyses draw on a stated preference survey amongst 1,330 respondents from Amsterdam.

Our findings reveal that motivations to participate differ between socio-demographic groups, between users and providers, and especially between different types of shared goods examined in this study: cars, rides, accommodation, tools and meals. Although this difference in motivations to participate in different sectors of the sharing economy is not necessarily surprising – i.e. the different types of goods compared in this study are quite different from each other – it underscores the importance to not conceive the sharing economy as one coherent phenomenon. The sharing of the expensive good of accommodation is highly economically motivated. Environmental motivations are important particularly for car and ride-sharing. For meal sharing, a sharing economy form with a high personal interaction component, social motivations play a large stimulating role. In contrast to sectorial differences and differences between users and providers, socio-demographic differences in motivations are of lower magnitude. Nevertheless, some significant effects are identified. Younger and low-income groups are more economically motivated to use and provide shared assets; younger, higher-income and higher-educated groups are less socially motivated; and women are more environmentally motivated. Finally, using different types of shared assets appears more economically motivated than providing.

The emerging literature on the sharing economy has approached this complex phenomenon from a variety of theoretical perspectives. Let us first discuss our results in the light of prior studies that use some form of motivation theory. In current studies most support is found for extrinsic motives of sharing economy behaviour (Tussyadiah, 2016; Hamari et al.; 2015; Bardhi & Eckhart, 2012). With its cross-sectoral comparison of sharing economy sectors this study provides a more nuanced picture. Indeed, for the sharing economy forms of accommodation sharing and car sharing, extrinsic, economic motivations are dominant. However, for meal, tool and ride sharing more intrinsic social and environmental motivations play an important role. The combination of motivations behind sharing economy participation thus is highly dependent on sharing economy sector. With regard to socio-demographic characteristics, the result that women are more environmentally driven resonates with Hellwig et al. (2015) who observe women being overrepresented among the group of intrinsically motivated *sharing idealists*. The finding that users are more economically motivated than providers is largely in line with the explorative study of Belotti et al. (2015). They employ a categorization of needs similar to Maslow's hierarchy (1970) and find that users tend to participate in the sharing economy predominantly for satisfying "basic needs", whereas the motivation of providers is somewhat more mixed, and includes also altruistic and community-oriented elements.

The findings also have implications for the definition of the sharing economy as voiced by Belk (2014a;2014b). He distinguishes between "sharing" and "pseudo-sharing" or collaborative consumption. True sharing is associated with lending driven by social concerns and pseudo-sharing with renting out mainly for economic gains. In the light of our results this

dichotomy seems too simplistic. Different combinations of motivations drive participation in each of the sectors of the sharing economy. Even if monetary exchange is involved in the process of sharing, environmental and social motivations can still be important. The configurations of different motivations for sharing economy participation of this study, resonate with the variety of logics Scaraboto (2016) observes on a user-initiated sharing economy platform. She sees sharing platforms as instances of hybrid economies, with a range of logics ranging from market-based exchange to altruistic gift-giving. There is a constant struggle between these logics, whereas at the same time various forms of hybrid logics are developed to overcome tensions. Contestations between logics are more pronounced when there are large differences in motivations between participating groups, such as between users and providers in the case of tool-sharing in this study. For platforms facilitating such exchanges, continuous "boundary work" to reconcile different motivations and logics seems thus required.

Our results also provide insights for the wider literature on sustainable innovation and societal transitions. First, in contrast to many transition studies, we have specifically distinguished between various user groups and their motivations. This provided insights particularly with regard to up-scaling and diffusion, an increasingly important topic in this field (Geels & Johnson, 2015; Shove, Walker & Brown, 2013). The slow diffusion of many sustainable innovations (Negro et a. 2012) contrasts sharply with the fast spread of sharing economy forms such as accommodation sharing and ride sharing, which have shown exponential growth patterns in the past few years. The rapid growth of the sharing economy is generally attributed to the fact that it is based on existing capacity that is under-utilized, which explains why scaling can occur so fast. However, the variety in motivations driving sharing economy participation as identified in this paper, also seem an important explanation for the rapid growth of sharing practices. Sharing economy forms like peer-to-peer car sharing provide direct economic as well as, to a certain extent, social benefits to adopters. These diverse benefits make "that there is something in it for anybody", leading to adoption far beyond a group of environmentally aware citizens.

This brings us to a second, and related, point: the investigation of user motivations is important for analysing whether the innovation can really induce a transition towards a more sustainable society. Kemp and van Lente (2011) argue that sustainability transitions involve a dual challenge: the change of both systems (e.g. of transportation, agriculture) and of consumer criteria. Transitions that fail to change consumer criteria will not lead to sustainability because of rebound effects and other impacts. The sharing economy seems a very insightful case on this point. In our study it was found that accommodation sharing was the sharing economy form mostly driven by economic motives. Not surprisingly, accommodation sharing has also been linked most prominently with negative sustainability effects, such as rebound effects caused by increased travel frequency (e.g. Tussyadiah & Pesonen, 2015). Motivations can change over time. People that start sharing for utilitarian reasons might later come to appreciate social and environmental aspects of sharing, or vice versa. A worthwhile transition research project seems therefore to study the co-evolution of innovation forms and motivations over time, hereby distinguishing between motivations for different groups of participants.

This research provides a comprehensive quantitative cross-comparison of motivations to participate in different sectors of the sharing economy. However, the broad scope of this research has some limitations to be addressed in further research. *First*, in order to cross-compare motivations to use and provide different shared assets among one sample of respondents we have opted for a stated preference survey technique. This has the drawback that even though many respondents state a willingness to share, it is unclear whether they will actually start sharing in the near future and if yes, whether their motivations to do so will still

be the same. As the sharing economy gradually up-scales, further cross-sectional research could cross-compare motivations of actual sharing economy participants and perhaps triangulate these with stated motivations for those interested amongst the general population. *Second*, alternative research designs, possibly longitudinal, may be used to model in more detail the patterns of causality that exist between motivations to share, sharing intentions and actual sharing behaviours. Additionally, large-scale quantitative studies may explicitly study the possible interaction effects between socio-demographic factors, sharing economy sectors and roles as user or provider in explaining motivations to share. *Third*, following earlier research (e.g. Tussyadiah, (2015)) we set out to explore economic, social, and environmental motivations to share. This is obviously only a limited number of motivations. Further research could explore other motivational dimensions of participation, as well as barriers, for example drawing on Social Exchange Theory (Kim, Yoon & Zo, 2015).

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