A Relational-Models View to Explain Peer-to-Peer Sharing

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ABSTRACT   The growth of peer-to-peer sharing is crucially dependent on continued participation of current platform members and on them behaving prosocially towards other participants who are usually strangers. We propose a relational-models view that revolves around the idea that how members perceive the relationships among participants on a sharing platform significantly affects these behavioural outcomes. We test this idea with a survey where we capture participants' perceptions of sharing relationships using Fiske's (1991) relational models – communal sharing, market pricing, and equality matching. We show that communal sharing and equality matching foster prosocial behaviour (which we label sharing citizenship behaviour) and the willingness to continue participating, whereas market pricing does not have the negative effects we expected. Our work advances relational models theory in addition to contributing to the literature on the sharing economy.

Keywords: peer-to-peer sharing, relational value, sharing citizenship behaviour, sharing economy, willingness to participate

INTRODUCTION

Peer-to-peer sharing refers to 'consumers granting each other temporary access to under-utilized physical assets ("idle capacity"), possibly for money' (Frenken and Schor, 2017, pp. 4–5). The growth of the sharing economy is closely tied to the upscaling of peer-to-peer sharing for two reasons. First, peer-to-peer sharing represents a large and rapidly growing part of the sharing economy. Assessing the size of the sharing economy

through five key peer-to-peer sectors, PricewaterhouseCoopers (2016a) found that in 2015 they produced revenues of almost 4 billion Euro in Europe and enabled approximately 28 billion Euro of transactions, with an expected 20-fold increase to 570 billion Euro by 2025 (PricewaterhouseCoopers, 2016b). Second, scholars have claimed that sharing between individuals embodies the original principles of the sharing economy (Frenken and Schor, 2017; Muñoz and Cohen, 2017; Murillo et al., 2017), since it allows to create a sense of community and social bonding (Benjaafar et al., 2019), it enables the empowerment of ordinary people (Murillo et al., 2017), and it helps tackle overproduction through the exploitation of under-utilized assets (Benjaafar et al., 2019). Therefore, in order to keep true to the fundamental tenets of the sharing economy, its growth should be fuelled *in primis* by the expansion of sharing among peers.

The growth of peer-to-peer sharing is, however, not a given. Compared to scaling up sharing by companies (e.g., Zipcar and Rent the Runway), scaling up peer-to-peer sharing requires overcoming the sizeable challenge posed by sharing with strangers. Sharing with strangers could make providers and users on peer-to-peer sharing platforms much more reluctant to share than they would be if the other party was a company, because they feel much more vulnerable to being taken advantage of by the other party (Schor and Fitzmaurice, 2015). What if a renter of our car does not treat it as we would, or, worse still, what if they actually deliberately cause damage or steal (Brunning, 2015; Möhlmann, 2016)? What if the meal we buy from a peer has been prepared in an unhygienic manner and makes us sick? Irresponsible behaviour and reluctance to share with strangers could threaten the growth of peer-to-peer sharing.

In order to investigate this potential threat, we depart from the well-established idea in social psychology that, when we feel dependent on strangers, our behaviour is very sensitive to our perceptions of what the situation is 'about', which shape our expectations about others' behaviour (Rusbult and Van Lange, 2003). We therefore expect that providers' and users' perceptions of the nature of the relationships among participants on a peer-to-peer sharing platform – including what motivates participants and what is normatively appropriate conduct on this platform – matter a lot to explain the behavioural outcomes crucial for the future of the sharing economy. To capture the nature of the relationships among participants, we build on Fiske's (1991, 1992) relational models theory. This theory has already been applied successfully in management research and presents the advantage of offering a richer conceptualization than the existing literature on peer-to-peer sharing platforms, while still being parsimonious. Specifically, we propose that participants can frame relationships among peers using three relational models: communal sharing (where belonging to the same community guides behaviour), equality matching (where balanced reciprocity guides behaviour), and market pricing (where a cost-benefit analysis guides behaviour).

Testing our ideas on a sample of 975 participants of four peer-to-peer sharing platforms, we found support for our general idea that stronger communal sharing and equality matching framing will positively affect two behavioural outcomes that are important for the sustainability of peer-to-peer sharing: (1) providers' and users' behaviour that reflects a heightened sense of responsibility towards other sharing participants, which we label 'sharing citizenship behaviour' (a concept that turned out to have two dimensions: 'altruism' and 'conscientiousness'), and (2) their willingness to continue sharing on the

platform. In contrast to what we hypothesized, we did not find communal sharing to have a systematically stronger positive impact than equality matching. Instead, equality matching exhibited a stronger relationship with conscientiousness and willingness to continue participating than communal sharing. Furthermore, we found the hypothesized negative impact of a stronger market pricing frame on willingness to continue participating, but not on the two dimensions of sharing citizenship behaviour. This is surprising given the repeated arguments across many bodies of literature that economic incentives often undermine morality (e.g., Bowles, 2008; Ghoshal and Moran, 1996).

Our work contributes to the literature on peer-to-peer sharing and to relational models theory. For the literature on peer-to-peer sharing, our relational-models view emphasizes the importance of the mental framing of the relationships among participants to explain sharing citizenship behaviour and willingness to continue participating on peer-to-peer sharing platforms. For the growth of the sharing economy, our findings suggest that sharing platforms could promote peer-to-peer sharing by developing features that prompt participants to frame their relationships more strongly in communal sharing or equality matching terms. For relational models theory, our work delivers one of the very first empirical tests of the theory in the management field. While our empirical results confirm the interest of using this theory to understand management-related phenomena, they also reveal the need to theorize about the effects of the relational models at a more fine-grained level: the ranking proposed by Bridoux and Stoelhorst (2016) turned out not to be generalizable to all types of cooperative behaviour.

THEORY AND HYPOTHESES

Peer-to-Peer Sharing: A Need to Look at Relationships

Whilst research on peer-to-peer sharing platforms is still scarce, analogies have been drawn with platforms that have received wider scholarly attention. In particular, the peer-to-peer sharing platforms have been conceptualized (Kyprianou, 2018; Zervas et al., 2017) as a kind of 'two-sided markets' (Rochet and Tirole, 2003, 2006) or 'platform markets' (Rietveld and Eggers, 2018) because these platforms are intermediaries that enable interactions between at least two sets of actors (providers and users), they do not take ownership of the goods transferred (Frenken and Schor, 2017), and they are characterized by indirect network effects (i.e., the value of the platform for each side depends on the number of actors on the other side) (Dreyer et al., 2017; Murillo et al., 2017).

Industrial economists have pioneered the study of platform markets (McIntyre and Srinivasan, 2017; Thomas et al., 2014), focusing in particular on the impact of network effects on the competition among platforms and on platforms' pricing decisions (e.g., Armstrong, 2006; Hagiu, 2009; Rochet and Tirole, 2003, 2006). Over the last years, management scholars have also paid increasing attention to platform markets. However, to date, research on peer-to-peer platform markets has mostly focused on peer-to-peer e-commerce. In this realm, scholars have contributed to our understanding of: (1) participants' strategies (Brough and Isaac, 2012; Reynolds et al., 2009) and reputation within a platform (Cheema, 2008; Obloj and Capron, 2011), as well as (2) the effects,

on participants' behaviour, trust, and performance, of platform strategies and design features (Dinerstein et al., 2018; Li et al., 2009), in particular reputation and regulation mechanisms (Hui et al., 2016; Kuwabara, 2015).

Peer-to-peer e-commerce shares similarities with peer-to-peer sharing that makes the literature on the former relevant to research on the latter. In particular, peer-to-peer e-commerce and sharing have in common that the platform provider facilitates connections between individuals who are strangers to each other (Schor, 2014). Exchanging with strangers is likely to be perceived as riskier by (potential) participants than transacting with business organizations as in the case of business-to-consumer platforms (Einav et al., 2016; Jones and Leonard, 2008; Kuwabara, 2015). Yet, peer-to-peer sharing also differs fundamentally from peer-to-peer e-commerce in at least two respects, which justifies the need for studies dedicated to peer-to-peer sharing in general, and dedicated to the relationships among participants on peer-to-peer sharing platforms in particular.

First, while economic value is always at the heart of peer-to-peer e-commerce, the value peer-to-peer sharing platforms aim to realize for their members usually includes a non-monetary component and is sometimes exclusively non-monetary (Acquier et al., 2017). The extent to which peer-to-peer exchanges are monetized varies across peer-to-peer sharing platforms and economic value can be completely absent (Frenken and Schor, 2017; Habibi et al., 2016), as illustrated by platforms such as Couchsurfing or Peerby, where providers give access to their possessions for free (respectively their house and their household goods). Furthermore, peer-to-peer sharing is often presented as a tool to generate new forms of solidarity and social bonding among individuals (Belk, 2010). Assuming that (at least some) individuals seek non-monetary value from their participation on peer-to-peer sharing platforms, we can expect the nature of the relationships among participants to matter because, according to their nature, relationships fulfil different relational needs and therefore deliver more or less relational value (Fiske, 2002).

Second, in contrast to e-commerce, peer-to-peer sharing does not generally encompass transferring permanently the ownership of a good (Jiang and Tian, 2018), but instead 'granting temporary access to under-utilized physical assets' (Frenken and Schor, 2017, pp. 4–5).[1] While buyer-seller interactions usually begin and end with the supply of the product in exchange of money, peer-to-peer sharing initiates when the provider gives the user access to his/her possession, it permeates the use of the shared good by the user, and terminates when the good is returned to the provider. Given the higher complexity and duration of relationships in peer-to-peer sharing compared to peer-to-peer e-commerce, the extent to which participants feel vulnerable to other participants' opportunism and misbehaviour is likely to be much higher (Huurne et al., 2017; Schaefers Wittkowski et al., 2016). In addition, whereas it is the buyer who copes with the higher risk when transferring ownership, opportunism and misbehaviour can take many more forms and affect both sides of the exchange when granting access. For example, on the peer-to-peer car sharing platform Turo, owners are vulnerable to renters damaging or destroying their car, while renters are vulnerable to car owners providing an unsafe vehicle or cashing in money for a car that is actually not available upon the renter's arrival.

Because of the vulnerability to other participants' opportunism and misbehaviour and because of the desire of (some) participants to obtain relational value, how participants perceive sharing relationships on the platform is likely to be an important driver

of participants' behaviour. It is well established in social psychology that when humans feel dependent on others, they tend to 'dedicate considerable effort to understand what the situation is 'about' and to developing expectancies about [the other's] probable behavior' (Rusbult and Van Lange, 2003, p. 355). This aspect has so far been overlooked by the literature on peer-to-peer sharing platforms, which has focused to date essentially on individual motivations to share (e.g., Böcker and Meelen, 2017; Habibi et al., 2016; Wilhelms et al., 2017), on platforms' business models and design features (e.g., Habibi et al., 2016; Muñoz and Cohen, 2017), and on the environmental, social or economic impacts of these factors (e.g., Benjaafar et al., 2019; Frenken and Schor, 2017; Jiang and Tian, 2018; Zervas et al., 2017).

Our study thus aims to expand the understanding of peer-to-peer sharing by investigating how individuals' mental representation of the relationships among participants on the sharing platform affects behaviour that is important for the future of peer-to-peer sharing, namely sharing citizenship behaviour and willingness to continue sharing on the platform. If participants on a sharing platform exhibit a high sense of responsibility throughout the sharing exchanges and are willing to take part again in peer-to-peer sharing, it increases the odds that the platform will be able to grow while maintaining the balance between supply and demand over time.

A Relational-Models View of Peer-to-Peer Sharing

In order to capture how participants perceive relationships on a peer-to-peer sharing platform, we use Fiske's relational models theory (Fiske, 1991, 1992; Haslam, 2004; Rai and Fiske, 2011). Disciplines as diverse as psychology, economics, political science, sociology, anthropology, and biology have studied why and to what extent people cooperate in social interactions, given the temptation to free-ride and the fear of being taken advantage of (Van Lange et al., 2013). A key message from this large body of research is that humans have developed mental structures to deal with the tension between collective and individual interests in social interactions (Fiske, 1991). These mental structures, which we call relational models in line with relational models theory (Fiske, 1991, 1992; Haslam, 2004), are 'representations, grammars, or script-like social schemata' (Fiske, 1991, p. 21) that enable people to internalize relationships as part of their cognitive functioning and translate them into behaviour (see Haslam and Ellemers, 2005; Turner et al., 1994).

People use these relational models (consciously or unconsciously) 'to plan and to generate their own action, to understand, remember, and anticipate others' action, to coordinate the joint production of collective action and institutions, and to evaluate their own and others' actions' (Fiske, 2004, p. 3). The relational models are not exclusively cognitive, they also comprise needs, motives, evaluative attitudes and judgments, as well as emotions (Fiske, 1991). The relational models trigger different behaviours in social interactions because they (a) involve different perceptions of who one is in relation to the partner, (b) are associated with different motives, and, therefore, (c) lead to different rules of appropriate behaviour for oneself and the partner (Bridoux and Stoelhorst, 2016). In other words, each of the relational models conveys distinct expectations regarding the relational norms governing a relationship, which in turn evoke distinct actions and

responses in relational partners (Bowles and Polonia-Reyes, 2012). Actions that are inappropriate according to a relational model are evaluated as immoral by individuals using that model and generate negative moral emotions such as guilt, shame, disgust, or outrage (Rai and Fiske, 2011). These negative moral emotions motivate individuals to both exhibit the behaviour that is appropriate according to the relational model and discipline others into behaving appropriately even if disciplining comes at a personal cost (Gintis et al., 2008; Turillo et al., 2002).

On the basis of an exhaustive review of the major work on social relationships in sociology, social anthropology, and social psychology, Fiske (1991) has argued that we employ four elementary relational models to coordinate nearly all our social interactions: communal sharing, market pricing, equality matching, and authority ranking. While the non-hierarchical nature of peer-to-peer relationships makes it unlikely that participants would perceive authority ranking[2] to govern these relationships, the other three models could apply to peer-to-peer relationships.

Communal sharing (CS) has a lot in common with, inter alia, Ouchi's (1980) clan, Adler's (2001) community, Gittell's relational coordination (Gittell and Douglas, 2012), and Clark and Mills' (1979) communal relationship. 'Communal sharing is a relation of unity, community, undifferentiated collective identity, and kindness, typically enacted among close kin' (Fiske, 1991, p. ix). The fusion of the self with the community characterizing CS means that individuals see themselves and other members of the community as equivalent, undifferentiated, and sharing the same goal to promote the community's interests (Bridoux and Stoelhorst, 2016). As a result, CS calls for generalized reciprocity – a norm according to which no one keeps track of how much is given and received (Fiske, 1991) – and individuals contribute altruistically to the common objective, regardless of personal rewards and costs (Bridoux and Stoelhorst, 2016). Belk (2014, p. 16) classifies this form of sharing as 'sharing in', because actors incorporate those with whom they share as 'aggregate extended self'.

Market pricing (MP) corresponds to the traditional economic view of transactions and is similar to, for example, Williamson's (1975) concept of market, and Clark and Mills' (1979) exchange relationship. 'Market pricing is based on an (intermodal) metric of value by which people compare different commodities and calculate exchange and cost/benefit ratios' (Fiske, 1991, p. ix). MP makes personal identities salient, with individuals seeing themselves as independent entities competing for achievement (Bridoux and Stoelhorst, 2016). This makes the pursuit of self-interest the norm (Fiske, 1991). This type of relationships is closely linked to Belk's (2014) 'sharing out' because it is not about helping others or making human connections, but rather about maximizing one's own profit.

Compared to the other models, Equality matching (EM) has received little attention in management research (Bridoux and Stoelhorst, 2016). It is therefore not surprising that it has not yet been explicitly considered in the literature on the sharing economy. 'Equality matching is a one-to-one correspondence relationship in which people are distinct but equal, as manifested in balanced reciprocity (or tit-for-tat: revenge), equal share distributions or identical contributions, in-kind replacement compensation, and turn taking' (Fiske, 1991, p. ix). In relationships framed as EM, individuals' identity stretches to include the relational partners' well-being, at least as long as the partners are perceived

to be cooperative (Bridoux and Stoelhorst, 2016). From this relational identity follows a norm of balanced reciprocity (Sahlins, 1972), whereby people are expected to take turns and strive for balance in what is given and received and ensure that any help is returned, usually in kind (Fiske, 1991).[3] This model of balanced exchange typically regulates relationships with neighbours and more distant friends.

We have three reasons for working with the relational models – CS, MP, and EM – to explain participants' behaviour on peer-to-peer sharing platforms. First, while still parsimonious, relational models theory offers a more complete set of mental representations of sharing relationships than the traditional dichotomies applied in studies of the sharing economy. As critics have already acknowledged (e.g., Arnould and Rose, 2016; Bucher et al., 2016), participants' motivations to engage in sharing relationships are often oversimplified: participants are often assumed to be driven either by purely altruistic motivations or solely by economic considerations. With the balanced reciprocity at the core of the equality matching model, relational models theory offers a second alternative to the pure economic self-interest characterizing market pricing, next to the altruism coming from a common identity in the communal sharing model. Second, empirical research pitting relational models theory against alternative perspectives on social relationships showed that relational models theory fared better in depicting real-life relationships than Foa and Foa's theory of resource exchange, Parsons' theory of role expectations, Mills and Clark's theory of communal and exchange relationships, and MacCrimmon and Messick's theory of social motives or orientations (Haslam, 1995; Haslam and Fiske, 1992). Third, Fiske's relational models theory has already been successfully used in the management field to explain relationships between individuals (e.g., Bridoux and Stoelhorst, 2016; Giessner and van Quaquebeke, 2010; Mossholder et al., 2011).

While the relational models have often been used to capture how individuals perceive their relationship with a *specific* partner, we apply the models to grasp how individuals perceive relationships among participants on peer-to-peer sharing platforms *in general*. This is in line with Mossholder et al. (2011), who used the models to capture relational climates in organizations, which they define as 'sociocognitive environments that […] support conceptually distinct forms of interpersonal relationships among employees' (Mossholder et al., 2011, p. 34). Specifically, we are interested in how individuals see (a) who participants are in relation to other participants on the sharing platform, (b) what motivates participants, and (c) what are appropriate behaviours on the sharing platform. We chose this conceptualization because individuals are likely to fall back on more generic mental frames in interacting with strangers, for whom they have no history of personal interactions from which to derive specific mental representations. Similar arguments have been made regarding the role of organizational climate in guiding employees' prosocial behaviour (e.g., helping, knowledge sharing) towards other employees who are strangers or distant acquaintances (Bock et al., 2005; Constant et al., 1996). As it would be the case among employees working closely together, we acknowledge that, in case of repeated dyadic interactions, participants on a sharing platform will over time gather enough information to choose the relational model that matches that specific relationship and may no longer rely on the more generic mental representations of how participants generally relate to each other. This implies that, with our conceptualization

of the relational models, repeated dyadic interactions fall outside of the scope of our study (we come back to this limitation in the discussion).

Furthermore, we expect that participants may employ a combination of the three relational models to mentally represent how peers generally relate to each other on the platform, whereas the management literature has often approached relational models as substitutes (e.g., Bridoux and Stoelhorst, 2016; Sheppard and Sherman, 1998), arguing that an individual can only hold one relational frame at one point in time, even if relational models can follow one another relatively quickly in an individual's mind in response to changes in the social interaction or the environment (Fiske, 1991, 1992). Yet, in their empirical study, Haslam and Fiske (1999) show that relational models can co-exist. Accordingly, Haslam and Fiske (1999, p. 242) have argued that social relationships may be 'governed by combinations of the models', which 'are not, therefore, empirically independent in principle'. Individuals may concurrently adopt different relational models to address 'different aspects of different social-relational interactions' (Rai and Fiske, 2011, p. 60).

In the rest of this section, we formulate hypotheses regarding the comparative impact of the relational models on participants' sharing citizenship behaviour and willingness to continue participating, our two dependent variables.

Behavioural Outcomes of the Relational Models

Sharing behaviour that shows a high sense of responsibility towards other participants is essential for the growth of peer-to-peer sharing, as it fosters satisfaction with participation and positive emotional responses to sharing, which are crucial to long-term success (Bardhi and Eckhardt, 2012; Habibi et al., 2017; Ikkala and Lampinen, 2015). Specifically, this type of prosocial behaviour has been argued to create positive emotions, such as feelings of gratitude, happiness and bonding, that motivate users and providers alike to seek out additional sharing experiences and remain committed over time (Bucher et al., 2016; Habibi et al., 2017; Ikkala and Lampinen, 2015). Scholars studying the sharing economy have provided multiple examples of this type of behaviour, e.g., additional services, small acts of hospitality, and consumer cocreation (e.g., Bardhi and Eckhardt, 2012; Belk, 2010; Habibi et al., 2016, Ikkala and Lampinen, 2015).

We see clear parallels between these many examples and what the human resource literature calls 'organizational citizenship behaviour' (OCB), which refers to specific forms of extra-role behaviour beneficial for the organization or co-workers (Podsakoff et al., 2000). We, therefore, chose the label *sharing citizenship behaviour* to designate sharing behaviour that shows a high sense of responsibility towards other participants. We built on the extensive literature on OCB to conceptualize sharing citizenship behaviour, a necessary step in order to measure the concept adequately (see Podsakoff et al., 2016). Specifically, we conceptualize sharing citizenship behaviour as encompassing two categories of behaviour. First, the literature describes sharing behaviour that is similar to 'altruism', a form of OCB that involves helping co-workers without expecting an extrinsic reward for this behaviour (Organ, 1997). For example, Airbnb hosts often engage in additional services, such as offering some food to their guests and giving additional advice and local recommendations; similarly, guests have been known to bring gifts and

express gratitude to their hosts (Ikkala and Lampinen, 2015). The second category of sharing citizenship behaviour is very close to the 'conscientiousness' dimension of OCB. '[A]kin to compliance with internalized norms defining what a "good employee ought to do"' (Smith et al., 1983, p. 657), Couchsurfer participants expressed an expectation of punctuality, cleanliness, and willingness to spend time with the host and exchange experiences, while rejecting the idea that their partners 'owed' anything to them or vice versa Harvey et al. (2014).

We hypothesize that how individuals perceive the relationships among participants on a peer-to-peer sharing platform affects the extent to which they exhibit sharing citizenship behaviour. Research in management has already linked Fiske's relational models to other forms of prosocial behaviour such as helping co-workers (Mossholder et al., 2011), knowledge sharing (Boer et al., 2011), and cooperation among stakeholders (Bridoux and Stoelhorst, 2016). The gist of this work is that behaviour depends on the individual's perception of the situation, i.e. on the answer he/she gives to the question 'What kind of situation is this?' (Messick, 1999; Weber et al., 2004). Individuals rely on relational schemas to answer this question (Blatt, 2009) and identify which kind of behaviour is appropriate in that specific context (Weber et al., 2004).

Following what Mossholder et al. (2011) have argued for helping co-workers and what Bridoux and Stoelhorst (2016) have argued for cooperation among stakeholders, we expect sharing citizenship behaviour to be most strongly positively affected by CS, followed by EM, while we expect a negative effect of MP. A CS frame has the largest positive impact because it brings individuals to identify with the collective and to expect other participants to similarly see themselves as community members (Fiske, 1991, p. 1992). As a result of the inclusion of other participants within a common social boundary, individuals perceive lower social distance among participants than in the case of a relational identity, which typifies EM, or a personal identity, which characterizes MP (Brewer and Gardner, 1996; Brewer and Kramer, 1986). This reduced social distance makes individuals more likely to equate their own and other participants' welfare (Brewer and Kramer, 1986) and, thus, more willing to fulfil other participants' needs because others' needs are very much perceived as one's own needs (Fiske, 1991). Consequently, the more individuals perceive the relationships among participants as CS, the more we can expect them to engage in sharing citizenship behaviour with little regard for the personal costs involved in order to fulfil other participants' needs.

By comparison to CS, the positive impact of EM on sharing citizenship behaviour should be smaller. In contrast to the collective identity that characterizes CS, EM is typified by a relational identity whereby the partner is seen as equal but different from the individual him/herself (Bridoux and Stoelhorst, 2016). As a result of this different level of identification, the norm guiding behaviour is not, like with CS, to contribute to common objectives regardless of personal costs and trying to fulfil each other's needs. Instead, the norm is balanced reciprocity according to which the benefits received and costs incurred by the parties to the exchange should be in balance (Fiske, 1991, 1992). Because balance is core, individuals who adopt an EM frame are conditional co-operators: they exhibit prosocial behaviour to the same extent as their partner (Fehr and Fischbacher, 2004; McClintock and Liebrand, 1988). Thus, for example, if a sharing

partner has provided a good in an appropriate state, a participant who sees relationships among participants as governed by EM will reciprocate by returning the good in good condition. The norm of balanced reciprocity underlying EM also encourages sharing citizenship behaviour because it comes with the expectation that such behaviour will be repaid by sharing partners in the future, in the form of either direct reciprocity (the same sharing partner reciprocates in the future) or indirect reciprocity (informed of the individual's past sharing citizenship behaviour, a future sharing partner reciprocates this behaviour). For example, car owners who strongly frame the sharing relationship on the platform as EM will likely offer a car in good condition because they expect that the users will reciprocate their sharing citizenship behaviour by treating the car well and returning it in good condition, thus saving the owner monetary and emotional costs.

Conversely, we posit that the more participants perceive the sharing relationship to be governed by MP, the less likely they are to exhibit sharing citizenship behaviour. In MP relationships, people 'reduce all relevant features and components of the relationship into a single value or utility metric' (Giessner and Van Quaquebeke, 2010, p. 46), which is likely to be money when exchanges are monetized. The self-interested pursuit of material benefits is therefore the norm for both one's own and other participants' behaviour (Fiske, 1991). Extant management literature has shown how triggering a business decision frame leads to unethical actions (Kouchaki et al., 2013) and less cooperation (Tenbrunsel and Messick, 1999) compared to a community frame. In a sharing economy context, when sharing is equated with money this 'effectively mov[es] the transaction out of the realm of the social and into the realm of business' (Belk, 2014, p. 12). The following hypothesis sums up our arguments for the comparative impact of the three relational models on sharing citizenship behaviour:

> *Hypothesis 1*: Sharing citizenship behaviour is more positively affected by CS than by EM, while it is negatively affected by MP.

A second behavioural outcome that is crucial for the future of peer-to-peer sharing is individuals' willingness to continue participating. Like for sharing citizenship behaviour, we expect that the more participants frame the sharing relationships on the platform as CS or EM, the higher their willingness to keep participating, while a stronger MP framing should lead to a lower willingness to continue sharing on the platform. Furthermore, we expect that the positive impact of CS is larger than the positive impact of EM. Two reasons underlie these expectations.

First, participants derive higher relational value from relationships framed as CS or EM than from the ones framed as MP, and higher relational value from relationships framed as CS than from the ones framed as EM. Relationships perceived as CS or EM provide utility to participants that, besides material benefits, encompasses intangible benefits such as the psychological well-being humans derive from feeling part of a group (CS) or feeling appreciated as a trustworthy partner (EM). The collective identity at the core of CS provides high relational value because it serves many positive functions: (a) a group identity offers social self-esteem, which derives from the comparison of the group to which one belongs with other groups, (b) it helps individuals structure their causal understanding of the social environment by reducing a complex social environment to a

smaller number of distinct categories, and (c) it very much simplifies predicting others' actions as other group members can be expected to adopt the prototypical behaviours, characteristics, and values associated with the particular group membership (Tajfel, 1978; Tajfel and Turner, 1979).

The relational identity characterizing EM also offers relational value to participants but less than a collective identity. Through the feeling of being a valued exchange partner, the positive relational identity linked to EM enhances participants' self-esteem (Dutton et al., 2010). Yet, as the unique sense of self remains psychologically present (Brewer and Gardner, 1996), a relational identity does not provide the benefits for CS listed under (b) and (c), namely facilitating participants' understanding of the social world and significantly increasing predictability in the social world. Regarding predictability specifically, while the collective identity and the attached behavioural norm to fulfil others' needs reduce the fear for other participants' opportunism to a large extent when sharing relationships are seen as scoring high on CS, such fear does remain salient when participants perceive sharing relationships as governed by EM. In contrast to a CS or EM frame, in an MP frame, relationships are primarily perceived as means to material ends (Bridoux and Stoelhorst, 2016) such as accessing goods for users and making a profit out of unused goods for providers. This means that participants do not derive much value from the sharing relationship beyond the utility linked to material benefits.

Second, when participants see themselves and potential sharing partners as members of the same community (CS) or as striving for reciprocity (EM), they will expect partners in potential future interactions to also value the sharing relationships themselves and to exhibit sharing citizenship behaviour so as to sustain these relationships (Bridoux and Stoelhorst, 2016). Expecting that other participants will refrain from misbehaving in turn increases participants' willingness to continue participating on a sharing platform. This effect is, however, stronger for CS than for EM because relational value is lower for EM compared to CS. In contrast, if participants characterize sharing relationships as high on MP, they expect future sharing relationships to be governed by self-interest. Participants may fear that it is likely that they will be the victim of others' misbehaviour when it is in others' self-interest to misbehave. On the basis of the two reasons just explained, we propose:

> *Hypothesis 2*: Willingness to continue participating is more positively affected by CS than by EM, while it is negatively affected by MP.

METHODOLOGY

Data Gathering and Sample

To investigate whether perceptions of relationships among peers help explain participants' sharing citizenship behaviour and willingness to continue participating, we surveyed active participants based in the Netherlands of four sharing platforms: Peerby, PeerbyGo, Snappcar, and Thuisafgehaald. Peerby started in Amsterdam in 2012 as a

sharing platform for household items that offered its members to share household items for free. In 2016, the organization behind Peerby also launched PeerbyGo, a sharing platform where transactions are paid for. Peerby.com is now active in most European cities, counts approximately 450,000 members, and has $1 billion worth of items in its database. The two services have separate websites. Another notable difference between the two services is that Peerby is request-based: peers post requests to which others in their neighbourhood can respond (peerby.com) and the requestee personally picks up the requested product at their neighbours' house. In contrast, on PeerbyGo only providers create an account on the website, in which they list the products they offer, their daily rental price, and as an additional service all rented items are insured through Peerby Guarantee. Providers deliver the products at the renters' house. The most popular products are the same on the two platforms and include: power drills, ladders, projectors, party tents, and pressure cleaners (European Commission, 2017).

The third platform, Snappcar, is the European leader in peer-to-peer car rental. Also referred to as the 'Airbnb for cars', Snappcar currently lists 41,000 cars in the Netherlands and is expanding rapidly in the rest of Europe. Similar to the PeerbyGo model, providers offer their cars on the website. Unlike Peerby however, users are vetted by the platform (Boztas, 2017). Once users have completed their registration, they can rent cars by sending a request to registered owners. Once the request is accepted, the user will have to pay for the transaction, after which the request is finalized. The final step is for the renter and provider to agree on a pick-up and drop-off location on the agreed-upon time and date, which also includes exchange of keys in person.

Finally, Thuisafgehaald is a community of more than 55,000 home cooks who share their meals with their neighbours throughout the Netherlands. Cooks list available meals and the number of portions on the site. Once users have registered, they can 'reserve' these meals and pick them up at the cook's house at the agreed-upon time. In Table I, we report additional information for each of the four platforms as well as some key figures.

In September 2016 the four sharing platforms invited their members to take part in a national survey focused on the sharing economy via an e-mail which contained a direct link to our online questionnaire. Participants did not receive a financial compensation for their participation, but an iPad could be won via a raffle, to further incentivize their participation. All the participating platforms regularly carry out their own online surveys, for which they typically invite a random sample of their members. Accordingly, we asked the platforms to randomize the selection of their members that we would survey so as to draw a representative sample of their participants. Inspection of our sampled respondents backs up the representativeness of our sample. For each of the four platforms, we have respondents from all income and education levels as well as from each category of participants, namely providers, users, and prosumers (cf. our control variables below). Furthermore, from a geographical standpoint, the respondents came from all 12 provinces in the Netherlands – Groningen, Friesland, Drenthe, Overijssel, Flevoland, Gelderland, Utrecht, Noord-Holland, Zuid-Holland, Zeeland, Noord-Brabant, Limburg – and covered 138 different municipalities, with, as expected, most respondents in our dataset located in the three most populated provinces – i.e., Utrecht, Noord-Holland, and Zuid-Holland. In total, we collected 1,520 questionnaires. Of our respondents, 813 were users of Peerby, 317 of PeerbyGo, 153 of Snappcar, and 237 of Thuisafgehaald.

Table I. The four platforms[a]

	Peerby	PeerbyGo	Snappcar	Thuisafgehaald
Date of foundation	2012	2015	2011	2012
Key service offered	A sharing platform in which people connect and lend out their household items to each other.	A sharing platform in which people meet and connect and rent out their household items to each other.	A car sharing platform in which people connect and rent out their privately-owned cars to each other.	A meal sharing platform in which people connect and cook for people in their neighbourhood for a small fee.
How does it work?	Members post about something they want to borrow, and neighbours get an email or push notification to which they can respond with a single click. Members pick-up and return the 'borrowed items' at the owner's house.	Members come into contact with owners on the platform based on which product they are looking for. Once a match is made, the owner will deliver and pick up the product at the renter's house.	Members send a rental request to the owner. Once the request is accepted and the payment is completed, the booking is finalized. The renter picks up and returns the car at the agreed time and location.	Members can find local meals nearby through a postcode search on the online platform. Once they have selected and ordered a meal online, the cook provides them with their contact details and they arrange a pick-up time.
Active countries	Belgium, USA, The Netherlands	The Netherlands	The Netherlands, Sweden, Denmark, Germany	The Netherlands
Total membership in the Netherlands	200,000	Unknown, access to services is not membership based	183,000[b]	84,000
Membership internationally[c]	250,000	–	400,000	–
Number of providers in the Netherlands	200,000[d]	Unknown	22,491[e]	11,200
Number of providers internationally	250,000	–	45,000	–
Number of transactions annually	100,000[f]	Unknown	Unknown	58,900

Table I.   *Continued*

	Peerby	*PeerbyGo*	*Snappcar*	*Thuisafgehaald*
Member costs[g]	Free of charge	38 Euro per month	Between 19.95–39.95 Euro per day excluding fee per mile travelled	6.88 Euro per meal
Delivery	Pick up	Home delivery	Pick up	Pick up
Review system in place	No	No	Yes	Yes
More information	www.peerby.com	www.peerbygo.com	www.snappcar.com	www.thuisafgehaald.nl

[a]Unless stated otherwise, the information reported in the table is retrieved directly from the websites of the four platforms. For more information, see: www.peerby.com, https://go.peerby.com, www.snappcar.nl, www.thuisafgehaald.nl.
[b]Estimate based on statistics provided by CROW (2016, 2018) on the number of P2P cars shared. An average P2P car is shared among 8 users. The total number of providers was added to this figure. In 2016, Snappcar had approximately 157,000 members.
[c]Data retrieved from Boztas (2017) and European Commission (2017).
[d]Peerby is request based, so no active distinction is made between users and providers.
[e]In 2016, approximately 17,000 car owners rented out their car through the platform.
[f]Estimate based on three-year statistics provided by Peerby (300,000 transactions over the past three years).
[g]Data retrieved from European Commission (2017).

Among the sampled respondents, 59 percent were female and 41 percent male. 44 percent of respondents had a university degree and 41 percent of respondents enjoyed a professional education, while only 15 percent of respondents were lower educated. 21 percent of our respondents fell into a lower-income category (up to 1,500 Euro per month), 45 percent enjoyed a medium income (between 1,501 and 3,500 Euro per month) and 26 percent a gross monthly income of 3,501 Euro or more. The average age was 45.21 (SD = 12.47). It was impossible to use all the observations gathered as several respondents only completed a portion of the survey. In the additional analysis subsection, we describe the steps we took to account for this as a potential source of bias. After having excluded incomplete surveys, the final working sample used for the analyses comprised 975 observations.

Measures

Our first dependent variable, *sharing citizenship behaviour*, was measured with 11 items (for an overview of all measures see Table II). We stayed as close as possible to the existing organizational citizenship scales (Lee and Allen, 2002; McNeely and Meglino, 1994; Podsakoff et al., 1990; Williams and Anderson, 1991). The preliminary instrument was reviewed by experts in the field and afterwards pilot-tested amongst 78 respondents. On the basis of these insights some of the items were dropped or modified. This resulted in a scale of 10 items of which 8 were kept in the final model (Cronbach α = 0.73). They closely resembled the dimensions 'conscientiousness' and 'altruism' of OCB (e.g., Organ, 1997; Podsakoff et al., 1990). For example, respondents were asked to what extent they 'obey platform rules and regulations even when no one is watching' and 'help other members, with any additional questions they might have, during my own time' (7-point scales; 1 = completely disagree; 7 = completely agree). Our second dependent variable, *willingness to continue participating*, was measured with three items that we adapted from Hamari et al. (2016). For example, we used the item 'all things considered, I expect to continue using [Platform X] in the future' (7-point scale; 1 = completely disagree; 7 = completely agree; Cronbach α = 0.66).

We also asked respondents to rate the interactions among the members of the sharing platform on the relational models *communal sharing (CS)*, *equality matching (EM)*, and *market pricing (MP)*. The three relational models were measured using 4-item scales each, that we adapted from Haslam and Fiske (1999) to apply to a group setting (7-point scale; 1 = completely disagree; 7 = completely agree). An item for *CS* is, for example, 'Members of [Platform X] form a community: they belong together' (Cronbach α = 0.65, after deleting item 1). *EM* is captured with items like: 'on [Platform X] members have the same opportunities and obligations' (Cronbach α = 0.67, after deleting item 1) and a representative item for *MP* is: 'group members have a right to a fair rate of return in proportion to what they have paid or contributed' (Cronbach α = 0.66, after deleting item 1).

We controlled for a variety of factors in order to account for potential unobserved heterogeneity. First, we controlled for several demographic factors, namely gender, age, level of education, and income. Previous research on sharing platforms showed that low-income groups and older people are more motivated by economic benefits (Böcker and Meelen, 2017), whilst women are more socially driven (Hellwig et al., 2015). Hence,

our dichotomous variable *female* scores 1 for females and 0 for males, while *age* is a continuous variable corresponding to the age of respondents. With respect to the education level, we categorized respondents according to three main categories (lower, professional, and high) in which high corresponds to a university degree, professional is associated to a degree from a professional school, while lower stands for any lower level of education. Accordingly, we introduced two dichotomous variables corresponding to the *education lower* and *education professional* categories. We also accounted for the varying income levels of respondents by grouping them into three main income categories in which low corresponds to a gross monthly salary of up to 1,500 Euro, medium to a monthly salary between 1,501 and 3,500 Euro and high to anything beyond 3,501 Euro. Therefore, we included two dichotomous variables *income medium* and *income high* in our analyses.

We also controlled for the role of participants on the platform since the perceived economic benefits that people get out of sharing might differ according to whether participants are providers or users. Even in a non-monetized sharing context, participants who 'borrow' an item can be economically motivated, as gaining temporary access to the good for free is cheaper than renting the good or buying it. Interestingly, Peerby has been known to stimulate people to be both providers and users on the platform. Accordingly, we grouped respondents using three categories, namely providers, users and prosumers – who correspond to consumers active in both roles (Ritzer and Jurgenson, 2010). In our model specification we therefore included two dichotomous variables identifying *providers* and *prosumers*. Additionally, we included a control variable, *economic motivation*, that more explicitly identifies the economic motivation driving participants. To measure economic motivation, we used the three items related to economic benefits from Hamari et al.'s (2016) four-item scale that aims to measure functional benefits (we left out the item about saving time). Respondents were asked to rate the extent to which their activity on the platform (a) improved their economic situation, (b) saved them money, and (c) gave them a financial advantage (Cronbach $\alpha = 0.73$). We also controlled for the number of years of membership in the given platform at the time of the survey (*membership*), as well as the frequency with which a given respondent used the corresponding platform – the variable *frequency* corresponds to the number of engagements every 3 months – as these variables may have an impact on the relationships under scrutiny. Finally, we included dummies corresponding to the platforms considered in our study.

RESULTS

We assessed the validity of our measures using confirmatory factor analysis, by comparing our proposed 6-factor model with five alternative nested models merging two or more of our six constructs measured with several items (namely, sharing citizenship behaviour, willingness to continue participating, communal sharing, equality matching, market pricing, and economic motivation) and one alternative model disaggregating sharing citizenship behaviour into consciousness and altruism. As reported in Table III, model comparisons based on sequential chi-square difference tests and differences in

Table II. Constructs and measurement items

Willingness to continue participating	'To what extent do you agree with the following statement'
	I can see myself participating more frequently in [PLATFORM X] in the future
	It is likely that I will frequently participate in collaborate consumption communities in the future
	All things considered, I expect to continue using [PLATFORM X] in the future
Relational models	'We are interested in your impression of how people interact on [PLATFORM X]'
Communal sharing	If a member of [PLATFORM X] needs something, someone on [PLATFORM X] will give it without expecting anything in return[a]
	Members of [PLATFORM X] feel a moral obligation to be kind and compassionate to each other
	Members of [PLATFORM X] feel that they have something unique in common with one another that makes you essentially the same
	Members of [PLATFORM X] form a community: they belong together
Equality matching	On [PLATFORM X] members keep track of what we give to each other, in order to keep the relationships balanced[a]
	Members of [PLATFORM X] consider yourselves peers and fellow members and partners of the same platform
	On [PLATFORM X] members treat each other equally
	On [PLATFORM X] members have the same opportunities and obligations
Market pricing	What you get from another member [PLATFORM X] is directly proportional to how much you give that member[a]
	Members of [PLATFORM X] see each other as business partners
	Group members have a right to a fair rate of return in proportion to what they have paid or contributed
	Interactions between members of [PLATFORM X] are strictly rational: they make decisions based on the ratio of the benefits they get and the costs to them
Sharing citizenship behaviour	'To what extent do you agree with the following statements on how you interact on the platform'
Altruism	I show personal interest in other members on the platform
	I am willing to help other members, with any additional questions they might have, during my own time
	I will adapt my own schedule to cater to other members
	I am always willing to help others on the platform
Conscientiousness	I give advance notice if I won't be able to make it on time for an appointment with another member
	I abide by the rules and procedures of the platform, even if no one is watching
	I am always on time for my appointments with other members
	I try to avoid causing trouble for other members

[a]This item was dropped because it loaded poorly.

comparative fit index (CFI) (Cheung and Rensvold, 2002) revealed that the 7-factor measurement model was the best fitting model and better fitting than the proposed 6-factor model. This indicates support for the unidimensionality of our relational models, but not of sharing citizenship behaviour. Therefore, we split sharing citizenship behaviour into two dimensions: *conscientiousness* and *altruism* (with Cronbach α equals to 0.77 and 0.68, respectively). The 7-factor model proved a good fit to the data: $\chi^2(209) = 699.55$, p < 0.001, square root mean residual (SRMR) = 0.05, CFI = 0.93, root mean square error of approximation (RMSEA) = 0.05. As this was the best fitting model, we pursued our analyses with these two separate dimensions of sharing citizenship behaviour. The additional analysis (reported in the Appendix) provides further evidence that our measures of the three relational models *CS*, *EM*, and *MP* exhibit adequate internal consistency, as well as convergent and discriminant validity.

Table IV contains the descriptive statistics and the pairwise correlations between the variables. We inspected the Variance Inflation Factors (VIFs) to assess potential multicollinearity. The VIFs values are all well below the strictest limit of 5.3 recommended by Hair et al. (2006). Therefore, we do not expect issues of multicollinearity to impact our results.

Main Analyses

Our hypotheses call for the estimation of how the three relational models *CS*, *EM*, and *MP* relate to *conscientiousness*, *altruism*, and *willingness to continue participating*. Our unit of

Table III. Fit indices for alternative measurement models

Measurement Model	χ^2 (df)	$\Delta\chi^2$ (df)	CFI	SRMS	RMSEA	PClose
Proposed model:						
Six factors[a]	1255.38 (215)	–	0.86	0.06	0.06	0.00
Alternative models:						
Five factors[b]	1388.51 (220)	133.13*** (5)	0.85	0.06	0.07	0.00
Four factors[c]	1725.53 (224)	470.15*** (9)	0.80	0.07	0.08	0.00
Three factors[d]	2898.34 (227)	1642.96*** (12)	0.65	0.10	0.10	0.00
One factor	4096.26 (230)	2840.88*** (15)	0.49	0.12	0.12	0.00
Seven factors[e]	699.55 (209)	555.83*** (6)	0.93	0.05	0.05	0.98

Note $N = 975$. CFI = comparative fit index; SRMR = standardized root mean residual; RMSEA = root mean square error of approximation, 90% confidence interval.
[a]Communal sharing, equality matching, market pricing, economic motivation, and sharing citizenship behaviour, and willingness to continue participating all load on their respective factors.
[b]Communal sharing and equality matching load on one factor, while market pricing, economic motivation, sharing citizenship behaviour, and willingness to continue participating all load on their respective factors.
[c]Communal sharing and equality matching load on one factor, economic motivation and market pricing load on one factor, sharing citizenship behaviour and willingness to continue participating both load on their respective factors.
[d]Communal sharing, market pricing and equality matching and economic motivation loading on one factor, our dependent variables sharing citizenship behaviour and willingness to continue participating loading on their respective factor.
[e]Our sharing citizenship behaviour dimension is divided into two factors, conscientiousness and altruism. All other variables load on their respective factors.
***p < 0.01 (two-tailed).

Table IV. Descriptive statistics and correlations

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1 Communal sharing (CS)	4.71	1.03	(0.65)																			
2 Equality matching (EM)	5.58	0.87	0.47***	(0.67)																		
3 Market pricing (MP)	3.79	1.27	-0.07*	-0.16***	(0.66)																	
4 Willingness to continue participating	5.64	0.92	0.24***	0.29***	-0.06†	(0.66)																
5 Conscientiousness	6.15	0.60	0.19***	0.33***	-0.01	0.23***	(0.77)															
6 Altruism	4.92	0.91	0.34***	0.19***	0.05	0.15***	0.33***	(0.68)														
7 Age	45.21	12.93	-0.03	-0.03	0.04	-0.10**	-0.02	0.04	—													
8 Female	0.59	0.49	0.02	0.03	-0.09**	0.05	0.02	-0.06*	0.03	—												
9 Income medium[a]	0.45	0.50	-0.01	-0.05	0.02	-0.02	-0.00	-0.03	-0.07*	0.05	—											
10 Income higher[a]	0.26	0.44	0.00	0.01	-0.02	0.01	0.01	-0.01	0.07*	-0.29***	-0.53***	—										
11 Education lower[b]	0.15	0.36	0.05	0.02	0.14***	0.01	0.09***	0.13***	0.12***	0.01	-0.02	-0.14***	—									
12 Education professional[b]	0.41	0.49	-0.03	0.01	0.02	-0.02	-0.06†	-0.01	0.12***	0.04	0.08*	-0.09**	-0.36***	—								
13 Provider[c]	0.34	0.47	-0.12***	-0.14***	0.23***	-0.10**	-0.05†	0.10**	0.06†	-0.07*	-0.09***	0.06†	0.04	-0.02	—							
14 Prosumer[c]	0.50	0.50	0.13***	0.18***	-0.41***	0.10**	0.07*	-0.01	-0.12***	0.07*	0.05	-0.03	-0.08*	0.01	-0.72***	—						
15 Peerby[d]	0.62	0.49	0.18***	0.22***	-0.60***	0.02	0.05†	-0.05†	-0.07*	0.03	0.00	0.02	-0.09**	0.03	-0.30***	0.56***	—					
16 PeerbyGO[d]	0.11	0.31	-0.05	-0.08*	0.27***	0.02	-0.05	0.02	-0.11***	-0.11**	0.01	0.00	0.01	-0.02	0.34***	-0.22***	-0.44***	—				
17 Thuisafgehaald[d]	0.13	0.34	-0.19***	-0.11***	0.36***	-0.02	0.06†	0.03	-0.01	-0.10**	-0.12	0.06†	0.00	-0.05	0.10**	-0.30***	-0.50***	-0.13***	—			
18 Membership	2.71	1.18	0.08*	0.06†	-0.19***	0.01	0.05	0.07*	0.16***	-0.00	0.01	0.02	-0.02	0.01	-0.14***	0.16***	0.12***	-0.37***	0.02	—		
19 Frequency	4.90	5.14	-0.04	-0.10**	0.17***	0.03	-0.02	0.15***	0.14***	-0.02	-0.03	0.01	0.11**	-0.02	0.26***	-0.25***	-0.34***	0.07*	0.09**	-0.03	—	
20 Economic motivation	4.29	1.45	0.05	0.00	0.31***	0.09**	0.03	0.06†	-0.10**	-0.06†	0.02	-0.05	0.03	-0.03	0.07*	-0.06*	-0.25***	0.21***	0.27***	-0.11***	0.04	(0.73)

Numbers on the diagonal are Cronbach's alpha.
[a]Reference is income lower.
[b]Reference is education high.
[c]Reference is user.
[d]Reference is Snappcar.
†p < 0.1; *p < 0.05; **p < 0.01; ***p < 0.001.

analysis is the individual respondent to the survey described in the previous subsection and we tested our hypotheses via econometric analyses. Specifically, we ran ordinary least squares (OLS) regressions to test our hypotheses on the effects of *CS*, *EM*, and *MP*.[4] For each of our three dependent variables –*conscientiousness, altruism*, and *willingness to continue participating*– we tested their effects both individually and simultaneously whilst controlling for all the control variables introduced in the previous subsection. Figure 1 shows our theoretical model, highlighting the hypotheses for which we obtained empirical support and the corresponding effects found.

We report the results of our empirical analysis using *conscientiousness* as dependent variable in Table V, while Table VI focuses on *altruism* and Table VII on *willingness to continue participating*. In each Table, Model 1 includes only the control variables while Models 2 to 4 test the individual relationships between each of the three relational models and the dependent variable of interest excluding the other relational models. Model 5 corresponds to our fully-specified model in which all our explanatory variables (i.e. *CS*, *EM*, and *MP*) are included together with all the control variables in one single regression model.

Models 2 to 5 in Table V indicate that *CS* and *EM* have a positive and significant relationship with *conscientiousness* while there is no significant relationship for *MP*. Specifically, Model 5 shows that the coefficient associated with *CS* (0.04) is significant with a p-value < 0.1 while the one associated with *EM* is larger (0.20) and significant with a p-value < 0.01. A Wald test shows that the difference between the coefficients of *CS* and *EM* is significant ($F(1, 957) = 19.49$, p-value < 0.001). Furthermore, Models 2 to 5 in Table VI indicate that of the three relational models only *CS* is significantly related to *altruism* (b = 0.31, p-value < 0.001). While *EM*'s coefficient is positive and significant in Model 3, its effect loses significance once we consider all three relational models together
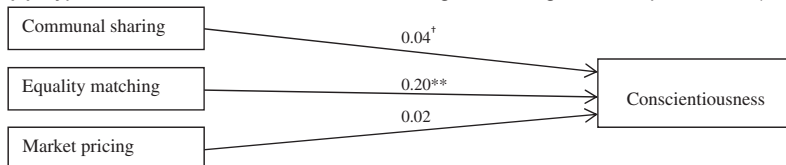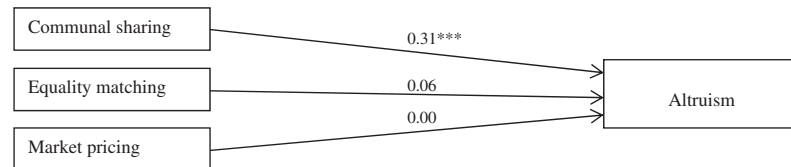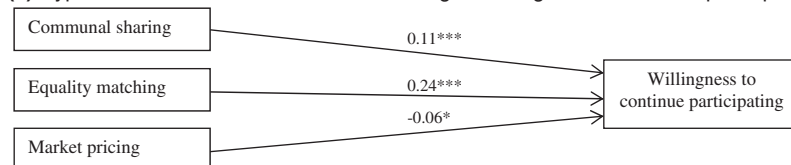

Figure 1. Theoretical model and main findings obtained

Table V. Relational models and sharing citizenship behaviour (DV = Conscientiousness)

	Model 1	Model 2	Model 3	Model 4	Model 5
Dependent variable	Conscientiousness	Conscientiousness	Conscientiousness	Conscientiousness	Conscientiousness
Independent variables					
Communal sharing		0.11***			$0.04^{\dagger}$
Equality matching			0.22***		0.20**
Market pricing				0.01	0.02
Controls					
Age	0.00	0.00	0.00	0.00	0.00
Female	0.05	0.05	0.04	0.06	0.04
Income medium	0.01	0.02	0.04	0.01	0.04
Income high	0.05	0.04	0.05	0.05	0.04
Education lower	0.16**	0.14*	0.13*	0.16**	0.12*
Education professional	−0.02	−0.02	−0.03	−0.02	−0.04
Provider	−0.03	0.01	0.01	−0.03	0.02
Prosumer	0.04	0.07	0.05	0.04	0.06
Peerby	0.18*	$0.14^{\dagger}$	0.08	0.19	0.10
PeerbyGo	0.13	0.12	0.09	0.13	0.09
Thuisafgehaald	0.27**	0.32***	0.26**	0.26**	0.28***
Membership	0.02	0.02	0.01	0.03	0.02
Frequency	0.00	0.00	0.00	0.00	0.00
Economic motivation	0.01	0.00	0.00	0.01	0.00
Constant	5.83***	5.34***	4.69***	5.78***	4.56***
N. of observations	975	975	975	975	975
Model R^2	0.03	0.07	0.13	0.03	0.13
Overall F	2.22**	4.62***	9.47***	2.09**	8.62***
Adjusted R^2	0.02	0.05	0.12	0.02	0.12
Change in R^2 (vs Mod 1)		0.04	0.10	0.00	0.10

†p < 0.1; *p < 0.05; **p < 0.01; ***p < 0.001.

in Model 5. Not surprisingly, the difference between the coefficients of CS and EM is significant ($F(1, 957) = 19.78$, p-value < 0.001). Finally, the results reported in Models 2 to 5 in Table VII show that *CS*, *EM*, and *MP* are all three significantly related to *willingness to continue participating*, with *CS* and *EM* positively and *MP* negatively related. Computing a Wald test reveals that the difference between the coefficients of *CS* (0.11) and *EM* (0.24) is significant ($F(1, 957) = 4.43$, p-value < 0.05). Overall, these results provide partial support for Hypotheses 1 and 2. While Hypotheses 1 and 2 propose a stronger effect of CS than EM, we only find this stronger effect for altruism, for the two other behavioural outcomes we find the opposite. Furthermore, while we hypothesized a negative effect of

MP, our results only support this hypothesis for *willingness to continue participating*, and not for the two dimensions of sharing citizenship behaviour, i.e. *conscientiousness* and *altruism*.

Additional Analyses

As a post-hoc analysis, we tested for the potential presence of interactions among the three relational models. Thus, we reran each of our fully-specified models – i.e., Model 5 in Tables V, VI, and VII – three times, each time adding a distinct interaction term between our key explanatory variables – i.e., *MP*x*CS*, *MP*x*EM*, *CS*x*EM*. In two of the nine new models (whose results are illustrated and discussed in the Appendix) we obtained a significant interaction. As an additional post-hoc analysis, we also considered whether the presence of a peer-review system interacts with some of our key explanatory variables.[5] As mentioned in Table I, of the four sampled platforms, Snappcar and Thuisafgehaald have a review system while Peerby and PeerbyGo have not. In the fully-specified models tested in the main analyses, it was superfluous to include an additional control variable distinguishing between platforms with and without review system, as this dummy is a linear combination of the dummies for the different platforms that were already included. Having said that, to capture any potential interaction between the presence of a review system and the explanatory variables, we reran our fully-specified models dropping all platform dummies and including one single dummy variable (*dummy review*), which identifies the two platforms with a review system. In one of the nine models tested we obtained a significant interaction, specifically, a positive moderating role of *dummy review* on the negative relationship between *MP* and *conscientiousness* (coefficient of the interaction term *MP*x*dummy review* = 0.18, p-value < 0.001). To visualize this interaction effect, we plotted in Figure 2 the average marginal effects of *MP* on the full range of *conscientiousness* and calculated these effects when platforms have a review system and when they do not (corresponding to a value of 1 and 0 of *dummy review*, respectively). Figure 2 shows that *dummy review* has a positive moderating effect on the underlying relationship between *MP* and *conscientiousness*. These results suggest that, on the one hand, there is no strong effect of the presence of review systems on the relationships under scrutiny in our work: in eight of the nine models tested we did not find an interaction of the review system. On the other hand, the result visualized in Figure 2 suggests that the effect of *MP* on participants' behaviour may be somewhat sensitive to the presence of a peer review system. In interpreting this result, it is important to note that our *dummy review* variable only allows us to group sampled platforms into two different groups. Thus, Snappcar and Thuisafgehaald may share some other characteristics beyond having a review system that are not captured by our data and are responsible for the interaction reported in Figure 2.

To check the robustness of our findings, we performed additional analyses that are reported in the Appendix and only briefly mentioned here. First, we used statistical methods to secure the absence of common method bias as our key variables all use data from the same survey. Second, in view of the fact that the operationalization of the three relational models *CS*, *MP*, and *EM* are all multi-scale items derived from survey respondents, we performed additional analyses to ensure that our measures exhibit adequate internal consistency, as well as convergent and discriminant validity. Third, we addressed

Table VI. Relational models and sharing citizenship behaviour (DV = Altruism)

	Model 1	Model 2	Model 3	Model 4	Model 5
Dependent variable	Altruism	Altruism	Altruism	Altruism	Altruism
Independent variables					
Communal sharing		0.33***			0.31***
Equality matching			0.22***		0.06
Market pricing				0.01	0.00
Controls					
Age	0.00	0.00	0.00	0.00	0.00
Gender	−0.13*	−0.14*	−0.14*	−0.12*	−0.14*
Income medium	−0.06	−0.06	−0.04	−0.07	−0.05
Income high	−0.07	−0.09	−0.07	−0.07	−0.09
Education lower	0.33***	0.27**	0.30**	0.32**	0.27**
Education professional	0.09	0.10	0.07	0.08	0.09
Provider	0.41***	0.52***	0.45***	0.41***	0.52***
Prosumer	0.39***	0.46***	0.39***	0.39***	0.46***
Peerby	−0.11	−0.23	−0.21†	−0.09	−0.24*
PeerbyGo	−0.07	−0.10	−0.11	−0.06	−0.11
Thuisafgehaald	0.04	0.20†	0.03	0.04	0.19†
Membership	0.06*	0.03	0.05†	0.06*	0.03
Frequency	0.02**	0.02**	0.02**	0.02**	0.02**
Economic motivation	0.03	0.00	0.02	0.02	−0.01
Constant	5.83***	2.94***	3.20***	4.26***	2.72***
N. of observations	975	975	975	975	975
Model R^2	0.07	0.19	0.11	0.07	0.20
Overall F	5.01***	15.30***	7.76***	4.69***	13.67***
Adjusted R^2	0.05	0.18	0.09	0.05	0.18
Change in R^2 (vs Mod 1)		0.12	0.04	0.00	0.13

†p < 0.1; *p < 0.05; **p < 0.01; ***p < 0.001.

a potential sample selection bias due to the fact that not all respondents completed the survey administered. This is because, if incomplete surveys are non-random, our results may be biased due to sample selection. To address this empirical issue, we followed common practice and used Heckman's (1979) two-stage estimation procedure. The results we obtained show evidence that our findings do not suffer from sample selection bias. Fourth, we addressed the potential endogeneity of our key explanatory variables, as scoring higher/lower on a given relational model may be non-random and could therefore bias our results. To test for the presence of such potential bias, we focused on the direct relationship between each of the three relational models and our three dependent variables and, following standard procedure (Bascle, 2008), used a two-stage approach

Table VII. Relational models and willingness to continue participating

Dependent variable	Model 1 Willingness to continue part.	Model 2 Willingness to continue part.	Model 3 Willingness to continue part.	Model 4 Willingness to continue part.	Model 5 Willingness to continue part.
Independent variables					
Communal sharing		0.20***			0.11***
Equality matching			0.30***		0.24***
Market pricing				−0.06*	−0.06*
Controls					
Age	−0.01**	−0.01**	−0.01**	−0.01**	−0.01**
Female	0.13*	0.13*	0.12†	0.12†	0.11†
Income medium	−0.03	−0.02	0.01	−0.02	0.01
Income high	0.09	0.07	0.09	0.09	0.08
Education lower	0.07	0.03	0.03	0.09	0.04
Education professional	0.01	0.02	−0.01	0.02	0.01
Provider	−0.20*	−0.14	−0.15	−0.20*	−0.12
Prosumer	0.04	0.09	0.05	0.02	0.06
Peerby	0.08	0.01	−0.05	0.00	−0.14
PeerbyGo	0.18	0.17	0.12	0.17	0.11
Thuisafgehaald	−0.01	0.09	−0.02	0.00	0.05
Membership	0.03	0.02	0.02	0.02	0.01
Frequency	0.02*	0.01*	0.02*	0.01*	0.01*
Economic motivation	0.06**	0.04*	0.05*	0.07**	0.05*
Constant	5.42***	4.57***	3.89***	5.68***	3.99***
N. of observations	975	975	975	975	975
Model R^2	0.04	0.09	0.12	0.05	0.13
Overall F	3.02***	6.18***	8.39***	3.09***	8.43***
Adjusted R^2	0.03	0.07	0.10	0.03	0.12
Change in R^2 (vs Mod 1)		0.05	0.08	0.00	0.09

†p < 0.1; *p < 0.05; **p < 0.01; ***p < 0.001.

similar to the one used to test for the presence of a sample selection bias. The results of these additional analyses, aimed at addressing potential endogeneity of the three relational models, lend additional support to the findings reported in the main analyses.

DISCUSSION AND CONCLUSIONS

Our work advances both our understanding of peer-to-peer sharing and relational models theory. To the literature on the sharing economy, our study makes two important contributions. First, drawing on organizational citizenship behaviour (e.g., Organ, 1997; Organ et al., 2006), we developed a new construct, i.e., sharing citizenship behaviour, that has two dimensions, namely conscientiousness and altruism. Whilst the literature had already conceptualized misbehaviour in a sharing context (Schaefers et al., 2016), less attention had been paid to conceptualizing prosocial behaviour in this context. Second,
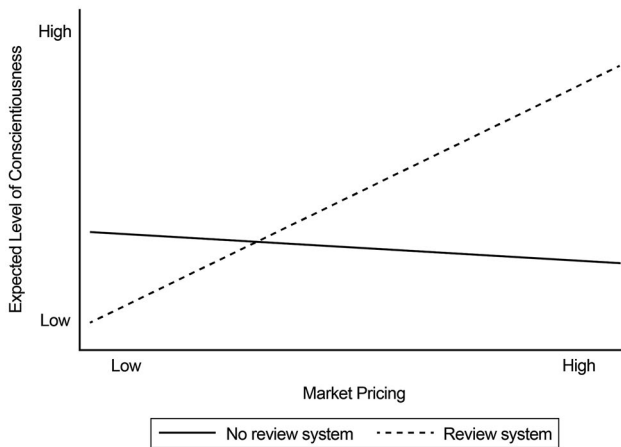
Figure 2. Average marginal effect of market pricing on conscientiousness and the interaction with the presence of a review system

we provided and tested a relational-models view of peer-to-peer sharing, the type of sharing relationships that is most threatened by behavioural uncertainty. Our findings show that perceiving relationships among participants as governed more strongly by CS and EM promotes sharing citizenship behaviour, in the form of conscientiousness and altruism, amongst both users and providers, as well as increases willingness to keep participating. These results show the value of our more nuanced way of approaching participants' perceptions of relationships on peer-to-peer sharing platforms: there are more ways to rouse the behavioural outcomes that contribute to the growth of the sharing economy than would be expected based on the dichotomies used so far to map participants' motivation.

Our findings also offer some empirical support for the expectations formulated in previous research that individuals look for relational value, in addition to utilitarian value, when they engage in the sharing economy (e.g., Habibi et al., 2016; Hellwig et al., 2015). Specifically, our results suggest that participating in the sharing economy can provide at least two forms of relational value: value that comes from belonging to a community (CS), and value that comes from transacting with partners who are seen as equal on the basis of balanced reciprocity (EM). Surprisingly, a strong MP framing of relationships among participants was not found to negatively impact sharing citizenship behaviour, contrary to what we expected. While existing literature argues that the impact of monetary incentives sends sharing from the realm of sharing to that of business (Belk, 2014; Kouchaki et al., 2013), our study indicates that this is not systematically the case. This lack of direct negative effect of MP is in line with the work by sharing scholars who have argued that economic and social motivations may coexist in a sharing context (Habibi et al., 2016). Yet, our additional analyses regarding the interactions among the relational models offer a more nuanced picture: while a strong MP frame may not have a direct negative effect on sharing citizenship behaviour, we found it to crowd out the positive effect of a CS frame on conscientiousness.

Our study has important implications for managers of peer-to-peer sharing platforms. Many managers of peer-to-peer sharing platforms are currently convinced that,

if sharing is to compete with traditional markets, sharing platforms must make sharing financially attractive and convenient for providers and users alike (Eckhardt and Bardhi, 2015). The hassle for participants associated with offline interactions are often believed to impair growth (Van de Glind, 2015). Consequently, many sharing platforms are taking steps to eliminate personal interactions and emphasize the monetary gains of peer-to-peer sharing in their communication towards participants. Our findings call managers of peer-to-peer sharing platforms to reconsider these choices. Sharing in the form of renting without personal interactions is likely to weaken an EM and CS representation of relationships and strengthen an MP one because it makes sharing not about helping others or making human connections, but about 'dividing a resource among separate entities' (Belk, 2010, p. 727). The rise in participants' misbehaviour that Turo – a U.S.-based peer-to-peer car sharing platform (formerly known as RelayRides) – experienced when transitioning from a personal to a convenient renting model provides anecdotal evidence in support of our expectations of a negative impact associated with weakening the EM and CS frame. In 2012 the sharing platform entered into a partnership with General Motors to install their Onstar system, a tool that allows people to unlock cars via an app, hereby removing the need for members of the platform to meet in person. Whilst this seemed a great idea, in practice it led to an erosion of accountability and a stark increase in participants' disputes (Lawler, 2013; Van de Glind, 2015). In the face of these problems, in 2013 the platform reverted back to its old system, in which owners and renters meet face to face to hand over the car key.

Rather than eliminating personal interactions and emphasizing monetary gains, we recommend developing platform features and launching initiatives that trigger participants to construe sharing relationships in terms of CS or EM, as these mental frames foster the willingness to continue participating and sharing citizenship behaviour. Our present study did not include the antecedents of the relational models. We therefore can only speculate about which platform features and initiatives would be most appropriate and more research is needed in this area. We expect that the presence of a peer-review system may help prompt an EM frame because such a system increases the possibility for indirect reciprocity among strangers (Einav et al., 2016; Kuwabara, 2015). For some platforms, a digital scoreboard tracking how active members are on a platform could further this goal too. Informal talks with Peerby brought to light that their challenge is not getting members to share but rather to stimulate users to ask their local community for goods more than once. Members of Peerby are uncomfortable to make frequent requests as they feel this makes the relationship unbalanced. A score count showing that participants' asks and shares are in balance could therefore help foster feelings of balanced reciprocity. We expect that a CS frame can be strengthened by initiatives that aim at community building and inspiring both online as well as offline interactions. For example, Thuisafgehaald (2018) successfully launched an initiative in which home cooks go the extra mile by providing people with disabilities, who live in their community, with a home-cooked meal that they prepare at their homes. Organizing local offline events such as meet and greets between participants, workshops around common themes, or a neighbourhood get-together should also help foster a sense of community and cohesion.

Our work also advances relational models theory. On the one hand, our work contributes to the so far very limited body of empirical research applying relational models

theory to management topics. While the number of theory papers building on relational models theory indicates an interest of management scholars for this theory (e.g., Bridoux and Stoelhorst, 2016; Giessner and Van Quaquebeke, 2010; Mossholder et al., 2011), few management scholars have applied it in empirical research (exceptions are Boer et al. (2011) and Keck et al. (2018)). Our results strongly support using relational models theory over the simpler dichotomy 'community/clan' vs. 'market' that is usually used to describe relationships in management research (e.g., Poppo et al., 2008; Wang et al., 2009). It is EM, the model that is not considered when adopting a simple dichotomy, that has the strongest effects for two of the three types of behaviour we considered in the context of peer-to-peer sharing facilitated by online-based platforms (namely, conscientiousness and willingness to continue participating).

On the other hand, our mixed support for our main effects calls for a much more nuanced theorizing of the effects of the relational models on different types of cooperative behaviour. Cooperative behaviour encompasses our three dependent variables; it is generally seen as behaviour that benefits collective value creation and includes prosocial behaviour and joining or leaving the collective (Bosse and Coughlan, 2016). While, following Bridoux and Stoelhorst (2016), we proposed that MP would be detrimental to cooperative behaviour and that CS would have a stronger positive impact than EM on all types of cooperative behaviour, we did not find a detrimental effect of MP and found a stronger effect of EM for two out of our three dependent variables.

These findings thus indicate a need to develop a typology of cooperative behaviour in order to be able to better understand the relational antecedents of different types of cooperative behaviour. With only three types of cooperative behaviour, we have limited material to suggest dimensions along which to build this typology. However, our three types seem to differ in terms of how personally costly and beneficial the behaviour is: while altruism (which covers, inter alia, adapting one's schedule to cater to other members, being always willing to help others on the platform) is costlier than personally beneficial, it is less clearly the case for our two types. In particular, one could be conscientious (which includes, inter alia, avoiding causing trouble for other members, being always on time for appointments with other members) without incurring high costs. Along the same line, participation could bring more benefits than costs for providers when sharing is for a fee and for users regardless of whether they access the good for free or for a fee.

We suggest further areas for follow-up research, in relation to the limitations of our study. First, we acknowledge that our work is limited by the nature of our sample and scope of the study. Given that we relied on the sharing platforms to administer our survey and lack information about the people who did not start answering our questionnaire, we cannot be completely confident that our sample is not biased. In addition, our sample is limited to participants located in the Netherlands of four sharing platforms on which combinations of physical goods and services are exchanged. Future research should replicate our study with a larger number of platforms across multiple countries and with platforms on which pure services are exchanged (e.g., cleaning, handyman services, consulting).

When including more platforms, scholars could also investigate which platform features influence how relationships among participants are framed. In particular, our relatively crude post-hoc analysis for the effect of a peer-review system (cf. Appendix) suggests

studying further the impact of different reputation systems on how participants frame relationships on a peer-to-peer sharing platform. Features such as rating systems aim to reduce uncertainty about others' opportunism by providing information about their past behaviour (Dreyer et al., 2017; Frenken and Schor, 2017; Kuwabara, 2015). Yet, looking at these features from the point of view of relational models theory, one can question whether such features only have the positive effect of reducing uncertainty, or whether they may also reduce the strength of a CS frame in favour of an EM or MP frame.

Second, although our results suggest that perceptions of relationships among participants *in general* relate to sharing citizenship behaviour and willingness to continue participating, a limitation is that our research did not account for repeated interactions among participants, because we did not collect information about the frequency of repeated interactions. If individuals interact regularly with the same other participants (e.g., always lending a car to the same neighbours), these other participants will cease to be 'strangers' to whom generic mental schemes are applied, and instead become relational partners to whom relational models grounded in personal experience are applied. Consequently, repeated interactions add explanatory factors linked to the interaction level – another level of analysis than the individual level that we studied. Research adopting a social network perspective to study prosocial behaviour suggests that such behaviour may be affected by the strength of (dyadic) relational ties (Simpson and Willer, 2015). For example, Bowler and Brass (2006) have shown that interpersonal friendship triggers altruistic behaviour among employees. On platforms where exchanges are usually repeated, participants' behaviour may thus be less well explained by the generic relational models at the platform level than is the case for the platforms we studied. We recommend that future research systematically asks respondents to report not only how they see the relationships among participants in general but also how they perceive their own relationships with other participants and the extent to which they engage in repeated interactions. It would allow to investigate whether respondents' perceptions of relationships among participants in general are biased by their own repeated interactions with some specific other participants.

Third, a variable that was not examined in our study, but that would further deepen the understanding of peer-to-peer sharing relationships, is the nature and degree of perceived interdependence with other participants. In the context of peer-to-peer sharing, perceived interdependence would capture the degree to which individuals expect their outcomes to be positively or negatively affected by other participants' behaviour. We expect the degree of perceived interdependence to differ across sharing platforms because the type of goods shared, the benefits participants receive from sharing, and the severity of the consequences of others' misbehaviour may vary across platforms. Future studies could therefore integrate interdependence into our model and explore how the degree of perceived (positive or negative) interdependence affects the impact of the relational models on participants' behaviour. In particular, the absence of a relationship between an MP frame and the behavioural outcomes in our study could hide two opposing effects: a negative relationship in case of high interdependence, which brings the need for pro-sociality, and a positive relationship in case of low interdependence, where pro-sociality is less important and MP can deliver the benefits of competition (with regard to quality and price) and the pursuit of the efficiency linked to self-interest.

To conclude, to management scholars, our research provides empirical evidence that sharing citizenship behaviour is not exclusively driven by material self-interest. On the contrary, our findings regarding the importance of relational benefits show the value of a relational-models approach, rather than a transactional approach, to further the growth of peer-to-peer sharing. To managers who are currently steering their sharing platforms into the direction of convenience and price to the detriment of personal connections, our results suggest that this might not be the best move: their platforms may well be better served by creating feelings of community or reciprocity.

NOTES

[1] In line with the literature (Belk, 2014; Botsman and Rogers, 2010), the platforms we studied offer a 'product service system', as participants on these platforms provide/receive a combination of physical goods and services. For example, a product-service combination is exchanged on Snappcar: the owner provides a physical good (the car) together with a service (e.g. providing temporary access to the car, cleaning the car and checking its correct functioning before the user gets access to it, etc.).

[2] Authority ranking shares similarities with Williamson's (1975) hierarchy. 'Authority ranking is a relationship of asymmetric differences, commonly exhibited in a hierarchical ordering of statuses and precedence, often accompanied by the exercise of command and complementary displays of deference and respect' (Fiske, 1991, p. ix). Since our work centres on peer-to-peer sharing, where participants do not differ much in power or status, the authority ranking relational model that involves hierarchical ordering is not relevant for our study. We thus excluded this relational model from our study, similarly to Mossholder et al. (2011) who did not consider authority ranking in their theorizing about helping behaviour among colleagues at the same hierarchical level.

[3] While reciprocity has often been discussed as an important driver of market relationships, it is important to note that balanced reciprocity is more than Trivers' (1971) reciprocal altruism. Reciprocal altruism is self-interested and future-oriented. It rests on the expectations of future material benefits from cooperation, for example, because one expects to be rewarded for cooperation when interacting again with the same partner in the future or when interacting with others who will be aware of one's past cooperative behaviour. In contrast, balanced reciprocity is backward-looking as well as future-oriented: past favours are paid back even if there is no expectation of a common future (Fehr and Gächter, 2002).

[4] We checked whether there were significant between-group effects at the platform level. As we found no significant between-group effects at the platform level, we proceeded with regression analysis at the individual level.

[5] We thank our reviewers for suggesting that it would be interesting to look at the interactions among the relational models and at the effect of a review system.

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APPENDIX

POST-HOC ANALYSIS

In what follows we tested for the potential presence of interactions among the three relational models. To do so, as mentioned in the article, we reran each of our fully-specified models – i.e., Model 5 in Tables V, VI, and VII – three times, each time adding a distinct interaction term between our key explanatory variables – i.e., $MPxCS$, $MPxEM$, $CSxEM$. In two of the nine new models we obtained a significant interaction, specifically, a negative moderating role of MP on the positive relationship between CS and *conscientiousness* (Coeff. of the interaction term $MPxCS = -0.02$, p-value < 0.1) and a positive interaction between CS and EM on *conscientiousness* (Coeff. of the interaction term $CSxEM = 0.04$, p-value < 0.01). To visualize these interactions effects, we plotted the results obtained in Figures A1 and A2. Specifically, in Figure A1 we plotted the average marginal effects of CS on the full range of *conscientiousness* and calculated these effects at -1 and $+1$ standard deviations of MP (corresponding to a low and a high level of MP, respectively). Figure A1 shows that MP has a negative moderating effect on the underlying relationship between CS and *conscientiousness*. Figure A2 shows the positive moderating effect of CS on the underlying relationship between EM and *conscientiousness*, when plotting the average marginal effects of EM on the full range of *conscientiousness* and calculating these effects at -1 and $+1$ standard deviations of CS (corresponding to a low and a high level of CS, respectively).
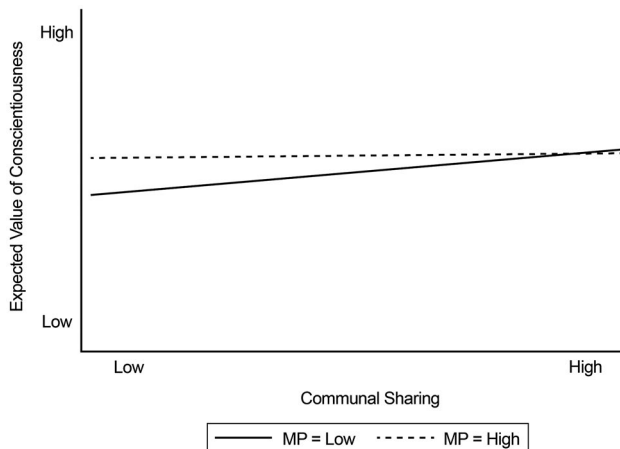

Figure A1. Average marginal effect of communal sharing on conscientiousness and the interaction with market pricing
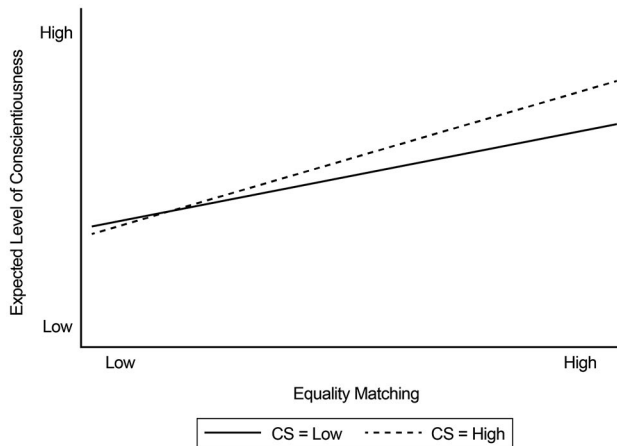
Figure A2. Average marginal effect of equality matching on conscientiousness and the interaction with communal sharing

These interactions make sense if we consider that in many social situations, individuals experience a tension between collective and self-interest. In the face of this tension, an individual motivated to maintain his/her self-image and social standing will only violate a social norm if there is a credible opportunity to claim an exemption from the norm, which resolves the moral dilemma linked to the violation in the individual's mind and (the individual hopes) in the mind of the members of the audience to whom the individual feels accountable (Blasi, 1983; Sykes and Matza, 1957). The presence of a strong market pricing frame likely provides individuals with a credible opportunity to justify an exemption from the norm of altruism linked to communal sharing. Justifications are a common way to claim an exemption: with a justification, the individuals accept responsibility for the action but deny the negative value associated with it by others (Scott and Lyman, 1968). We can similarly explain why communal sharing and equality matching strengthen each other's effects on conscientiousness. As exhibiting sharing citizenship behaviour is the normatively appropriate behaviour in both relational models, together the models make being conscientious more salient among the set of behavioural alternatives and reduce the room individuals have for justifying self-interested behaviour as a legitimate exemption.

ROBUSTNESS CHECKS

As a first robustness check, we secured the absence of common method bias using statistical methods to determine the probability of such bias (Podsakof et al., 2003). The major concern relates to our key variables as they all use data from the same survey. To determine whether our data is likely to suffer from common method bias in relation to these variables, we performed the Harman's single-factor test (Podsakoff et al., 2003) and thus ran an exploratory factor analysis on the relevant items as listed in Table II in order to establish the number of factors that are required to account for the variance in the variables. Focusing on all the items used to build our three explanatory variables *MP*, *EM*, and *CS*, the analysis indicated three factors with eigenvalues greater than 1, therefore confirming the lack of unidimensionality in our data.

Second, in view of the fact that the operationalization of the three relational models *CS*, *MP*, and *EM* are all multi-scale items derived from survey respondents, we performed additional analyses to ensure that our measures exhibit adequate internal consistency, as well as convergent and discriminant validity. We grounded our assessment of internal consistency (composite reliability) on Fornell and Larcker's (1981) measure. The results obtained indicate that the measures for internal consistency for *MP* (0.80), *EM* (0.78), and *CS* (0.81) are all greater than the 0.70 threshold that is required to establish internal consistency (Nunnally and Bernstein, 1994). In relation to convergent validity, we computed Fornell and Larcker's average variance extracted (AVE) measure for *MP* (0.57), *EM* (0.55), and *CS* (0.58). Our findings showed that all AVEs surpassed the 0.50 cut-off necessary for the AVE to confirm a satisfactory level of convergent validity. We also followed Fornell and Larcker's (1981) method to assess discriminant validity. The square roots of the AVE for *MP* (0.76), *EM* (0.74), and *CS* (0.76) are all greater than the correlations between each of the latent construct

pairings. Additionally, the square root of the AVE for each of three relational models is also greater than the correlation between each latent construct and every other variable considered in the analysis. This offers additional evidence in support of the discriminant validity of the three latent constructs used in our analyses (Hair et al., 2006).

Third, we addressed a potential sample selection bias due to the fact that not all respondents completed the survey. If incomplete surveys are non-random, our empirical results may be biased due to sample selection. To address this empirical issue, we followed common practice and used Heckman's (1979) two-stage estimation procedure. In the first stage, we used as dependent variable a dummy that specified whether the respondent completed the survey in its entirety and thus allowed for its inclusion in the final working sample (*dummy complete survey*). As our main exclusion variable we used a dummy that scored 1 when the respondent's income corresponds to the lowest possible category and 0 otherwise (*dummy low income*), as this is positively related to the likelihood that the respondent completes the survey (r = 0.33), while not related to any of the three behavioural outcomes *conscientiousness* (r = 0.03), *altruism* (r = 0.05), and *willingness to continue participating* (r = 0.03), thus satisfying the exclusion restriction of Heckman's (1979) two-stage estimation procedure. In the first stage we used as explanatory variables the set of control variables listed in Model 1 in Table V for which we had gathered most responses corresponding to age, specific platform used, and type of participation (provider, user, or prosumer). In the second stage we used the same set of explanatory variables and added our measures of the three relational models *CS*, *EM*, and *MP* as well as the vector of inverse Mills ratio (*IMR*) from the selection equation model estimated in the first stage. We repeated this two-stage estimation procedure three times, each time focusing on a different dependent variable in the second stage—i.e. *conscientiousness*, *altruism*, and *willingness to continue participating*. The results obtained are entirely aligned with the ones obtained without this correction (i.e. the ones reported in Model 5 in Tables V, VI, and VII) with the coefficient of *IMR* not significant in any of the three second stage model specifications, thus providing empirical evidence that our findings do not suffer from sample selection bias.

Fourth, we addressed the potential endogeneity of our key explanatory variables, as scoring higher/lower on a given relational model may be non-random and could therefore bias our results. To test for the presence of such potential bias, we focused on the direct relationship between each of the three relational models and our three dependent variables and used a two-stage approach similar to the one used to test for the presence of a sample selection bias (Bascle, 2008) (cf. also Certo et al. (2016) and Wooldridge (2010)). Starting with *CS*, in the first stage, we estimated a probit model in which the dependent variable is the propensity to display a high level of *CS* using a dummy that scores 1 if the respondent's measure of *CS* is higher than the average and 0 otherwise (*CS dummy*). The set of explanatory variables in this first-stage model corresponds to the variables gathered through our survey that one may theoretically argue to have an effect on a given respondent's level of *CS*, i.e., age, gender, education and income levels. As exclusion variable we gathered additional data based on the area in which each respondent resided at the time of completion of the survey (we had asked respondents for their postal code) and used the percentage of kids younger than 5 years old in the corresponding province (*percentage of young kids*) reported by the Dutch Central Bureau of Statistics (CBS, 2016). This is a relevant and appropriate instrument because a higher percentage of young kids should prime the adult population to use the relational frame that is most typical of family, namely CS (Fiske, 1991). Methodologically, *percentage of young kids* satisfies the exclusion restriction as it is positively related to *CS dummy* while not related to any of the three dependent variables used in our study—*conscientiousness*, *altruism*, and *willingness to continue participating*.

From the first stage we computed the inverse mills ratio (*IMR*) and used it as a control variable in the second stage in order to obtain consistent and unbiased coefficients. In the second stage, we ran an OLS regression with *conscientiousness* as our dependent variable and *CS dummy* as the main explanatory variable together with all the other explanatory variables included in the first stage. The results we obtained are entirely aligned with the ones obtained without this correction (which also correspond to the ones reported in Model 2 in Table V in the main analysis). Moreover, the coefficient associated with *IMR* is not significant. This is an important finding as the lack of any statistical significance of this coefficient corroborates the notion that the potential endogeneity associated with reporting a high versus low level of *CS* does not affect our results related to the relationship between *CS* and *conscientiousness*. We repeated this two-stage estimation procedure twice, using as dependent variable in the second stage first *altruism* and then *willingness to continue participating*. In both cases, the results obtained are entirely aligned with the ones obtained without this correction and the

coefficient associated with *IMR* was never significant, thus further corroborating the notion that the potential endogeneity of *CS* does not affect our main results.

To address the potential endogeneity of the other two relational models, *EM* and *MP*, we followed the same approach adopted for *CS* and used the same exclusion variable for *EM* and *MP*, as we tested for the potential endogeneity of these two constructs separately. The instrument we used is CBS' data on the number of people with psychological trouble/ household violence/ homeless people in the municipality in which the respondent resided at the time of completion of the survey (*number of homeless people* (CBS Statline, 2018)). Methodologically, *number of homeless people* satisfies the exclusion criteria as it has a significant and positive correlation with *MP dummy*, a negative and significant correlation with *EM dummy* (both *MP dummy* and *EM dummy* were built following the same logic used to construct *CS dummy*), while it is not significantly correlated with any of our three dependent variables. Theoretically, it appears to be a valid instrument as we can expect a higher number of people with psychological trouble, more household violence, and a higher number of homeless people to be linked to more social distance among the inhabitants of a municipality, which characterizes MP, and less social control, which characterizes EM (Fiske, 1991). The two-stage estimation procedure confirms the same relationships between *MP dummy* and *EM dummy* and the three dependent variables as reported in the main analyses (i.e., Models 3 and 4 in Tables V, VI, and VII), with the coefficient associated with *IMR* not significant in any of the specifications used. Thus, these additional model specifications aimed at addressing potential endogeneity of the three relational models lend additional support to our findings reported in the main analyses.

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