

# Sharing-Dominant Logic? Quantifying the Association between Consumer Intelligence and Choice of Social Access Modes

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With sharing economy and access-based consumption, consumers increasingly access goods through social access modes other than private ownership—such as co-ownership, leasing, or borrowing. Prior research focuses on consumers' attitudinal motivations and consumption-cultural use experiences pertaining to such social exchange-based access modes. In so doing, prior research has overlooked the influence that consumers' fundamental, even biologically shaped, cognitive traits may have on their choice of access modes. To fill this research gap, this study analyzes a data set of more than 30,000 new car registrations by male consumers in Finland, including cognitive test data from the Finnish Defense Forces and covariates from other governmental sources. **The field data suggests that consumers' intelligence scores and their choice to co-own and lease their cars are positively associated.** Econometric evidence further suggests that the association between intelligence and choice of social exchange-based access modes can be explained by intelligent consumers' higher social trust in people and institutions, as well as two circumstantial mechanisms: their financial standing and tendency to seek savings. The findings from the field data are supported by an additional survey study ( $n = 460$ ). Implications for the evolution of markets and consumption, as well as human intelligence and cooperation, are discussed.

**Keywords:** access, ownership, cognitive ability, intelligence, sharing, social exchange

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Different ways of accessing a consumption good, and the different types of exchanges consumers rely on in gaining such access, are fundamental to consumer behavior (Belk 2010). Therefore, the factors that influence individuals' choices of modes of access to goods have long been of interest to consumer researchers (Scaraboto 2015). The recent rise of the sharing economy and the collaborative consumption movement has further fueled this interest (Rudmin 2016), especially when it comes to access modes that are characterized by social exchange with peer consumers (e.g., co-ownership, borrowing) or with companies (e.g., leasing). Thus, with the burgeoning sharing economy, consumer researchers as well as practitioners are keen to better understand the factors that may drive consumers' inclinations to choose such social exchange-based access modes in particular.

Previous empirical research exploring consumers' social exchange-based access mode choices has focused on the situational costs, benefits, and needs that predict consumer preferences for these access modes (e.g., in the contexts of rental club of vehicles, co-usage or co-ownership of cell phone subscriptions; Lamberton and Rose 2012) or the attitudinal consumer traits predicting those preferences (e.g., short-term apparel rental; Moeller and Wittkowski 2010). There is also an emerging research stream addressing the usage experiences and consumption culture pertaining to these access modes per se (e.g., short-term rental of cars through a club, Bardhi and Eckhardt 2012; co-access to art through exhibitions, Chen 2009; co-usage of a gaming application, Scaraboto 2015). However, while focusing on the situational and attitudinal factors predicting consumer choices of social exchange-based access modes, or the (consumption-cultural) usage experiences related to these access modes, previous research has overlooked the possibility that consumer characteristics that are nonsituational, nonattitudinal, and noncultural might also influence consumers' choice of social exchange-based access modes. Thus, in this research, we embark to fill this research gap by exploring how consumers' fundamental, largely biologically determined, cognitive traits may affect their choice of social exchange-based access modes.

As the focal trait of this kind, we concentrate on individuals' general cognitive ability (i.e., intelligence) and its association with consumers' access mode choices. This is because in the broad terms of evolutionary theory, human intelligence has been considered to be fundamentally associated with our species' ability and willingness to engage in social exchanges and cooperation (Nowak and Sigmund 2005; Pinker 2010). Moreover, in line with the evolutionary theory's arguments at the species level, laboratory experiments on the individual level have found positive correlations between individuals' intelligence scores and their social exchange behaviors in economic games (Chen et al. 2013; Millet and Dewitte 2007). Furthermore, interestingly, the social exchange-based modes of access to consumption goods—such as co-ownership, leasing, and borrowing of goods (e.g., cars, boats, appliances)—are also commonly characterized as the “smart consumer's choice” in anecdotes provided by industry practitioners (e.g., [www.smart yacht.net](http://www.smart yacht.net); [www.orto.uk.com](http://www.orto.uk.com)) and by consumers themselves (Bardhi and Eckhardt 2012; Eckhardt and Bardhi 2016).

To summarize, despite the previous conceptual and anecdotal notions, as well as preliminary experimental evidence from laboratory games, large-scale empirical field evidence of the association between intelligence and individual consumers' choices of social exchange-based access modes to goods is still missing. To address this gap, the essential research question of this research becomes: is consumers' fundamental intelligence associated with their choice of social exchange-based access modes to goods, such as co-ownership, leasing, and borrowing?

Thus, the primary contribution of this research is to provide a large-scale empirical investigation and quantification of whether the general association between human species' intelligence and choice of social exchange and cooperation also holds true in the consumer behavior context on the individual level: consumers' choice of co-ownership, leasing, and borrowing of goods. To this end, we compile and analyze a large-scale field data set ( $n > 30,000$ ) on consumers' individual-level intelligence scores and their choices of access modes to new cars in Finland. Furthermore, our secondary contribution is to provide empirical evidence of the mechanism of *why* smarter consumers may tend to prefer and choose social exchange-based access modes. For this, we run a systematic series of robustness and falsification checks on our field data as well as conduct a survey study ( $n = 460$ ) with mediation analyses. We find that out of three potential psychological mechanisms, consumers' willingness to build and sustain social relationships (Mitchell, Cropanzano, and Quisenberry 2012) through social trust in other individuals and institutions (Carl 2014) may best explain the association between consumers' intelligence and their social exchange-based access mode choices. In addition, the findings suggest that next to social trust, two circumstantial (nonpsychological) mechanisms—the consumer's financial standing and tendency to save—partially explain the association between intelligence and the choice of social exchange-based access modes.

## CONCEPTUAL FOUNDATION

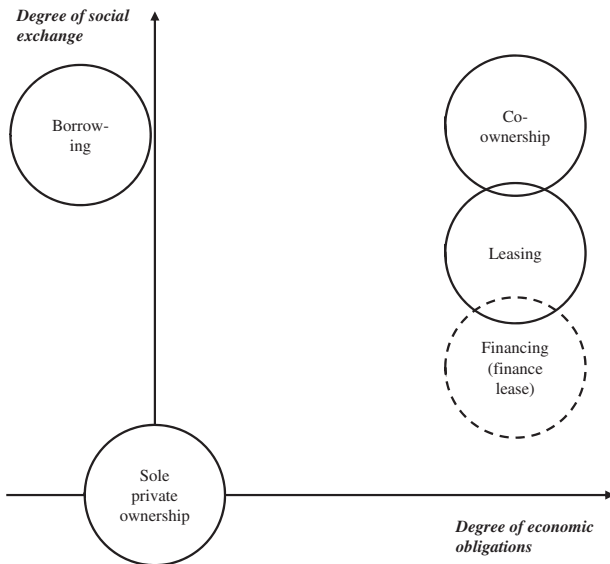
### Classifying Access Modes Based on the Degree of Social Exchange

There are different ways, or access modes, through which an individual consumer can obtain authorized access to a good, such as a car. Figure 1 illustrates the access modes relevant to this research and classifies them according to the degree of entanglement that they entail between the focal consumer and the counterparty, on two dimensions. Specifically, the degree of entanglement between the two parties depends on the (i) degree of economic obligations and (ii) the degree of social exchange involved (Cropanzano and Mitchell 2005; Eckhardt and Bardhi 2016). The former refers to the longer-term economic obligations of the focal consumer toward the counterparty of the exchange relationship (beyond a one-off purchase transaction), and the latter refers to the extent of social exchange between the parties as well as the consumer's long-term social obligations toward the counterparty (Blau 1964; Homans 1961).

Of the different access modes, the most conventional access mode—sole private ownership of a good—can be characterized as a one-off economic transaction that does not feature a high degree of either economic obligations or

FIGURE 1

CLASSIFICATION OF ACCESS MODES BASED ON ENTANGLEMENT WITH COUNTERPARTY IN TERMS OF SOCIAL EXCHANGE AND ECONOMIC OBLIGATION



NOTE.—The focal access modes are shown as solid circles and the borderline access mode, Financing, as a dashed circle.

social exchange between the parties in the long term (Bardhi and Eckhardt 2012). Indeed, the purchase of a good to one's private ownership usually involves merely a one-time social encounter between the consumer and the seller company's salesperson, with little social interaction beyond that (Belk and Coon 1993). No substantial, longer-term economic obligations are established between the consumer and the seller either, as the consumer fulfills the one-off economic obligation to the seller by paying the purchase price of the good.<sup>1</sup>

Another access mode that typically includes a company as the counterparty of exchange is leasing or renting (Moeller and Wittkowski 2010).<sup>2</sup> This access mode is characterized by a higher degree of long-term economic obligations than those involved in sole private ownership, as the focal consumer usually commits to paying regular leasing fees to the company for the duration of the access period. Compared with sole private ownership, leasing also

involves more social interaction between the consumer and the leasing company, as the consumer will regularly interact with the company for payments as well as customer service–related issues (e.g., maintenance of the good).

The other two access options this research addresses, co-ownership and borrowing, are even more strongly based on social exchange (Eckhardt and Bardhi 2016; Jenkins, Molesworth, and Scullion 2014) than leasing. This is because in contrast to leasing, in co-ownership or borrowing between two individuals, there is usually no juridical contract that would enable the consumer(s) to legally enforce their rights to access the good. Rather, it is an unwritten “social contract,” which requires an ongoing social exchange between the peer consumers that allows them to get a fair share of access to the good (Belk 2010). In terms of the degree of economic obligations, however, co-ownership and borrowing also differ markedly from each other. In co-ownership, the co-owning consumers share the economic responsibilities and costs associated with the good (Belk 2010) over its lifetime. In contrast, in borrowing, the focal, borrowing consumer is not typically obliged to pay anything for the purchase or usage, nor for the maintenance, of the good.<sup>3</sup>

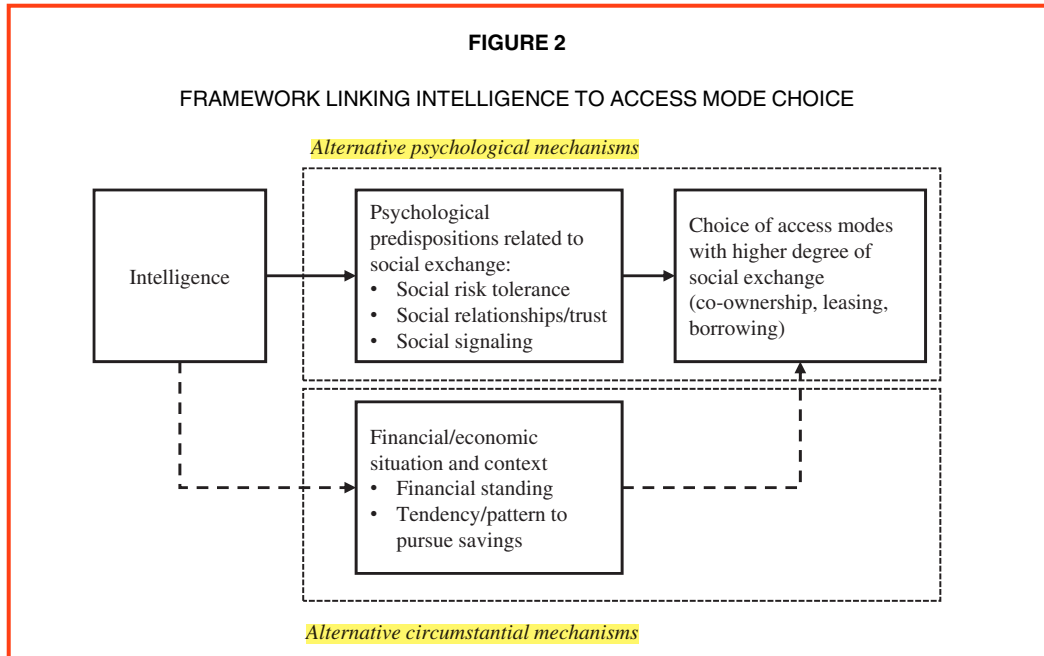
In summary, the three focal access modes—leasing, co-ownership, and borrowing—differ from the traditional access mode, sole private ownership, in the degree to which they entail social exchange between the consumer and a company or other consumers, as well as in the degree of long-term economic obligation involved. Next, we theorize why smarter consumers—via their intelligence-related predispositions—maybe more inclined to choose the access modes involving a high degree of social exchange: co-ownership, leasing, and borrowing. Specifically, we outline three alternative theories and propose three related psychological mechanisms that may explain the potential correlation between intelligence and consumer choice of these social exchange–based access modes. In addition, we outline two additional, circumstantial mechanisms that are related to the choice context and the economic circumstances of the consumer. Figure 2 visualizes this framework.

Notice that, in addition to the aforementioned three primary social exchange–based access modes, figure 1 indicates one borderline case of an access mode: financing. Akin to “finance lease” (Wittkowski, Moeller, and Wirtz 2013), in this access mode, the good remains in the legal ownership of a financial institution (e.g., bank), but the focal consumer becomes the possessor and user of the good. Hence, the consumer's long-term economic obligation is similar to that in leasing, but the degree of social exchange

<sup>1</sup> During ownership, the consumer becomes liable for long-term maintenance and repair costs of the good, but these costs are typically paid in independent transactions and to a party other than the seller company.

<sup>2</sup> We have no reason to believe that our main arguments about leasing or renting would not also hold for peer-to-peer leasing/renting (Bardhi and Eckhardt 2012; Lambertson and Rose 2012; Moeller and Wittkowski 2010).

<sup>3</sup> The responsibility for usage-related extra costs of the good (e.g., gasoline costs of a car) may vary, depending on an informal agreement between the borrower and lender. Moreover, borrowing consumers may be expected to return the favor by demonstrating reciprocity (e.g., lending one of their own possessions to lenders; Jenkins et al. 2014).



is low because the financing company does not assume responsibility for the good's maintenance- and usage-related customer service, with social interaction. In this sense, this access mode does not, de facto, differ much from sole private ownership and is thus referred to as a "borderline case" of a social exchange-based access mode (cf. [Belk 2010](#), 717).

### Psychological Mechanisms Explaining the Association between Access Mode Choice and Intelligence

Psychological mechanisms that could explain why smarter consumers may prefer the social exchange involved in co-ownership, leasing, and borrowing relate to three broad theoretical perspectives about individuals' motivations for social exchange. First, traditional exchange theories suggest that consumers generally engage in the type of exchanges that maximize their individual benefits or rewards ([Mitchell et al. 2012](#)). As the uncertainty or riskiness of social exchange makes the rewards uncertain or risky as well ([Cosmides, Barrett, and Tooby 2010](#); [Eckhardt and Bardhi 2016](#)), consumers' predispositions toward risk-taking may influence their choice of social exchange-based access modes from this perspective. Second, individuals may be motivated to engage in social exchange in order to establish, sustain, and leverage reciprocal, cooperative social relationships in their own right ([Mitchell et al. 2012](#)). From this perspective, consumers may trust that such social relationships will yield long-term economic/utilitarian and social/communal rewards, in terms of achieving both individual and joint goals ([Hooghe, Marien,](#)

[and de Vroome 2012](#)). Notice that trust here refers not only to trust in the communal rewards (e.g., sense of belonging; cf. [Scaraboto 2015](#)), but also to trust in the economic rewards of the social cooperation. Third, another class of social theory suggests that consumers may also be motivated to engage in certain types of exchanges in order to socially signal or show off their qualities ([Hawkes 1991](#)), such as prestige, trendiness, wealth, or altruism.

As suggested by [figure 2](#), intelligence may give rise to these alternative motivations to engage in social exchange through certain psychological predispositions with which intelligence may correlate. In turn, the different access modes to goods (e.g., co-ownership, leasing, and borrowing vs. sole private ownership) are associated with these predispositions to different degrees, as summarized in [table 1](#). Taken together, one or several of these psychological predispositions, due to their association with intelligence, may explain the relationship between intelligence and consumer choice of social exchange-based access modes. We next specify these three psychological predispositions in more detail.

***Social Risk Tolerance.*** In terms of the risk-reward relationship of social exchange ([Eckhardt and Bardhi 2016](#)), prior research shows that intelligence is generally correlated with people's lower risk aversion, or higher risk tolerance ([Benjamin, Brown, and Shapiro 2013](#); [Burks et al. 2009](#)). Specifically, an intelligent individual's risk tolerance may be based on an ability to anticipate the behaviors of other people ([Benito-Ostolaza, Hernández, and Sanchis-Llopis 2016](#)), as well as to detect potential cheaters in the social environment ([Cosmides et al. 2010](#)). Against this

**TABLE 1**  
**SOCIAL EXCHANGE–BASED ACCESS MODES AND RELATED PSYCHOLOGICAL PREDISPOSITIONS AND CIRCUMSTANTIAL FACTORS**

Access mode	Exchange partner	Psychological predispositions					Circumstantial factors	
		Social trust	Social risk tolerance	Costly signaling via altruism	Symbolic signaling	Financial standing	Tendency to save	
Co-ownership	Another consumer (co-owner)	<ul style="list-style-type: none"> <li>Requires trust in the co-owner, that s/he will give a fair share of access to the good, and cover their own share of costs</li> </ul>	<ul style="list-style-type: none"> <li>Involves risk that the co-owner does not retain the good in good condition</li> <li>Involves risk that the co-owner overuses the product</li> </ul>	<ul style="list-style-type: none"> <li>Enables consumer to help the co-owner reduce his/her costs</li> </ul>	<ul style="list-style-type: none"> <li>Allows access to more expensive good (through sharing of acquisition cost)</li> <li>Allows to signal pro-environmentalism, thrift, trendiness</li> </ul>	<ul style="list-style-type: none"> <li>Enables consumer to prove their ability (through income) to pay their share of maintenance costs</li> </ul>	<ul style="list-style-type: none"> <li>Allows consumer to share ownership costs with co-owner</li> </ul>	
Leasing/rental	Leasing company	<ul style="list-style-type: none"> <li>Requires trust in the leasing company, in the sense that maintenance, repair, and customer service is available</li> </ul>	<ul style="list-style-type: none"> <li>Involves risk of one's inability to pay the access fees</li> <li>Involves risk that company does not provide adequate service</li> </ul>	N/A	<ul style="list-style-type: none"> <li>Allows access to more expensive good (through sharing of acquisition cost)</li> <li>Allows to signal pro-environmentalism, thrift, trendiness</li> </ul>	<ul style="list-style-type: none"> <li>Enables consumer to prove their ability (through income) to pay the monthly leasing fees</li> </ul>	<ul style="list-style-type: none"> <li>Allows consumer to transfer some ownership costs for maintenance, repair, and customer service to leasing company</li> </ul>	
Borrowing	Another consumer (lender)	<ul style="list-style-type: none"> <li>Requires trust in the lender, that s/he keeps the lending promise, even in the lack of a formal contract or monetary compensation</li> </ul>	<ul style="list-style-type: none"> <li>Involves risk that the product is not available, or in agreed-upon condition</li> <li>Involves risk of having to return the favor</li> </ul>	N/A	<ul style="list-style-type: none"> <li>Allows access to more expensive good (through sharing of acquisition cost)</li> <li>Allows to signal pro-environmentalism, thrift, trendiness</li> </ul>	<ul style="list-style-type: none"> <li>Negative effect: No financial "need" to borrow if the consumer can afford to purchase the good on own</li> </ul>	<ul style="list-style-type: none"> <li>Allows consumer to transfer all ownership costs to lender</li> </ul>	



backdrop, as shown in table 1, co-ownership, leasing, and borrowing all involve a certain degree of social risk. Thus, the general predisposition to tolerate and manage—rather than avoid—risks might predict a positive correlation between intelligence and the individual's choice of some of the social exchange–based access modes.

***Social Relationships and Trust.*** When it comes to the motivation to establish, sustain, and leverage social relationships through social exchange, trust in the counterparty of exchange has been recognized as a “key determinant of participation in collaborative consumption” (Lamberton and Rose 2012, 113). In turn, research in psychology has established that more intelligent individuals have more social trust in other individuals and institutions (Carl 2014), including those outside one's family and closest friends (Carl and Billari 2014). Indeed, several recent studies document significant positive correlations between intelligence and social trust (Carl and Billari 2014; Hooghe et al. 2012; Sturgis, Read, and Sturgis 2010). The reasoning for this correlation is that intelligence allows individuals to better understand their own and others' motivations in social relations (Yamagishi, Kikuchi, and Kosugi 1999), and to grasp the need for trusted relationships to achieve goals in cooperation with others (Hooghe et al. 2012). As shown in table 1, the social exchange–based access modes of co-ownership, leasing, and borrowing all require such social trust. Thus, the correlation between intelligence and choice of these access modes may be explained by intelligent individuals' greater social trust in others.

***Social Signaling and Symbolism.*** In terms of signaling, intelligence might be associated with an individual's preference for co-ownership, leasing, and borrowing because these access modes may allow individuals to advertise and signal certain qualities of theirs to other people (Belk 2007; Hawkes 1991). There are two types of such signaling: symbolic signaling of personal qualities, and costly signaling via prosocial altruism. In terms of symbolic signaling, intelligent individuals may generally wish to socially and conspicuously signal their qualities and abilities in order to receive some benefit in return (e.g., attracting mates; Griskevicius et al. 2007). For instance, since intelligence tends to correlate with social status (Aspara, Wittkowski, and Luo 2018), one's willingness to signal status or prestige might explain the relationship between intelligence and access mode choice. This is because co-ownership, leasing, and borrowing allow consumers to (conspicuously) use a more expensive good than what they might be able to afford to privately own (table 1). Other personal qualities that intelligent individuals might potentially seek to signal through these access modes include trendiness, nonconformity, thrift, or environmental-friendliness, or even one's intelligence itself.

In terms of costly signaling, intelligence has also been shown to correlate with altruistic prosocial behaviors

(Chen et al. 2013; Millet and Dewitte 2007; Nowak 2008; Nowak and Sigmund 2005; Pinker 2010), whereby altruism is the performance of acts that are costly to oneself but confer benefits to another individual (Nowak and Sigmund 2005). According to evolutionary theory (Marlowe 2004), individuals may try to enhance their reputation in the community by engaging in altruistic acts, and in this way signal to others that they have capabilities and means to afford such extra costs. Considering that the social exchange–based access modes, especially co-ownership, have certain altruistic aspects (table 1) and are costlier socially than sole private ownership, intelligent individuals may want to advertise their qualities by engaging in such a costlier social exchange–based access mode.

### Circumstantial Mechanisms Explaining the Association between Access Mode Choice and Intelligence

Beyond the preceding three psychological mechanisms, two circumstantial mechanisms related to the economic obligations involved in the access mode choice (figure 1) could also explain a potential positive correlation between intelligence and choice of co-ownership, leasing, and borrowing: the consumer's financial standing and tendency to save. Regarding financial standing, research in psychology (Ceci and Williams 1997) as well as in finance (Grinblatt, Keloharju, and Linnainmaa 2011) has demonstrated that intelligence has a positive correlation with consumers' financial standing in terms of income and net worth. Against this backdrop, a positive correlation between intelligence and consumer choice of co-ownership or leasing, especially, could be explained by the circumstantial fact that intelligent consumers tend to have a stronger financial standing, which in turn allows them to better convince the exchange counterparty of their ability to fulfill their economic obligations. In contrast, financial standing may not similarly predict a positive correlation between intelligence and borrowing, because of the lack of economic obligations involved in borrowing (see table 1). The association between intelligence and borrowing via financial standing might even be negative, as a consumer with a stronger financial standing may have no need to borrow a good instead of owning it.

In terms of tendency to save, prior research has demonstrated that intelligence correlates with individuals' ability to make economically beneficial choices, such as savings and investment choices of higher return (Grinblatt, Keloharju, and Linnainmaa 2012), or purchase choices that save both monetary costs and environmental burdens (Aspara, Luo, and Dhar 2017). Compared to sole private ownership, the three social exchange–based access modes (co-ownership, leasing, and borrowing) involve lower economic costs in terms of maintaining the good, especially, due to the counterparty assuming or sharing those costs.

Thus, intelligence's positive correlation with the choice of these access modes might also be explained by intelligent consumers' general tendency to seek savings.

Below, we test, with large-scale field data on consumers' car registrations, whether intelligence is positively correlated with the choice of social exchange-based access modes over sole private ownership of cars. Further, based on the field data, we seek indirect evidence for which of the psychological mechanisms (risk tolerance, trust, symbolic signaling, and costly signaling) and circumstantial mechanisms (financial standing, tendency to save) may best explain the association between intelligence and access mode choice. Further below, with an additional survey study, we seek additional, direct evidence of the psychological mechanism.

## FIELD STUDY

### Data

*Sample.* The basic population studied in the field study comprised males who were born between 1953 and 1992 and who were residents in the Uusimaa region around Finland's capital Helsinki on January 1, 2007. The cognitive test data were obtained from Finland's Defense Forces and comprised males who had joined the country's mandatory military service since 1982. Our data set includes only males because even if volunteer females were allowed to join the military service in Finland in the 1990s, only a few few had done so yearly until 2007. Overall, we did not use any sampling procedure, but included into the data set the entire population census of the male individuals (born 1953–92, resident in Uusimaa in 2007) as they appeared in census registers of Finland's Population Register Center. The population sample comprised 213,835 individuals, after we eliminated individuals who had moved away from the country or died by 2011, and individuals who had not been tested by Finland's Defense Forces for the key predictor variable, intelligence (due to not joining the military service for personal reasons, or for being non-Finnish citizens). In effect, our primary data set includes all new cars ( $n = 34,816$ ) registered to these individuals between 2007 and 2011, and the primary unit of analysis is the registration of a new car to an individual, with a certain registered access mode (see below). The car registration data were compiled from the Finnish Vehicle Administration (FVA). See web appendix WA1 for further details on the sample and data.

*Measures.* Regarding the measures, our main predictor variable is the individual's intelligence score, based on the Defense Forces' cognitive test on conscripts. In the test, 120 question items assess intelligence in three domains: verbal, numerical, and visuospatial cognitive ability. The verbal and numerical test items reflect the theory, dating back to [Thurstone \(1924/1999\)](#), that intelligence reflects

two main factors pertaining to numerical and verbal proficiency. The visuospatial logic test is analogous to the widely used Raven Advanced Progressive Matrices test ([Gray and Thompson 2004](#)). In our analyses, we utilized a composite intelligence score formed of the three measures. It is standardized, by the Defense Forces, to follow the stanine distribution on a scale of 1–9.

The main outcome variable is a categorical choice variable related to the registered access mode of the individual's car. The baseline, reference-level access mode (0) is *sole private ownership*, wherein the individual is registered (by FVA) as the sole, private owner of the car (with no other formally registered owners or users). The focal access modes analyzed are: (i) co-ownership (i.e., being registered as the owner of the car together with another individual); (ii) leasing (i.e., being registered as lessee of the car); and (iii) formal borrowing (i.e., being registered as the "holder," or primary user, of a car whose registered owner is another individual).

In addition to these primary social exchange-based access modes, we include three other access modes into our analysis. First, we include the aforementioned borderline access mode, (iv) financing (i.e., the individual being registered as the primary holder/user of a car, whose registered financial owner is a company or financial institution). Second, we include as another borderline access mode (v) formal lending, which may be characterized as the reverse of formal borrowing and is reflected in our field data as the focal consumer being registered as the owner of a car, and another consumer being registered as its primary holder/user.<sup>4</sup> Finally, we also control for one further access mode available in the data: (vi) using a car owned by one's employer. Notably, all six access modes are mutually exclusive in our data in the sense that the unit of analysis, an individual-car dyad, will never be characterized by more than one of the access modes. However, an individual may have a registered access mode to more than one car in a given year or over the years, and a given car may have more than one individual accessing it in our data. The latter is true for cars that are co-owned by two individuals, or borrowed by one consumer from another lender, in case both of these individuals appear in our data.

As to covariates, we compiled data from the governmental statistics agency Statistics Finland, which has access to records of Finland's Population Register Center and Finnish Tax Authority. The main control variables include individual-specific variables (e.g., age, income), as well as car-specific variables (e.g., car size) and car registration-specific variables (e.g., the year of the registration). Table WA1–1 in web appendix WA1 shows descriptive

<sup>4</sup> Notice that the lending consumer may also access and use the car to some extent oneself, even if primarily lending it to another consumer's use. In this sense, lending is also a "borderline case" of a social exchange-based access mode for the lender consumer.

statistics of the main variables, and table WA1–2 shows the bivariate correlations.

## Model Specification

As the main analysis method, we use a multinomial logit model on our choice data (access modes 0 and i–vi). In this multinomial logit model, also characterized as a conditional or generalized logit model (Lambert-Pandraud and Laurent 2010; So and Kuhfeld 2010), the predictor variables are the interaction terms of the individual's intelligence score and dummy variables pertaining to the alternative access modes. Such an interaction term is included for all the access mode dummies, except for sole private ownership, which therefore acts as the reference level or reference choice in the results. These interaction terms serve as our focal predictors, because intelligence is constant within an individual, and cannot predict the choice outcome if not interacted with the choice alternatives (Lambert-Pandraud and Laurent 2010; So and Kuhfeld 2010). For this same reason, we also entered the control variables (e.g., age, car size) as interaction terms with the access mode dummy variables into the model. Thus, our main model is as follows:

$$V_{nj} = \beta_0 X_{\text{Access\_mode}} + \beta_1 X_{\text{Intelligence} \times \text{Access\_mode}} + \beta_2 X_{\text{Age} \times \text{Access\_mode}} + \beta_3 X_{\text{Car\_size} \times \text{Access\_mode}} + \beta_4 X_{\text{Year} \times \text{Access\_mode}} + \beta_5 X_{\text{Other\_controls} \times \text{Access\_mode}} + \varepsilon_{nj}$$

where  $V_{nj}$  represents the latent utility of the car access mode alternative  $j = 1, \dots, J$  to an individual  $n$ , with  $J$  error terms  $\varepsilon_{nj}$  for any individual  $n$ . In the first term,  $\beta_0$  represents the matrix of intercept coefficients, capturing unobserved factors that characterize each access mode's desirability across individuals overall. In turn,  $X_{\text{Intelligence} \times \text{Access\_mode}}$  is the individual's intelligence score, interacted with the access-mode dummies, and  $\beta_1$  therefore comprises the focal coefficients of interest, reflecting the effects of intelligence on the latent utilities that the alternative access modes provide to the individual. The matrices  $X_{\text{Age} \times \text{Access\_mode}}$ ,  $X_{\text{Car\_size} \times \text{Access\_mode}}$ , and  $X_{\text{Year} \times \text{Access\_mode}}$  include the access-mode dummies interacted with the covariates age, car size, and registration year. Similarly,  $X_{\text{Other\_control} \times \text{Access\_mode}}$  represents the access mode dummies interacted with additional covariates included in additional analyses (e.g., disposable income, car engine size). Overall, with this model, the probability that an individual chooses one of the  $J$  alternative access modes,  $c_i$ , from the choice set  $C$  is modeled as:<sup>5</sup>

$$p(c_i|C) = \frac{\exp(V(c_i))}{\sum_{j=1}^J \exp(V(c_j))}$$

## Direct Evidence of the Association between Intelligence and Choice of Co-Ownership, Leasing, or Borrowing

We first test whether intelligence correlates with consumers' choice of social exchange–based access modes. The lefthand column of table 2 shows the effect coefficients resulting from our main multinomial logit model on access mode choice. The results indicate that intelligence is significantly positively associated with the choice to co-own ( $\beta = .245$ ,  $SE = .015$ ,  $p < .0001$ ) and to lease a car ( $\beta = .204$ ,  $SE = .027$ ,  $p < .0001$ ), relative to the reference level access mode of sole private ownership. In contrast, intelligence's association with borrowing ( $\beta = -.009$ ,  $SE = .016$ ,  $p > .50$ ) is insignificant. The effect sizes in the form of hazard ratios, or HR (intelligence on co-ownership:  $HR = 1.28$ ; intelligence on leasing:  $HR = 1.23$ ), suggest that an eight-unit increase of intelligence from the lowest score to the highest (1 to 9) increases the odds of co-ownership by 7.2 times ( $1.28^8$ ) and leasing by 5.2 times ( $1.23^8$ ). This effect size approximation corresponds with patterns visible in figures 3a and 3b. Specifically, figure 3a shows that the probability of sole ownership decreases from approximately 70% to 50% when intelligence increases from the lowest score of 1 to the highest score of 9. In turn, figure 3b shows that the observed shares and the predicted likelihoods for co-ownership and leasing substantially increase with intelligence. The seven- and five-fold increases in the probabilities for co-ownership and leasing, respectively, are visible in the increase of co-ownership probability from 1–1.5% to almost 10% and in the increase of leasing probability from .5% to above 2%, when intelligence increases from 1 to 9.

## Indirect Evidence of the Psychological Mechanism

As the field data do not include psychographic data to directly test which of the psychological mechanisms—risk tolerance, social trust, symbolic signaling, or costly signaling via altruism—explains the statistical associations observed above, we seek indirect evidence about the alternative mechanisms through indirect statistical analyses akin to “falsification checks” (see Goldfarb and Tucker 2014 for an analogy). We do this by first comparing the effect coefficients we report above, with the effect coefficients of the two borderline cases of social exchange–based access modes: financing and lending. First, for the alternative mechanisms of risk tolerance or symbolic signaling to

<sup>5</sup> We estimate this model with SAS procedure phreg with Breslow likelihood, as this Breslow likelihood has exactly the same form as the likelihood of a multinomial, conditional logit model (So and Kuhfeld 2010, 668).



TABLE 2

FIELD STUDY RESULTS: MULTINOMIAL LOGIT MODEL OF CONSUMER'S CHOICE OF ACCESS MODE

	$\beta$	SE	$p$	HR	$\beta$	SE	$p$	HR	$\beta$	SE	$p$	HR
Co-own	-1.841	.534	<.0001	.00	-16.176	.745	<.0001	.000	-16.921	.630	<.0001	.0000
Leasing	-3.456	.975	.000	.03	-9.931	1.345	<.0001	.000	-12.776	1.177	<.0001	.000
Borrowing	1.898	.622	.002	6.67	7.490	.746	<.0001	179.524	1.800	.689	.009	6.048
Financed	-8.070	.253	<.0001	.00	-13.081	.350	<.0001	.000	-13.687	.307	<.0001	.000
Lending	.820	.592	.166	2.27	3.500	.731	<.0001	33.124	.735	.669	.272	2.086
Employer-provided	-21.751	.919	<.0001	.00	-42.685	1.487	<.0001	.000	-24.696	1.047	<.0001	.000
Intelligence $\times$ Co-own	.245	.015	<.0001	1.28	.194	.015	<.0001	1.215	.225	.015	<.0001	1.253
Intelligence $\times$ Leasing	.204	.027	<.0001	1.23	.144	.028	<.0001	1.154	.184	.027	<.0001	1.202
Intelligence $\times$ Borrowing	-.009	.016	.581	.99	.036	.017	.034	1.036	-.010	.016	.548	.990
Intelligence $\times$ Lending	-.009	.016	.558	.99	.009	.016	.586	1.009	-.010	.016	.517	.990
Intelligence $\times$ Financed	.016	.007	.016	1.02	-.030	.007	<.0001	.970	-.001	.007	.853	.999
Intelligence $\times$ Employer	.255	.023	<.0001	1.29	.083	.024	.001	1.086	.245	.023	<.0001	1.278
Age $\times$ Co-own	.024	.004	<.0001	1.03	.010	.004	.017	1.010	.022	.004	<.0001	1.022
Age $\times$ Lending	-.038	.004	<.0001	.96	-.025	.004	<.0001	.975	-.037	.004	<.0001	.963
Age $\times$ Employer	.025	.006	<.0001	1.03	-.019	.007	.005	.981	.023	.006	.000	1.023
Age $\times$ Financed	.023	.002	<.0001	1.02	.009	.002	<.0001	1.009	.020	.002	<.0001	1.02
Age $\times$ Leasing	.026	.007	<.0001	1.03	.006	.007	.428	1.006	.023	.007	.001	1.024
Age $\times$ Borrowing	-.009	.004	.018	.99	.012	.004	.003	1.012	-.009	.004	.017	.991
Car size $\times$ Co-own	.002	.000	<.0001	1.00	.002	.000	<.0001	1.002	.006	.000	<.0001	1.006
Car size $\times$ Lending	-.001	.000	.001	1.00	-.001	.000	.014	.999	-.001	.000	.009	.999
Car size $\times$ Employer	.006	.000	<.0001	1.01	.004	.000	<.0001	1.004	.008	.000	<.0001	1.008
Car size $\times$ Financed	.002	.000	<.0001	1.00	.002	.000	<.0001	1.002	.006	.000	<.0001	1.006
Car size $\times$ Leasing	-.001	.000	.155	1.00	-.001	.000	.003	.999	.005	.001	<.0001	1.005
Car size $\times$ Borrowing	-.002	.000	<.0001	1.00	-.001	.000	<.0001	.999	-.002	.000	<.0001	.998
Year $\times$ Co-own	.071	.018	<.0001	1.07	.050	.018	.007	1.051	.016	.019	.385	1.016
Year $\times$ Lending	-.025	.021	.230	.98	-.009	.021	.663	.991	-.028	.021	.181	.972
Year $\times$ Employer	.040	.028	.153	1.04	-.011	.028	.708	.990	.018	.028	.516	1.019
Year $\times$ Financed	.018	.009	.043	1.02	-.003	.009	.715	.997	-.028	.009	.002	.973
Year $\times$ Leasing	-.428	.039	<.0001	.65	-.454	.039	<.0001	.635	-.509	.040	<.0001	.601
Year $\times$ Borrowing	.027	.022	.209	1.03	.061	.022	.006	1.063	.026	.022	.239	1.026
Income $\times$ Co-own					.722	.068	<.0001	2.059				
Income $\times$ Lending					-.384	.062	<.0001	.681				
Income $\times$ Employer					2.687	.139	<.0001	14.694				
Income $\times$ Financed					.674	.031	<.0001	1.962				
Income $\times$ Leasing					.905	.125	<.0001	2.472				
Income $\times$ Borrowing					-.804	.060	<.0001	.448				
Car engine $\times$ Co-own									-.002	.000	<.0001	.998
Car engine $\times$ Lending									.000	.000	.758	1.000
Car engine $\times$ Employer									-.001	.000	<.0001	.999
Car engine $\times$ Financed									-.001	.000	<.0001	.999
Car engine $\times$ Leasing									-.003	.000	<.0001	.997
Car engine $\times$ Borrowing									.000	.000	.986	1.000
$n$		34,817				34,816				34,803		
-2LogL		80,247.947				78,950.45				78,407.955		
AIC		80,307.947				79,022.45				78,479.955		
BIC		80,561.683				79,326.94				78,784.424		

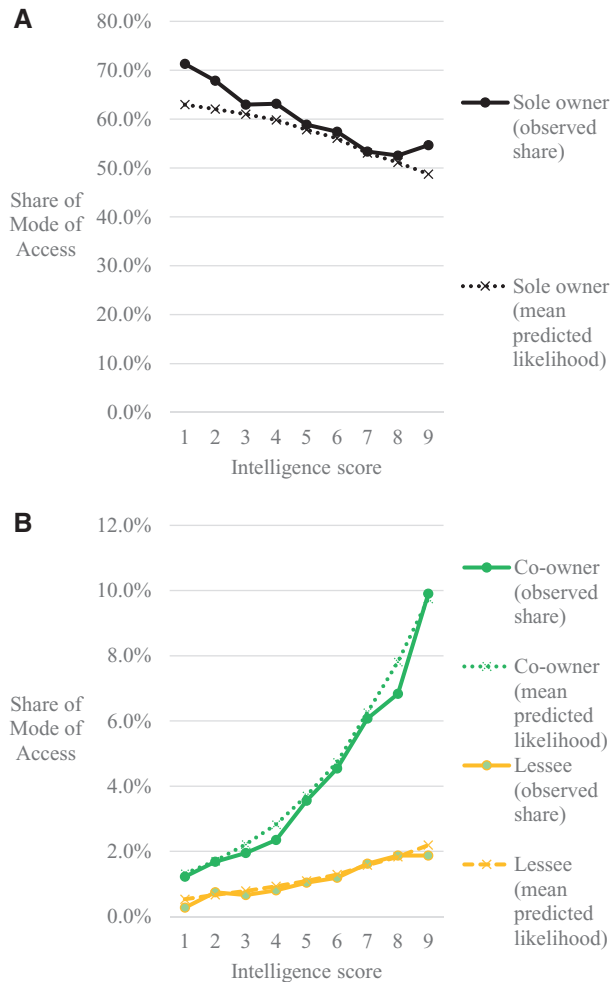
hold, the effect coefficient of intelligence should be at least equally positive (as for co-ownership and leasing) for an access mode that requires more risk-taking, and/or enables more social signaling. Financing (via, e.g., a bank loan) is such an access mode, as it involves heightened risk-taking (regarding the ability to pay back the loan in due course), but also enables more social signaling (allowing consumers to access a more conspicuous car than what they could otherwise afford). The effect coefficients in table 2, however, show that the association between intelligence and the financing access mode is barely significant ( $\beta = .016$ ,

$SE = .007$ ,  $p = .02$ ) and much smaller in effect size ( $HR = 1.02$ ) than intelligence's above effects on co-ownership ( $HR = 1.28$ ) and leasing ( $HR = 1.23$ ). Thus, these results constitute first indirect, falsifying pieces of evidence against the notion that risk tolerance or symbolic signaling would be the primary mechanisms explaining the relationship between intelligence and the choice of social exchange-based access modes.

Second, should the alternative mechanism of costly signaling via altruism underlie smarter consumers' choice of social exchange-based access modes, intelligence should

FIGURE 3

(A) PREDICTED LIKELIHOOD AND OBSERVED SHARE OF OWNERSHIP (B) PREDICTED LIKELIHOOD AND OBSERVED SHARE OF CO-OWNERSHIP AND LEASING[AQ1]



correlate to an equal or greater extent with the “reverse” access mode of lending, as it does with borrowing, co-ownership, or leasing. This is because in lending, the ownership costs remain with the focal consumer, while another consumer also benefits from the use of the good. Thus, the focal consumer’s choice of lending should be particularly motivated by altruism (Cropanzano and Mitchell 2005). However, we find indirect, falsifying evidence also against the notion that costly signaling via altruism would be the primary mechanism explaining the association between intelligence and choice of social exchange-based access modes, as we find that intelligence is in fact not associated with lending at all ( $\beta = -.009$ ,  $SE = .016$ ,  $p > .50$ ; table 2).

Taken together, the indirect falsification checks against the mechanisms of risk tolerance, symbolic signaling, and costly signaling via altruism lead us to conclude, preliminarily, that the association between intelligence and choice of social exchange-based access modes may be primarily explained by the remaining, nonfalsified mechanism of social trust. Next, we give additional evidence for this, through a series of additional statistical analyses providing further indirect checks of the social trust mechanism.

### Additional Checks of the Social Trust Mechanism

*Additional Check 1 of Social Trust Mechanism: Different Types of Intelligence.* We first provide an additional check of the social trust mechanism by analyzing and comparing the association of different types of intelligence with consumers’ access mode choice. We theorize that in case the social trust mechanism holds, the positive effect of intelligence on the choice of these access modes should be more pronounced for verbal intelligence and numeric intelligence than for visuospatial intelligence. Regarding verbal intelligence, language skills are a key factor underlying human species’ reliance on social cooperation in general (Pinker 2010), and individuals’ effective social interactions in particular (Doise and Mugny 1984; Mayer, Salovey, and Caruso 2004). At the individual level, verbal ability (Carl and Billari 2014) and numeric ability (Hooghe et al. 2012) have been found to correlate especially with social trust. Logically, numeric intelligence is also likely to be associated with one’s ability to calculate the joint benefits of social cooperation, be they economic or communal. In contrast, we are unaware of any studies or theories linking social trust with visuospatial intelligence. Nonetheless, should the alternative mechanism of costly signaling via altruism be true, intelligence’s correlation with the choice of social exchange-based access modes should be more pronounced for visuospatial abilities than verbal or numeric abilities, as laboratory experiments show that visuospatial intelligence especially correlates with altruism (Millet and Dewitte 2007). Similarly, should the alternative mechanism of risk tolerance be true, the association between intelligence and choice of social exchange-based access modes should also be pronounced for visuospatial intelligence. This is because previous research has demonstrated a correlation between individuals’ risk management abilities and visuospatial abilities (Burks et al. 2009).

In order to test this, we re-estimated our main multinomial logit model by using the three types of intelligence separately as the main predictor. A comparison of these models (table 3) shows that the model fit is clearly better for verbal intelligence ( $AIC = 80, 260$ ) and numeric intelligence ( $AIC = 80, 280$ ) than visuospatial intelligence ( $AIC = 80, 490$ ). Moreover, in the case of co-ownership

TABLE 3

FIELD STUDY RESULTS: MULTINOMIAL LOGIT MODEL OF THE CONSUMER'S CHOICE OF ACCESS MODE TO CAR—BY INTELLIGENCE TYPES

Parameter	Verbal intelligence			Numeric intelligence			Visuospatial intelligence		
	$\beta$	SE	$p$	$\beta$	SE	$p$	$\beta$	SE	$p$
Co-ownership	-10.904	.534	<.0001	-10.655	.534	<.0001	-11.065	.533	<.0001
Leasing	-3.654	.978	.000	-3.310	.973	.001	-3.641	.971	.000
Borrowing	1.897	.622	.002	1.898	.622	.002	1.935	.623	.002
Financed	-8.089	.254	<.0001	-8.060	.253	<.0001	-8.069	.254	<.0001
Lending	.821	.592	.166	.812	.591	.170	.826	.593	.164
Employer-provided	-21.906	.920	<.0001	-21.601	.919	<.0001	-21.707	.916	<.0001
<b>Intelligence <math>\times</math> Co-ownership</b>	<b>.226</b>	<b>.015</b>	<b>&lt;.0001</b>	<b>.225</b>	<b>.014</b>	<b>&lt;.0001</b>	<b>.178</b>	<b>.014</b>	<b>&lt;.0001</b>
<b>Intelligence <math>\times</math> Leasing</b>	<b>.248</b>	<b>.027</b>	<b>&lt;.0001</b>	<b>.164</b>	<b>.025</b>	<b>&lt;.0001</b>	<b>.118</b>	<b>.026</b>	<b>&lt;.0001</b>
Intelligence $\times$ Borrowing	-.001	.016	.971	.001	.016	.949	-.015	.016	.340
Intelligence $\times$ Lending	-.006	.016	.707	-.020	.015	.196	-.005	.016	.756
Intelligence $\times$ Financed	.024	.007	.000	.017	.006	.008	.002	.007	.764
Intelligence $\times$ Employer-provided	.268	.023	<.0001	.249	.022	<.0001	.139	.022	<.0001
Age $\times$ Co-ownership	.026	.004	<.0001	.025	.004	<.0001	.033	.004	<.0001
Age $\times$ Lending	-.038	.004	<.0001	-.037	.004	<.0001	-.038	.004	<.0001
Age $\times$ Employer-provided	.024	.006	<.0001	.024	.006	<.0001	.034	.006	<.0001
Age $\times$ Financed	.022	.002	<.0001	.023	.002	<.0001	.023	.002	<.0001
Age $\times$ Leasing	.025	.007	.000	.028	.007	<.0001	.033	.006	<.0001
Age $\times$ Borrowing	-.009	.004	.013	-.010	.004	.013	-.009	.004	.015
Car size $\times$ Co-ownership	.002	.000	<.0001	.002	.000	<.0001	.002	.000	<.0001
Car size $\times$ Lending	-.001	.000	.000	-.001	.000	.001	-.001	.000	.000
Car size $\times$ Employer-provided	.006	.000	<.0001	.006	.000	<.0001	.006	.000	<.0001
Car size $\times$ Financed	.002	.000	<.0001	.002	.000	<.0001	.002	.000	<.0001
Car size $\times$ Leasing	-.001	.000	.172	-.001	.000	.169	.000	.000	.329
Car size $\times$ Borrowing	-.002	.000	<.0001	-.002	.000	<.0001	-.002	.000	<.0001
Year $\times$ Co-ownership	.070	.018	.000	.072	.018	<.0001	.069	.018	.000
Year $\times$ Lending	-.025	.021	.231	-.025	.021	.226	-.025	.021	.234
Year $\times$ Employer-provided	.038	.028	.181	.040	.028	.150	.038	.028	.176
Year $\times$ Financed	.018	.009	.043	.018	.009	.042	.018	.009	.044
Year $\times$ Leasing	-.429	.039	<.0001	-.427	.039	<.0001	-.430	.039	<.0001
Year $\times$ Borrowing	.027	.022	.208	.027	.022	.208	.027	.022	.205
<i>n</i>		34,817			34,817			34,817	
-2LogL		80,259.575			80,279.793			80,490.396	
AIC		80,319.575			80,339.793			80,550.396	
BIC		80,573.311			80,593.529			80,804.132	

and leasing, the effect coefficients are 30–50% greater for verbal intelligence ( $\beta_{\text{co-ownership}} = .226$ ,  $SE = .015$ ,  $p < .0001$ ;  $\beta_{\text{leasing}} = .248$ ,  $SE = .027$ ,  $p < .0001$ ) and numeric intelligence ( $\beta_{\text{co-ownership}} = .225$ ,  $SE = .014$ ,  $p < .0001$ ;  $\beta_{\text{leasing}} = .164$ ,  $SE = .025$ ,  $p < .0001$ ) than for visuospatial intelligence ( $\beta_{\text{co-ownership}} = .178$ ,  $SE = .014$ ,  $p < .0001$ ;  $\beta_{\text{leasing}} = .118$ ,  $SE = .026$ ,  $p < .05$ ). Thus, these results, with pronounced effects by verbal and numerical intelligence, indicate further support for the social trust mechanism, instead of the mechanisms of costly signaling via altruism and of risk management.

Notice that in the above analyses, the three types of intelligence were not included in one model, because the intelligence types are highly correlated ( $r > .6$ ; table WA1–2), which can lead to unstable parameter estimates due to multicollinearity of the predictor variables. However, when the three intelligence types are forced into the same model (table WA1–1 in web appendix WA1), the results remain consistent: the coefficients for verbal intelligence

( $\beta_{\text{co-ownership}} = .117$ ,  $p < .0001$ ;  $\beta_{\text{leasing}} = .245$ ,  $p < .0001$ ) and numeric intelligence ( $\beta_{\text{co-ownership}} = .133$ ,  $p < .0001$ ;  $\beta_{\text{leasing}} = .027$ ,  $p > .4$ ) remain significant (with the exception of numeric intelligence and leasing), while the coefficients for visuospatial intelligence become insignificant ( $\beta_{\text{co-ownership}} = .034$ ,  $p > .05$ ;  $\beta_{\text{leasing}} = -.030$ ,  $p > .30$ ). At any rate, this comparison of the effects of the different intelligence types has to be interpreted with caution, as the overall correlation between the different intelligence scores and access mode choices may also be caused by general intelligence (“g factor”), which is co-constituted of all three types of intelligence together.

*Additional Check 2 of Social Trust Mechanism: Co-Ownerships Outside versus Inside Household.* Second, people are likely to have relatively stronger trust in the members of their own household than in external individuals (cf. Belk 2010), independent of their intelligence-elicited social trust. Conversely, therefore, intelligence

should play an at least equally pronounced role in eliciting trust in people who are external to one's household. Thus, the positive effect of intelligence on the consumer being registered as a co-owner of a car should be at least equally or more pronounced for co-ownerships with individuals who are external to the consumer's household than for those with individuals who are internal. In contrast, we have no theory nor reason to assume that risk tolerance, symbolic signaling, or costly signaling would be affected by intelligence to a greater degree for household-external peer consumers. In fact, even without intelligence, household-external co-ownerships could actually provide more (rather than less) ample opportunities for social signaling, as well as social risk-taking, than household-internal co-ownerships.

To test these, we conducted the analysis separately for consumers having other household members versus consumers living alone. In the former model, we included three additional choice categories to the dependent variable to account for cases in which the individual was registered as a co-owner, borrower, or lender for a car with an individual living at the same (vs. different) address. Table WA1-2 in web appendix WA1 shows the results. For consumers with other household members, the positive effect coefficient of intelligence becomes significantly higher for co-ownerships with another individual who is external to one's household ( $\beta = .258$ ,  $SE = .086$ ,  $p < .01$ ) than it is for co-ownership with another individual who is part of the same household ( $\beta = .213$ ,  $SE = .015$ ,  $p < .0001$ ). The higher (not lower) coefficient for household-external co-ownerships results hence provide further evidence that social trust is more likely to explain the positive association between consumer's intelligence and co-ownership than symbolic signaling, costly signaling via altruism, or risk-tolerance.

*Additional Check 3 of Social Trust Mechanism: Informal Social Exchange-Based Access.* Third, we attend to informal social exchange-based access modes to cars. In an ideal form, social exchange-based sharing would not require a formal registration of the exchange and related usage rights (Jenkins et al. 2014) so that the consumer's use of the good would be guided only by informal social contracts. Due to the absence of such formal registration, informal sharing should therefore require an even higher degree of trust between the exchange partners (Jenkins et al. 2014) than formally registered access modes, such as the formally registered co-ownership and leasing analyzed above. Thus, should the social trust mechanism hold for the formally registered modes of co-ownership and leasing, there should be an equally sizeable correlation between intelligence and informal modes of sharing.

As our data set does not contain a direct measure of informal sharing of cars, we use individuals who are *not* registered to have *any* formal access mode to a car as proxy,

as these consumers are likely to occasionally, informally use cars owned by their acquaintances, as well as public transit vehicles. To test this, we conducted a binary logistic regression of the consumer being formally registered as using *any* of the access modes, versus having *no* formally registered access mode at all. The upper panel of table WA1-3 (in web appendix WA1) shows the results, indicating that intelligence is negatively associated with having a formally registered access mode ( $\beta = -.015$ ,  $SE = .003$ ,  $p < .0001$ ). In other words, more intelligent consumers are less likely to have any formally registered access mode to cars, which implies that they are likely to resort to informal, nonregistered access modes of sharing, in which the need for trust is even more prominent. As a further test, we ran an additional analysis of the work commuting costs (filed to the Tax Authority) of those consumers who do not have any formal car registration. The results in the lower panel of table WA1-3 show that intelligence is positively correlated with these commuting costs ( $\beta = .039$ ,  $SE = .005$ ,  $p < .0001$ ), which suggests that intelligent consumers are indeed more likely to resort to informal, shared access modes when commuting. This constitutes further evidence of the notion that intelligence's association with social trust is likely to underlie the correlation between intelligence and choice of social exchange-based access modes.

### Direct Evidence of the Circumstantial Mechanisms

Beyond the indirect evidence of the psychological mechanism of social trust that we provide above, the field data allows us to more directly test the circumstantial mechanisms of financial standing and tendency to save. To test for the former, we analyze whether the association between intelligence and co-ownership and leasing is mediated by the consumer's financial standing in terms of disposable income. As a first step of the mediation analysis (Baron and Kenny 1986; Preacher and Hayes 2004), the main effect analyses already confirm that intelligence is associated with co-ownership and leasing. In the second step, a regression analysis with the same predictors of the main model shows that intelligence predicts income ( $\beta = .067$ ,  $SE = .0013$ ;  $p < .0001$ ). As a third step, we enter income as an additional covariate to the main-effect model and find that the associations between intelligence and co-ownership (from  $\beta_{\text{baseline model}} = .245$ ,  $p < .0001$  to  $\beta_{\text{income included}} = .194$ ,  $p < .0001$ ) and leasing (from  $\beta_{\text{baseline model}} = .204$ ,  $p < .0001$  to  $\beta_{\text{income included}} = .144$ ,  $p < .0001$ ) become weaker with the addition of income (table 2, middle columns). Because the effect of intelligence on these access mode choices thereby "decreases by a nontrivial amount, but not to zero" (Preacher and Hayes 2004, 717), we can conclude that income *partially* mediates the association between intelligence and the choice of these



access modes. In other words, a substantial direct effect path remains from intelligence to co-ownership and leasing—even if a significant indirect effect path also emerges via income, as confirmed by a Sobel test statistic adjusted for the logit model (Iacobucci 2012) ( $z_{\text{co-ownership}} = 10.4$ ,  $p < .001$ ;  $z_{\text{leasing}} = 7.2$ ,  $p < .001$ ). Therefore, we can conclude that the circumstantial mechanism of financial standing is likely to partially complement the psychological mechanism of social trust in explaining the association between intelligence and co-ownership and leasing. As an additional result, in this model including income, we find that intelligence obtains a positive, direct effect path on borrowing ( $\beta = .036$ ,  $SE = .017$ ;  $p < .05$ ). This stands in contrast to the statistically insignificant association of intelligence and borrowing in the baseline model (left column, table 2), and may be explained by the fact that while borrowing is likely based on social trust, like co-ownership, the negative effect of financial standing on borrowing ( $\beta = -.804$ ,  $SE = .06$ ,  $p < .0001$ ) may cancel this out in the baseline model (as intelligent higher-income individuals have less “need” to borrow).

To test for the mediating role of tendency to save, we analyze whether the positive association between intelligence on co-ownership and leasing is mediated by, or co-correlated with, another economic savings-related choice: a car that has a smaller engine, and thereby lower gasoline costs. In this mediation analysis, we first find that intelligence has a negative association with the engine size of the car accessed by the consumer ( $\beta = -13.46$ ,  $SE = 1.07$ ,  $p < .001$ ). This suggests that more intelligent consumers may indeed choose cars with smaller engines to save money. Then, when including engine size as a covariate in the main model, we find that the associations between intelligence and choice of co-ownership ( $\beta = .225$ ,  $SE = .015$ ,  $p < .0001$ ) and leasing ( $\beta = .184$ ,  $SE = .027$ ,  $p < .0001$ ) are somewhat weakened, compared with the effects of the main model ( $\beta_{\text{co-owner}} = .245$ ,  $p < .0001$ ;  $\beta_{\text{leasing}} = .204$ ,  $p < .0001$ ; table 2, right columns). Also, again, the Sobel test statistic (Iacobucci 2012) indicates that engine size is a partial mediator of the main effects ( $z_{\text{co-ownership}} = 10.3$ ,  $p < .001$ ;  $z_{\text{leasing}} = 8.88$ ,  $p < .001$ ), which suggests that consumers’ inclination to pursue economic savings also mediates the association between intelligence and choice of the social exchange-based access modes.

Overall, the analyses suggest that intelligence is positively associated with consumers’ choice of co-ownership and leasing access modes, and that this may be explained by the psychological construct of social trust and the circumstantial mechanisms of financial standing and tendency to save. However, to assess whether the association between consumer intelligence and choice of social exchange-based access modes might be elicited by even other alternative factors, we ran a series of additional robustness checks, which we discuss below.

## Additional Robustness Checks

*Individual-Level Clustering.* As our data include car registrations for the years 2007–11, an individual can have several cars registered, making those access mode choices likely correlated within individuals. To account for this, we estimated the main model with a robust sandwich covariance matrix by clustering on individual. The results in table WA1–4 show, however, that the coefficients for co-ownership ( $\beta = .245$ ,  $SE = .016$ ,  $p < .0001$ ) and leasing ( $\beta = .204$ ,  $SE = .029$ ,  $p < .0001$ ) remain essentially unchanged when we include intra-individual clustering.

*Individuals’ Second or Third Cars.* It is possible that the motivations and choice of social exchange-based access modes vary for the first or only car—versus the second, third, or further car—registered to a consumer.<sup>6</sup> For example, while individuals may acquire their first car (possibly of their favorite brand) into sole private ownership, they may purchase another car into co-ownership or borrow it because of diminished financial means after the first car’s purchase, and/or because the first car already satisfied their personal tastes. To check this, we estimated the main model separately for consumers’ first (or only) car registration and for their following registrations. As shown in table WA1–5, the correlations of intelligence and the choices to co-own and lease ( $\beta_{\text{co-ownership}} = .352$ ,  $SE = .042$ ,  $p < .0001$ ;  $\beta_{\text{leasing}} = .296$ ,  $SE = .069$ ,  $p < .0001$ ) are indeed larger in size for the individual’s second and further cars than for the individual’s first car ( $\beta_{\text{co-ownership}} = .213$ ,  $SE = .016$ ,  $p < .0001$ ;  $\beta_{\text{leasing}} = .174$ ,  $SE = .029$ ,  $p < .0001$ ). Nonetheless, the effects remain highly significant for the first car, suggesting that the effect of intelligence on access mode choice is not limited to second and further cars only.<sup>7</sup>

*Mere Availability of Sharing Partners.* It is also possible that a spurious correlation between intelligence and co-ownership, especially, might emerge due to the mere availability of co-ownership partners. Notably, intelligence has been found to positively correlate with males’ marriage and family prospects (Aspara et al. 2018; Taylor et al.

<sup>6</sup> The authors thank an anonymous reviewer for this suggestion. If, at the time of registration, there was not another car registered to the individual, this was classified as “first/only car.” If there was another car already registered to the individual, then the focal car was classified as “second/further car.”

<sup>7</sup> A variation of this account is one where the individual’s first car may be provided by the person’s employer, while the second car may be co-owned, leased, or borrowed. To check for the possibility that the results above are driven by employer-provided car holders, we ran our main model anew by excluding those car holders from the analysis. The results indicate that the associations of intelligence and choice of co-ownership and leasing ( $\beta_{\text{co-ownership}} = .250$ ,  $SE = .024$ ,  $p < .0001$ ;  $\beta_{\text{leasing}} = .236$ ,  $SE = .043$ ,  $p < .0001$ ) are similar in size and significance, as in the main model. This confirms that the results of the main model are not driven only by consumers who have an employer-owned car.

2005); residence in urban areas (Jokela et al. 2017); politically and socially liberal attitudes (Carl 2015; Deary, Batty, and Gale 2008); and age (Li et al. 2015). All these factors, in turn, may increase the availability of co-ownership partners in the form of family members, neighbors, and/or peers. To check that the effects reported in the main model (table 2) are not accounted for simply by these availability factors, we re-estimated the main model separately for (a) consumers with versus without spouse, (b) with versus without children, (c) residence in urban versus non-urban area, (d) residence in an area with high versus low support for a socially liberal political party, and (e) younger versus older age.

The results in tables WA1–6–WA1–10 show, on one hand, that the effect on co-ownership remains in a rather narrow, statistically highly significant range between  $\beta = .181$  and  $\beta = .276$  in all these models ( $p < .0001$ ). This suggests that the association of intelligence and co-ownership is not accounted for merely by the fact that intelligence may increase the odds of having a spouse or of living in a socially liberal region, for example. On the other hand, the association between intelligence and leasing gets somewhat reduced for consumers living in urban areas ( $\beta = .141$ ,  $SE = .031$ ,  $p < .001$ ). The results of an additional model, including the disposable income mediator, further reduces this correlation among consumers living in urban areas ( $\beta = .072$ ,  $p < .05$ ). This can be interpreted as a stronger mediation of the intelligence–leasing link by financial standing among consumers living in urban areas. Correspondingly, social trust would mediate the intelligence–leasing link to a greater degree among consumers living in non-urban areas. This is conceivable, as in urban locations, there are copious car leasing dealers and service provider companies, and consumers are unlikely to have personal interaction with them, whereas in non-urban locations, car leasing dealers and service provider companies are probably relatively few, allowing for more trusted relationships to form between the focal consumer and the companies.

*Car-Specific Control: Premium Brand.* Finally, beyond the individual-specific robustness checks, we performed a check to account for one important car-specific covariate: car brand. This is a relevant control, as consumers may tend toward co-owning, leasing, or borrowing costlier car brands especially, in order to share the higher costs of such brands. As our data do not cover car acquisition prices (nor their leasing, co-ownership, or borrowing costs), we use the premiumness of the car's brand as a proxy for its costs.<sup>8</sup> The results in table WA1–11 show that even after we include the brand proxy, intelligence continues to have a

highly significant positive association with preference for co-ownership and leasing ( $\beta_{\text{co-ownership}} = .246$ ,  $SE = .015$ ,  $p < .0001$ ;  $\beta_{\text{leasing}} = .205$ ,  $SE = .027$ ,  $p < .0001$ ). This supports the notion that it is not primarily a brand-related economizing motivation that drives the association between intelligence and these social exchange–based access modes. In fact, in our data, premium-branded cars are co-owned and leased significantly *less* often than nonpremium cars ( $\beta_{\text{premium/co-ownership}} = -.861$ ,  $SE = .069$ ,  $p < .0001$ ;  $\beta_{\text{premium/leasing}} = -.862$ ,  $SE = .142$ ,  $p < .0001$ ).

## Summary of the Field Data Findings

The field data demonstrate that intelligence is positively and relatively strongly correlated with consumers' choice of two social exchange–based access modes in particular: co-ownership and leasing. The data also provide indirect evidence that the correlations are likely explained by the association between intelligence and the psychological construct of social trust in others, as well as direct evidence that the two circumstantial mechanisms of financial standing and tendency to save serve as complementary explanations. In the case of the social exchange–based access mode of borrowing, intelligence is positively associated with financial standing, which in turn is negatively associated with borrowing. This dampens the positive direct association between intelligence and borrowing via social trust.

## SURVEY STUDY

The results of the field study provide indirect evidence that the psychological mechanism for why intelligent consumers choose social exchange–based access modes is likely to relate to their greater social trust in others. To seek further, direct evidence of this mechanism, we designed a complementary survey study, in which we psychographically measured consumers' social trust as well as the alternative psychological constructs.

## Method

For a detailed description of the study method, please see web appendix WA2. We recruited 460 consumers via the Prolific online research pool as respondents ( $M_{\text{age}} = 35.3$  years; 53.5% males). To measure the key dependent variable, car access mode choice, we asked respondents, "Thinking about your access to and usage of cars, please select the alternative below, which best describes your current situation." The alternative response options here were sole private ownership, and the focal social exchange–based access modes of co-ownership, borrowing, and leasing. For co-ownership and borrowing, the respondents could further indicate whether they co-owned (borrowed) the car with (from) their spouse, or some other

<sup>8</sup> We constructed the binary proxy for premium brands through expert coding of the brands appearing in the data, based on whether a particular brand was among the more versus less expensive brands of that car manufacturer.

person. The majority of respondents had a car in their sole private ownership (68.7%), while up to one-fifth co-owned a car (with spouse [13.3%] or other [5%]), one-tenth borrowed a car (from spouse [2%] or other [8%]), and 3.5% leased a car. Due to the relatively small sample size and low shares of some access modes, the results for those must be interpreted with caution.

We measured general cognitive ability by asking the respondents to self-report their verbal and math SAT scores, and their GPA (Chen et al. 2013) ( $\alpha = .70$ ). To measure the mediating variable pertaining to the psychological mechanism that received most indirect support in the field study—social trust—we asked, “To what extent do you feel you can trust other people that you interact with in your daily life?” (anchored by 1 = “very little” to 7 = “very much”; Rand, Greene, and Nowak 2012). The measures for all the other mediating variables pertaining to the alternative mechanisms are listed in the appendix.

## Results

We analyzed the survey data in two stages. We first estimated a series of linear regression analyses, in which we regressed one alternative mediating variable at a time on cognitive ability and the key control variables (income, spouse, number of children). Second, we estimated a multinomial logit model of the respondent’s car access mode choice, similar to the field study, in which we used all the alternative mediating variables as predictors.

The results of the two-stage analysis (see figure 4; details on the analysis and results are given in web appendix WA2) are in line with the indirect evidence obtained in the field study, suggesting that social trust is the primary psychological mechanism underlying the association between cognitive ability and choice of social exchange-based access modes. Specifically, in the first-stage regression analyses, we find that cognitive ability predicts social trust ( $\beta = +.122$ ,  $SE = .053$ ,  $p < .05$ ) and financial standing in terms of income ( $\beta = +.213$ ,  $SE = .057$ ,  $p < .001$ ). There is no significant effect of cognitive ability on any of the other, alternative mediators (risk tolerance, costly signaling, symbolic signaling; tendency to save), except for the additional control variable of social liberalism ( $\beta = +.116$ ,  $SE = .053$ ,  $p < .05$ ).

Further, the results of the second-stage multinomial choice model demonstrate that social trust, in turn, predicts likelihood to co-own a car with someone other than one’s spouse ( $\beta = +.35$ ,  $SE = .19$ ,  $p < .05$ ) and the likelihood to lease a car ( $\beta = +.45$ ,  $SE = .26$ ,  $p < .05$ ). Sobel tests (Iacobucci 2012) show that these mediations via social trust are partial and marginally significant ( $z_{\text{co-ownership}} = 1.36$ ,  $p < .10$ ;  $z_{\text{leasing}} = 1.31$ ,  $p < .10$ ). Financial standing also has a positive effect on likelihood to lease a car ( $\beta = +.42$ ,  $SE = .20$ ,  $p < .05$ ). A Sobel test confirms that this mediation via income on leasing is also significant

( $z_{\text{leasing}} = 1.78$ ,  $p < .05$ ). Social liberalism, the additional covariate found above to be predicted by cognitive ability, does not further predict any of the access modes ( $p > .05$ ). The fact that the effect of social trust on likelihood to co-own a car with one’s spouse is insignificant ( $\beta = +.05$ ,  $SE = .12$ ,  $p > .10$ ) in turn implies that spouses may have reasons for co-ownership other than social trust (e.g., tax or insurance benefits). Regarding likelihood to borrow, the survey results are also in line with the field study. They show that while social trust predicts likelihood to borrow a car from a person other than one’s spouse ( $\beta = +.34$ ,  $SE = .16$ ,  $p < .05$ ), financial standing has an even greater negative effect thereon ( $\beta = -.38$ ,  $SE = .14$ ,  $p < .01$ ).

In summary, the survey data provided evidence consistent with the field study: of all the alternative psychological mechanisms or constructs, only social trust acted as a significant mediator between cognitive ability and consumer choice of the social exchange-based access modes of co-ownership and leasing. In the survey, these effects were significant only for leasing and co-ownership with an individual other than one’s spouse, whereas in the field data, we were unable to directly analyze whether a co-ownership occurred with one’s spouse or another household member. Thus, a conservative conclusion, based on both studies, is that intelligence and co-ownership are associated for co-ownerships with both consumers external to one’s household and ones within it, but not necessarily with one’s spouse. Of the circumstantial mechanisms, the survey confirmed that the consumer’s financial standing acts as a complementary mediator between intelligence and the access mode choice. Yet the survey study did not confirm that the other circumstantial mediator of the field study, tendency to save, would act as a significant mediator. However, the survey study’s purpose and advantage lay first and foremost in the direct psychographic measurement of the psychological mediators—the survey measures related to the consumer’s financial standing and economizing behavior involve more error (due to, e.g., the potential sensitivity of the income-related questions to respondents). This may have rendered the effects of the latter less significant in the survey study, especially considering the small sample size.

## DISCUSSION

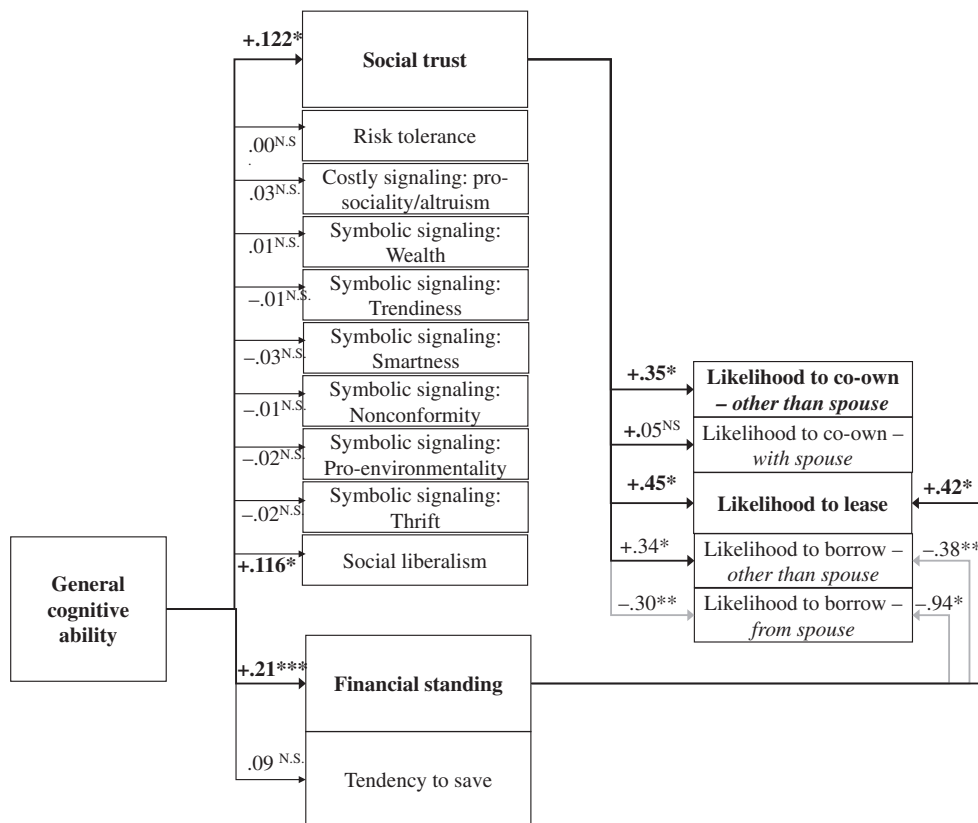
### Implications for and Contributions to Theory

In summary, this study provides large-scale empirical evidence of a strong positive correlation between consumers’ cognitive ability and choice of co-ownership and leasing of goods, as well as a weak positive correlation between cognitive ability and borrowing of goods. Furthermore, several analyses based on the field data and follow-up survey data suggest that the positive correlation between intelligence and inclination to choose co-

With these SEs, could be smaller

FIGURE 4

## SURVEY STUDY RESULTS



NOTES.— \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$  (one-sided). The effects of general cognitive ability on the mediating variables are estimated with a series of linear regression analyses, with each mediating variable serving as dependent variable in one regression. The effects of the mediating variables on the likelihoods to co-own/lease/borrow (vs. sole private ownership) are estimated with a separate multinomial logit model (as in the field study). To simplify the figure, effect arrows of such mediating variables that are not significantly predicted by general cognitive ability (i.e., all other mediators than social trust and financial standing) are not included in the figure. Regarding social liberalism, which was significantly predicted by cognitive ability ( $b = .12$ ,  $p < .05$ ), The effects to the access mode choices on the right are not depicted either, because they were all statistically insignificant.

ownership and leasing, in particular, may be explained by the association between individuals' intelligence and their predisposition to have social trust in other people and institutions. In addition, the correlations were complementarily explained by the consumer's financial standing (in both field data and survey data) and tendency to save (in field data). That is, intelligence increases the chances that the consumer has a stronger financial standing as well as generally prefers choices leading to economic savings, and a stronger financial standing and savings tendency in turn increase the consumer's inclination to choose co-ownership and leasing (whereas the former also decreases the inclination to borrow). At the same time, the analyses show that smarter consumers' preference for these social exchange-based access modes is not likely to be explained by

alternative psychological mechanisms such as risk tolerance, symbolic signaling, or altruism.

With these results, our research contributes to three literatures. First, our findings extend the literature on consumers' choice of access modes (Bardhi and Eckhardt 2012; Belk 2010; Blau 1964) by providing the first large-scale empirical quantification of smart consumers' choices of social exchange-based access modes to goods (i.e., co-ownership, leasing, and borrowing) over access modes that involve relatively little social exchange (e.g., sole private ownership, financing). While prior research has conceptually suggested that social exchange-based access modes may represent a smart way to obtain access to consumption goods (Bardhi and Eckhardt 2012; Eckhardt and Bardhi 2016), large-scale empirical evidence for this presumption



was lacking to date. We also contribute to the more specific literature that explores consumer preferences for access modes in the realm of the sharing economy in particular (Bardhi and Eckhardt 2012; Chen 2009; Lamberton and Rose 2012; Moeller and Wittkowski 2010; Scaraboto 2015). Previous studies suggest that attitudinal motivations and situational needs (e.g., convenience-seeking, environment consciousness, trend orientation) elicit preference for social exchange–based access modes and consumption. We add large-scale empirical evidence that a consumer’s fundamental cognitive abilities can also impact these preferences.

We also contribute to the literatures by theorizing and finding supportive empirical evidence for the notion that social trust the primary psychological mechanism underlying the association between intelligence and social exchange–based access mode choices. Thus, our research essentially confirms the speculation by Lamberton and Rose (2012) that trust will be a “key determinant of participation in collaborative consumption” (113). Nevertheless, whereas Lamberton and Rose (2012) could not empirically confirm the effect of trust,<sup>9</sup> our large-scale field study and follow-up survey provide evidence of social trust as the mechanism linking intelligence with the choice of social exchange–based access modes. At the same time, our finding that altruism is unlikely to be the primary psychological mechanism explaining the effect of intelligence on choices of social exchange–based access modes also echoes the results of prior work (Bardhi and Eckhardt 2012; Scaraboto 2015). Likewise, our finding that the association between intelligence and access mode choice is also partially mediated by the consumer’s tendency to save is similar to those of prior research, too. Notice, however, that in our results, social trust is also likely to incorporate some trust in economic savings, as in our perspective trust not only refers to the communal reward of sense of belonging (cf. Scaraboto 2015), but also to joint economic benefits or savings yielded by the (social) exchange.

Second, this research adds to the emerging literature stream in behavioral economics, studying the effects of intelligence on consumer choices in various domains of life. Prior research in this literature has focused on the rather self-evident effects of consumer intelligence on, for instance, better investment choices (Grinblatt et al. 2011, 2012), better debt management choices (Li et al. 2015), or choices involving both pro-environmental and economic benefits (Aspara et al. 2017). Our results demonstrate that intelligence is also associated with—less self-evidently—consumers’ choice of co-owning and leasing of goods.

Third and finally, our research adds to literature on evolutionary psychology and biology by identifying a new

manifestation of the link between human intelligence and our ability to socially adapt to situations that allow us to increase our fitness with the environment (Blau 1964; Cosmides et al. 2010)—both in familiar contexts (Kaufman et al. 2011) and in new ones (Kanazawa 2010; Kaufman et al. 2011)—through social cooperation. Our research extends this literature by providing new evidence of this link at the individual level, in the contemporary context of consumption behavior related to the social exchange–based modes of co-ownership, leasing, and borrowing. Prior literature had mainly theorized and established this link only at the level of human species in general (Nowak and Sigmund 2005; Pinker 2010).

### Implications for Practice

Our results have important implications for service providers that offer services and platforms for social exchange–based access of consumption goods, such as providers of lending, leasing, and rental services, as well as providers of brokerage platforms that match consumers interested in co-ownership of goods. As our results suggest that consumers with a higher cognitive ability have a natural predisposition to prefer co-ownership and leasing solutions, service providers may find it worthwhile to consider such consumers as a key target group for their offerings. Equally important, service providers should make the benefits of social cooperation more salient and understandable even to consumers with lesser cognitive abilities. To this end, communications to such consumers should clearly pinpoint and explain that social exchange–based access fosters a social relationship with another consumer or company, and is a “win-win” in terms of both economic savings and communal benefits. Further, consumers of lesser cognitive ability could also be provided with services that enforce their social trust through tangible means, such as service guarantees in leasing contracts.

Our findings also have implications for public policy makers, who aim to enhance the resource efficiency of people’s lifestyles and consumption practices in order to alleviate environmental burdens. Compared to sole private ownership, social exchange–based modes of access to goods enable more efficient use of resources, as they reduce the need of each consumer to individually own goods. Our results imply that by providing platforms for social exchange–based transactions that take into account consumers’ differential cognitive abilities, policy makers may be able to increase consumers’ interest in and adoption of such social exchange–based access modes. Furthermore, policy makers may set up decision-making support tools to complement and enhance consumers’ cognitive skills, when it comes to their consumption choices. For example, policy makers can introduce public domain websites featuring tools that allow consumers to easily calculate and visualize the benefits of social exchange–based access

<sup>9</sup> Lamberton and Rose (2012) address and measure trust only toward other bike renters, not toward the exchange party, which may explain the insignificant effect.

modes to goods, as well as to contrast them with the traditional, private ownership options.

### Limitations and Avenues for Future Research

Our research has certain limitations, which also offer directions for future research. Our data focus mostly on rather traditional versions of social exchange–based access modes, such as long-term co-ownership, leasing, and borrowing. With the rise of the sharing economy, new versions of social exchange–based access modes keep emerging, such as short-term rental of cars through online platforms or clubs (Eckhardt and Bardhi 2016; Rudmin 2016), peer-to-peer rental through brokerage platforms (Moeller and Wittkowski 2010), and even combinations of several access modes (e.g., renting out a car that one has leased from a company to another consumer; Lanctot 2016). Thus, future research should expand our understanding by empirically examining whether smarter consumers would also prefer the newer, short-term versions of social exchange–based access modes—just as they were found to prefer the long-term co-ownership, leasing, and borrowing options in this study.

Our research and data are restricted to two geographic regions (field data: Finland; survey data: the US), and we invite future research to explore the relationship between intelligence and social exchange–based access modes in other countries. Countries of more collectivist cultures would be especially important to study. For instance, choice of social exchange–based access modes in Asian countries may not be as strongly explained by people's cognitive ability, but may also be a result of their collectivist cultural orientation (Belk 2010).

Another area for future research is to explore the association between intelligence and social exchange–based access modes, and the underlying mechanisms in contexts other than cars. After all, cars are rather special consumption goods due to their high purchase and usage costs as well as high durability. Future research could especially delve into the role of social trust in smart consumers' choices for social exchange–based modes of access to goods with lower durability, shorter life cycles, and lower purchase costs. On one hand, with goods of lower durability, the focal consumer's social trust in the co-owning counterparty may play an even more important role than in the case of more durable goods such as cars. This is because the consumer needs to be able to trust that the counterparty retains the good in decent condition despite the low durability. On the other hand, smart consumers' decision to co-own goods that allow for only a short duration of use, such as children's toys, may also be motivated by factors other than social trust, such as their desire to minimize environmental damage (Ozanne and Ozanne 2011).

Furthermore, we invite future researchers to explore whether psychological mechanisms other than the ones

studied in this research play a role in the association between intelligence and consumers' choice of social exchange–based access modes. For instance, studies imply that consumers sometimes choose consumption behaviors that do not conform to perceived standards of appropriate behaviors, in order to attain higher status (Bellezza, Gino, and Keinan 2014). Hence, smart consumers' choice of an unconventional social exchange–based access mode might also be explained by their desire to deviate from normative consumption modes. Also, somewhat contrary to our findings, prior studies (Bardhi and Eckhardt 2012; Lamberton and Rose 2012) suggest that consumers' use of platforms that allow short-term rental/borrowing access to goods may not be explained by trust they have in other renters/borrowers of the same service provider's goods. Therefore, more research is needed to examine whether intelligent consumers' social trust in other renters/borrowers, specifically, may also underlie their preference for such social exchange–based access modes and platforms, beyond the generic social trust studied in the present research. Such short-term rentals and borrowings tend to involve few personal interactions with other renters and borrowers of the goods, or may even be anonymous (Bardhi and Eckhardt 2012). Thus, circumstantial aspects may play a more important role than social trust in smart consumers' choices of short-term rental or borrowing solutions.

Acknowledging the limitations of our field data (e.g., focus on traditional, long-term versions of social exchange–based access modes; mere indirect evidence of psychological mechanisms) and survey data (e.g., low observed share of certain social exchange–based access modes; potential memory and social desirability bias among respondents), we also urge future research to utilize complementary research designs and data collection projects (e.g., qualitative or ethnographic data) to investigate whether other mechanisms than the consumer's social trust, financial standing, and tendency to pursue savings could underlie the effect of intelligence on the choice of social exchange–based access modes. Especially, future studies are needed to determine the extent to which intelligent consumers' willingness or ability to maximize their economic and/or convenience benefits (Bardhi and Eckhardt 2012) may also explain their choices of social exchange and trust-based access modes—that is, to what extent is social trust in fact trust in the economic benefits one obtains from the social exchange, and to what extent is it trust in the communal benefits one obtains from the social exchange (sense of belonging).

In conclusion, our results suggest that a “sharing-dominant logic” exists in car markets at least, in the sense that smart(er) consumers are inclined to rely on social exchange–based access modes to obtain access to these goods. The explanation advanced for this in this research is that intelligence enhances consumers' trust in other individuals and institutions, and thereby in both the economic

and communal rewards of cooperative sharing. In the bigger picture, the fact that human intelligence levels are increasing over time (Jokela et al. 2017) gives us a reason to believe that the institutional logics of the entire market economy may become more sharing-dominant over time, too. Accordingly, future research may also inquire into the market-level evolution of such sharing-dominant logics, to complement prior studies on the evolution of “service-dominant logic” (Vargo and Lusch 2004).

## DATA COLLECTION INFORMATION

Data collection and compilation for the (a) field study was technically performed by the governmental research agency Statistics Finland in 2014, following a request for data and data compilation instructions from the first author. According to the instructions of the first author, Statistics Finland compiled the final data sets based on raw data obtained from other governmental sources: the Finnish

Defense Forces, Finnish Vehicle Administration, Finnish Tax Authority, and Finnish Population Register Center. Additional field data on the political election results were compiled and merged with the original data set by Statistics Finland in 2017, following instructions from the first author. The first and second authors together planned the specific analyses on the field data, as reported in this article. The first author, supported by the second author, implemented the statistical analyses on the field data, through a remote connection to the data storage of Statistics Finland. The first and second author together performed interpretation of the results. Data collection for the second survey was designed by the second author, supported by the first author, in 2017. The second and first authors together planned the analyses on the survey data. The first author, supported by the second author, implemented the statistical analyses on the survey data. The first and second author together performed interpretation of the survey results.

## APPENDIX: SURVEY STUDY MEASURES

Variable	Operationalization	Source	$\alpha$
<b>Focal predictor variable</b>			
General cognitive ability	Self-reported scores <ul style="list-style-type: none"> <li>• SAT math</li> <li>• SAT verbal</li> <li>• GPA</li> </ul>	Chen et al. (2013)	.70
<b>Alternative psychological mechanisms/Mediating variables</b>			
Social trust	<ul style="list-style-type: none"> <li>• "To what extent do you feel you can trust other people that you interact with in your daily life?" (anchored by 1 = "very little" to 7 = "very much").</li> </ul>	Rand et al. (2012)	
Risk tolerance	<ul style="list-style-type: none"> <li>• "Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?" (anchored by 1 = "Unwilling to take risks" and 7 = "Fully prepared to take risks")</li> </ul>	Rand et al. (2012)	
Costly signaling via altruism/prosociality	<ul style="list-style-type: none"> <li>• "I share things I like with my friends"</li> <li>• "I try to help others"</li> <li>• "I am gentle"</li> <li>• "When I see a sad person, I try to make him/her happy"</li> </ul>	Caprara and Pastorelli (1993)	.81
Symbolic signaling:	"I have chosen this particular way of accessing a car, because it indicates to others..."	Own	
• wealth	... "that I am wealthy"	Own	
• trendiness	... "that I am going with a trend"	Own	
• smartness	... "that I am smart"	Own	
• nonconformity	... "that I am doing something others do not do"	Own	
• pro-environment	... "that I am caring about the environment"	Own	
• thrift	... "that I am frugal"	Own	
Social liberalism	<ul style="list-style-type: none"> <li>• "I tend to vote for liberal political candidates"</li> <li>• "I believe that there is no absolute right or wrong"</li> <li>• "I believe laws should be strictly enforced" (reverse-coded)</li> <li>• "I tend to vote for conservative political candidates" (reverse-coded)</li> </ul>	Hirsh et al. (2010)	.86
<b>Alternative circumstantial mechanisms/Mediating variables</b>			
Financial standing	<ul style="list-style-type: none"> <li>• Self-reported financial standing in terms of yearly income</li> </ul>		
Tendency to save	<ul style="list-style-type: none"> <li>• "I have chosen this particular way of accessing a car, because..."</li> <li>• ... "it enables me to really save money in the long term"</li> <li>• ... "I got a good long-term deal"</li> <li>• ... "it allows me to spend less in the long term"</li> </ul>		.88



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