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Online information seeking patterns and social inequality in a digital economy

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ABSTRACT

This article aims to map the information-seeking habits of population groups in a digital economy. The growing use of technologies in the modern online era has increased the availability of information regarding services and items through user-generated content and applications. However, the potential for leverage through ICTs may not be evenly distributed across different consumer segments. We use population-level survey data used as the basis for the official statistics in Finland to find differences according to gender, age cohort, education, income and residential area. The results show that Finns are active in using different channels of information acquisition. We found significant differences in how information is obtained between population groups. Men and younger cohorts are more accustomed to using a variety of services and sources for seeking out information. The results also highlighted educational differences that have been rooted in the Finnish information society. Using a nationally representative data, the article points out digital inequalities linked to potential differences in consumer benefits.

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Platforms; online consumers; digital inequality; population survey

Introduction

The marketplace is at the core of society, where participants carry out consumption patterns based on perceived needs. As technology continues to evolve at a quickened pace, so too have the methods available to consumers for carrying out purchasing decisions in everyday life. The Internet has taken a strong hold in mediating how and what people buy. The growing use of technologies in the modern online era has exponentially increased the availability of user-generated content and how that content is consumed (Kaplan and Haenlein 2010). Both sides of the supply and demand equation have transitioned to the online space with the progression of digitization, especially in mature ICT societies such as Finland (Floridi 2016) where participating in the online economy is, for many, a normal part of life.

It is clear that the online environment has been revolutionary in terms of mediating consumption and purchasing decisions by facilitating the marketplace in three primary ways. First, the online setting allows for highly effective communication concerning products, services, or user experiences (Elms, De Kervenoael, and Hallsworth 2016;

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Lissitsa and Kol 2016). Second, the Internet fosters a user marketplace experience that is not limited to physical space and as such can enhance customer interactions with product suppliers, other customers and resources to better inform purchasing decisions (Pappas 2016; Lissitsa and Kol 2016). Third, the Internet brings a high level of customer convenience by making transactions more efficient than is possible offline between purchasers and retailers (Lissitsa and Kol 2016). Thus, the ways in which consumption is facilitated online have continued to develop in order to make purchasing easier, while the resources available to consumers to inform better decision making according to personal preferences have continued to grow as well.

However, it is possible that this empowerment of the consumer through ICTs is not taken advantage of equally, leaving others worse off, especially in cases where the marketplace has shifted entirely to the online environment. With the significant consumer benefits linked to the digital marketplace comes the risk of inequality within advanced societies among those who have not transitioned their purchasing habits online. Despite the wide scale adoption of participation in the digital economy through product research through peer reviews, placing orders or seeking out better prices, population level research assessing how the benefits of digital economy participation are distributed is scarce.

As such, this article aims to provide a novel look into how the benefits of participation in the digital economy are distributed in a modern ICT society to assess possible inequalities among population groups, especially among those who are less active in the online environment and therefore in its marketplace. The focus here is on Finland, which has one of the highest Internet penetration rates at a population level in the world (Eurostat 2017), and 50 percent of whose population participates in the digital economy in terms of making online purchases (OSF 2018). This study provides a nuanced look into this participation by assessing the population as a whole while controlling for various background variables and analyzing the prominence of taking advantage of key benefits of the online marketplace. We examine not only variations in buying goods and services online, but also which online platforms consumers use when searching for information on their online purchases. The results of the study thus provide a new perspective on potential digital inequality between population groups while also linking popular use-purposes in the online marketplace to socio-demographic characteristics.

Literature review

The digital economy

As the marketplace has transitioned into the online space, a variety of overlapping components make up this relatively new digital economy that has yet to be clearly defined (Schor 2017). Generally speaking, the digital economy is made up of all marketplace activities involving transactions of buying and selling that are mediated by ICTs and therefore the Internet. In past research, various categories within this digital marketplace have emerged to further characterize the types of transactions and related interactions that are possible. The digital economy is illustrated in Figure 1, showing two primary categories along with the area of overlap between them. The figure includes the dynamic boundaries between consumers and producers online, in addition to key characteristics of the online market environment for both buyers and sellers.

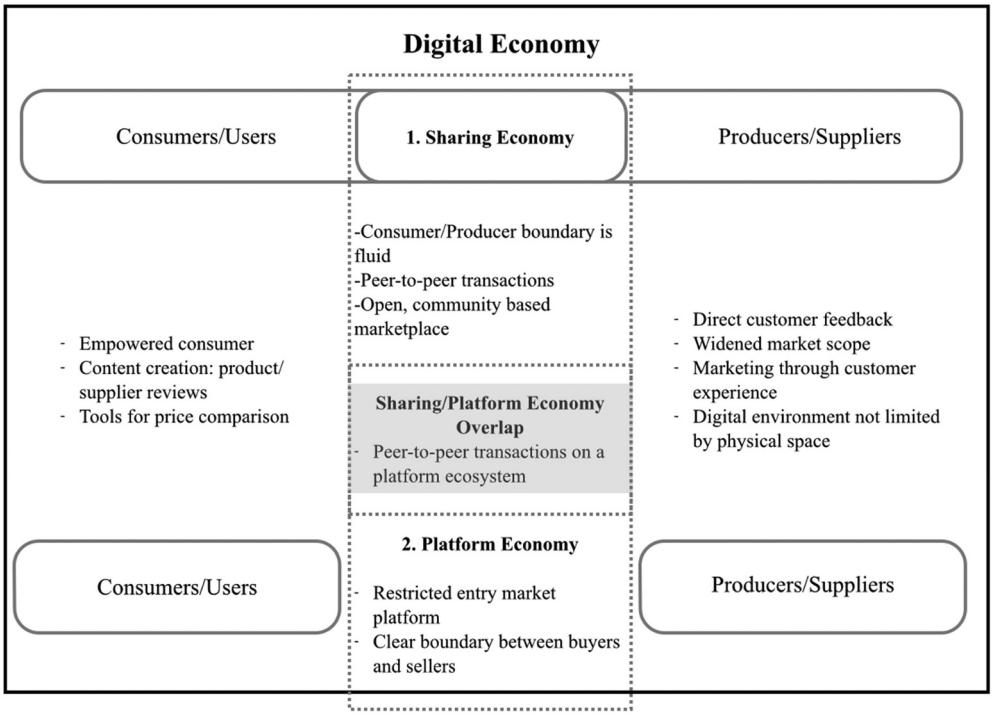

Figure 1. The digital economy as a marketplace.

The platform economy, a key recent development within the digital economy online, is made up of platform business models, perhaps the most widely known of which are Google and Facebook, which provide an infrastructure on which other platforms can be built (Schor 2017). These market platforms include retail such as Ebay and the Amazon marketplace, travel such as Airbnb, and transportations such as Uber. The popularity of platform-based transactions has skyrocketed in the past decade, with these product and service providers requiring users to sign up and join the service to enter the self-enclosed marketplace ecosystem (Schor 2017). Notably, these platform economy providers are highly dependent on user reviews in terms of customer feedback of both sellers and suppliers through product experiences themselves. As such, the user experience involves a great deal of research potential due to the peer-created experience content created for the benefit of other users on these platforms toward informing better purchasing decisions.

The sharing economy is a second component of the digital marketplace that overlaps with the platform economy, as many product or service providers are difficult to definitively classify. The sharing economy is a peer-to-peer-based transaction environment involving goods and services and is coordinated through the Internet (Frenken & Schor 2017). This component of the digital economy is based on collaborative networks of users involving various forms of community, shared interests and commerce or sharing (Acquier, Daudigeos, and Pinkse 2017; Botsman and Rogers 2010). Here, participants are in direct contact with peers in trading, selling and purchasing goods and services. Notably, the overlap with the platform economy is significant at times; for example, individual users can sell on platforms alongside large companies under the framework

of a larger digital marketplace provider such as Ebay or Amazon marketplace. As such, the specific digital marketplace definition is determined to a large degree by the form of the transaction and the parties involved, sometimes regardless of the online setting involved.

Digital divides

The proliferation of the online marketplace has been dramatic, which has been in line with the spread of ICT use globally. In past research, closer to the early phases of social media development, a great deal of attention was paid to differences in technology use among various population groups within society. As new technologies are introduced to population groups, there are typically differences in access and consumption within society (Rogers Everett 1995). However, as wide scale adoption takes place, the level of access inequality diminishes in the market, and therefore previously limiting socio-demographic factors lose their influence on novel forms of consumption (Räsänen 2006; van Dijk 2005). Here, limited access is the key factor in determining damaging inequality among various population groups (van Deursen and Van Dijk 2011). In the case of the digital economy, this would mean a lack of access to the online marketplace itself and thus complete exclusion from the possibility of making transactions therein.

Inequalities in access have tended to diminish in terms of ICT use since the advent of social media (see Greenwood, Perrin, and Duggan 2016; Eurostat 2017; Perrin 2015), but digital divides can appear in a secondary way, namely through differing skills and Internet use purposes (Hargittai 2002; van Deursen and Helsper 2015). A growing body of research has identified new areas of inequality caused by 'second-level digital divides', where there are significant differences in ICT skills or competence necessary for effective use of its benefits in daily life and linked to various socio-demographic characteristics (van Deursen and van Dijk 2014). Findings have shown that wealthier and more highly educated portions of the population tend to have improved access to new technologies and to be more experienced in their use (e.g. DiMaggio and Hargittai 2001; Schradie 2011; van Dijk 2005; van Deursen and van Dijk 2014).

As such, access to the online market place does not guarantee equality in terms of benefits available therein for saving time, money and becoming informed about relevant suppliers, producers, products or services. User reviews provide potentially valuable information for buyers about quality, value and trustworthiness of products, platforms and suppliers. While also reducing uncertainty, online price comparison methods facilitate maximally beneficial resource allocation and browsing a producer's online presence allows for a comparison between offline experience and digital transaction ecosystems.

Notably, inequalities in general ICT use in Finland have been well documented, throughout the wide scale technology adoption process in the nation. Since 2001, the proportion of individuals over the age of 15 years who had recently used the Internet has increased from 50% to 88% in 2016. This was accompanied by a diminishing of age group Internet use differences, though young people continue to be the most active online (OSF 2016). Given Finland's status as a mature information society due to the high level of technology adoption through mobile technology, computers and Internet use (Floridi 2016), its technology use trends can give insight to nations heading in the same direction in terms of technology consumption.

New social media platforms and other applications are regularly introduced to consumers. The younger and other savvy user groups often familiarize themselves with the new tools

early on. Central here is of course that socio-demographic differences among population groups continue to associate with Internet use-purposes, likely also in relation to the digital marketplace (Räsänen and Koiranen 2016). However, research on the secondary digital divides related to the digital marketplace in Finland has not yet been carried out and as such the focus this study is to delve into this new and highly relevant area of societal evolution to better understand potentially significant sources of inequality.

Research design

The goal of this study is to provide new insight into how various population groups use the online setting for transactions, namely in the digital marketplace, and how any differences may be linked to socio-demographic factors. We first look at the probabilities of online shopping for different socio-demographic groups. After that, we focus on information-seeking strategies of those who have made online purchases. This approach allows for a new perspective on possible societal inequalities in terms of how the benefits of the online marketplace are distributed in Finland. The approach is framed with the following research questions:

(1) Who are the most likely population groups to buy items or services online?
(2) What kind of socio-demographic differences exist among those who have ordered or purchased items or services online, in terms of:

a. How often have they visited manufacturers' or service providers' websites?
b. How actively have they used online price comparison sites or applications?
c. How often have they spent time reading online peer-reviews?

We provide the following hypotheses regarding the research questions. First (H1), we expect to find notable socio-demographic disparities in the probability of making online purchases. The most notable differences likely exist in terms of age, income and education. Past research focusing on consumer behavior, both offline and online, show persistent findings according to which high level of education and income correlate with higher amounts of consumer expenditure (e.g. Rastogi 2010a; Räsänen 2006). At the same time, the effect of age is likely the opposite. Many preceding studies indicate that younger generations spend a greater share of their expenditure online when compared to older ones (e.g. van den Poel and Buckinx 2005; Isa, Salleh, and Aziz 2016). Additionally, area of residence may have an impact on the probability of making online purchases, since urban dwellers tend to spend more money on services than those who live outside of urban areas. Here, we do not expect to find strong gender effects even though men can be slightly more active spenders than women. Preceding research shows that men spend somewhat more money and time online than do women (e.g. Lim and Ting 2014; Sakkthivel 2009; Suki and Suki 2017).

Second (H2), we assume that socio-demographic background associates with the probability of visiting manufacturers' or service provider's webpages, using price comparison tools, and reading peer-reviews online. We assume that a high level of education and income as well as younger age increase the likelihood of seeking information about the products or services on various platforms. Men and urban dwellers are also more likely to find additional information than women and those living outside of urban areas. A recent study from Finland showed that especially education and age associate with the frequencies of conducting general

information searches online (Ertiö and Räsänen 2019). In particular, there is variation in how Finns make use of health information found online. The study showed that younger demographics, those with higher levels of education and income, and inhabitants of big Finnish cities associate with seeking health information online. Similar findings, showing the persisting socio-demographic disparities in utilizing available online information, have also been reported elsewhere (e.g. van Deursen & van Dijk 2014; Schmitt, Debbelt, and Schneider 2018).

Our findings are expected to align with previous findings. However, while our assumptions are based on preceding research focusing on individual activities, such as online buying and information-seeking, we do not know how well our hypotheses will be supported when analyzing different forms of engaging in digital consumer platforms.

Data and methods

Data

We used data based on a survey called 'Use of information and communications technology by individuals (UICT)' collected by Statistic Finland. The yearly survey assesses the commonality of technology and online platform use, the frequency of use, diversity, use purposes, use locations, and online shopping. The survey is used as a basis for the official statistics of Finland. The clear advantage of this is that the data have been complemented with the register-based information, which reduces missing responses on demographic variables and thus improves the quality of data.

We used the sample collected in 2016. During that year, the survey had a particular module including questions regarding the use of platform economy services. The sample was targeted to Finnish citizens aged 16–89 and was gathered from the population register by using a simple random sampling method; the sample size was 4850. The responses were collected with a mixed-mode method, as those aged 16–69 could choose whether they would respond online or through a telephone interview. 70–89-year-olds participated through telephone interview. The total response rate was 53% as the final data included 2575 respondents. 32% of respondents (N = 826) responded through the online form, and 68% (N = 1,749) gave a telephone interview.

The data were post-adjusted to correspond to the population distributions with the weight variables, while also considering the non-response bias error. In the formation of weight variables, the data were tabulated with the population distributions by gender, age, education, native language, region, and municipal grouping.

Measures and analytical techniques

First, we filtered those who had never bought items or services online, while we also estimated the likelihood of online shopping for different demographic groups by using logistic regression. The initial question was 'Have you ordered or bought something for your own or household use via the Internet during the last 12 months?' It was specified that ordering is a commitment to trade and buying did not depend on the payment method, which can also take place outside of the web. The responses also include purchases from auction pages.

The question was presented solely for those who had used the Internet at least sometimes in the 12 months. In order to obtain the population-level estimations, we

also considered those who had not used the Internet by grouping them with those who had not made purchases online at all. We present the results of the analysis as predicted probabilities and odds ratios with the standard errors and statistical tests.

In the second stage, we targeted those who had bought items or services online. By using three different variables, we evaluated whether respondents use different sources in searching for information about the services and products that they have purchased online. The questions had focussed on online purchases or orders made in the last 12 months. First, we analyzed whether online-buyers have searched for information about products or services via official Internet pages of stores, product manufacturers or service providers. Secondly, we analyzed if online-buyers used price or product comparison sites or applications. Finally, we analyzed whether online-buyers used peer-review pages to find information about products or services. We had labelled the variables as 'Official sites', 'Comparison sites', and 'Peer-review sites,' respectively.

Respondents gave their responses via a four-point scale, in which 1 was 'Never', 2 'Seldom', 3 'Sometimes' and 4 'Always'. In the multivariable analysis, we used ordinal logistic regression (OLR) to predict the likelihood of using platform services while considering the intensity of usage. The OLR is a suitable method for analyzing ordinal variables as it assumes that the relationship between each group of independent variables is the same; this is called the parallel regression assumption or proportional odds assumption, in which it is essential that the size of the coefficients between groups of independent variables are the same, irrespective of what categories are examined (Long and Freese 2006). In preparation of ordinal regression models, we employed Brant tests and found that age, education and income did not meet the parallel lines assumptions in relation to each dependent variable. To avoid an incorrect interpretation of the results, we conducted robust checks for the final models by constructing generalized ordinal regression models (Williams 2016). The results of analyses are shown in the Appendix. In the body text, we present the table displaying the results of OLR as proportional odds ratios.

In terms of independent variables, we analyzed a set of variables consisting of respondents' gender, age, education, income, and residential area. We assessed age as a cohort variable, where birth range classes were organized as 1926–51, 1952–61, 1962–71, 1972–81, 1982–91, and 1992–00. The oldest cohort (born prior 1952) covers those aged 65 and over. While this age group combines many age categories, such as under 70-year-olds and over 80-year-olds, the classification serves well our analytic purposes. First, the classification enables us to include enough responses from older citizens who have made online purchases. Second, by the age 65, most Finns are already retired (OSF 2020). We categorized respondents' education into five groups according to whether he or she had completed primary, secondary, upper-secondary, bachelor or at least master-level education. We assessed the effect of income level using variable reporting in which income quartile respondents are placed in the population level. We categorized information on respondents' place of residence according to current domicile either as metropolitan (Helsinki area), other city areas (over 80 000 inhabitants), town or countryside.

We performed the analyses with Stata (version 15) by utilizing the user-written packages, such as gologit2 to run generalized ordinal regression (Williams 2006), and coefplots (Jann 2014) with blindschemes (Bischof 2017) to illustrate the results in figures.

Table 1. The descriptive statistics of the applied variables.

Variables	N	%
Dependent		
Buying items or services online during the last 12 months		
Yes	1475	57.3
No	1101	42.7
Source of information: Producers' sites *		
Never	110	7.5
Seldom	195	13.2
Sometimes	461	31.3
Always	708	48.0
Source of information: Price comparison sites and applications **		
Never	343	23.3
Seldom	253	17.2
Sometimes	488	33.1
Always	390	26.5
Source of information: Peer-reviews ***		
Never	253	17.2
Seldom	194	13.2
Sometimes	540	36.6
Always	487	33.0
Independent		
Gender = 1, Men	1241	48.2
Gender = 2, Women	1335	51.8
Cohort = 1, 1926–51	842	32.7
Cohort = 2, 1952–61	478	18.6
Cohort = 3, 1962–71	375	14.6
Cohort = 4, 1972–81	328	12.7
Cohort = 5, 1982–91	297	11.5
Cohort = 6, 1992–00	256	10.0
Education = 1, Primary	671	26.1
Education = 2, Secondary	973	37.8
Education = 3, Upper secondary	294	11.4
Education = 4, Bachelor	316	12.3
Education = 5, Master	322	12.5
Income = 1, 1st quartile	479	20.2
Income = 2, 2nd quartile	559	23.5
Income = 3, 3rd quartile	714	30.1
Income = 4, 4th quartile	623	26.2
Residence = 1, Rural	477	18.5
Residence = 2, Town	567	22.0
Residence = 3, City	741	28.8
Residence = 4, Metropolitan	791	30.7

* 'When buying online have you read the Internet pages of different stores, manufacturers of products or service providers?'

** 'When buying online have you used price or product comparison sites or applications?'

*** 'When buying online have you read customer reviews of products or services on blogs or elsewhere on the Internet?'.

Table 1 shows the initial questions for dependent variables and the descriptive statistics of all applied variables.

Findings

We began the empirical study by analyzing the likelihood of online buying. Figure 2 and Table 2 show the results of logistic regression analysis. In the examined adult population, the likelihood of online buying is high, 0.69. When it comes to population differences, we first assess the non-standardized results that directly indicate how the population groups differ in making online purchases.

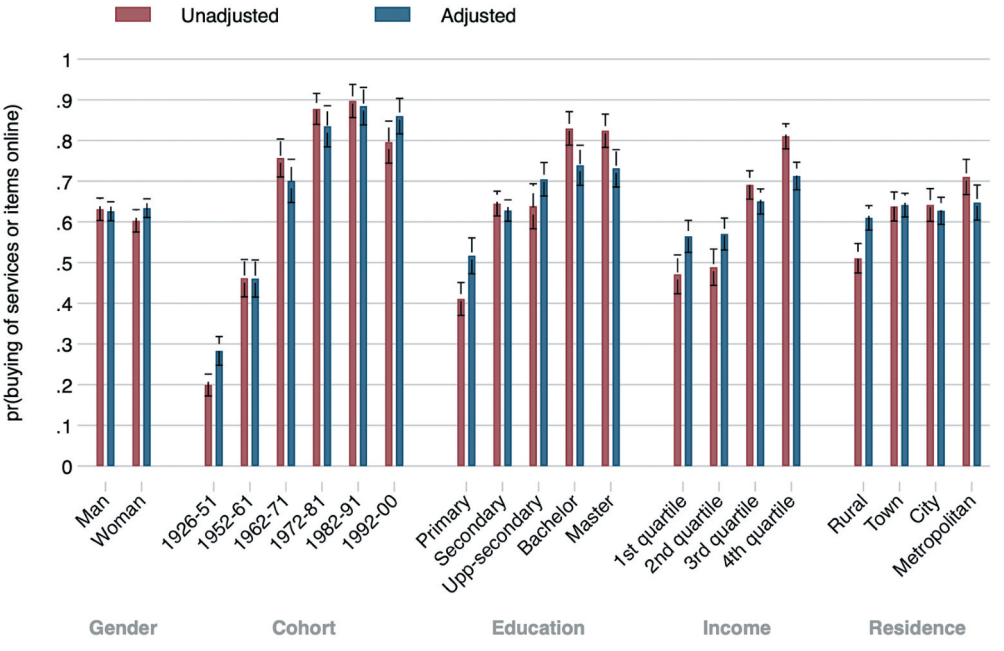

Figure 2. Probability of buying items or services online (unadjusted and adjusted population level estimations from the logit models presented in Table 1).

Table 2. Likelihood of buying of items and services online. Population-level odd ratios with standard errors.

Dependent variable: Probability of buying online	Unadjusted effects		Adjusted effects	
Predicting variables	OR	SE	OR	SE
Men	a		a	
Women	0.89	(0.08)	1.06	(0.13)
Year of birth: 1926–51	a		a	
1952–61	3.45***	(0.44)	2.39***	(0.34)
1962–71	12.53***	(1.95)	7.47***	(1.27)
1972–81	28.88***	(5.77)	17.31***	(3.83)
1982–91	35.04***	(8.47)	26.89***	(6.91)
1992–00	15.69***	(2.88)	21.30***	(4.72)
Education: Primary	a		a	
Secondary	2.61***	(0.28)	1.98***	(0.31)
Upper secondary	2.53***	(0.38)	3.30***	(0.65)
Bachelor	6.99***	(1.20)	4.23***	(0.97)
Master	6.72***	(1.12)	4.00***	(0.87)
Income: 1st quartile	a		a	
2nd quartile	1.07	(0.14)	1.04	(0.17)
3rd quartile	2.51***	(0.32)	1.73***	(0.28)
4th quartile	4.80***	(0.68)	2.65***	(0.48)
Residence Rural	a		a	
Town	1.69***	(0.18)	1.24	(0.18)
City	1.71***	(0.20)	1.12	(0.17)
Metropolitan	2.35***	(0.30)	1.29	(0.24)
Observations			2,374	

Robust standard errors in parentheses
*** p < 0.001, ** p < 0.01, * p < 0.05.

We did not find a difference between genders. Instead, online buying varied significantly across the age groups. The four youngest cohorts were mainly active in online buying (probability varied between 0.80 and 0.95) and we found the clear gap between the oldest cohort and others. Equally, education continues to divide the population groups when analyzing online activities. We found that those who had achieved at least a college-level education (bachelor and master level) had over a 0.9 probability of buying online, and their odds ratio with the least educated group was almost 10.0 ($p < 0.001$). There were also significant differences between the income groups when the odds ratio between the top and bottom quarters was over 5.0 ($p < 0.001$). Finally, we found that residential area had a significant association with online buying, as all other groups differ significantly from those living in rural areas.

The standardization of the background variables slightly changed the interpretation, as the differences between population groups narrowed. However, the results continued to highlight the fact that the oldest age group are less likely buy online. In the case of educational differences, a significant gap found between those who had studied after the second degree and those who had not. The difference between the top and bottom income quarters halved but was still significant after the standardization. Finally, it was revealed that the residential differences exist mainly through other background variables, as we did not find significant differences between areas after the standardization of the background variables.

Next, we examined how online-buyers are looking for information on products and services when making online purchases. Figure 3 shows that Finns are relatively actively utilizing the official pages of producers, price and product comparison websites, and peer-review sites for making purchasing decisions.

Almost half of the online-buyers (47.9%) always look for information on the official websites of producers for making purchasing decisions. Over a quarter of respondents (26.3%) always used price and product comparison sites. Reading peer-review ratings is also relatively common as more than a third of online-buyers (34.1%) reported always doing that when buying online products or services.

We also analyzed in more detail which population groups seek information on products and services on the official websites of producers. Table 3 presents the results of the OLR. Direct effects indicate that the variation of the variable is dependent on gender, age, education, and residential area. An adjusted model confirms the results by showing that men are more inclined to seek information from the producers' official sites. The effect of age was found to be more explicit as the youngest cohort was the most active group.

Education was also found to be a crucial factor, but the differences were only evident between the least educated and others. Interestingly, the results showed a significant link between residential area and the dependent variable, as people living in the Metropolitan area had a high tendency to search for information on producers' official sites. The generalized model gave support for the interpretation of results assuming the parallel-lines assumption.

Next, we analyzed how different population groups use price and product comparison sites, and applications when making purchasing decisions. The results differ somewhat from Table 2. According to the adjusted model shown in Table 3, we found that only gender and education determine the use of comparison sites. Men were clearly more inclined to use these sites. In the case of education, respondents who had completed post-secondary education had a higher probability when compared to the primary educated. The generalized model

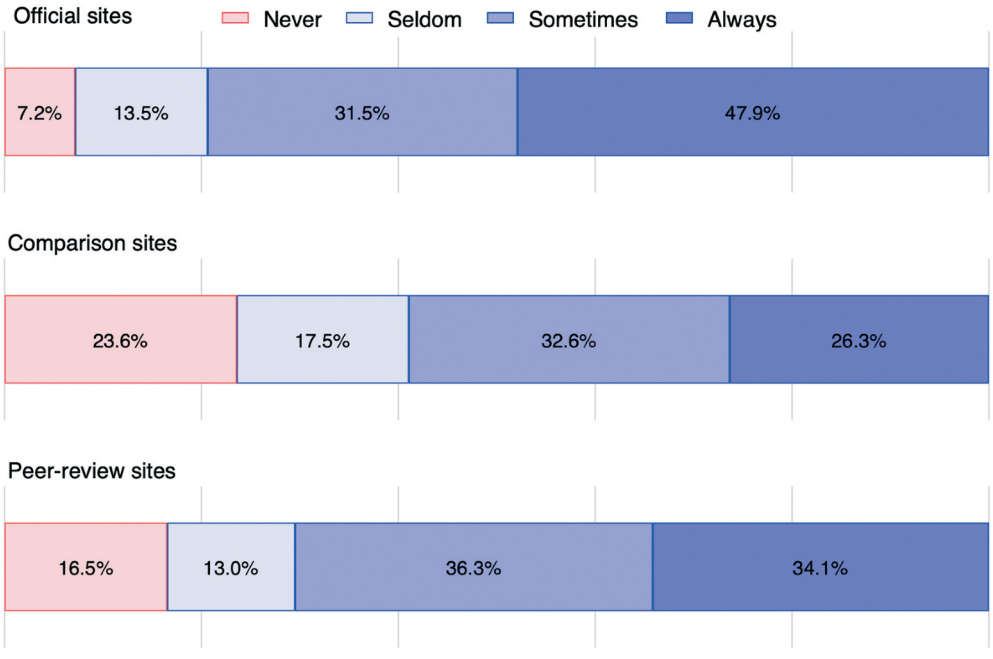

Figure 3. The use of different sources of information when buying online, estimated proportions of online-buyers.

shown in Appendix mainly compiled the same results as the parallel-lines model, but the effect of education was found to be different. In the generalized model, education effects were found for those who had achieved upper-secondary or bachelor level education, but the effect of master level was not significant.

Finally, we also examined how different demographic groups of online-buyers utilize peer-reviews when buying online. According to the direct associations, the variable was dependent on gender, age, education, and the residential area. The adjusted model confirms the interpretation of direct associations. Men were more inclined to use peer-reviews. The youngest cohort had a greater tendency to use peer-reviews compared to the oldest group. Educational differences were again highlighted by those who had completed only primary education and others. Additionally, we found that those who had completed a bachelor level were the most active information seekers. We also found a small effect of the residential area; people living in the metropolitan area had a significantly higher probability of using peer-reviews compared those living in rural areas.

We performed an additional test to examine the differences between socio-economic groups. Namely, this was the examination of whether or not there are constant patters of information seeking in online consumption among population groups. Figure 4 illustrates the results of models as predicted probabilities of always using a particular source of information when making online purchases. This figure offers us a more sophisticated test for the information-seeking patterns that different population groups have in their daily life. Overall, the figure confirms the interpretations in connection with Table 3. Although the observed variations are not necessarily very strong, the findings are clear. Different

Table 3. The propensity to use different sources of information when buying services and products online. Proportional odd ratios based on the ordered logit model.

	Source of information:											
	Official sites				Comparison sites				Peer-reviews			
Predicting variables	M1		M2		M1		M2		M1		M2	
	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE
Women	a		a		a		a		a		a	
Men	1.38***	(0.14)	1.52***	(0.17)	1.64***	(0.16)	1.75***	(0.18)	1.42***	(0.14)	1.47***	(0.15)
1926–51	a		a		a		a				a	
1952–61	1.25	(0.27)	1.11	(0.25)	1.41	(0.30)	1.39	(0.30)	1.38	(0.28)	1.23	(0.26)
1962–71	1.37	(0.30)	1.16	(0.26)	1.43	(0.29)	1.29	(0.27)	1.53*	(0.30)	1.31	(0.27)
1972–81	2.05***	(0.45)	1.70*	(0.38)	1.53*	(0.32)	1.38	(0.30)	2.27***	(0.45)	1.91**	(0.40)
1982–91	1.83**	(0.39)	1.53	(0.34)	1.49	(0.31)	1.38	(0.30)	2.40***	(0.46)	2.06***	(0.41)
1992–00	1.41	(0.31)	2.27**	(0.59)	1.00	(0.21)	1.46	(0.35)	2.46***	(0.52)	2.84***	(0.68)
Primary	a		a				a		a		a	
Secondary	1.86***	(0.29)	2.09***	(0.39)	1.47	(0.24)	1.33	(0.25)	1.56	(0.20)	1.46*	(0.27)
Upper secondary	1.35*	(0.28)	1.95**	(0.46)	1.75**	(0.33)	1.89**	(0.44)	1.01	(0.20)	1.74*	(0.41)
Bachelor	2.66***	(0.64)	2.82***	(0.64)	1.91***	(0.32)	1.90**	(0.42)	1.55*	(0.28)	1.94**	(0.42)
Master	2.45***	(0.64)	2.86***	(0.64)	2.00***	(0.34)	1.99**	(0.44)	1.43*	(0.25)	1.71*	(0.36)
1st quartile	a		a				a		a		a	
2nd quartile	0.81	(0.16)	0.88	(0.18)	0.99	(0.19)	0.98	(0.19)	0.71	(0.17)	0.80	(0.17)
3rd quartile	0.93	(0.16)	0.92	(0.16)	1.21	(0.20)	1.08	(0.19)	0.77	(0.15)	0.82	(0.15)
4th quartile	1.16	(0.20)	1.07	(0.20)	1.25	(0.20)	0.99	(0.18)	1.02	(0.19)	1.05	(0.19)
Rural	a		a				a		a		a	
Town	1.20	(0.16)	1.12	(0.16)	1.00	(0.14)	1.01	(0.14)	1.10	(0.15)	1.00	(0.15)
City	1.31	(0.19)	1.03	(0.16)	1.15	(0.15)	1.03	(0.15)	1.35*	(0.19)	1.10	(0.17)
Metropolitan	1.63**	(0.25)	1.48*	(0.25)	1.29	(0.19)	1.19	(0.19)	1.70***	(0.25)	1.46*	(0.23)
Observations			1,391				1,391				1,391	

The odd ratios estimated for those who had bought online during the last 12 months.
M1 = Unadjusted effects; M2 = Adjusted effects
Robust standard errors in parentheses
*** p < 0.001, ** p < 0.01, * p < 0.05.

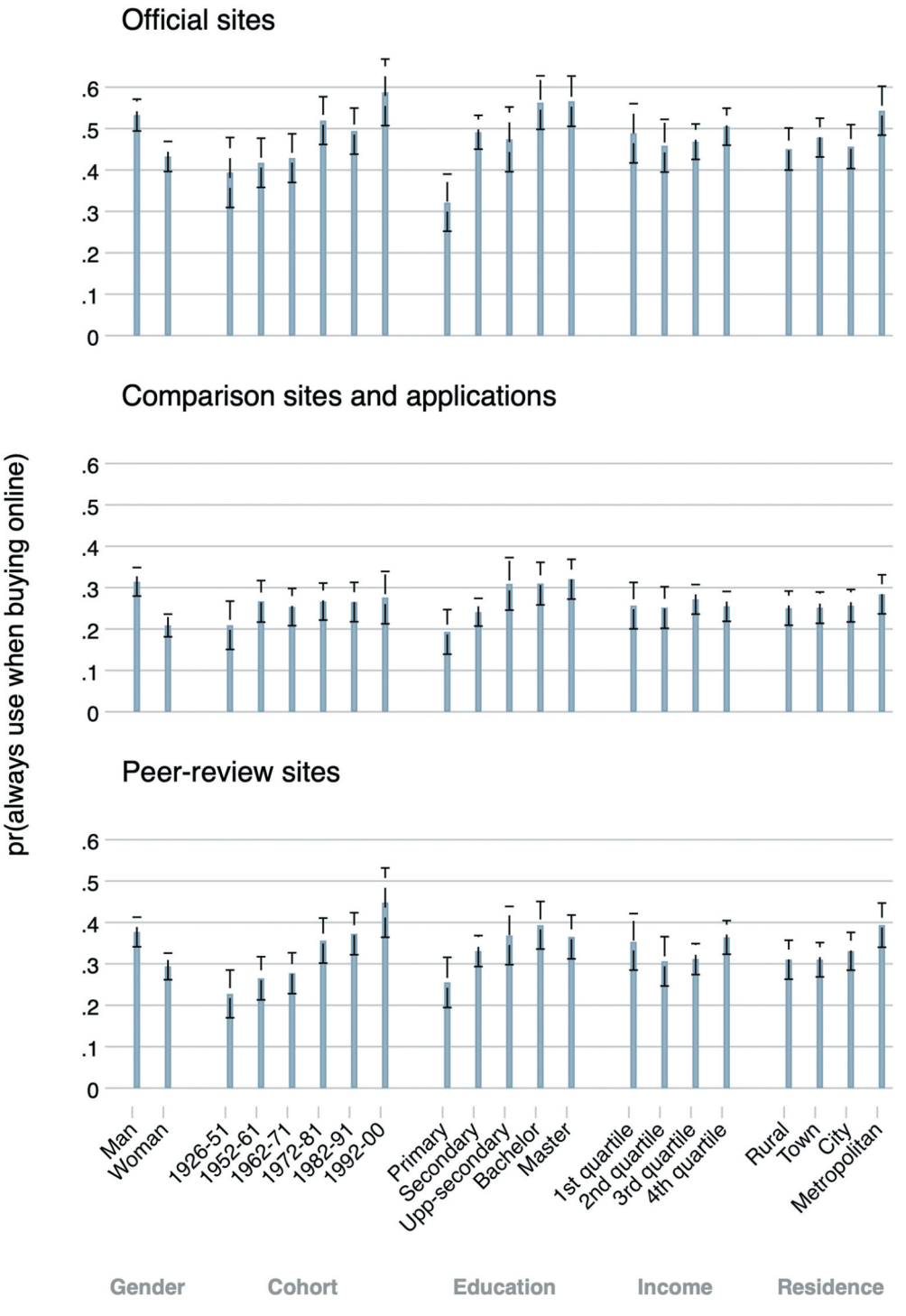

Figure 4. Probability of always using official sites, comparison sites or applications, and peer-review sites when buying online (post-estimated predictions from the ordered logit models presented in Table 3).

socio-demographic groups have indeed varying preferences for finding information on different online platforms.

Discussion

This study examined the information-seeking patterns of different population groups in Finland. The main interest in the analysis was in the persistence of the digital divide when examining those information tools that benefit the consumers in the platform era. Given the wide-scale transition of the marketplace to the online setting, along with relevant tools for maximally beneficial decision-making, a central issue, in terms of potential inequality, is whether or not certain population groups are less active online. Here, lack of online presence can result in limited consumption access, price competitiveness, and supplier or product information. As such, the study provides a novel look at how the benefits of participation in the online economy are distributed in Finland, a modern ICT society that can act as a valuable benchmark for further research into this global phenomenon. Variations in buying goods and services along with which online platforms are most popular among various population groups add to this research frontier in this study.

Our results indicate that Finns are active in using different channels of information acquisition. There were also significant differences in how information is obtained between population groups. Men and younger cohorts are more accustomed to using a variety of services and sources for getting information. These findings point to the persistence of the digital divides in the efficacy of using different information sources available online.

In terms of our first hypothesis (H1), our results confirmed that clear disparities in online purchase habits exist. Education and income were found to be key dividers in the digital setting, with those of higher levels being more active in the online marketplace. This trend in the Finnish online economy reinforces consumption expenditure trends in past research elsewhere (e.g. Rastogi 2010b; Räsänen 2006). Notably, online buying varied significantly by age groups as well, with the oldest cohort being by far the least likely to participate online compared to a relatively equal online presence at the other end of the age spectrum. This plateau may be due to the normalization of online behaviour among the majority of the population after the passing of initial pioneer adopters in early entry age groups. The exclusion of the oldest portion of the population can be a significant societal detriment, especially where price competitiveness is significantly higher online, reducing real purchasing power offline. Finally, as expected, area of residence was a significant predictor of online market activity, with rural residents being the key outlier based on less digital purchasing.

Findings revolving around particular online marketplace activities confirmed our second hypothesis (H2) in that socio-demographic variables associate with particular online activities. Younger age, higher education, being male and living in urban areas were associated with using producer sites for information gathering. In terms of comparison sites, higher education and being male were key associations. These findings, though involving more nuanced online information-gathering methods that create new contrasts between population groups, are in line with past research that has shown that education level and age are associated with conducting online information searches (Ertiö and Räsänen 2019). Furthermore, metropolitan area residents, men and younger people were more likely to seek out peer-reviews.

These findings shed light on future avenues for research in a variety of ways. The finding that the rural population is less active in online purchases is an interesting one, given the

convenience of being able to order from a global market to places less likely to have comprehensive suppliers locally. This may be linked to a basket of goods principle; urban dwellers may be more likely to 'shop around' online after initial needs are met, while more rural populations may be less inclined to consider online shopping a significant pastime. Linked to this, those living in urban environments tend to generally spend more time carrying out information seeking for consumption purposes due to shopping being a more significant part of city life compared to more rural environments. Furthermore, the high degree of male activity in searching out various types of information relevant to online purchases warrants further investigation; whether there are any notable differences in perceived purchasing experience values between genders when choosing between investigating purchases virtually or physically might be an interesting question to consider. Here, differences in impulse buying might shed light on whether assessment of product quality occurs virtually or physically once received, for example.

Overall, the study sheds light on new areas for future research, but is not without its limitations. The dataset comes from Finland and is built on a cross-sectional snapshot over the course of only one year. As such, the study's findings cannot be considered representative for other nations, nor can the findings be considered static over time. In addition, we did not examine the possible variations within the age cohort 65 and over. What are needed are more comparisons cross-nationally and over time within nations due to the nature of rapid change in the online marketplace. The more accurate the understanding of new areas of population-level inequalities, the better the response to meeting those needs to ensure that everyone can benefit from the massive technological evolution and resulting consumer landscape of the online setting.

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References

Acquier, A., T. Daudigeos, and J. Pinkse. 2017. "Promises and Paradoxes of the Sharing Economy: An Organizing Framework." *Technological Forecasting and Social Change* 125: 1–10.

Bischof, D. 2017. "New Graphic Schemes for Stata: Plotplain and Plotting." *The Stata Journal* 17 (3): 748–759.

Botsman, R., and R. Rogers. 2010. "Beyond Zipcar: Collaborative Consumption." *Harvard Business Review* 88 (10): 30.

DiMaggio, P., and E. Hargittai. 2001. "From the 'Digital Divide' to 'Digital Inequality': Studying Internet Use as Penetration Increases." *Princeton: Center for Arts and Cultural Policy Studies, Woodrow Wilson School, Princeton University* 4 (1): 4–2.

Elms, J., R. De Kervenoael, and A. Hallsworth. 2016. "Internet or Store? An Ethnographic Study of Consumers' Internet and Store-based Grocery Shopping Practices." *Journal of Retailing and Consumer Services* 32: 234–243.

Ertiö, T., and P. Räsänen. 2019. "Consumerism in Online Health Information Search and Self-tracking Devices." *International Journal of Consumer Studies* 43 (3): 245–252.

Eurostat. 2017. "Digital Economy and Society. Main Tables." http://ec.europa.eu/eurostat/web/digital-economy-and-society/data/main-tables

Floridi, L. 2016. "The Method of Abstraction." In *The Routledge Handbook of Philosophy of Information*, ed. L. Floridi, 66–72. Oxon/New York: Routledge.

Greenwood, S., A. Perrin, and M. Duggan. 2016. "Social Media Update 2016." *Pew Research Center*. *http://assets.pewresearch.org/wpcontent/uploads/sites/14/2016/11/10132827/PI_2016,11*

Hargittai, E. 2002. "Second-level Digital Divide: Differences in People's Online Skills." *First Monday* 7: 4.

Isa, N. F., N. A. M. Salleh, and A. A. Aziz. 2016. "Determinants and Impact of Online Social Interaction on Online Buying Behavior." *Procedia-Social and Behavioral Sciences* 219: 352–358.

Jann, B. 2014. "Plotting Regression Coefficients and Other Estimates." *The Stata Journal* 14 (4): 708–737.

Kaplan, A. M., and M. Haenlein. 2010. "Users of the World, Unite! The Challenges and Opportunities of Social Media." *Business Horizons* 53 (1): 59–68.

Lim, W. M., and D. H. Ting. 2014. "Consumer Acceptance and Continuance of Online Group Buying." *Journal of Computer Information Systems* 54 (3): 87–96.

Lissitsa, S., and O. Kol. 2016. "Generation X Vs. Generation Y–A Decade of Online Shopping." *Journal of Retailing and Consumer Services* 31: 304–312.

Long, J. S., and J. Freese. 2006. *Regression Models for Categorical Dependent Variables Using Stata*. Texas: Stata press.

Official Statistics of Finland (OSF). 2016. "Use of Information and Communications Technology by Individuals." ISSN=2341-8710. 2016. Accessed 23 October 2019. http://www.stat.fi/til/sutivi/2016/sutivi_2016_2016-12-09_tie_001_en.html

Official Statistics of Finland (OSF). 2018. "Use of Information and Communications Technology by Individuals." ISSN=2341-8710. Accessed 23 October 2019. http://www.stat.fi/til/sutivi/index_en.html

Official Statistics of Finland (OSF). 2020. "Labour Force Survey [E-publication]." ISSN=1798-7857. October 2020, Appendix table 5. Activity rates by sex and age 2019/10-2020/10. http://www.stat.fi/til/tyti/2020/10/tyti_2020_10_2020-11-24_tau_005_en.html

Pappas, N. 2016. "Marketing Strategies, Perceived Risks, and Consumer Trust in Online Buying Behavior." *Journal of Retailing and Consumer Services* 29: 92–103.

Perrin, A. 2015. "Social Media Usage: 2005–2015". Accessed October 2019. http://www.pewinternet.org/2015/10/08/social-networking-usage-2005-2015/

Räsänen, P. 2006. "Information Society for All? Structural Characteristics of Internet Use in 15 European Countries." *European Societies* 8 (1): 59–81.

Räsänen, P., and I. Koiranen. 2016. "Changing Patterns of ICT Use in Finland–The Senior Citizens' Perspective." International Conference on Human Aspects of IT for the Aged Population, 226–237. Cham: Springer.

Rastogi, A. 2010a. "A Model Based Approach to Implement Cloud Computing in e-Governance." *International Journal of Computer Applications* 9 (7): 15–18.

Rastogi, A. K. 2010b. "A Study of Indian Online Consumers & Their Buying Behaviour." *International Research Journal* 1 (10): 80–82.

Rogers Everett, M. 1995. *Diffusion of Innovations*. New York: Free Press.

Sakkthivel, A. M. 2009. "Impact of Demographics on Online Buying Behaviour Towards Different Products." *International Journal of Electronic Finance* 3 (3): 284–296.

Schmitt, J. B., C. A. Debbelt, and F. M. Schneider. 2018. "Too Much Information? Predictors of Information Overload in the Context of Online News Exposure." *Information, Communication & Society* 21 (8): 1151–1167.

Schor, J. B. 2017. "Does the Sharing Economy Increase Inequality within the Eighty Percent?: Findings from a Qualitative Study of Platform Providers." *Cambridge Journal of Regions, Economy and Society* 10 (2): 263–279.

Schradie, J. 2011. "The Digital Production Gap: The Digital Divide and Web 2.0 Collide." *Poetics* 39 (2): 145–168.

Suki, N. M., and N. M. Suki. 2017. "Modeling the Determinants of Consumers' Attitudes toward Online Group Buying: Do Risks and Trusts Matters?" *Journal of Retailing and Consumer Services* 36: 180–188.

van den Poel, D., and W. Buckinx. 2005. "Predicting Online-purchasing Behavior." *European Journal of Operational Research* 166 (2): 557–575.

van Deursen, A., and J. Van Dijk. 2011. "Internet Skills and the Digital Divide." *New Media & Society* 13 (6): 893–911.

van Deursen, A. J., and E. J. Helsper. 2015. "A Nuanced Understanding of Internet Use and Non-use among the Elderly." *European Journal of Communication* 30 (2): 171–187.

van Deursen, A. J. A. M., and J. A. van Dijk. 2014. "The Digital Divide Shifts to Differences in Usage." *New Media & Society* 16 (3): 507–526.

van Dijk, J. A. 2005. *The Deepening Divide: Inequality in the Information Society*. Thousand Oaks/ London/New Delhi: Sage Publications.

Williams, R. 2006. "Generalized Ordered Logit/partial Proportional Odds Models for Ordinal Dependent Variables." *The Stata Journal* 6 (1): 58–82.

Williams, R. 2016. "Understanding and Interpreting Generalized Ordered Logit Models." *The Journal of Mathematical Sociology* 40 (1): 7–20.

Appendix The propensity to use different sources of information when buying services and products online. Partial proportional odds ratios based on the generalized ordered logit models

	Providers' sites		Price comparison sites and applications		Customer reviews	
Variables	OR	SE	OR	SE	OR	SE
Women	a		a		a	
Men	1.52***	(0.17)	1.75***	(0.18)	1.47***	(0.15)
1926–51	a		a		a	
1952–61	1.11	(0.25)	0.90	(0.30)	1.23	(0.26)
1962–71	1.16	(0.26)	0.86	(0.27)	1.30	(0.27)
1972–81	1.70*	(0.38)	0.88	(0.30)	1.90**	(0.40)
1982–91	1.53	(0.34)	0.96	(0.30)	2.04***	(0.41)
1992–00	2.27**	(0.59)	0.93	(0.35)	2.84***	(0.68)
Primary	a		a		a	
Secondary	2.09***	(0.39)	1.31	(0.25)	1.43*	(0.27)
Upper secondary	1.95**	(0.46)	1.85**	(0.44)	1.70*	(0.41)
Bachelor	2.82***	(0.64)	1.85**	(0.42)	1.88**	(0.42)
Master	2.86***	(0.64)	1.39	(0.44)	1.47*	(0.36)
1st quartile	a		a		a	
2nd quartile	0.88	(0.18)	0.97	(0.19)	1.02	(0.17)
3rd quartile	0.92	(0.16)	1.07	(0.19)	0.82	(0.15)
4th quartile	1.07	(0.20)	0.98	(0.18)	1.05	(0.19)
Rural	a		a		a	
Town	1.12	(0.16)	1.01	(0.14)	1.00	(0.15)
City	1.03	(0.16)	1.03	(0.15)	1.10	(0.17)
Metropolitan	1.48*	(0.25)	1.19	(0.19)	1.48*	(0.23)
Observations	1,391		1,391		1,391	

Robust standard errors in parentheses
*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.