



Utrecht University

Bachelorthesis Sociology

Digital discrimination: Airbnb Amsterdam

The influence of ethnicity and reviews on bookings and prices



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Abstract

In this thesis an answer is sought to be given on the question if there is any influence of the ethnicity of the host on the number of bookings and prices used. This resulted in the exact research question: *To what extent is there any influence of the ethnicity and reputation of the hosts of Airbnb Amsterdam on the amount of bookings and price of listings?* To answer this research question, data of the Inside Airbnb Project has been used. After studying the existing literature and describing the different mechanisms and theories, multiple regression analysis have been applied. This resulted in expected and unexpected outcomes. Although, there is no effect of ethnicity on bookings, a negative significant effect of ethnicity on prices was one of the results. This means that non-western hosts ask lower prices than western hosts for their listings. The reputation system of Airbnb does not significantly influence this effect. Concluding, there is evidence for ethnic discrimination taking place at Airbnb listings in Amsterdam. However, due to limitations of the data used, further research is necessary to understand the functioning of these mechanisms at Airbnb.

Introduction

Over the years the concept of a sharing economy has changed drastically. From a market form primarily shared by kin and communities in a marketable form wherein strangers exchange goods and services (Schor & Fitzmaurice, 2015). The formal definition of a sharing economy, also called collaborative consumption, has been defined by Hamari and colleagues as follows: “The peer-to-peer-based activity of obtaining, giving, or sharing the access to goods and services, coordinated through community-based online services” (Hamari et al., 2016, p. 2049).

The main reason for the emergence of this new concept of sharing economy is the internet, according to Schor and Fitzmaurice (2015). *Time* magazine even named the rise of the sharing economy, one of the ten ideas that will change the world (Walsh, 2011). There are multiple important factors which are necessary for the concept to work. Several articles determined that peer trust, reputation and relative advantage are the central drivers for the sharing economy concept (Schor and Fitzmaurice, 2015; Hamari et al., 2016; Lamberton and Rose, 2012). Famous examples of companies using this idea of a sharing economy probably are the taxi service Uber, the online marketplace eBay and the car sharing service Zipcar.

However, the most famous and spoken about example is probably Airbnb (Seright, 2018). Airbnb has been founded in 2008 and can be described as an online community marketplace, facilitating short-term rentals ranging from shared accommodations to entire homes (Zervas et al., 2014). Within the Netherlands, Airbnb is especially large in Amsterdam with a market sector of 12% (Simon, 2018) facilitating 800,000 people in 2017 (Keultjes, 2018). In comparison with 575,000 in 2016 this is a huge increase (ibid.) If the demand side increases the supply should also increase, which is most likely the case for Airbnb Amsterdam as the amount of accommodations has risen from 15,000 to 32,000 in 2016 (Munsterman, 2017). As research by Ecorys showed, the offered accommodations are spread over the whole city and not only in the city centre (Briene et al., 2018). Also, 15% of the population of Amsterdam is not Dutch and almost 8% not from the European Union (Centraal Bureau voor de Statistiek, 2018).

The emergence of Airbnb and the sharing economy also has a negative side. Several researches point out ethnic discrimination on sharing economy platforms including Airbnb. For example, research by Edelman, Luca and Svirsky (2017) shows that hosts with African-American names have a lower list price than Americans with white names and the same counts for Hispanics and Asian hosts in San Francisco according to Kakar et al. (2016). Research by Cheng and Foley (2018) shows the opportunity for people to copy discriminating behavior to the online world due to the presence of certain animosity on the platform.

As discussed, peer trust is one of the main drivers of the sharing economy. As Airbnb allows sellers to provide personal profiles, post pictures of themselves and link to their Facebook accounts, social media are used as leverage to build trust (Edelman and Luca, 2014). While this is an optimal way to build trust, it could also lead to an unintended consequence of discrimination (Cheng and Foley, 2018). As the guests see the picture and first names of the hosts. A non-western name and appearance can lead to economic disadvantages. Research conducted by Blommaert, Coenders and van Tubergen (2012) concluded that an Arabian name has negative consequences on job opportunities. This thesis will test if having a non-western name also has an economic disadvantage on the Airbnb platform in Amsterdam. As eight percent of the population in Amsterdam is non-western, it is important to look into this.

Airbnb has received lots of critics over the years for their lack of interest in this issue after several published articles that shows ethnic discrimination on Airbnb (De Volkskrant, 2016). After these critics Airbnb has made the profile picture less clear, but also added a policy declaration which users have to sign that includes an anti-discrimination part. Another way that Airbnb uses to tackle this possible consequence is their review system. As reputation was another important driver for the sharing economy. Reviews can lead to less discrimination as reviews can cause a decrease in statistical discrimination. Statistical discrimination on Airbnb means that the user has the assumption that the quality of a listing is lower due to the prejudice they hold towards the ethnicity of the host (Edelman and Luca, 2014). A listing is the apartment or house the hosts list on Airbnb. If the host has lots of reviews, which are mostly positive on Airbnb (Zervas et al., 2015), the prejudice can be reduced. For this prejudice to decrease it is important that the host does have reviews. Multiple studies show that online reviews can clearly have a positive impact on your reputation (Lin and Xu, 2017; Ter Huurne et al, 2017).

The focus of this research will primarily be on digital discrimination on Airbnb in Amsterdam. As providing personal information including your name, picture and Facebook profile can result into more trust towards the host but could also lead to discrimination. To see if digital discrimination really takes place at Airbnb the following research question will be central in this thesis: *To what extent is there any influence of the ethnicity and reputation of the hosts of Airbnb Amsterdam on the amount of bookings and price of listings?*

In the Netherlands there has been no scientific research conducted yet on ethnic discrimination at Airbnb. However, the Dutch *RTL Nieuws* has done a small research on ethnic discrimination at Airbnb in Amsterdam, Utrecht, Groningen and Maastricht. They created profiles of guests with a Dutch and a Moroccan name and reacted to more than 100 listings within the same price category and on the same date. The profile with the Moroccan name gets rejected more than twice in comparison with the Dutch profile name (van den Berg and Brens, 2016). This article by *RTL Nieuws* is not certainly a scientific research as it is unclear which methods they used and which mechanisms led to this discrimination.

This research will show if there is discrimination within the sharing economy and if reputation systems, which are of importance in the online sharing economy, can decrease this possible discrimination. These outcomes can be important for Airbnb and the sharing economy as they want to tackle this social problem. If the results prove discrimination, Airbnb could change its policy.

Theoretical framework

In order to answer the research question, it is important to conceptualize the theories involved. In this part of the thesis the theories will be discussed which will lead to the hypotheses.

Trust in the sharing economy

There are multiple important factors which are necessary for the sharing economy concept to function. Several articles determined that peer trust, reputation and relative advantage are the central drivers for the sharing economy concept (Schor and Fitzmaurice, 2015; Hamari et al., 2016; Lamberton and Rose, 2012). As trust is one of the main drivers of the online sharing economy, it is important to define this concept and its differences with offline trust.

The question that remains is why trusting is harder online than offline (Wang and Emurian, 2005). According to Wang and Emurian lack of trust has been identified as one of the most important factors for people to engage in electronic commerce (e-commerce). They state that online trust shares characteristics with offline trust, but there are some important distinctions which could be used to understand the nature of trust in an online context. Four differences between online and offline trust are described by Wang and Emurian (2005) as follows:

1. *Trustor and trustee*: In addition to the two regular parties in an offline situation the trustor within an online situation is a customer who is browsing an e-commerce website and the trustee is the website itself or in the case of Airbnb the host renting out his house/apartment via the Airbnb website. Thus, the website itself is the platform of trust.
2. *Vulnerability*: Due to the anonymity people face with e-commerce, sellers have the possibility to behave in an unpredictable manner. Besides that, consumers take the risk of possible consequences when transacting online. Guests are put in a vulnerable position as they could end up in a foreign city, discovering that the listing does not exist or that the host did not prepare well by forgetting to give instructions how to enter the apartment. So, if the host does not meet these 'requirements' according to the customer then there is less chance for a booking to occur.

3. *Produced actions*: If a consumer has trust in e-commerce, there are two forms of actions consumers undertake. Firstly, they purchase providing personal information and secondly only looking at the products, like walking into a store without buying anything. Both these actions can only take place if a consumer has the idea that they have more to gain than to lose.

4. *Subjective matter*: Besides offline trust that is associated with individual differences, there can also be online trust to machines and technology. This online trust differs for each individual.

These four differences between online and offline trust in the sharing economy show the importance of trust. Especially the cases of the trustor and trustee and the vulnerability are important at Airbnb. The concepts of trustor, trustee and vulnerability can also be described as trust in peers which shows whether the supplier has the skills and competencies to execute his part of the transaction, and whether he is considered as a transaction partner of high integrity and benevolence (Hawlitschek et al., 2016). In short, these terms mean that the guest takes certain risks as financial and personal losses are at stake when trusting the host in being competent and reliable in renting out a listing.

Information asymmetry and reputation

Now that the importance of information and trust is discussed, the problem of trust needs to be focused on Airbnb. This will be done by using the ‘lemon problem’ by economist George Akerlof. In his research Akerlof compares the concept of asymmetric information to the market for used cars (Akerlof, 1970). He states that within this market, buyers always have less information about the car than the sellers, as the buyer cannot distinguish the difference between an atrocious used car (lemon) and a used car which is totally worth it (peach).

At Airbnb this is also the case. Potential guests cannot see the quality of the accommodation and does not know if the host can be trusted. The only information the guests have are the accommodation pictures of the host, the profile picture and name of the host, the information about the apartment written by the host and reviews of former guests. Thus, the potential guest will base his trust on this given information, as Riegelsberger and colleagues (2016) have described that the profile information is important for the trustor.

Furthermore, reviews of former guests are of importance in the decision-making. Positive reviews are good for the reputation of the host. This reputation can also be described as social embeddedness (Riegelsberger et al., 2016). As reviews are a part of the hosts' complete profile, their reputation can also threaten the amount of bookings. If the reputation of the host is high and the fulfillment of the listing is below expectations, this can lead to negative reviews and a less positive reputation (ibid.). Within Airbnb 95 percent of all properties have a user-generated rating of 4.5 or 5 stars, which is the highest possible number of stars a property can receive (Zervas et al., 2015). This means that nearly all reviews on Airbnb are positive and almost all hosts have a good reputation. This reputation creates a prediction for the future behavior of the host. As people tend to live up to their reputations and expectations, positive reviews will lead to certain expectations of the possible guest. Jøsang (2012) described this in an article about reputation systems, as long as the platform has a policy that prohibits malicious manipulation of reviews then reputation systems can be a good predictor for future behavior. On Airbnb, only guests that actually made a booking can submit a review about their stay, so this policy should work to prevent manipulation of reviews. This is part of the trust in peers as described before and by Hawlitschek and colleagues (2016). These higher expectations have a positive influence on the amount of bookings and prices as it adds extra trust for the guests. As more reviews lead to more information and better reputation of the host, considering almost all reviews are positive, the interaction between reputation and ethnicity can influence possible discrimination which decreases the amount of bookings a host receives or the prices it uses.

Ethnic discrimination

After discussing the influence of trust and reputation on the guests' decision-making for booking an apartment, the influence of possible ethnic discrimination needs to be looked at. As described in the introduction, there has been research conducted that prove ethnic discrimination within the sharing economy. Ethnic discrimination can be defined as differential treatment that leads to unequal outcomes based entirely on ascribed features such as race, ethnic background, name origin and foreign appearance (Blank et al., 2004). There are several possible explanations for this type of discrimination. Edelman and Luca (2014), who conducted a research on discrimination in online markets, make a distinction between types of discrimination within decision-making mechanisms.

These types are taste-based discrimination and statistical discrimination. In taste-based discrimination, the guests purely make a decision based on their user preference (Becker, 1993). Within this type, the discrimination will not change with more or better information given about the apartment of the host for example. In statistical discrimination, the guest has a belief about a certain ethnicity of the host which is not certainly based on facts, but if reliable information is shown, this discrimination disappears (Arrow, 1972). Although Edelman and Luca (2014) describe these as different types of discrimination, they do not exclude each other. Taste-based discrimination and statistical discrimination do not exclude each other because statistical discrimination can be measured by providing more profile information for a certain ethnic group and then concluding if the discrimination has decreased. The discrimination that is left after providing more profile information is mostly called taste-based discrimination, so in that way it is not possible to disentangle these types of discrimination (Edelman and Luca, 2014).

Edelman and Luca (2014) were one of the first to conduct research on ethnic discrimination at Airbnb. They state that the decision-making of possible guests should be based on trust, as described before trust is an important aspect in the decision-making process. However, according to their research this trust is mostly based on the personal profiles which could facilitate ethnic discrimination. Their results show that black hosts charge twelve percent less than non-black hosts while keeping location, rental characteristics and quality constant. These results show that adding personal information to increase the trust in peers increases the risk of possible ethnic discrimination. This study did add the effect of rating on pricing and only found a significant effect of the location rating on pricing. However, they did not add a general variable of guest satisfaction, but split it into the different categories accuracy, cleanliness, check-in, communication, location and value.

There has been a very recent study by Tjaden, Schwemmer and Khadjavi (2018) on ethnic discrimination in the sharing economy. Although, research suggests that online market platforms reduce information asymmetries and correct biases against certain groups (Agrawal et al, 2013). Tjaden and colleagues studied the German online carpooling market and concluded that there is prove for ethnic discrimination only by knowing the driver's name. This study shows that the apparent discrimination can be labeled as statistical discrimination. Their research compares car owners with a German name and those with an Arabic, Turkish or Persian name.

The drivers with an Arabic, Turkish or Persian name do not only receive less clicks on their profiles, which could be seen as interest in booking this ride, they also have 32 percent lower prices than the average market price. However, this research also concludes that having positive reviews, and so a high rating, decreases the ethnic discrimination as costumers rely less on solely the name.

Despite the lack of research on ethnic discrimination at Airbnb in the Netherlands, there are several studies which do show ethnic discrimination in other branches in the Netherlands. Only recently Dutch news agencies *Trouw* and *RTL Nieuws* discovered possible ethnic profiling by the Dutch tax authorities (Kleijnijenhuis, 2019) (Klein, 2019). They ascertained that the tax authorities focused on parents with a foreign origin when controlling the child allowances.

Concluding, the mechanisms which give an explanation for ethnic discrimination and the several researches on this topic lead to these hypotheses:

H1: Hosts with non-western names will have fewer bookings and lower prices than hosts with western names.

H2: The more (positive) reviews the hosts have, the more bookings they will get and higher prices they will ask.

H3: The negative effect of having a non-western name (H1) is smaller if the hosts have more (positive) reviews.

Methods

Data

Within this research, the data of Inside Airbnb will be used. The data has been scraped on the 31st of January in 2019 by the inside Airbnb project. This data is not directly given by Airbnb but all this data is publicly available for everyone with an Airbnb account. Besides that, this project only offers data of the hosts on Airbnb and not of possible customers. The inside Airbnb project offers a great scale of data about Airbnb in several cities around the world. This data consists of different parts of information like prices, locations and reviews of listings. Inside Airbnb only gathers data of listings being online at the moment of scraping. In total this dataset consisted of 20,048 Airbnb listings in Amsterdam. Eventually, after only using observations with a valid value on all used variables, a total of 14,349 observations remained. All these observations consisted of information about the name and gender of the host, the price of the listing and the amount of reviews for the listing.

Variables

The dependent variables within this research are the amount of bookings and the price per listing. As the amount of bookings is not directly given in the dataset, the amount of reviews in 2018 will be used to calculate the bookings a host has received in 2018. Research by Fradkin and colleagues (2018) states that 67 percent of bookings eventually lead to a review, which can only be written after a booking or transaction. Via a calculation, the amount of bookings can be approximated by multiplying the amount of reviews in 2018 by 1.49. This variable is called *Bookings*. The price of the listings is given in the dataset, but as there were multiple outliers in this variable and some listings had a price of zero euros (these listings were probably available for a longer period) the variable price of listings is coded into a logarithm, wherein a base of 10 has been used. This variable is called *log10price*.

This paper uses two different independent variables. Namely, the ethnicity of the host and the amount of reviews a listing has received prior to 2018. The ethnicity of the host is not given in the dataset as only the names of the hosts are stated. The ethnicity of the host will be determined by using the fractions of how many times a name is used for different ethnicities in the Netherlands. This fraction is calculated from the Dutch Civil Registration (Dutch: Gemeentelijke Basisadministratie).

This data consists of information on the amount of Dutch people with a certain name that have parents who are born in the Netherlands or other countries. Eventually, these ethnicities will be split into non-western and western names. These fractions are put into SPSS, which shows what the chances are for a hosts' name being a certain ethnicity. CBS (2018) has made a distinction to state different migration backgrounds. A western host comes from Europe (except Turkey), North-America, Oceania, Indonesia and Japan. A non-western comes from Africa, Latin-America, Asia (except Indonesia and Japan) and Turkey. If an observation has a 50 or higher percent chance of being Turkish, Moroccan, Antillean, Caribbean or another Non-western ethnicity the observation will be seen as non-western. All other observations will be seen as western. The ethnicity of the host will eventually be used as a dummy, so having a western or a non-western background. This variable is called *Non-western* as scoring one on this dummy variable states that the host is non-western.

The amount of reviews is given in the dataset. However, only the reviews given before 2018 will be used in this variable as the reviews given in 2018 are used for calculating the number of bookings. This variable is called *Prereview2018* Thus, the amount of reviews are being used for calculating the dependent variable *Bookings* and for the independent variable *Prereview2018*. This is possible as the variable *Bookings* only uses reviews written in 2018 and the independent variable *Prereview2018* uses reviews written before 2018.

For the controlling variable gender the same fractions have been used as for ethnicity. So within the Dutch Civil Registration there are fractions of a name being female or male. If there is a 50 or higher percent chance of a name being female the host is female. Otherwise, the host is male. This variable is called *Female* as scoring one on this dummy variable states that the host is female.

Analysis method

In this research a multiple linear regression analysis will be applied to measure the effect of the ethnicity and amount of reviews of the host on the amount of bookings and the price of listings. The first model in table 2 measures the effect of the ethnicity of the host and the number of reviews before 2018 on the amount of bookings it receives and the first model in table 3 measures the effect of ethnicity and reviews on the price the host uses.

These models will test hypothesis 1 and 2, as this research uses two different dependent variables they are separated into two tables. Table 2 consists of the influence on the dependent variable *Bookings* and table 3 of the base 10 logarithm of price. (*Log10price*).

In the second model in both tables, the interaction effect between the ethnicity of the host and the amount of reviews will be added. A multiple regression will be used and will test hypotheses 3. The control variable *Female* will be added to all the models.

Results

In table 1, the descriptive statistics of the variables used in this research are reported. *Table 1* shows multiple figures. For example, the average amount of bookings a host has received is just over eight (Mean= 8.04). Besides that, the variable *Non-western* shows that there is a low number of non-western people in the dataset (Mean= 0.01). The original variable *Price* is added to show on which variable the base 10 logarithm of *Log10price* is based. Within the dataset 47 percent is female (mean=0.47).

Table 1. *Descriptive statistics of the used variables*

Variable	Descriptive statistics				
	N	Minimum	Maximum	Mean	S.E.
Bookings	14349	0	238.40	8.37	18.45
Price	14349	8	5000	151.19	112.662
Log10price	14349	.90	3.70	2.12	.21
Non-western	14349	0	1	.01	.12
Prereview2018	14349	0	510	13.85	34.40
Female	14349	0	1	.47	.50

The results of hypothesis 1: *Hosts with non-western names will have fewer bookings and lower prices than hosts with western names* can be found in model 1 of table 2 and 3. In table 2 the results on the dependent variable *Bookings* can be found. The null hypothesis of no difference between the influence of western and non-western names on the amount of bookings cannot be rejected as there is no prove that western hosts receive more bookings than non-western hosts ($b= 1.409$, $t=1.470$, $p= .142$). Also, if we control for gender, the effect of ethnicity on the number of bookings is not significant ($b=1.340$, $t=1,392$, $p=.164$). Model 1 in table 3 shows different results on the influence of ethnicity on prices. A negative significant effect is found of being a non-western host on the prices they use on Airbnb in comparison with western hosts ($b=-.081$, $t=-5.535$, $p<.001$). After controlling for gender the negative significant effect of ethnicity on listing prices still exists ($b= -.085$, $t=-5.479$, $p<.001$). Concluding, hypothesis 1 is partly rejected, as there is no significant effect of ethnicity on the number of bookings, but there is a negative significant effect on listing prices.

The results of hypothesis 2: *The more (positive) reviews the hosts have, the more bookings they will get and the higher prices they will ask* can also be found in model 1 of table 2 and 3. In table 2 the results of the effect of the number of reviews before 2018 on the number of bookings can be found. There is indeed a positive significant effect of reviews on the number of bookings. Per review a host has received before 2018, the number of bookings increases with $b=.362$ ($t=109.370$, $p<.001$). Also, if we control for gender, the effect of reviews on the number of bookings is positively significant ($b=.361$, $t=109.276$, $p<.001$). In model 1 of table 3 the total opposite can be seen. Instead of higher prices due to more reviews, there is actually a negative significant effect of reviews on prices ($b=-.001$, $t=-11.388$, $p<.001$). Which means that more reviews actually lead to lower prices. When this effect is being controlled for gender, there is still a negative significant effect of reviews on prices ($b=-.001$, $t=-11.426$, $p<.001$). The control variable itself also shows an interesting figure as gender has a negative significant effect on prices ($b=-.012$, $t=-3.300$, $p<.005$). Concluding, hypothesis 2 is partly rejected too. There is a positive significant effect of reviews on the number of bookings, but instead of a positive significant effect of reviews on prices there actually seems to be a negative significant effect.

The results of hypothesis 3: *The negative effect of having a non-western name (H1) is smaller if the hosts have more (positive) reviews* can be found in model 2 of tables 2 and 3 as the effect of names is important to both dependent variables. In table 2 can be seen that there is no significant effect of the interaction between being non-western and the amount of reviews on the amount of bookings with ($b=.045$, $t=1.051$, $p=.293$). In table 3 model 2 the same can be seen for the interaction effect on prices ($b=.000$, $t=.252$, $p=.801$). After controlling for gender the interaction effect on bookings ($b=.045$, $t=1.058$, $p=.290$) and prices ($b=.000$, $t=.293$, $p=.770$) is still not significant. The control variable itself also shows an interesting figure as gender has a negative significant effect on prices ($b=-.012$, $t=-3.303$, $p<.005$). Concluding, hypothesis 3 is fully rejected, namely, the interaction between ethnicity and number of reviews before 2018 does not decrease the proposed discrimination.

The stated results measured the effects of ethnicity by operationalizing it as a dummy variable. This means that if the name of the host has a higher than 50 percent change of being non-western then the host is indeed non-western in all earlier conducted regression analysis. As the descriptive statistics show a very low amount of non-western hosts (mean=.01), a robustness check has been conducted.

In this check, ethnicity has been operationalized as a fraction.

Thus, no 50 percent cut-off, but a fraction which could mean: The higher chance of the host being non-western, the fewer number of bookings the host receives. This check led to the same results as shown in table 4. The earlier reported significant effects are still significant and the non-significant effects are still not significant.

Table 2. Regression analysis for the number of bookings

Variable	Model 1		Including control variable		Model 2		Including control variable	
	B	S.E.	B	S.E.	B	S.E.	B	S.E.
Constant	3.345	.123	3.528	.164	3.349	.123	3.533	.164
Non-western	1.409	.958	1.340	.963	.998	1.035	.925	1.040
Prereview2018	.362***	.003	.361***	.003	.361***	.003	.361***	.003
eth*rev					.045	.042	.045	.042
Female			-.384	.228			-.387	.228
R ²	.454		.454		.454		.454	

Constant = Bookings. *** significance at $p < .001$ ** significance at $p < .005$ * significance at $p < .05$

Table 3. Regression analysis for the pricing

Variable	Model 1		Including control variable		Model 2		Including control variable	
	B	S.E.	B	S.E.	B	S.E.	B	S.E.
Constant	2.132	.002	2.137	.003	2.132	.002	2.137	.003
Non-western	-.081***	.015	-.085***	.015	-.083***	.016	-.086***	.016
Prereview2018	-.001***	.000	-.001***	.000	-.001***	.000	-.001***	.000
eth*rev					.000	.001	.000	.001
Female			-.012**	.003			-.012**	.003
R ²	.011		.011		.011		.011	

Constant is Log10price. *** significance at $p < .001$ ** significance at $p < .005$ * significance at $p < .05$

Table 4. Robustness check regression analysis: ethnicity as fraction

Variable	Model 1		Model 2					
	B	S.E.	Including control variable		Including control variable		Including control variable	
	B	S.E.	B	S.E.	B	S.E.	B	S.E.
Constant (bookings)	3.283	.132	3.469	.171	3.299	.133	3.485	.172
Nonwesternfrac	1.692	1.005	1.654	1.008	1.318	1.072	1.282	1.074
Prereview2018	-.362***	.003	.361***	.003	.361***	.003	.361***	.003
eth*rev					.042	.042	.042	.042
Female			-.390	.228			-.389	.228
R ²	.454		.454		.454		.454	
Constant (Log10price)	2.136	.002	2.141	.003	2.136	.002	2.141	.003
Nonwesternfrac	-.108***	.015	-.110***	.015	-.111***	.016	-.114***	.016
Prereview2018	-.001***	.000	-.001***	.000	-.001***	.000	-.001***	.000
eth*rev					.000	.001	.000	.001
Female			-.011**	.003			-.011**	.003
R ²	.012		.013		.012		.013	

Constants are both dependent variables. *** significance at $p < .001$ ** significance at $p < .005$ * significance at $p < .05$

Conclusion and discussion

The research question which is central in this thesis is: *To what extent is there any influence of the ethnicity and reputation of the hosts of Airbnb Amsterdam on the amount of bookings and price of listings?* The theoretical framework section about trust in the sharing economy suggested that guests at Airbnb base their decision of booking a certain listing on trust. However, the ethnicity of the host could influence this trust due to possible ethnic discrimination by the guest. This ethnic discrimination would be purely based on the name of the host. Airbnb tries to reduce possible ethnic discrimination by, for example, introducing the review system. As more reviews, which are mostly positive at Airbnb, should lead to more bookings. Positive reviews could lead to a better reputation of the host and eventually decrease the ethnic discrimination by the guest.

The first hypothesis stated a negative effect of having a non-western name on the number of bookings received and prices used by the host at Airbnb. The results partly confirmed this negative effect. Namely, the results found a negative effect of having a non-western name on the prices used by the host. This is in line with the theory, as the theory suggested that decisions could be made on name origin (Blank et al., 2004) and on different types of discrimination (Edelman and Luca, 2014). As listings of non-western hosts are less wanted, they probably had to adjust their prices to equalize the differences in bookings. It also shows the same negative effect of being non-western on price as earlier studies conducted in other cities or at other platforms (Tjaden et al., 2018; Edelman and Luca, 2014). Furthermore, the other part of hypothesis one, which states that having a non-western name has a negative effect on the number of bookings received, cannot be supported and has to be rejected. Although, this effect could maybe be explained by, the earlier described, difference in prices.

Secondly, according to the discussed lemons problem of Akerlof (1970), the information-asymmetry can be fixed by reputation systems. Due to the reviews of prior guests the potential guest has more information about the host, which could lead to a better reputation of the host. This theory led to the second hypothesis: *The more (positive) reviews the hosts have, the more bookings they will get and higher prices they will ask.* In agreement with the theory on information-asymmetry, the results do show a positive effect of the number of reviews on the number of bookings a host receives.

There seems to be a negative significant relation in the effect between the number of reviews and the prices used by hosts, which is not in line with the theory.

The combination of theories about possible ethnic discrimination and reputation systems led to the third hypothesis: *The negative effect of having a non-western name (H1) is smaller if the hosts have more (positive) reviews.* As discrimination based on names means that the trust levels are lower, the presence of reputation systems could improve these lower trust levels. Thus, more reviews should reduce the negative effect of having a non-western name on the number of bookings and prices used. The results were not in line with the theory as the full hypothesis is rejected.

Why some results were not in line with the theory has to be discussed to make suggestions for future research and for possible policy changes at Airbnb. There are several explanations for the partial rejection of the first hypothesis (no significant effect of having a non-western name on the number of bookings for the host). Firstly, as described in the theory, trust in the sharing economy is based on several indicators (Riegelsberger et al., 2005). At Airbnb the hosts have several ways to increase their trustworthiness. Besides the profile name, hosts can also add, for example, a profile picture and a detailed description of the listing. These extra parts of information can increase trust for the guest and decrease the importance of the name of the host. Unfortunately, these were not available in the data of the Inside Airbnb project. For the rejection of the third hypothesis, the same reasons could be given. The negative effect of non-western names on bookings could have already been reduced by other parts of information on the hosts' profile. Also, the negative effect of non-western names was even partly proved in the first place anyway which means that the chances of the third hypothesis being significant were reduced already.

The second hypothesis is also partly rejected. Namely, the part which states that more reviews lead to higher prices. Although multiple studies state that having positive reviews lead to higher prices (Ögut and Onur Taş, 2012; Jiang and Wang, 2008), within Airbnb this is not the case. The possible explanation for this has been described before, as almost all reviews on Airbnb are positive, the prices for hosts with reviews will possibly not change drastically. Also, guests could have based their review on their satisfaction with the price paid, so higher prices could then lead to lower satisfaction and reputation which the hosts do not want to happen.

Besides the described differences in outcomes derived from the theory, there are several other limitations in this research. The most important limitation is the fact that there were almost no non-western hosts in the given dataset, as only 1% of the hosts were non-western. It could be that there is just a small amount of hosts being non-western in Amsterdam, but this is not certain as Airbnb or the Inside Airbnb project do not provide these exact data. This limitation could lead to a bias in the reported results.

Another limitation was the operationalization of the dependent variable *Bookings*, as an important assumption being made was that all hosts receive as much reviews as other hosts after a booking. There is no data on the exact amount of bookings for a host in a certain period. For example, it could be that women, in comparison with men, have a higher chance of receiving a review after a booking. Also, a research by Hu, Pavlou and Zhang (2009) stated that guests mostly leave a review behind after being extremely disappointed or extremely satisfied with the host's listing. This means that all experiences in between those two extremes receive less reviews. There is also no data about the period a listing has been online for at Airbnb. There is a possibility that certain listings were only available for a part of 2018 which leads to less reviews and eventually, in the calculation, to less bookings. The same applies to the reviews before 2018 as some listings were maybe only online for a year.

The other dependent variable *Log10price* derived from the in the dataset available variable *Price* also had some limitations. Firstly, all listings listed for zero euros were not taken into the base of 10 logarithm of price as logarithms cannot be based on zero. These listings could have had an influence on the amount of bookings received. Besides that, the variable *Price* had some outliers influencing the results too much, so these were deleted as well. Deleting these outliers and 'free' listings could have influenced the results, as the hosts were maybe non-western or the listings received almost no bookings.

The ultimate limitation is the availability of information of the Inside Airbnb Project, as it only has information available on the supply side of Airbnb. So, there is absolutely no information about the possible future guests, but also not about guests in the past, which have booked and did or did not leave a review.

These limitations lead to recommendations for further research. It would be ideal to have all information about hosts and guests over a longer period. As, even if this study proved ethnic discrimination on all dependent variables, it would be too easy to state ethnic discrimination takes place at Airbnb or not. It would be interesting to test if the number of bookings for hosts increase with an increasing user rating or if booking a listing really depends on the ethnicity of the host or other factors as the profile picture, listing description or listing location. Besides that, the reputation system of Airbnb is more comprehensive than only the reviews. There is a user generated rating based on different factors as location or cleanliness, it would be interesting to test if these differ for the decision-making of the guest.

Although this research includes several limitations which need to be looked at in the future, it still shows some interesting figures. Some results delivered other outcomes than derived from theory, while others were in agreement with the theory. This shows that there is still a lot to learn about the operation of the sharing economy and Airbnb specifically. As this was one of the first scientific study focusing on Airbnb Amsterdam, it shows important insights for future research on Airbnb in Amsterdam.

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