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## Fairness of the First-Come, First-Served rule on the rental housing market: answers from a hypothetical survey experiment

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# Fairness of the First-Come, First-Served rule on the rental housing market: answers from a hypothetical survey experiment

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## Abstract

Echoing recent policies implemented in Seattle and Portland, we examine perceptions of the fairness of the first-come, first-served (FCFS) rule in the context of discrimination in the rental housing market. We use an original hypothetical survey experiment in which a rental agent is confronted with the discriminatory preferences of his landlord clients. A sample of 1,541 respondents representative of the US population was asked about which choice was the best, from a moral point of view: to allocate rental units exclusively to the non-discriminated group, exclusively to the discriminated group, or to whichever group applied first (FCFS rule). Factorial manipulations included in the design are i) the cost of implementing the FCFS rule for the rental agent, who risks losing his landlord clients if he/she rents to the discriminated group, ii) peer effects, i.e., what other rental agents do and iii) which social norm (egalitarian, segregationist and pro-FCFS) is shared by members of the community. Consistent with the literature, we find that the FCFS rule ranks high among other normative principles, but that its cost has a causal effect on the support it receives from respondents. We also find that both peer effects and social norms have a causal effect on the support for the FCFS rule, with social norms having a stronger effect. Finally, we find that the respondents who are likely to experience discrimination are the least likely to support the FCFS rule.

## Highlights

- the FCFS rule ranks highly among other normative principles
- in a client-based discrimination context, the cost of the FCFS rule has a casual impact on its support
- both peer effects and social norms have a causal impact on the support of the FCFS rule
- support of the FCFS rule is lower for respondents likely to experience discrimination

**Keywords:** discrimination, fairness, first-come first-served rule, hypothetical survey experiment, rental housing market, vignettes

**JEL codes:** C99, D63, J15, R28, R31

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# 1. Introduction

There is extensive evidence that the allocation of housing units in the housing market is not fair and that housing discrimination is widespread (see Flage, 2018 and Auspurg et al., 2019) for recent meta-analyses). In US cities, see Ondrich et al. (1999), Choi et al. (2005), Zhao et al. (2006), Hanson & Hawley (2011), Korver-Glenn (2018), Fang et al. (2019), Hellyer (2021), and Chan & Fan (2023). In European cities, see Bosch et al., (2010) for Spain, Gouveia et al. (2020) for Portugal, Baldini & Federici (2011) for Italy, Beatty & Sommervoll (2012) for Norway, Carlsson & Eriksson (2014) for Sweden, Auspurg et al. (2017) for Germany, Acolin et al. (2016), Bunel et al. (2021), Le Gallo et al. (2020) for France, and Ghekiere & Verhaeghe (2022) for Belgium. In Asia, see Galster et al. (2018) for Australia, Liu & Rommel (2023) for China, and Suzuki et al., (2022) for Tokyo. For recent papers on discrimination on AirBnB platforms, see Edelman et al. (2017) and Marchenko (2019).

Public authorities use several strategies to combat discrimination on the housing market. Often, discrimination is prohibited by regulation, with criminal and/or financial sanctions. In the US, the Fair Housing Act of 1968<sup>1</sup> prohibits discrimination on the basis of race, colour, religion, sex or national origin in the sale, rental or financing of housing. Similar legislation exists in many other countries, as in Europe (EU Racial Equality Directive 2000/43/EC) or the UK (Equality Act 2010). Another strategy is to ensure equality by introducing a quota system for the representation of different social groups at the local level, as in Singapore's Ethnic Integration Policy programme (Tan, 2023; Yap, 2022).

In this paper, we consider a third type of anti-discriminatory public policy, recently implemented in the rental housing markets of Seattle in 2016 and Portland in 2019: the mandatory allocation of housing units on a first-come, first-served (FCFS) basis. Although the FCFS rule is often cited as an alternative rule for allocating scarce goods (alongside other rules such as auctions, lotteries or prioritising the weakest), its use in this context is motivated by the desire to find an efficient but also fair way to combat discriminatory behaviour on the part of landlords or rental agencies.

Following (Kahneman et al., 1986), who emphasised the importance of *fairness* as a relevant dimension of economic behaviour, our focus in this paper is on the *acceptability* of this rule from a normative point of view. Our work is in line with the empirical social choice literature<sup>2</sup>, that uses hypothetical survey experiments to investigate the determinants of normative preferences for social justice principles: for example, utilitarianism vs. Rawlsianism vs. equality, as in Faravelli (2007), procedural fairness, as in Anand (2001), or equality vs. responsibility, as in Schokkaert & Devooght (2003), or allocation principles, as in Fisman et al. (2017).

In this paper, we present the results of an original hypothetical survey experiment designed to measure how fair the public thinks it is to use a Seattle & Portland-inspired FCFS rule to allocate vacant units in the presence of discrimination in the rental housing market.

In our design, two groups of tenants compete to rent vacant housing units. A rental agent must decide how to allocate the vacant units, knowing that landlords dislike one group of tenants and will financially penalise him/her if he/she rents the units to members of that discriminated group. The rental agent faces a moral dilemma: accommodate the landlords' discriminatory preferences and maximise his profit, or refuse to enforce the landlords' desired discrimination and lose his profit. Respondents are asked what the rental agent should do from a moral point of view. They are given

<sup>1</sup> The Fair Housing Act was later extended in 1988 to include discrimination based on disability and familial status.

<sup>2</sup> For seminal papers, see (Gaertner & Schokkaert, 2011; Konow, 2001; Yaari & Bar-Hillel, 1984).

three alternatives: 1) allocate the vacant dwellings exclusively to members of the discriminated group, 2) allocate the vacant dwellings exclusively to members of the non-discriminated group or 3) allocate units 50/50 to members of both groups (reflecting the proportion of each group in the general population).

We examine the extent of respondents' support for the FCFS rule relative to the agent's profit by manipulating the order of arrival of the disadvantaged group. We consider two polar scenarios: if all the members of the discriminated group arrive before other tenants, implementing the first-come, first-served rule would result in the rental agent will losing all their clients and profits. When all the fist-arrived applicants belong to the non-discriminated group, enforcing the first-come, first-served rule will not incur any costs for the rental agent. To study how respondent characteristics influence their support of the FCFS rule, a follow-up questionnaire is conducted. Finally, we manipulate the behaviour of other rental agents and the social norms within the community at large to account for the context-sensitivity of normative choices.

The study's principal findings are as follows. The first-come, first-served (FCFS) rule ranked second among respondents, following the 50/50 proportional rule and preceding both positive and negative discrimination. Nevertheless, backing for the FCFS rule is significantly dependent on its cost for the rental agent. When the FCFS rule leads to the selection of applicants whom landlords dislike and who, as a result, impose a financial penalty on the rental agent, it is upheld by one in six respondents. In contrast, when the FCFS rule leads to the renting vacant dwellings to applicants that the landlord does not dislike (with no financial penalty for the rental agent), it is endorsed by over two-fifths of respondents. These results echo Tyran and Hegdegaard (2018) who show that compliance to rules is mitigated by their cost. We also find that respondents who are vulnerable to discrimination (women, non-White, and poor respondents) and groups residing in the East and West coast of the United States are less inclined to choose the FCFS rule. Nevertheless, we do not find any correlation with respondents' political opinion. Finally, we found that respondents are more inclined to endorse the FCFS rule (allocating vacant units to whichever group arrives first) when contextual effects (peer effects and social norms) align with it.

The rest of the paper is organized as follows. Section 2 discusses previous evidence related to the acceptability of the FCFS rule and its real-world implementation in the rental housing market of cities in America. In section 3, we'll present our survey design in relation to previous evidence on rental agents' role of in rental housing market discrimination. Data collection and some summary statistics will also be presented in section 3. Section 4 will present results on the support for the FCFS rule, and the casual effect of our factorial manipulations. Section 5 concludes the paper.

## 2. Literature review

The first-come, first-served (FCFS)<sup>3</sup> rule is a commonly used principle in many markets due to its simple and fair solution to allocating scarce resources. According to Perry & Zarsky (2014), the FCFS rule was initially implemented in the United States through the Pacific Telegraph Act of 1860, which aimed to enhance communication between the Atlantic and Pacific states. Since then, the FCFS rule has been informally adopted in many allocation processes, ranging from supermarket queues to the allocation of transplant organs for patients who are able to survive while waiting for a transplant (Herreros et al., 2020).

<sup>3</sup> Also called "First In, First Out" (FIFO) rule in queuing theory.

This section presents recent implementations of this rule as an anti-discriminatory housing policy in Seattle and Portland (section 2.1.) and findings from the literature on the perceived fairness of the FCFS rule (section 2.2.).

## 2.1. Implementation of the FCFS rule in rental housing markets

In the rental housing market, the first-come, first-served principle can be seen as a fair way to allocating scarce housing units. If the tenants' order of arrival is random<sup>4</sup>, it automatically prevents any discriminatory allocation of dwellings based on individual characteristics (such as age, ethnicity, family status or previous criminal convictions).

The FCFS rule has recently been implemented in Seattle and Portland as part of an initiative to reduce discrimination in their rental housing markets<sup>5</sup>.

Seattle's *First-in-Time* legislation<sup>6</sup> was introduced by the Seattle City Council in 2016 and became effective on July 1<sup>st</sup> of the following year. This statute mandates that landlords inform their tenants of their screening criteria<sup>7</sup> and maintain a record of when complete applications were received. Applications must then be screened chronologically, and the housing unit must be allocated to the first qualified applicant, i.e. the first one who completed the application first and meets all the requirements<sup>8</sup>. Landlords who breach the ordinance face penalties, including rent refunds or credits, tenancy reinstatement, civil penalties and attorneys' fees and expenses.

Portland's *Fair Access in Renting* ordinance was adopted in June 2019 and became effective in March 1<sup>st</sup> of the following year<sup>9</sup>. It also created rental application system based on the first-come-first-served rule. According Portland legislation, landlords must provide a 72-hour notice before accepting applications for a unit. Like in Seattle, landlords are required to document the date and time of applications and allocate units to the first qualified candidate.

Unlike to more traditional awareness campaigns against discrimination that aim to influence behaviours through social norms or financial or criminal penalties, Seattle and Portland policies impose a mandatory FCFS-based allocation system for vacant dwellings on all rental agents. The aim of this paper is to investigate the public support for such a rule.

The next section presents a design presented that incorporates both social norms and peer effects on the support of FCFS rule in a context of housing market discrimination.

<sup>4</sup> When the FCFS rule leads to queuing, the time spent in the line can be interpreted as an opportunity cost (Wittman, 1982 and Elster, 1989). However, agents with heterogeneous characteristics may have heterogeneous opportunity costs of time, and develop differentiated strategies to minimize the time spend queuing. In this case, the order of arrival in the queue (i.e. the time spent in it) is not random and the FCFS rule does differentiate agents based on their individual characteristics. In this paper, we neutralize this aspect by stating that the order of arrival of the tenants is random.

<sup>5</sup> Reosti showed that Seattle landlords have adapted to the FCFS regulation in order to keep using discretionary criteria for selecting renters (Reosti, 2020) .

<sup>6</sup> The FIT rule is codified in Seattle Municipal Code 14.08.050. It was declared constitutional by the Supreme Court of the State of Washington in November 2019. In April 2020 the US Supreme Court declined to hear an appeal of the FIT ordinance.

<sup>7</sup> Landlords must also provide a list of documents necessary for the application, and inform applicants if they need to provide additional information.

<sup>8</sup> The first applicant has 48h to decline or accept the offer before the landlord offers tenancy to the next qualified applicant on the list. The process continues chronologically until an applicant accepts the offer.

<sup>9</sup> The Fair Access in Renting ordinance is codified in Portland City's Municipal Code 30.01.086. Besides implementing the FCFS rule, it also addressed access to housing for low income people and people with disabilities, as well as restricting the use of credit and criminal histories as screening criteria.

## 2.2. Fairness of the FCFS rule

The literature emphasises the perceived fairness of the FCFS rule. Rafaeli et al. (2002) echoed Larson's seminal paper on the importance of social justice and fairness in the psychology of waiting in line (Larson, 1987). They showed that the perceived fairness of a queue's organisational principle is sometimes more crucial than the time spent in the queue or financial considerations. Using an experimental framework, Oberholzer-Gee (2006) demonstrated that, in some queuing scenarios, the FCFS rule may be costly implemented by participants even when they are offered a monetary compensation to let a stranger cut in line. John & Millum (2020) justified the moral fairness of enforcing the FCFS rule in queues as opposed to line cutting by evoking Rawls' concept of fairness to play by the system's rules.

Furthermore, research consistently suggests that the general public favours the FCFS rule compared to other normative principles. As early as 1986, Kahneman et al. (1986) questioned 191 adults in Vancouver on how scarce football tickets should be allocated: through an auction, a lottery or the first-come first-served rule (i.e., queueing). The preference for FCFS was evident, with 68% of respondents selecting this option, followed by 25% in favour of lottery and only 4% in favour of an auction. Similarly, Frey & Pommerehne (1993) found, in a context of excess demand, that three quarters of the respondents considered the FCFS procedure to be the fairest. Savage & Torgler (2010) conducted a vignette-based survey to investigate the acceptability of six different allocation systems (including the first-come, first served rule; random allocation; and price systems used by a public or private entity) for a scarce resource (bottled water on a hot day at a sightseeing spot). They found that a significant proportion of respondents (16.1%) provided strong support for the FCFS rule, following the prioritarian<sup>10</sup> rule ("weakest individuals first") (53.7% of respondents) but preceding any of the price systems considered (9.7% of respondents).

Recently, during the Covid-19 pandemic, ministerial guidelines on to the allocation of scarce critical care resources such as intensive care unit (ICU) beds and ventilators, have referenced the FCFS rule as a second-order principle applicable to already prioritised vulnerable groups (Herrerros et al., 2020; Wiśniowska et al., 2022). The FCFS rule enjoys a widespread support in this context (Fallucchi et al., 2021), as well as for Covid-19 vaccines allocation (Schmidt, 2020). Fallucchi et al. (2021) conducted a hypothetical survey experiment<sup>11</sup> where respondents were asked to imagine a situation in which the US Federal Government was preparing to release instructions for the allocation of ICU beds during the COVID-19 pandemic. They probed respondents' opinions on the recommended principles through 8 hypothetical scenarios where two patients of varying characteristics needed one ICU bed. Respondents were randomly presented a particular version of the survey and were asked to choose between four options: admit patient A, admit patient B, decide randomly, or admit a patient on a first-come first-served basis. The results showed overwhelming support for the first-come first-served rule, particularly compared to the random allocation of the scarce resource (91% vs. 9%). This preference was particularly strong amongst participants with egalitarian beliefs.

Interestingly, this preference stands at odds with the opinion of actual Covid-19 ICU physicians and triage committees (Emanuel et al., 2020)<sup>12</sup>, for whom prioritizing the worst off (those who are the

<sup>10</sup> See Parfit (1997) for a discussion of the "prioritarian" principle.

<sup>11</sup> Details of this methodology will be presented in the next section.

<sup>12</sup> Emanuel et al. (2020) presented other arguments against the FCFS rule in the Covid-19 context: it may unduly favour the patients who live closer to the hospital and/or who have the social and monetary means to get to the hospital faster. It may also generate negative externalities by encouraging crowding when social distancing is necessary and by excluding later-comers who delayed becoming sick because of a better adherence to anti-Covid recommendations or of an unwillingness to crowd scarce public resources. By contrast, the rule of maximizing benefits should receive the highest priority. Random allocation may be used for selecting patients with the same

sickest or the youngest) should be used when it aligns with maximising medical benefits, such as preventing the spread of the virus.

Among this literature, an originality of this paper is that we investigate whether the FCFS rule is perceived as a fair solution to client-based *discrimination* in the housing market, compared to other principles, such as prioritarianism and profit maximization. Our first working hypothesis [1] is that the FCFS ranks high among other normative principles, but that, however, it may be surpassed by prioritarian principles.

### 3. Experimental design

Our hypothetical survey experiment is designed to study the acceptability of the FCFS rule as a solution to client-based discrimination on the housing rental market. The next subsection (3.1.1.) briefly discusses the benefits of using a hypothetical survey experiment to elicit normative preferences. We'll next present the framing (3.1.2.) and the factorial manipulations depicted in the vignette (3.1.3.). Section 3.2. presents information on the survey data collection and some summary statistics.

#### 3.1. Survey design

##### 3.1.1. *Benefits of using a hypothetical survey experiment to elicit normative preferences*

In a vignette-based hypothetical survey experiments<sup>13</sup> (sometimes also called “vignette surveys” or “factorial surveys” in the literature), participants provide their opinion on a short fictional situation (the “vignette”) where they are presented with a choice of alternatives. By comparing the responses of different participant groups presented with alternative versions of the same vignette, experimenters can measure the causal impact of factorial variations on participant preferences.

This methodology and has several advantages to elicit normative preferences, compared to stated attitudinal surveys or behavioural experiments.

Compared to behavioural experiments, in a vignette-based survey, the experimenter can establish certain elements “as true” that would be inaccessible for manipulation in observational or behavioural-experimental studies. For example, in our case, it is possible to establish as a fact that the agent in charge of the allocation of housing units is not personally prejudiced against the discriminated group.

Compared to stated attitudinal surveys, vignette-based hypothetical survey experiments possess strong internal validity due to their experimental nature (Taylor, 2006).

Moreover, discussing concrete circumstances instead of using abstract principles lessens the unobserved differences in perceptions among the participants (Atzmüller & Steiner, 2010; Aguinis & Bradley, 2014) and the hypothetical nature of the situation described in the vignette limits respondents’ biographical bias (Schoenberg & Ravdal, 2000). For instance, in our case we have set the vignette in a faraway planet where the characters depicted in the vignette belong to different

prognosis.

<sup>13</sup> Hypothetical survey experiments can be traced back to the seminal work of Herkovitz's in 1931 and 1950. Throughout the 1970s, their methodology was further consolidated in the fields of sociology (Rossi, 1979; Rossi & Nock, 1982), social psychology (Nosanchuk, 1972) and economics (Kahneman & Tversky, 1979). Since then, hypothetical survey experiments have become a routine tool in social sciences and in economics (see Kahneman & Tversky (1979) ; Yaari & Bar-Hillel (1984) for seminal papers and Gaertner & Schokkaert (2011) and Konow (2001) for methodological references in Empirical Social Choice) for measuring beliefs “in contexts that are difficult to study in a real-world setting” (Haaland et al., 2023).



nondescript alien species to limit unobserved bias against real-world ethnic groups. Such maximal distancing strategies are shared by many papers in Empirical Social Choice (see for example Faravelli (2007), Konow (2001), or Schwettmann (2012)).

The narrative nature of a vignette also helps the full depiction of complex concepts (Oll et al., 2018). In the same line, ideologically loaded concepts (Evans et al., 2015) can be presented in a way that reduces desirability bias when addressing sensitive issues. For example, in our case, our vignette portrays a client-based discrimination situation in the housing market without relying on the polysemic and normative term of “discrimination”.

### 3.1.2. Framing: client-based discrimination in a rental housing market

Our vignette depicts a situation where discrimination in the rental housing market is driven by client-based discrimination. This framing was chosen to echo Becker’s theoretical framework (Becker, 1971) as well as recent empirical evidence on the rental housing market.

For instance, Flage (2018) showed that statistical discrimination is higher among landlords than among real estate agents<sup>14</sup>. Ghekiere, Lippens, et al., (2022) and Verstraete & Verhaeghe (2020) showed that, in the Brussels region, real estate agents are willing to implement strategies to exclude ethnic minority tenants at the request of clients. Moreover, using a hypothetical survey experiment on a sample of 576 student respondents asked to put themselves in the shoes of rental agents<sup>15</sup>, Ghekiere, Verhaeghe, et al. (2022) found strong evidence towards ethnic taste-based discrimination as the main driver of the respondents’ willingness to invite applicants for a house visit.

In our vignette, a real estate agent with no personal discriminatory preferences<sup>16</sup> must decide how to allocate the vacant units of a new subdivision, while being aware that his landlord clients are prejudiced against tenants from one of the city’s two ethnic groups.

In this context, echoing Becker’s client-based discrimination framework and after Tyran & Hedegaard (2018) and Bunel & Tovar (2021), the rental agent’s moral behaviour is put in tension with his financial needs. Specifically, if the real estate agent chooses to rent vacant units to members of the discriminated group, he’ll lose clients and suffer a profit loss. However, if he/she rents vacant units only to members of the non-discriminated group, he’ll keep his clients and make a full profit.

<sup>14</sup> By contrast, Le Gallo et al. (2020) found that for the 50 largest urban areas in metropolitan France, the levels of discrimination do not differ much between ads from individual landlords or real estate agencies.

<sup>15</sup> Following Kahneman & Tversky (1979), some authors ask respondents to indicate what they would themselves do in the situation described in the vignette. Their answers reflect the choice of a real agent placed in a hypothetical situation. Ghekiere, Verhaeghe, et al. (2022) follow this line. In their paper, students were put in the shoes of a rental agent in a context of discrimination on the rental housing market. In this paper, we acknowledge the result of Holt & Laury (2002) that “*contrary to Kahneman and Tversky’s supposition, subjects facing hypothetical choices cannot imagine how they would actually behave under high-incentive conditions*” (p.1654). We do not ask what the respondent’s himself or herself would do in the situation, but what he or she believes should be done by the decision-maker in the situation described in the vignette. As a result, our design allows collecting robust evidence on normative preferences, but we have no claims of providing information on the actual behaviour of respondents.

<sup>16</sup> Recent papers such as Ondrich et al. (2003) showed evidence of taste discrimination of real estate agents on the US housing market against African-Americans. Besbris & Faber (2017) and Galster & Godfrey (2005) also found evidence of racial steering. Korver-Glenn (2018) showed, based on an ethnographic survey, how the real estate profession in Houston is structured in predominantly white networks, and how the structure of the real estate agents’ compensation maintains the discrimination of non-white minority buyers and sellers. In a European context, Ghekiere, Lippens, et al. (2022) showed that the size and gender ratio of real estate agencies has an effect on housing discrimination in the Brussels area. Using a testing, Bunel et al. (2019) showed that discrimination against Kanak tenants in New Caledonia is driven by landlords behaviour but also by real estate agents. In our design, making the most of the vignette’s fictional nature, we neutralize the real estate agent’s preferences and establish as a fact that he has no prejudice against the discriminated group.

To elicit their support of the FCFS rule, respondents are given information on the order of arrival of the discriminated and the non-discriminated groups of tenants. They are then asked which of the following real estate agent's choices is the fairest, in their opinion, from a moral point of view<sup>17</sup>.

- Renting vacant units exclusively to tenants from the non-discriminated group and keeping all of his clients and income
- Renting vacant units exclusively to tenants from the discriminated group and losing all of his clients and income
- Renting vacant units 50/50 to tenants from both groups and losing half of his clients and income

### 3.1.3. Factorial manipulations: cost effects, peer effects and social norms

On this basis, we introduce three factorial variations. The first one is designed to investigate the extent to which respondents are inclined to apply the FCFS rule to tackle the profit/discrimination trade-off presented in the vignette. To do so, we manipulate the information on the order of arrival of tenants from the discriminated and non-discriminated groups.

In half the vignette versions (versions 1 to 9), tenants from the discriminated group arrive first. In these versions, implementing the FCFS rule and renting vacant units exclusively to the first-arrived applicants is very costly for the rental agent, as he/she will lose all of his/her clients and won't earn any profit.

In the other half of the vignette versions (versions 10 to 18), those who arrive first are the non-discriminated group members. In this case, adhering to the FCFS rule is not costly for the rental agent, as the first-arrived group is in line with the landlords' preferences.

As a result, our design acknowledges the potential cost of using the FCFS rule in a context of client-based discrimination. Following Tyran & Hedegaard (2018) and Bunel & Tovar (2021), our second working hypothesis [2] is that respondents' support of the FCFS rule will be influenced by its cost. Measuring the percentage of respondents who opt to follow the FCFS rule when it is very costly will offer an approximation of the "core" support of the FCFS. Additionally, comparing the implementation of the FCFS rule for different costs allows for gauging the level of sensitivity of respondents to the cost of enforcing the rule.

Second, we manipulate two contextual effects: social norms and peer effects.

The literature shows that agents' behaviour is influenced by moral suasion (see the seminal papers of Elster (1989) or Romans (1966) and the recent empirical contribution of Dal Bó & Dal Bó (2014). More specifically, recent research has highlighted the impact of this effect on the prejudiced behaviors of rental agents: Fang et al. (2019) showed that a phone call from the city services reminding rental agents of the law and of the legal sanctions against discrimination significantly reduced discrimination against Hispanic tenants in New York (however, it had no impact on discrimination against African-Americans). In this regard, Murchie et al. (2021) showed that discrimination against African American tenants was influenced by an email from a fair housing organization. Following Tyran & Hedegaard (2018), Bunel & Tovar (2021) found, using a hypothetical survey experiment conducted on 915 French students, that social norms could influence respondents' normative perceptions of various forms of discrimination on the labour market.

<sup>17</sup> They were informed that their opinion would not affect the real estate agent's actual decision.

As a result, in our design respondents receive a version of the vignette where a social norm on the allocation of housing units is randomly picked among three alternatives<sup>18</sup>: i) local ethnic “*segregation*” (versions 1, 4, 7, 10, 13, and 16) where different ethnic groups should not live in the same places and therefore be separated, ii) local ethnic “*diversity*” (versions 3, 6, 9, 12, 15, and 18) where ethnic groups should live together in the same places and iii) the “*first-come, first-served*” rule (versions 2, 5, 8, 11, 14, and 17) where units should be allocated to the first tenants who apply without considering their group affiliations.

Our third working hypothesis that (i) moral suasion also has a causal impact on respondents’ normative preferences, (ii) the acceptability of the FCFS rule is affected by current real-world social norms such as segregation and diversity and (iii) that a FCFS-based shared social norm enhances the acceptability of the FCFS-based rule.

Last, we explore whether peer behaviour affects moral judgements on the rental agent’s options. To the best of our knowledge, this is the first time this factor was introduced in the literature as a determinant of normative preferences or behaviours on the housing market.

We introduce 3 alternative peer behaviour: i) “*discrimination*” (versions 1 to 3 and 10 to 12) where other real estate agents do not allocate any vacant unit to tenants from the group discriminated against by landlords, ii) “*First-come, first-served*” (versions 4 to 6 and 13 to 15) where other real estate agents allocate units to the first tenants who apply, regardless of group affiliation and iii) “*50/50*” (versions 7 to 9 and 16 to 18) where other real estate agents rent to an equal number of members from the discriminated and non-discriminated groups, which reflect the proportion of both groups in the city’s population.

If the rental agent implements the FCFS rule instead of complying to landlords’ discriminatory preferences, they risk being forced driven out of the market due to competition with discriminatory rivals. On the other hand, if all the other rental agents choose to enforce the FCFS rule, opting for discrimination would provide a competitive advantage for the rental agent. Our aim is to determine the robustness of the acceptability of enforcing the FCFS rule over such a profitable, competitive behaviour.

Our fourth working hypothesis [4] is that respondents will take into account the amount of competition faced by the rental agent, and that they’ll be more likely to state that the rental agent should enforce the FCFS rule if other rental agents do so too.

All in all, our design consists of 18 versions of the vignette based on the combination of the order of arrival of the discriminated and the non-discriminated groups (discriminated first = yes; no), the social norm (segregation; diversity; FCFS) and the peer effects (discrimination; FCFS; 50/50) factors (see Appendix A2 for a table presenting all versions).

The next section will provide information on the survey’s administration as well as some summary statistics.

<sup>18</sup> We explicitly state that these norms are understood and shared by all members of the community.

### 3.2. Data collection and Summary Statistics

The survey took place on June 23 and 24, 2019, and respondents were drawn from the SurveyMonkey.com panel. Our final sample<sup>19</sup> included 1541 respondents (see Table 1 for summary statistics). The completion rate of 70% is similar to other online studies close to ours (for example, see Fallucchi et al., 2021).

**Table 1. Summary statistics**

Variable	N	% OF SAMPLE		Variable	N	% OF SAMPLE	
		UNWEIGHTED	WEIGHTED			UNWEIGHTED	WEIGHTED
<b>Gender</b>				<b>Ethnicity</b>			
Male	705	45.7	49.6	White	1141	74.0	60.9
Female	836	54.3	50.4	Other	400	26.0	39.1
<b>Age</b>				<b>Residential status</b>			
< 30 years old	263	17.1	21.5	Tenant	589	38.2	43.0
30 to 59 years old	830	53.9	60.4	Homeowner	952	61.8	57.0
> 60 years old	448	29.1	18.1				
<b>Education</b>				<b>Respondent adopts the point of view</b>			
No college degree	684	44.4	45.3	Of all characters	970	62.9	62.1
A college degree	857	55.6	54.7	Of one character	571	37.1	37.9
<b>Political opinions</b>				<b>Region</b>			
Liberal	564	36.6	37.0	Atlantic coast	547	35.5	35.4
Independent	551	35.8	37.8	Pacific coast	262	17.0	17.8
Conservative	426	27.6	25.2	Central US	732	47.5	46.8
<b>Income</b>				<b>Neighbourhood</b>			
< 50K\$/year	623	40.4	41.9	Majority	750	48.7	44.0
50K\$ to 100K\$/year	471	30.6	30.2	Minority	206	13.4	16.7
> 100K\$/year	447	29.0	27.9	Mixed neighbourhood	585	38.0	39.3
<b>Total</b>	1541	100	100		1541	100	100

Data source: Margouillat survey, 2019

<sup>19</sup> Compared to the US population, our sample has a higher proportion of women (54%) and of respondents declaring being White (¾ of the respondents, against a proportion of 50% in the American population). Respondents declaring liberal political opinions are over-represented compared to the Gallup polls (1/3 in our base against ¼ in the polls). According to US census, 2/3 of Americans own their home. This proportion is slightly lower in our sample (61%). The proportion of Americans with a high school diploma is higher in our sample than in the American population (55% versus 40%). This difference is due to the fact that the panel is made up of individuals connected to a telephone or a computer, which leads to a greater selection of respondents with a high school diploma. To account for these differences, Appendix 6 presents a robustness check of the results presented in this paper using a weighted sample based on age, race and gender proportions of the 2019 US population (data used: 2019 US census data).

The SurveyMonkey panel, along with others platforms such as Qualtrics, is commonly utilised in conducting online surveys (see for example Milrad et al., 2019 ; Waterfield et al., 2020, or Rizzo et al., 2021). Participants registered on the platform take online surveys in return for small incentives (a charitable donation of \$0.50 and an entry into a gift card prize draw).

Using an online panel like SurveyMonkey has several advantages. Firstly, the randomized allocation of vignette versions to respondents is automatic<sup>20</sup>. Secondly, in our case, using a student sample would not be appropriate, since students are more likely to live with their parents or benefit from communal housing on their campuses. As a result, working with a general population sample<sup>21</sup> such as ours is an improvement on previous works (Bunel & Tovar, 2021; Ghekiere, Verhaeghe, et al., 2022), with respondents having more representative experiences of the rental housing market. Thirdly, the platform provides information on some key socio-economic features of respondents (such as gender, age, region, and income level), which allows to drop these questions from our survey, reduce respondents' cognitive costs and boost data quality. This is relevant since respondents' attention and engagement is a consistent concern in online surveys. Fourthly, the platform provides information on the time spent on the survey by respondents, which can be used as a control of the quality of their answers<sup>22</sup>. Finally, respondents are assured of the confidentiality of their answers vis-à-vis the researchers, reducing desirability bias and enhancing response quality.

The survey experiment consisted<sup>23</sup> of (see Appendix 1 for the vignette's full text) (i) a welcome screen presenting the aim and scope of the study, (ii) a scenario randomly selected from a portfolio of 18 alternative versions of the vignette<sup>24</sup> and (iii) a short series of follow-up questions, including respondent sociodemographic characteristics (gender, age, ethnicity, income, education, homeowner/tenant status, ethnic diversity in the respondent's neighbourhood region) and attitudinal opinions (political opinions, identification with the discriminated group) that previous evidence showed being significant factors predicting moral choices in a discrimination context.

Our last working hypothesis [5] is that liberal respondents as well as those more likely to have experienced the discrimination described in the vignette (tenants, female, non-White, and poorer respondents) will be less likely to be supportive of the FCFS rule than other normative principles such as positive discrimination.

<sup>20</sup> We do not observe any significant differences in the respondents' characteristics across our vignette's versions (see Appendix 7) for more detailed results.

<sup>21</sup> These pragmatic considerations aside, there is a lively discussion on the general relevance of student samples in experimental surveys; for in-depth discussions, see Boydston et al. (2014) and Haaland et al. (2023).

<sup>22</sup> Respondents may choose to answer as quickly as possible without reading the questions in order to maximize their payoffs. To control for this, we have excluded respondents who spent less than 2 minutes completing the survey and/or who did not provide answers to all questions.

<sup>23</sup> There were no other questions about other subjects in the survey.

<sup>24</sup> Following Walzenbach (2019), we use a between-person design where respondents were randomly presented with only one version of the vignette to minimize respondent fatigue and desirability bias. See Atzmüller & Steiner (2010) or Aguinis & Bradley (2014) for a discussion of within-person vs. between-person designs.

## 4. Results

### 4.1. Fairness of the FCFS rule

#### 4.1.1. A second-order principle that outranks profit maximization and prioritarianism

First, let's show how, in a set-up where landlords enforce a client-based discrimination, the FCFS rule fares in comparison to other normative rules from the literature, such as the 50/50 proportional rule and the support of the least advantaged.

Table 2 shows that the overwhelming majority of the respondents support the 50/50 rule (60.5%, i.e. 933 out of 1,541) that stipulates that the real estate agent should rent the dwellings in equal proportion to members of the discriminated and the non-discriminated group, which reflects their respective proportions in the city's general population.

**Table 2. General results**

		The rental agent should follow the FCFS rule and rent the vacant units ...								
		YES			NO					All
		... exclusively to first arrived applicants			... 50/50 to both groups		... exclusively to last arrived applicants			
Who arrives first?	Nb	% of sample		Nb	% of sample		Nb	% of sample		Nb
		Unweighted	Weighted		Unweighted	Weighted		Unweighted	Weighted	
Discriminated applicants	136	17.6	17.9	518	67.1	65.8	118	15.3	16.3	772
Non-discriminated applicants	326	42.4	43.5	415	54.0	52.4	28	3.6	4.1	769
<b>All</b>	<b>462</b>	<b>30.00</b>	<b>30.7</b>	<b>933</b>	<b>60.50</b>	<b>59.2</b>	<b>146</b>	<b>9.50</b>	<b>10.1</b>	<b>1541</b>

Data source: Margouillat survey, 2019

This finding challenges previous literature on FCFS which emphasizes the intrinsic fairness of the FCFS rule in scarcity contexts. After the 50/50 rule, however, we find that the FCFS rule is the second most popular choice among respondents. 30.0% of respondents (462 out of 1,541) support the choice of rental exclusively to whichever group arrives first. This finding confirms our working hypothesis [1]. The fact that the FCFS principle exhibits such a high ranking among normative principles is consistent with earlier research (Kahneman et al., 1986; Frey & Pommerehne, 1993; Savage & Torgler, 2010; Fallucchi et al., 2021).

Secondly, we find that the FCFS rule takes precedence over both profit maximization and the prioritization of the weakest.

If respondents believed that rental agents should prioritize maximising their income, they would state that the rental agent should exclusively rent to non-discriminated applicants, irrespective of their arrival time. Renting to first-arrived members of the discriminated group would financially harm the rental agents because of the financial penalty imposed by the prejudiced landlords. Contrary to this logic, we find that when the discriminated group arrives first, 17.6% of respondents endorse the FCFS rule and stated that the units should be allocated to them, no matter the financial cost for the rental agent. In the same scenario, only 15.3% of respondents opt for securing the rental agent's profit by stating that the vacant housing units should be allocated to the non-discriminated tenants.

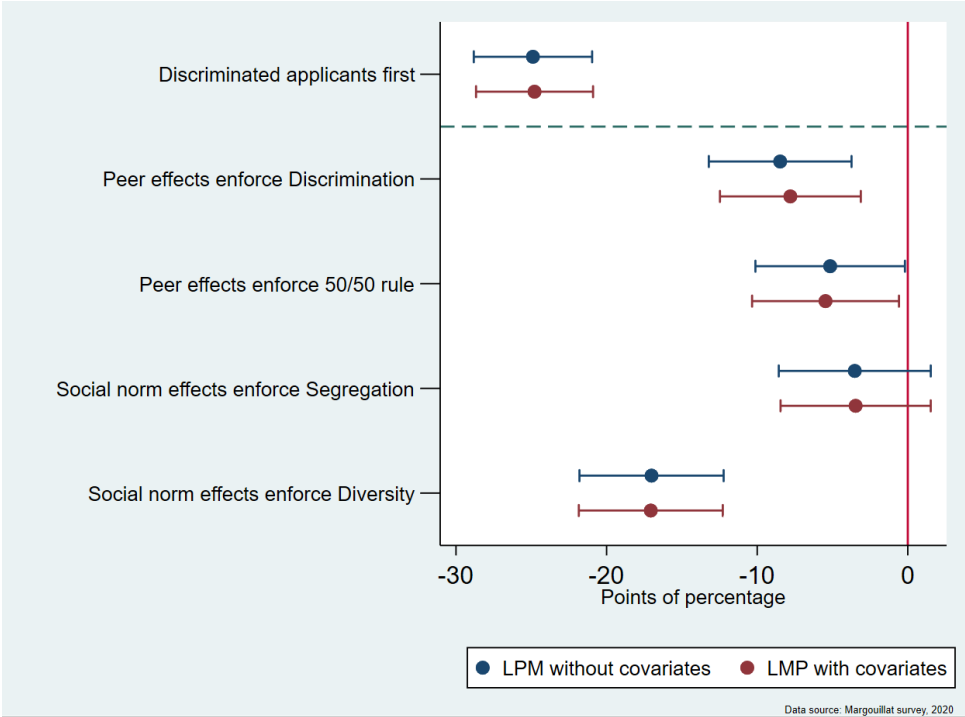
If respondents believed that rental agents should prioritize the weakest, they would stat that the rental agent should exclusively rent to discriminated applicants, irrespective of their arrival time. But we find that when the discriminated tenants arrive second, we find that only 3.6% of respondents state that the rental agent should rent the vacant units exclusively to them. This finding is at odds with the literature outlined in the previous section, where support for the weakest dominates all other justice principles (Savage & Torgler, 2010). One possible explanation could be the distinction in the types of goods, as explored in the existing research on preferences for the FCFS rule. In normative choice contexts, there are previous evidence that health and other goods are not treated equally (Hurley et al., 2011).

A second factor to consider is the cost of enforcing positive discrimination in our set-up. Respondents who believe that the rental agent should exclusively rent vacant units to members of the discriminated group of tenants recognize that he/she will lose all of his/her landlord clients. In contrast, choosing the 50/50 solution (stating that the rental agent should rent half of the vacant units to members of each group) involves losing half of his clients. We'll explore this issue in the next section.

4.1.2. Cost matters

Let's now look more closely at the dependence of the support of the FCFS rule to its cost for the real estate agent.

**Figure 1. Marginal effect of order of arrival and of contextual effects on the probability of choosing the FCFS rule (linear probability model)**



Marginal effect associated with the weighted linear probability model of choosing the FCFS rule. Control variables are age, gender, ethnicity, education, political opinion, income, ethnic diversity in the respondent's neighbourhood, geographical localisation, respondent's point of view. Reading: when respondents are told that the candidates who apply first all belong to the discriminated group, the probability that they will select the FCFS rule falls by 24.8 percentage points. This amount is 24.9 points when we do not control for covariates. The reference group for peer effect is when peer effect enforces FCFS rule. The reference group for social norm is when the social norm endorses FCFS rule.

Table 2 illustrates that if the non-discriminated group of applicants arrive first, implementing the FCFS rule is costless for the rental agent. Furthermore, 42.4% of respondents align with the FCFS rule, and state that the rental agent should exclusively rent dwellings to them (versus the 54.0% who choose the 50/50 allocation of vacant units, and only 3.6% who prioritize the least advantaged group). When applicants from the discriminated group arrive first and following the FCFS rule is very costly for the rental agent, and adhering to the first-come, first-served rule is very expensive for the rental agent, only 17.6% of respondents propose allocating vacant units to this group (compared to 67.1% who choose equality and 15.3% who select the non-discriminated group). There is a 24.8% disparity in the proportion of respondents who believe that the rental agent should provide accommodation to the first-arrived group when it is costless versus very costly for the rental agent.

To determine whether this finding is significant while controlling for respondent characteristics, we conducted a straightforward binomial logit regression<sup>25</sup>. In this regression, the dependent variable is the support of the FCFS rule, coded as 1 when respondents follow the FCFS rule (i.e., state that the real estate agent should exclusively allocate vacant units to members of the group who arrived first) and coded as 0 for other choices (i.e., allocating vacant units in 50/50 to members of both groups or exclusively to members of the group who arrived last) (see Appendix 3 for a detailed presentation of the models used in the paper).

Figure 1 shows results of this regression when including 2 groups of covariates: (i) individual characteristics (age, gender, education, political views, income, ethnicity, housing status, neighbourhood diversity, US region and point of view) and (ii) the order of arrival of the discriminated applicants<sup>26</sup> (which determines the cost of following the FCFS rule for the rental agent). We find that in cases where the first-arriving applicants are members of the discriminated group and implementing the FCFS rule would result in substantial costs for the real estate agent, the likelihood of respondents opting for this rule decreases by 25.2 percentage points.

As a result, working hypothesis [2] is validated. Our findings align with previous evidence (Bunel & Tovar, 2021; Tyran & Hedegaard, 2018), we find that the second-rank place of the FCFS rule holds true whatever its cost, but also that its support significantly drops when it is costly.

#### 4.3. Respondent characteristics and preference for the FCFS rule

Let's now explore how respondent characteristics influence their support of the FCFS rule, all things being equal.

Figure 2 shows<sup>27</sup> that younger, male, White, and rich respondents are more likely to support the FCFS rule than their counterparts who are respectively older, female, non-White, and poor. One interpretation could be that these latter respondents are more sensitive to the prioritarian principle of allocation of vacant units, whereby the situation of the most disadvantaged is given privileged consideration. This aligns with previous evidence from Schmidt (2020), Fallucchi et al. (2021) and Savage & Torgler (2010), where the prioritization of the most vulnerable individuals is identified as the primary principle, with the FCFS rule ranking second.

<sup>25</sup> See Appendix 3 for the specification of the models used in the paper, and Appendix 5 for a robustness check of results using a probit model instead.

<sup>26</sup> The covariate was introduced as a dummy equal to 1 if choosing the FCFS rule is costly for the rental agent, and equal to 0 otherwise. See Model 1 in Table A2 of Appendix 4 for detailed coefficients and marginal effects.

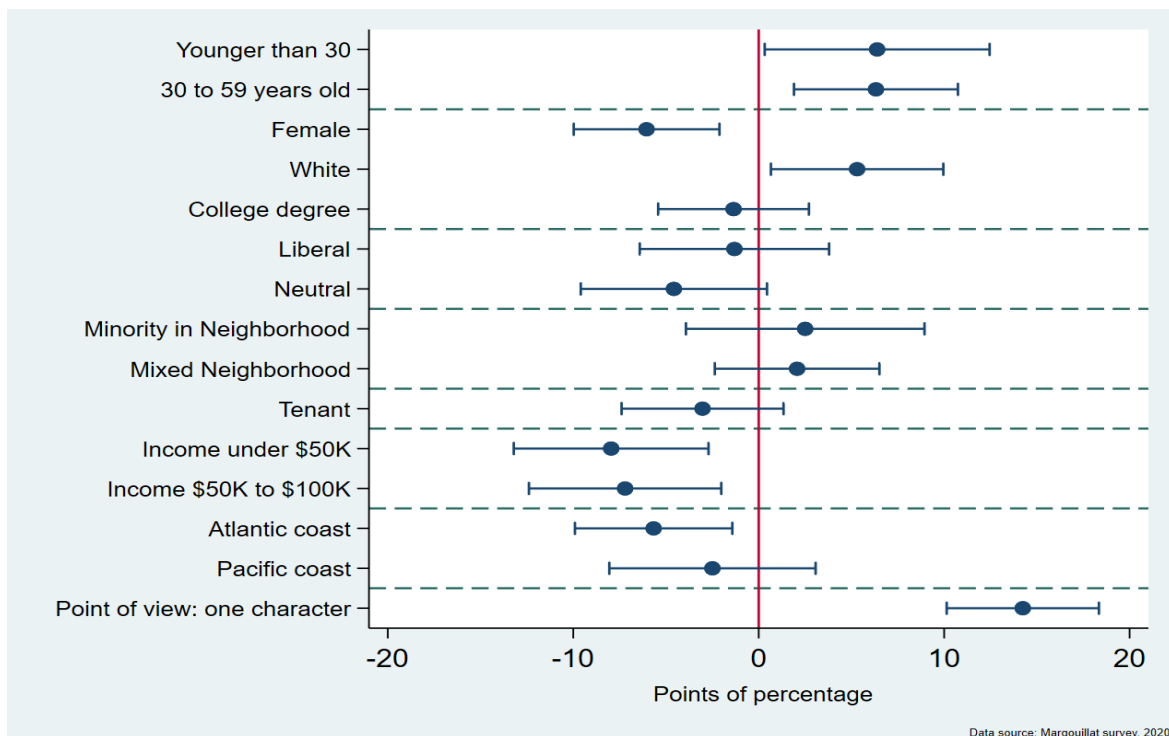
<sup>27</sup> Figure 3 presents the results of Model 5 where 2 groups of covariates were introduced: i) individual characteristics (age, gender, education, political opinions, income, ethnicity, housing status, ethnic diversity in the respondent's neighbourhood, US region and point of view) and ii) manipulated factors : the order of arrival of the discriminated applicants, peer and social norms contextual effects. See Appendix 4 and Table A2 for detailed coefficients and marginal effects.



Furthermore, the FCFS rule is neutral as it ensures an equal treatment of all rental applicants; this aligns with our finding that respondents who adopted the perspective of a single character in the vignette were more inclined to back the FCFS rule than those who assessed the situation from the point of view of all characters taken together. However, uniform implementation of the FCFS rule may lead to indirect discrimination<sup>28</sup> if employed with groups and individuals who have dissimilar access to information on available units / to the real estate agencies, or lack the ability to fulfil the requirements of real estate agencies application procedures.

Next, we find that residents of the Atlantic coast are less inclined to choose the FCFS rule compared to those residing in the Central United States. It is noteworthy that Seattle and Portland, which have implemented an anti-discrimination policy based on the FCFS rule, are not located in the region where the majority supports this principle.

**Figure 2. Marginal effects of respondent characteristics on the probability of choosing the FCFS rule (linear probability model)**



Marginal effect associated with the weighted linear probability model of choosing the FCFS rule. Reference categories are: 60 years and older, male; no white, no college degree, conservative, ethnic diversity in the respondent's neighbourhood, homeowner, income over \$100K per year, localisation Central US, all characters Reading: *the respondent's probability to select the FCFS rule increases by 6.4 percentage points when the respondent is younger than 30 years compare to respondent aged 60 years and over.*

Moreover, we obtain three intriguing insignificant correlations.

Contrary to common findings in the discrimination literature (for example in Bunel & Tovar, 2021), endorsing the FCFS rule does not display a significant relationship with the political beliefs of the survey respondents. The backing or lack of support for the FCFS rule seems to be non-partisan, regardless of the expense of implementing it for the real estate agent (i.e., taking into account the order of arrival of tenants from the discriminated and the non-discriminated groups). Moreover, we

<sup>28</sup> Indirect discrimination happens when a process that applies in the same way for everybody systematically disadvantages a group of people because of their characteristics (physical abilities, family characteristics) or because of the consequences of some external discrimination (living in a segregated area with poor transportation makes it more difficult to reach rental agencies in a timely manner).

did not find a significant correlation between approval of the FCFS rule and educational levels. There is no correlation between being a tenant or a homeowner and the support of allocating vacant dwellings to tenants based on a first-come, first-served basis. This could be because tenants and homeowners gave similar housing market experiences, with many of the latter having rented before buying a property. Last, we find that the ethnic diversity reported by the respondent (belonging to the ethnic majority / the minority or living in a diverse neighbourhood) has no significant impact on the respondents' preferences.

All in all, working hypothesis [5] is only partially validated: respondent identity is a good predictor of the support of the FCFS rule, but ideology and one's personal situation on the housing market is not.

### 4.3. Peer and social norms effects matter

Last, let's explore whether the FCFS rule's enforcement by contextual effects, such as peer effects and social norms, has a causal effect on the respondents' support for this rule.

Table 3 and Figure 1 show a significant causal impact of enforcing the FCFS rule through both contextual effects on the normative preferences of respondents.

**Table 3. Peer and social norms contextual effects**

		The rental agent should follow the FCFS rule & rent exclusively to applicants from the group who arrives first							
		YES			NO			All	
		% of sample							
Peer effects enforce	Social norms enforce	Nb	Unweighted	Weighted	Nb	Unweighted	Weighted	Nb	z-test (p-value)
The FCFS rule	All rules	176	34.4	35.6	336	65.6	64.4	512	6.744*** (0.009)
Another rule		286	27.8	28.2	743	72.2	71.8	1029	
All rules	The FCFS rule	192	37.6	38.0	319	62.4	62.0	511	20.458** *
	Another rule	270	26.2	27.1	760	73.8	72.9	1030	

Data source: Margouillat survey, 2019

For peer effects, Table 3 shows that the proportion of respondents who state that the rental agent should allocate units to first-arrived applicants is significantly higher (34.4% vs. 27.8%) when they know that other rental agents are also adhering to the FCFS rule than when they do not (i.e., allocating units to members of the group that arrived last, or allocating units 50/50 to both groups of applicants). Figure 1<sup>29</sup> supports this finding while controlling for respondent characteristics. Compared to respondents who read a scenario where other rental agents implemented the FCFS rule, those who were presented with a scenario where the rental agent's peers implemented other rules (such as the 50/50 rule or discrimination) were found to be respectively 5.4 and 7.0 percentage points less likely recommend allocating vacant units to first-arrived applicants. All in all, these results confirm working hypothesis [4].

For social norms, Table 3 shows the higher the proportion of respondents who state that the rental agent should allocate units to first-arrived applicants is significantly higher (37.6% vs. 26.2%) when they are informed that the social norm, known and accepted by all in the community, is the FCFS rule. Controlling for respondent characteristics, Figure 1<sup>30</sup> shows that this finding is applicable solely to a single type of social norms. Compared to the scenarios where social norms support the FCFS

<sup>29</sup> Figure 1 presents the results of Model 2, which introduces two groups of covariates: i) respondent characteristics and ii) a dummy with the factorial manipulations on peer effects. See Table A2 of Appendix 4 for detailed coefficients and marginal effects.

rule, the proportion of respondents who state that the real estate agent should enforce the FCFS rule significantly drops by 17.5 percentage points when social norms support diversity. Conversely, when social norms advocate segregation, the drop is of 3.5 percentage points, but it is no longer significant.

Overall, these results support past evidence on moral suasion (Bunel & Tovar, 2021; Tyran & Hedegaard, 2018) and confirm working hypothesis [3].

Moreover, we find that the contextual factors mutually strengthen each other (see Table 4 and Figure 3). Table 4 shows that the proportion of respondents who believe that the real estate agent should assign vacant units to first-arrived applicants, in alignment with the FCFS principle, jumps from 23.1% when neither peer effects nor social norms enforced the FCFS rule to 34.6% when only one of them did, and up to 38.9% when both did.

**Table 4. Intensity impact of FCFS contextual effects**

Peers effects and /or social norms enforce FCFS	The rental agent should rent							Chi <sup>2</sup> test
	Exclusively to applicants from the group who arrives first			Other choices			All	
	Nb	% of sample		Nb	% of sample		Nb	
	Unweighted	Weighted		Unweighted	Weighted			
Both peers and social norms	63	38.9	40.6	99	61.1	59.4	162	28.682*** (0.000)
Either peers or social norms	242	34.6	35.1	457	65.4	64.9	699	
Neither peers nor social norms	157	23.1	23.7	523	76.9	76.3	680	

Data source: Margouillat survey, 2019

In greater depth, we examine<sup>31</sup> how the backing of the FCFS rule is affected by combinations of peer effects and social norms, controlling for respondent characteristics. The results, displayed in Figure 3, reveal no noteworthy discrepancies between cases where peer effects and social norms are both enforcing the rule and instances where only one of these factors is in play. One interpretation of these findings is that moral suasion effects of FCFS have a more significant impact than alternative normative principles, regardless of the channel through which they are conveyed.

However, this does not hold true when social norms enforce diversity principles and peer effects reinforce the FCFS rule. In this scenario, the proportion of respondents supporting the FCFS rule is 11.9 percentage points lower compared to cases where both effects enforce the FCFS rule.

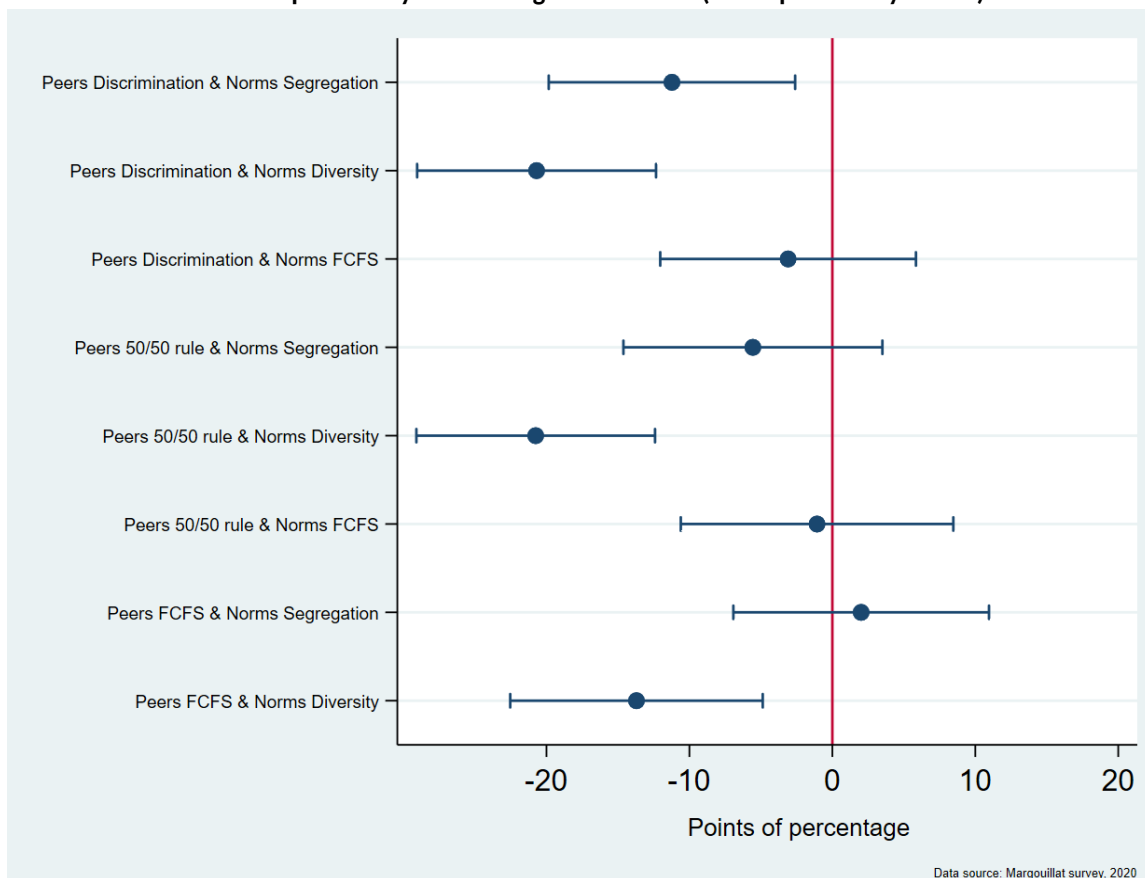
This leads to a second observation: social norms that endorse diversity have the more the strongest and opposing effect on the FCFS rule's support. Figure 3 shows that when social norms enforce diversity and peer effects enforce either the 50/50 rule (causing a significant drop of 17.1 percentage points in the proportion of respondents who support the FCFS rule) or discrimination (with a significant 17.5 percentage point drop), the combined effect of social norms and peer effects is at its strongest.

This last case is worth noting, as it aligns best with the real-world context of profit-seeking discrimination by peers and the enforcement of local ethnic diversity by social norms. Our findings suggest that out of all the fictional combinations of contextual effects studied, the one most closely mirrors the situation in US cities also has the least acceptance of the FCFS policy. Policy-wise, this implies that enhancing the legitimacy of a policy implementing the FCFS rule (peer effects = FCFS), requires prioritising the promotion of its impartiality within the wider public and encouraging its widespread adoption as a social convention.

<sup>30</sup> Figure 1 presents the results of Model 3, which introduces two groups of covariates: i) respondent characteristics and ii) a dummy with the factorial manipulations on social norms. See Table A2 of Appendix 4 for detailed coefficients and marginal effects.

<sup>31</sup> Model 5 introduces two sets of covariates: i) respondent characteristics and ii) dummy variables for all peer effects and social norm combinations. See Table A2 of Appendix 4 for detailed coefficients and marginal effects.

**Figure 3. Marginal effects of combinations of peer and social norm effects on the probability of choosing the FCFS rule (linear probability model)**



Marginal effect associated with the weighted linear probability model of choosing the FCFS rule. Control variables are age, gender, ethnicity, education, political opinion, income, ethnic diversity in the respondent's neighbourhood, geographical localisation, respondent's point of view. Reading: Compare to the situation where peer effect and norm effect enforce FCFS rule, *when* peer effect and norm effect enforce Discrimination and segregation respondent's probability to choose FCFS rule falls from 11.2 points of percentage.

## 5. Conclusion

In this paper, we explore the normative support for the first-come, first-served rule in a rental housing market where landlords pressurize rental agents to discriminate against certain tenants. To conduct this study, we designed and presented an original hypothetical survey experiment to 1541 respondents in the United States.

While the hypothetical survey experiment methodology has previously been used to study the acceptability of discrimination itself within the labour and housing markets (Bunel & Tovar, 2021; Ghekiere, Verhaeghe, et al., 2022), this paper shifts focus to the normative acceptability of alternative allocation rules in the context of discrimination.

We had a dual motivation for our study: firstly, it was to investigate the parameters of the acceptability of the FCFS rule that has been recently implemented in the housing policies of Seattle and Portland. Secondly, it was to enhance the empirical social choice literature by exploring the normative acceptability of a rarely studied allocation principle.

We found that, in line with the literature, the FCFS rule only comes second to the 50/50 rule and is preferred to either positive or negative discrimination. We also found that the FCFS rule is less likely to be chosen by individuals who are themselves more likely to suffer from discrimination, as well as

by populations on the East and West coasts of the USA. However, we do not find any association with respondents' political orientation. Last but not least, the factorial manipulations included in the design show causal effects of both the cost of enforcing the FCFS rule (due to the landlords' discriminatory preferences) and of contextual effects, where social norms seem to have a much stronger influence than peer effects.

There are several main limitations to our work, including sample size constraints that limit the explanatory power of some contextual effects combinations. They also restrict the granularity of results based on respondents' identity characteristics. Following this line, we found no correlation between the respondents' moral choices and their tenant/homeowner status or the ethnic diversity in their neighborhood. Using a larger sample could provide more insight on these issues. Another interesting line of investigation would be to use a framing with less conceptual distancing, which would picture real-world discriminated groups.

Second, other factors could be considered than those included in our study. Our design contrasts the preference for the FCFS rule to other principles such as discrimination (positive or negative) and the allocation of vacant residential units according to the proportion of the two groups in the population. For simplicity's sake, we chose to set this proportion at 50/50. Nonetheless, it is worth noting that minority groups are more prone to experiencing discrimination in reality. Considering different ratios of discriminated and non-discriminated tenants could aid in distinguishing between selecting an equal allocation of vacant units to members of both groups or opting for a distribution that mirrors the representation of both groups in the overall population. Also, echoing the spatial mismatch literature, it might be interesting to consider scenarios with alternative explanations of why the discriminated tenants are less likely than the non-discriminated ones to arrive first – and be selected by the FCFS rule (for example, lack of information, poor access to transportation vs. lack of effort). In the same line, it could be interesting to echo (Bunel & Tovar, 2021 and Ghekiere, Verhaeghe, et al., 2022) and specify alternative reasons for the landlord's discriminatory preferences (for example, pure xenophobic preferences vs. statistical discrimination). The design could also incorporate details regarding the ethnic diversity of neighbourhoods where vacant units are present to enhance understanding. In this line, it would be intriguing to assign actual identities to the discriminated and non-discriminated group based on ethnicity, wealth, or prison status.

Finally, our results suggest that the probability of supporting the FCFS rule is maximal when it is both followed by all rental agents (as enforced in the real-world Seattle and Portland housing policies) and supported by social norms (probability increased by 14 percentage points), and that it is minimal when other rental agents cater to the landlords' discriminatory preferences and social norms promote a 50/50 allocation of housing units. However, this later configuration reflects most real-world situations. This means that, to maximize the acceptability of real-world policies implementing the FCFS rule, monitoring the rental agents' behaviour is important, but that a strong public opinion campaign is also necessary to influence social norms in favour of the FCFS rule. In this regard, a future survey targeted at Portland and Seattle residents (who have been subjected to the real-world policy FCFS rule in the rental housing market) vs. neighbouring cities (who have not) could provide insightful results.

Last, on a different level, alternative framings for the study of the acceptability of the FCFS rule could be explored, by exploring other contexts and by comparing the FCFS rule and by confronting it to more principles that an allocation proportional to the size of the discriminated and non-discriminated groups, and positive discrimination and negative discrimination.

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## 7. Appendix

### Appendix 1. Vignette, screenshots and factorial manipulations

Figure A1a – Screenshot of the survey's welcome screen



**Thank you for taking our survey!**

People have very **different opinions** on **right and wrong**. We're academic scientists interested in acquiring knowledge about these opinions from many people from all over the US.

In the next page you'll find **1 short story** where a character must make a decision. You'll be asked **which choice is the best** in **YOUR opinion**. There is not a good or a bad answer! We're interested in your opinion.

Please read the story carefully before making your decision.

After, there are **6 quick questions about you**. They will help us compare the answers from all the respondents to the survey.

All in all, the survey takes about **3-4 minutes to complete**. We hope you'll enjoy it :)

Neutra is a planet in a far away and peaceful galaxy. A new city, Ocean City, is being founded on planet Neutra. Only two alien races, who can breathe underwater, the Enkas and the Okrins, want to settle in Ocean City.

[Social norm] In Planet Neutra, all the communities (including the Okrins and the Enkas) share the same social norm:

- [Social norm = First-come, first-served] First-come, first-served: houses should be rented to the first applicants
- [Social norm = Segregation] All races should be separated, so the Enkas and the Okrins should not live in the same cities.
- [Social norm = Diversity] All races should equally share the same territory: there should be the same number of Enkas and of Okrins everywhere

The landlords of Ocean City buy the services of real estate agents to find tenants for their properties. Tom is the manager of a real estate agency, in charge of finding tenants for bubble houses in Ocean City. This job is his only source of income. Personally, Tom likes both the Enka and the Okrin aliens.

However, the landlords of Ocean City do not want to have Enka tenants. Tom knows that he/she will lose clients and suffer a financial loss if he/she selects too many Enka tenants for his landlord clients.

[Order of arrival] At first, only [Order of arrival = Enka/Okrin] aliens apply to rent the bubble houses managed by Tom. They all would make good tenants. Later, [Order of arrival = Okrin/Enka] aliens also apply to rent the same houses managed by Tom. They also would make good tenants.

[Peer effects] Tom knows that his competitors, the other real estate agents:

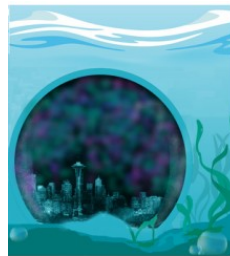
- [Peer effects = Discrimination] only rent to Okrins tenants
- [Peer effects = First-come, first-served] rent to the first applicants who apply for a house.
- [Peer effects = 50/50 rule] rent to an equal number of Okrins and of Enkas.

Tom must propose tenants to his landlord clients, who do not like the Enkas.

In your opinion, which of the options below is the fairest, from a moral point of view? (Your answer will not have any impact on Tom's choice).

- Tom only selects Enkas, who applied [first/last]. In this case, Tom will lose most of his clients and lose most of his income
- Tom only selects Okrins, who applied [last/first]. In this case, Tom will not lose any of his clients and will receive a full income.
- Tom selects an equal number of Enkas and Okrins. In this case, Tom will lose half of his clients and lose half of his income.

Figure A1b – Screenshot of the vignette's page



Neutra is a planet in a far away and peaceful galaxy. A new city, Ocean City, is being founded on planet Neutra. Only **two alien races** who can breathe underwater, the **Enkas** and the **Okrins**, want to **settle in Ocean City**.

In Planet Neutra, all the communities (including the Okrins and the Enkas) share the **same social norm: all races should equally share the same territory**. There should be the same number of Enkas and of Okrins everywhere.

The **landlords** of Ocean City buy the services of real estate agents to find tenants for their properties. **Tom** is the manager of a **real estate agency**, in charge of finding tenants for bubble houses in Ocean City. This job is his **only source of income**. Personally, Tom likes both the Enka and the Okrin aliens.

However, the **landlords** of Ocean City **do not want** to have **Enka tenants**. **Tom** knows that he will lose clients and **suffer a financial loss** if he selects **too many Enka** tenants for his landlord clients.

**At first**, only **Okrin** aliens **apply** to rent the bubble houses managed by Tom. They all would make good tenants. **Later**, **Enka** aliens also **apply** to rent the same houses managed by Tom. They also would make good tenants.

Tom knows that **his competitors**, the other real estate agents, **rent** based on a **first-come, first-served principle**, without taking into account the race of the applicants.

**Tom** must **propose tenants** to his landlord clients, **who do not like the Enkas**.

**Question.** In your opinion, **which** of the options below **is the fairest**, from a moral point of view? (Your answer will not have any impact on Tom's choice).

- Tom only selects Okrins**, who **applied first**. In this case, **Tom** will not lose any of his clients and will **receive a full income**.
- Tom only selects Enkas**, who **applied later**. In this case, **Tom** will lose most of his clients and **lose most of his income**.
- Tom selects an equal number** of Enkas and Okrins. In this case, **Tom** will lose half of his clients and **lose half of his income**.



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 See how easy it is to [create a survey](#).

## Appendix 2. Weighting and raw results for all versions

Table A2a shows that our sample is not perfectly balanced compared to the 2019 US population. To correct this bias, all results were recomputed using a weight sample based on the 2019 US Census. Results were robust to this change.

**Table A2a. Cross-tabulation of our unweighted sample vs. the US Census by age, race and gender**

Table A5a		White		Not White	
		Males	Females	Males	Females
Under 30 years old	US Census	5,9%	5,6%	5,1%	4,9%
	Our sample	4,4%	5,0%	3,9%	3,8%
30 to 59 years old	US Census	18,1%	18,1%	11,9%	12,3%
	Our sample	18,2%	20,8%	7,1%	7,8%
60 + years old	US Census	6,3%	6,8%	2,3%	2,7%
	Our sample	10,6%	15,0%	1,6%	1,9%

**Table A2b. Raw results for all versions**

			The rental agent should rent...									
			Exclusively to the first-arrived applicants			50/50 to both groups			Exclusively to the last-arrived applicants			Total
Peer effects	Social norm		Nb	% of sample		Nb	% of sample		Nb	% of sample		Nb
				Unweighted	Weighted		Unweighted	Weighted		Unweighted	Weighted	
<b>All versions</b>			<b>462</b>	<b>30.0</b>	<b>30.7</b>	<b>933</b>	<b>60.5</b>	<b>59.2</b>	<b>146</b>	<b>9.5</b>	<b>10.1</b>	<b>1541</b>
<b>Discriminated applicants arrive first</b>												
V1	discrimination	segregation	6	7.2	6.7	60	72.3	71.0	17	20.5	22.4	83
V2	discrimination	FCFS	23	23.2	23.9	66	66.7	64.9	10	10.1	11.2	99
V3	discrimination	diversity	8	8.3	9.8	77	80.2	76.4	11	11.5	13.8	96
V4	FCFS	segregation	25	26.9	25.0	53	57.0	55.7	15	16.1	19.3	93
V5	FCFS	FCFS	19	28.8	29.0	34	51.5	48.8	13	19.7	22.2	66
V6	FCFS	diversity	13	14.0	15.2	65	69.9	68.7	15	16.1	16.1	93
V7	50/50 rule	segregation	11	13.9	15.6	50	63.3	61.0	18	22.8	23.4	79
V8	50/50 rule	FCFS	23	29.9	29.9	48	62.3	63.6	6	7.8	6.4	77
V9	50/50 rule	diversity	8	9.3	8.7	65	75.6	78.1	13	15.1	13.2	86
<b>1 to 9</b>	<b>all</b>	<b>all</b>	<b>136</b>	<b>17.6</b>	<b>17.9</b>	<b>518</b>	<b>67.1</b>	<b>65.8</b>	<b>118</b>	<b>15.3</b>	<b>16.2</b>	<b>772</b>
<b>Non-discriminated applicants arrive first</b>												
V10	discrimination	segregation	39	51.3	48.0	32	42.1	45.0	5	6.6	7.0	76
V11	discrimination	FCFS	45	46.4	46.2	49	50.5	50.7	3	3.1	3.0	97
V12	discrimination	diversity	25	26.3	26.1	66	69.5	70.2	4	4.2	3.7	95
V13	FCFS	segregation	50	53.8	57.8	39	41.9	38.1	4	4.3	4.1	93
V14	FCFS	FCFS	44	45.8	48.6	48	50.0	45.8	4	4.2	5.6	96
V15	FCFS	diversity	25	35.2	35.2	43	60.6	60.1	3	4.2	4.6	71
V16	50/50 rule	segregation	39	45.9	50.6	44	51.8	46.3	2	2.4	3.1	85
V17	50/50 rule	FCFS	38	50.0	48.5	36	47.4	48.1	2	2.6	3.3	76
V18	50/50 rule	diversity	21	26.3	27.6	58	72.5	70.4	1	1.2	2.0	80
<b>10 to 18</b>	<b>all</b>	<b>all</b>	<b>326</b>	<b>42.4</b>	<b>43.5</b>	<b>415</b>	<b>54.0</b>	<b>52.4</b>	<b>28</b>	<b>3.6</b>	<b>4.0</b>	<b>769</b>

Data source: Margouillat survey, 2019

### Appendix 3. LPM versus LOGIT models

In the paper, we use a linear probability model to analyse the decision to opt for the FCFS rule. Covariates  $X_i$  are a vector of individual characteristics of respondent  $i$ : age (ref: under 30 years old, from 30 to 59 years old, ref: *over 60 years old*), gender (ref: *female*, male), education (ref: *no college degree*, college degrees), political opinions (ref: *liberal*, independent, conservative), income (ref: *under \$50K a year*, between \$50K and \$100K, *over \$100K a year*), ethnicity (ref: *not White*, White), housing status (ref: *tenant*, homeowner) neighbourhood diversity (ref: *the respondent lives in mixed neighbourhood with no dominant ethnicity*, the respondent lives in a neighbourhood where their ethnicity dominant, the respondent lives in a neighbourhood where their ethnicity is a minority), region (ref: *Central US*, Atlantic coast, Pacific coast), and point of view (ref: *the respondent considered the situation of all agents in the vignette before stating their choice*, the respondent adopted a vignette's character's point of view to make their choice).

We note  $Z_j$  the covariates specifying the factorial variation  $j$  of the vignette given to the respondent.

- Order of arrival is a dummy variable equal to 1 if the discriminated group arrives first (which means that selecting the FCFS rule will be costly for the rental agent) and 0 if it arrives last (which means that selecting the FCFS rule will be costless for the rental agent).
- Peers is a categorical variable characterizing the others real estate agents' behaviour (ref: *FCFS*, *50/50 rule*, *Discrimination*).
- Social norm is a categorical variable characterizing the social norm shared by all in the city (ref: *FCFS*, *Diversity*, *Segregation*)

In LPM we estimate the following model:

$$D_{ij} = \beta X'_i + \gamma Z'_j + \varepsilon_{ij}$$

where  $D_{ij}$  is a dummy variable equal to 1 if respondent  $i$  exposed to vignette  $j$  selected the FCFS rule (i.e., stated that the real estate agent should exclusively allocate vacant units to members of the group who arrived first) and equal to 0 otherwise (i.e., allocating vacant units in equal parts to members of both groups or exclusively to members of the group who arrived last).

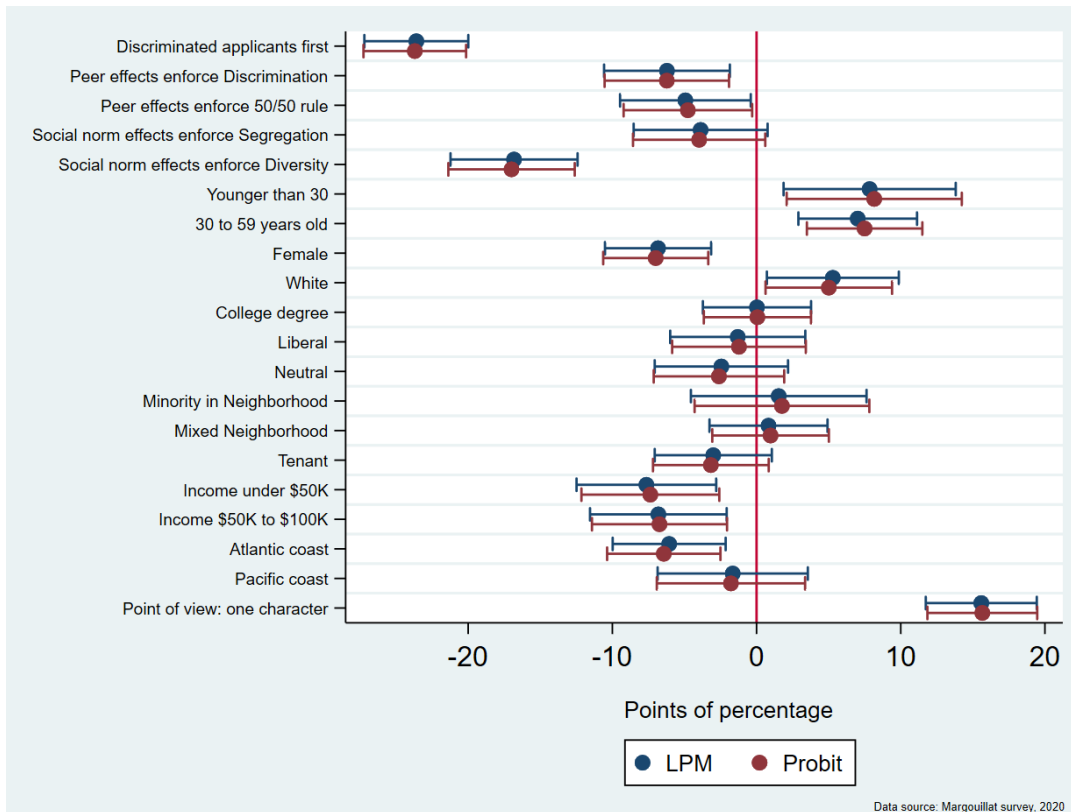
In chapter 15 Wooldridge (2010) discusses the limit of the LMP regarding the more usual logit model where the  $\beta$  and  $\gamma$  are estimated using the following

$$P(D_{ij}=1 \mid X_i, Z_j) = \frac{\exp(\beta X'_i + \gamma Z'_j)}{1 + \exp(\beta X'_i + \gamma Z'_j)}$$

In most cases, the marginal effects obtained using these two models are very close. In this article we favour the LPM model because it is easier to introduce a weighting system.

Figure A3 exposes the comparison of the marginal effects of both models. We observe no significant differences between both regressions.

Figure A3. Comparison of marginal effects for logit vs. probit models



#### Appendix 4. Detailed regression output

In this appendix to check the interdependency between the covariates we estimate several models. In Model 0, only the individual characteristics are introduced:  $\text{logit}(D_{ij}=1 \vee X_i)$ .

Model 1 adds information on the order of arrival of the discriminated group (ref: *the discriminated group arrives first*):  $\text{logit}(D_{ij}=1 \vee X_i, \text{OrderofArrival})$ .

Model 2 includes Peer effects:  $\text{logit}(D_{ij}=1 \vee X_i, \text{Orderofarrival}, \text{Peers})$ .

In Model 3, we include Social norm effects:  $\text{logit}(D_{ij}=1 \vee X_i, \text{OrderofArrival}, \text{SocialNorm})$ .

In Model 4, we include both peer and social norms effects:  $\text{logit}(D_{ij}=1 \vee X_i, \text{OrderofArrival}, \text{Peers}, \text{SocialNorm})$ .

Last, in Model 5 we include a variable providing information on both the joint influence of peer effects and the social norm (ref: *both social norms and peer effects enforce the FCFS rule*).  $\text{logit}(D_{ij}=1 \vee X_i, \text{OrderofArrival}, \text{Peers} \times \text{SocialNorm})$ .

**Table A4. Determinants of the acceptability of the FCFS rule (logit model)**

	Model (0)		Model (1)		Model (2)		Model (3)		Model (4)		Model (5)	
	Coeff (Std. Err.)	Marginal effect (Std. Err.)	Coef0s (Std. Err.)	Marginal effect (Std. Err.)	Coeff (Std. Err.)	Marginal effect (Std. Err.)	Coeff (Std. Err.)	Marginal effect (Std. Err.)	Coeff (Std. Err.)	Marginal effect (Std. Err.)	Coeff (Std. Err.)	Marginal effect (Std. Err.)
Discriminated applicants arrive last (ref: arrive first)			1.289*** (0.124)	0.252*** (0.023)	1.294*** (0.124)	0.252*** (0.023)	1.301*** (0.126)	0.25*** (0.023)	1.303*** (0.127)	0.25*** (0.023)	1.315*** (0.127)	0.252*** (0.023)
Peer effects enforce Discrimination (ref: enforce FCFS)					-0.362** (0.144)	-0.070** (0.027)			-0.349** (0.147)	-0.066** (0.027)		
Peer effects enforce the 50/50 rule (ref: enforce FCFS)					-0.281* (0.147)	-0.054* (0.028)			-0.264* (0.149)	-0.05* (0.028)		
Social norm effects enforce Segregation (ref: enforce FCFS)							-0.185 (0.142)	-0.035 (0.027)	-0.204 (0.143)	-0.039 (0.027)		
Social norm effects enforce Diversity (ref: enforce FCFS)							-0.980*** (0.154)	-0.175*** (0.025)	-0.981*** (0.155)	-0.175*** (0.025)		
Peers Discrimination & Norms Segregation (ref: FCFS & FCFS)											-0.460* (0.259)	-0.081** (0.041)
Peers Discrimination & Norms Diversity (ref: FCFS & FCFS)											-1.140*** (0.266)	-0.175*** (0.031)
Peers Discrimination & Norms FCFS (ref: FCFS & FCFS)											-0.071 (0.238)	-0.014 (0.045)
Peers 50/50 rule & Norms Segregation (ref: FCFS & FCFS)											-0.338 (0.252)	-0.061 (0.042)
Peers 50/50 rule & Norms Diversity (ref: FCFS & FCFS)											-1.121*** (0.276)	-0.171*** (0.031)
Peers 50/50 rule & Norms FCFS (ref: FCFS & FCFS)											0.052 (0.250)	0.010 (0.049)
Peers FCFS & Norms Segregation (ref: FCFS & FCFS)											0.124 (0.238)	0.025 (0.048)
Peers FCFS & Norms Diversity (ref: FCFS & FCFS)											-0.713*** (0.264)	-0.119*** (0.037)

\* p<0.1; \*\* p<0.05; \*\*\* p<0.01

Data source: Margouillat survey, 2019

**Table A4 (continued). Determinants of the acceptability of the FCFS rule (logit model)**

	Model (0)		Model (1)		Model (2)		Model (3)		Model (4)		Model (5)	
	Coeff (Std. Err.)	Marginal effect (Std. Err.)	Coef0s (Std. Err.)	Marginal effect (Std. Err.)	Coeff (Std. Err.)	Marginal effect (Std. Err.)	Coeff (Std. Err.)	Marginal effect (Std. Err.)	Coeff (Std. Err.)	Marginal effect (Std. Err.)	Coeff (Std. Err.)	Marginal effect (Std. Err.)
30 to 59 years old (ref: older than 60)	0.039 (0.165)	0.008 (0.034)	-0.031 (0.173)	-0.006 (0.034)	-0.025 (0.173)	-0.005 (0.034)	-0.040 (0.175)	-0.008 (0.034)	-0.036 (0.176)	-0.007 (0.034)	-0.020 (0.176)	-0.004 (0.034)
Younger than 30 (ref: older than 60)	-0.392** (0.194)	-0.078** (0.037)	-0.437** (0.203)	-0.083** (0.037)	-0.423** (0.204)	-0.08** (0.037)	-0.485** (0.206)	-0.09** (0.036)	-0.475** (0.207)	-0.088** (0.036)	-0.452** (0.208)	-0.083** (0.036)
Female (ref: male)	0.318*** (0.116)	0.066*** (0.024)	0.359*** (0.121)	0.071*** (0.024)	0.368*** (0.121)	0.073*** (0.024)	0.385*** (0.123)	0.075*** (0.024)	0.393*** (0.123)	0.077*** (0.024)	0.396*** (0.124)	0.077*** (0.024)
College degree (ref no college degree)	0.009 (0.122)	0.002 (0.025)	-0.020 (0.127)	-0.004 (0.025)	-0.022 (0.127)	-0.004 (0.025)	0.004 (0.129)	0.001 (0.025)	0.003 (0.129)	0.001 (0.025)	0.007 (0.130)	0.001 (0.025)
Liberal (ref: conservative)	0.026 (0.147)	0.005 (0.03)	0.029 (0.153)	0.006 (0.03)	0.030 (0.153)	0.006 (0.03)	0.066 (0.155)	0.013 (0.031)	0.068 (0.156)	0.013 (0.031)	0.056 (0.157)	0.011 (0.031)
Independent (ref: conservative)	-0.099 (0.138)	-0.02 (0.028)	-0.093 (0.144)	-0.018 (0.028)	-0.087 (0.144)	-0.017 (0.028)	-0.085 (0.146)	-0.016 (0.028)	-0.079 (0.147)	-0.015 (0.028)	-0.083 (0.147)	-0.016 (0.028)
Income < \$50K (ref: over \$100K)	0.036 (0.146)	0.007 (0.03)	0.046 (0.152)	0.009 (0.03)	0.044 (0.152)	0.009 (0.03)	0.040 (0.154)	0.008 (0.03)	0.037 (0.154)	0.007 (0.03)	0.037 (0.155)	0.007 (0.03)
Income \$50K to \$100K (ref: over \$100K)	0.404*** (0.149)	0.086*** (0.033)	0.391** (0.155)	0.08** (0.033)	0.394** (0.155)	0.081** (0.033)	0.407*** (0.157)	0.082** (0.033)	0.407*** (0.158)	0.082** (0.033)	0.409*** (0.158)	0.082** (0.033)
Not White (ref: White)	0.304** (0.150)	0.06** (0.029)	0.266* (0.155)	0.051* (0.029)	0.271* (0.155)	0.052* (0.029)	0.286* (0.157)	0.054* (0.028)	0.290* (0.157)	0.054* (0.028)	0.289* (0.158)	0.054* (0.028)
Tenant (ref: homeowner)	0.109 (0.133)	0.022 (0.027)	0.157 (0.138)	0.031 (0.027)	0.165 (0.139)	0.032 (0.027)	0.172 (0.140)	0.033 (0.027)	0.181 (0.141)	0.035 (0.027)	0.179 (0.141)	0.034 (0.027)
Mixed neighbourhood (ref: majority)	-0.074 (0.132)	-0.015 (0.027)	-0.051 (0.137)	-0.01 (0.027)	-0.062 (0.137)	-0.012 (0.027)	-0.043 (0.139)	-0.008 (0.027)	-0.055 (0.140)	-0.011 (0.027)	-0.051 (0.140)	-0.01 (0.027)
Minority in neighbourhood (ref: majority)	-0.052 (0.191)	-0.011 (0.039)	0.000 (0.198)	0.000 (0.039)	0.002 (0.198)	0.000 (0.039)	0.046 (0.200)	0.009 (0.04)	0.044 (0.201)	0.009 (0.04)	0.040 (0.202)	0.008 (0.04)
Atlantic coast (ref: Central US)	-0.350*** (0.130)	-0.07*** (0.025)	-0.365*** (0.136)	-0.070*** (0.025)	-0.358*** (0.136)	-0.069*** (0.025)	-0.377*** (0.138)	-0.071*** (0.025)	-0.369*** (0.139)	-0.07*** (0.025)	-0.373*** (0.139)	-0.07*** (0.025)
Pacific coast (ref: Central US)	-0.056 (0.164)	-0.011 (0.033)	-0.037 (0.171)	-0.007 (0.033)	-0.047 (0.171)	-0.009 (0.033)	-0.090 (0.174)	-0.017 (0.033)	-0.098 (0.174)	-0.019 (0.033)	-0.104 (0.175)	-0.02 (0.033)
Point of view: one character (ref: all characters)	-0.795*** (0.116)	-0.169*** (0.025)	-0.860*** (0.122)	-0.177*** (0.026)	-0.861*** (0.122)	-0.177*** (0.026)	-0.847*** (0.124)	-0.172*** (0.026)	-0.849*** (0.125)	-0.172*** (0.026)	-0.839*** (0.125)	-0.17*** (0.026)
Constant		-0.672*** (0.232)				-1.332*** (0.253)				-1.141*** (0.263)		-1.037*** (0.269)
Observations		1,541		1,541		1,541		1,541		1,541		1,541
Log Likelihood		-898.810		-840.353		-836.886		-817.196		-814.118		-812.465
Akaike Inf. Crit.		1,829.620		1,714.705		1,711.772		1,672.391		1,670.237		1,674.930

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Data source: Margouillat survey, 2019

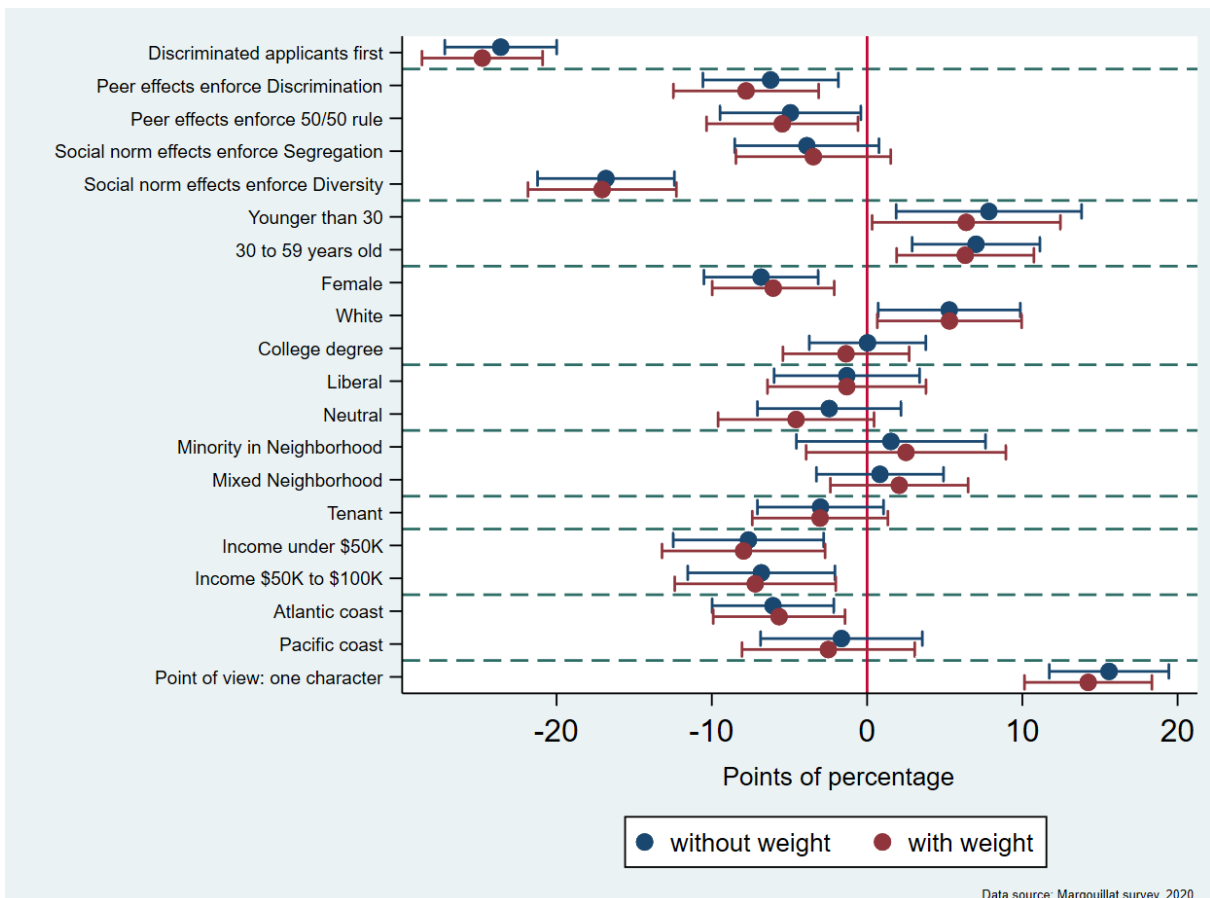


## Appendix 5. Robustness check 1: weighting

In the paper, we present results using a weighted sample reflecting the structure of the US population in terms of age, gender, and ethnicity.

To check the impact of the weighting on our results, figure A5 exposes the marginal effects of the LMP with or without the weight. We observe no significant differences between both regressions.

**Figure A5. Comparison of marginal effects between the weighted and unweighted samples**



Marginal effect associated with the unweighted and weighted linear probability model of choosing the FCFS rule. For respondent's characteristics reference categories are: 60 years and older, male; no white, no college degree, conservative, ethnic diversity in the respondent's neighbourhood, homeowner, income over \$100K per year, localisation Central US, all characters. For peer effect the reference group for is when peer effect enforces FCFS rule. For social norm the reference group is when the social norm endorses FCFS rule.

## Appendix 6. Robustness check 2: sample composition

VARIABLE		All	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18	Chi <sup>2</sup> test p-value
<b>Gender</b>	Male	49.6	46.7	46.8	56.5	57.2	50.7	47.5	44.1	42.1	53.0	54.7	44.2	57.6	47.8	48.6	46.3	47.6	50.6	48.7	0.644
	Female	50.4	53.3	53.3	43.5	42.8	49.3	52.5	55.9	57.9	47.0	45.3	55.8	42.4	52.2	51.5	53.8	52.4	49.4	51.3	
<b>Age</b>	Younger than 30	21.5	29.6	27.3	18.0	26.4	24.8	22.5	15.9	12.5	29.7	18.9	23.9	18.9	27.9	12.3	26.1	15.1	19.4	15.5	0.136
	From 30 to 59 years old	60.4	44.0	53.0	60.4	56.4	55.8	64.2	66.6	68.7	52.3	68.5	59.7	64.2	54.9	68.8	62.4	60.5	63.9	65.9	
	Older than 60	18.1	26.4	19.7	21.6	17.2	19.4	13.4	17.6	18.8	18.0	12.7	16.5	17.0	17.2	18.9	11.6	24.4	16.7	18.6	
<b>Education</b>	No college degree	45.3	43.8	55.6	46.9	41.8	55.6	42.1	39.7	47.8	44.2	45.5	54.5	36.2	49.1	40.5	43.6	40.3	41.7	46.5	0.610
	A college degree	54.7	56.2	44.4	53.1	58.2	44.4	57.9	60.3	52.2	55.8	54.6	45.5	63.8	50.9	59.5	56.4	59.7	58.3	53.5	
<b>Political opinions</b>	Liberal	37.0	35.5	37.9	32.4	40.5	32.5	38.3	36.2	39.4	39.5	43.8	40.8	30.9	39.4	40.7	30.2	35.0	27.8	42.5	0.354
	Independent	37.8	45.0	37.8	40.3	35.4	43.1	32.4	36.7	37.5	39.5	33.8	35.2	39.6	39.6	39.9	35.2	27.6	42.4	40.4	
	Conservative	25.2	19.6	24.4	27.3	24.2	24.4	29.3	27.1	23.1	21.0	22.4	24.0	29.5	21.0	19.4	34.6	37.4	29.9	17.1	
<b>Income</b>	Below 50K \$ a year	41.9	43.5	50.2	38.0	44.4	41.2	47.8	35.8	39.2	37.8	44.5	46.9	38.8	48.6	43.2	32.8	35.0	33.6	47.2	0.590
	From 50 to 100K \$ a year	30.2	34.5	32.4	31.4	29.4	26.2	27.1	40.8	26.6	23.9	30.5	26.9	30.8	32.2	29.6	29.9	28.8	31.5	30.3	
	Above 100K \$ a year	27.9	22.1	17.4	30.7	26.2	32.6	25.2	23.4	34.2	38.3	25.0	26.2	30.5	19.2	27.2	37.2	36.2	34.9	22.5	
<b>Ethnicity</b>	White	60.9	54.5	60.0	60.2	57.5	64.7	61.9	56.3	60.8	56.6	61.2	62.9	69.9	57.6	63.2	64.5	57.7	64.4	63.1	0.969
	Other	39.1	45.5	40.0	39.8	42.5	35.3	38.1	43.7	39.2	43.4	38.8	37.1	30.2	42.4	36.8	35.5	42.3	35.6	36.9	
<b>Residential status</b>	Tenant	43.0	36.5	46.9	37.8	41.5	47.9	48.8	42.8	43.3	37.1	38.6	46.7	49.2	53.0	45.1	35.5	40.9	35.5	42.5	0.513
	Homeowner	57.0	63.5	53.1	62.2	58.5	52.1	51.2	57.2	56.7	62.9	61.4	53.3	50.8	47.0	54.9	64.5	59.1	64.5	57.5	
<b>Respondent adopts the point of view</b>	Of all characters	62.1	66.5	64.0	71.0	54.5	59.2	63.2	53.0	56.2	62.0	61.1	61.3	68.3	55.3	70.4	66.9	66.6	56.8	61.2	0.329
	Of one character	37.9	33.5	36.0	29.0	45.5	40.8	36.8	47.0	43.8	38.0	38.9	38.7	31.7	44.7	29.7	33.1	33.5	43.2	38.8	
<b>Region</b>	Atlantic coast	35.4	40.2	29.1	40.2	36.6	29.5	34.1	33.8	29.4	43.2	29.8	41.7	34.5	36.4	34.8	28.7	41.2	36.4	33.8	0.416
	Pacific coast	17.8	12.9	16.9	11.9	24.0	13.2	18.7	26.3	23.0	21.8	18.7	20.2	10.6	12.4	22.3	19.6	21.7	14.6	11.1	
	Central US	46.8	46.9	54.1	47.9	39.4	57.4	47.3	40.0	47.7	35.0	51.6	38.2	55.0	51.2	42.9	51.7	37.1	49.0	55.1	
<b>Neighbourhood</b>	Majority	44.0	44.2	45.6	42.7	40.5	29.3	35.8	47.5	31.5	33.9	44.0	43.9	30.9	45.3	33.8	33.3	40.5	35.3	44.9	0.244
	Minority	16.7	13.9	11.3	15.4	15.2	18.3	15.1	18.9	31.0	22.1	15.4	18.0	21.5	18.8	14.7	17.2	9.5	12.6	13.4	
	Mixed neighbourhood	39.3	41.9	43.1	42.0	44.3	52.4	49.2	33.6	37.6	44.0	40.6	38.1	47.6	35.9	51.4	49.5	50.1	52.2	41.7	

Data source: Margouillat survey, 2019