

Along which identity lines does 21st century Britain divide? Evidence from Big Brother.

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Abstract

This paper measures discrimination in the reality TV show Big Brother, a high-stakes environment. Data on contestants' nominations are taken from 35 series of the British version of the show, covering the years 2000-2016. Race and age discrimination are found, with contestants more likely to nominate those of a different race and those different in age from themselves. However, no discrimination is identified on the basis of gender, geographical region of origin, or level of education. Racial discrimination is driven by males, but females exhibit stronger age discrimination than males. Age discrimination is driven by the younger contestants discriminating against the older. Regional differences emerge, particularly between contestants from Greater London and those from the north of England; northerners have a stronger tendency to engage in racial and age discrimination, and to discriminate in favour of the opposite gender.

1. INTRODUCTION

Because the impact of discrimination is considerable in any society, and the impact of extreme discrimination is catastrophic to the welfare of its victims, scholars from across the social sciences have long regarded discrimination as an interesting and important topic. However, not all discrimination is equal in strength. Discriminatory treatment occurs along multiple different identity lines, but the intensity of each of these types of discrimination varies across time and space. One country may commit genocide against racial minorities but enjoy a high level of gender equality, while another may deny women the vote but protect the elderly. A country where people of different races are forbidden from interacting may subsequently desegregate and liberalise its attitudes and behaviours. It is doubtful that findings on one form of discrimination can necessarily be generalised to other forms, or that findings on a particular form of discrimination within a particular population and era will hold true within other populations or eras. Therefore it is important that researchers separately investigate different forms of discrimination, and that they do so with focus on specific populations and points in history.

This paper focuses on discrimination in Britain, along multiple identity lines and within various sub-populations, in the 21st century. The country's size and influential position in the world, as well as the historical context, make it a particularly compelling case to study. Prejudice and discrimination had existed overtly in the country in the 20th century, but by the arrival of the 21st Britain had taken on socially progressive governance, with a drive towards strong anti-discrimination legislation (Hepple et al, 2000). Certain forms of discrimination in Britain have become politically incorrect, or socially inappropriate (Barr et al, 2018). However, the backlash against such political correctness, exemplified in the rise of nationalism and the campaign to leave the European Union, suggest social identity and

discrimination in Britain remain relevant, and make these important and timely matters for research.

In this study discrimination is measured using data from a quasi-natural experiment: the British version of the reality TV show Big Brother, during the years 2000-2016. In Big Brother, a small group of contestants (housemates) live together in a house for a period of weeks or months with no contact with the outside world. Contestants are periodically evicted by a public vote, with those contestants facing the public vote determined by the prior nominations of each contestant. The last contestant to avoid eviction wins the show, and a large cash prize. Discrimination is measured through the nomination choices housemates make, by testing for the systematic tendency to nominate those with dissimilar identity characteristics.

Big Brother provides a useful environment in which to study discrimination. The mini-society contestants form in the house is – like in an experiment – closed from the external world, and alliances are allowed to develop naturally. However, the length and intensity of the time housemates are forced to spend together bring about an environment which would be difficult to create experimentally or observe naturally. The mundane environment – unlike in other reality TV shows or gameshows, housemates do not need any special talents to progress through the show, but are required simply to keep living in a house – means that friendships are likely to form for similar reasons as they would in the outside world. At the same time, the stakes are high. The prizemoney for the show's winner, along with the fame accruing to those surviving for longest, mean that a housemate's nominations – and any discrimination exhibited in them – have meaningful economic consequences in affecting nominees' chances of experiencing these benefits. Discrimination in Big Brother

can be measured cleanly, and the show's longevity – with 35 series airing up to 2016 – allows the construction and analysis of a large dataset.¹

I test for discrimination occurring on the basis of race, gender, age, geographical region of origin, and educational level. While some of these forms of discrimination have received a lot of quantitative analysis, others have received little (Rodgers, 2009). A vast body of empirical evidence documents the pervasiveness of racial discrimination across different countries and historical periods (Arrow, 1998; Zschirnt and Ruedin, 2016). Specifically in Britain, racial discrimination has been identified historically (e.g. Firth, 1981; Stewart, 1983) and more recently (Heath and Cheung, 2006; Wood et al, 2009).

As with race, there is substantial empirical evidence of gender discrimination across time and space, although also the suggestion that it has reduced in intensity over time (Jarrell and Stanley, 2004). Such discrimination has been measured within Britain (e.g. Wright and Ermisch, 1991), including in the 21st century (Joshi et al, 2007). The gender discrimination literature has tended to focus on the labour market, however; lab experiments, in contrast, have not often detected gender discrimination (Lane, 2016). It is therefore far from certain that one would expect to find gender discrimination on Big Brother.

Unlike race and gender, there has been relatively little quantitative research on age discrimination. The existing studies have, however, tended to show strong effects (e.g. Ahmed et al, 2012). This indeed has been the case specifically in 21st century Britain, where a field experiment by Riach and Rich (2010) found levels of age discrimination in excess of those usually estimated for race.

¹ Such useful characteristics of reality TV shows and gameshows have made them popular tools in recent years for empirical research on a range of other economic phenomena (e.g. Beetsma et al, 2001; Blavatskyy and Pogrebna, 2008; Deck et al, 2008; Pogrebna, 2008; Post et al, 2008; Pogrebna and Blavatskyy, 2009; Belot et al, 2010; Haan et al, 2011; Lindquist and Säve-Söderbergh, 2011; Hogarth et al, 2012; Van den Assem et al, 2012; Keldenich and Klemm, 2014; Baltussen et al, 2016).

Discrimination on the basis of geographical region has rarely been quantified. There is evidence of discrimination between residents of different neighbouring villages (e.g. Dugar and Shahriar, 2012), and between different nationalities (e.g. Carpenter and Cardenas, 2011); discrimination against rural-to-urban migrants in China has been documented (Kuang and Liu, 2012), while Hebllich et al (2015) found increased cooperation between Germans who speak the same regional accents. However, I am not aware of any research linking discrimination to geographical region within Britain. This is perhaps surprising; the importance of regional identity has been well-documented (Paasi, 2003) – particularly in Britain (Tomaney and Ward, 2000) – and regional parochialism can have negative consequences for a country's cohesiveness.

There is also a lack of quantitative research into discrimination on the basis of educational level. Britain is a particularly interesting country in which to investigate this issue: George Orwell described England as 'the most class-ridden country under the sun' (Orwell, 1962, p.10) but by the launch of Big Brother the country's prime minister, Tony Blair, had claimed that social class no longer existed.

Having measured discrimination along these various identity lines, this paper furthermore investigates how the tendency to discriminate by race, gender and age differs according to a person's demographic characteristics. Previous research supplies some evidence that in general males have a greater tendency for discriminatory behaviour than females (Rand et al, 2009; Balliet et al, 2014). This is backed up by an evolutionary 'male warrior hypothesis' and consistent evidence that males are more prone to prejudice against out-groups (McDonald et al, 2012). Evidence is lacking on age differences in discrimination, but older people have been found to be more prejudiced (e.g. Von Hippel et al, 2000). Specifically within Britain, strong age differences in support for anti-immigration political

movements (Whitaker and Lynch, 2011) may lead one to expect racial discrimination to be stronger amongst older people.

Likewise, the purported concentration of a ‘liberal metropolitan elite’ – much discussed in the media following the 2016 EU referendum, in which there were strong regional and class-based differences in voting patterns – raises the possibility that the extent to which a person discriminates will depend both on which part of the country they are from and how highly educated they are, with particularly low discrimination expected amongst Londoners. However, in a field experiment Riach and Rich (2010) found age discrimination to be stronger in London than the rest of England. Ultimately, little is known about demographic variation in the strength of discrimination in Britain, and these are therefore important empirical questions to address.

The main results of this study can be summarised as follows. Strong evidence of racial discrimination is found, with white contestants more likely to nominate non-white than white housemates. Strong evidence of age discrimination is also found: the likelihood of a housemate being nominated increases with their age difference from the nominator. However, I do not find evidence of discrimination against the opposite gender, nor of discrimination against those from different regional or educational backgrounds.

White males discriminate more strongly along racial lines than white females. However, females are more likely to discriminate by age. Regional differences also emerge, with the clearest differences between contestants from London and those from the north of England. Racial discrimination is stronger by (white) northerners than by (white) Londoners, and age discrimination is stronger by northerners than by Londoners, but Londoners are more likely to discriminate against the opposite gender, with a weakly significant tendency amongst northerners to nominate their own gender. The strongest effect of age difference

appears on the nomination choices of younger contestants, indicating that the age discrimination is driven primarily by negative treatment towards elder housemates by the younger. No type of discrimination significantly differs between more and less highly educated individuals.

As well as contributing to the literature on discrimination in general, and in 21st century Britain specifically, this paper also adds to the growing literature analysing discrimination by contestants on gameshows and reality TV. Studies on gameshows have found contestants discriminating on the basis of race (Anwar, 2012), gender (Atanasov and Dana, 2013), age (List, 2006) and beauty (Belot et al, 2012; Hamermesh, 2012), although others have found little evidence of discrimination (Levitt, 2004; Antonovics et al, 2005). In analyses of the reality TV show *Come Dine With Me*, Ahmed (2013) and Schüller et al (2014) identified contestant behaviour consistent with ethnic discrimination. The two most similar papers to this study both measure discrimination on *Survivor*, another reality show whose format involves contestants voting to eliminate one another; Dilks et al (2010) and Wall (2011) both find discrimination against women on the show, while the former also finds discrimination against minorities and older contestants.² The setting explored in this study differs from *Survivor* both in the population from which contestants are drawn (Britain rather than the United States) and, to some extent, the nature of the contest.³

² In a slightly different vein, other studies have investigated and found racial and gender discrimination by *viewers* on reality shows (Lee, 2009; Lane, 2019).

³ One difference is that in *Survivor* contestants are required to work for food and shelter, so considerations about the practical abilities of others are likely to influence nominations to a much greater extent than in *Big Brother*. Another is that, in *Big Brother*, contestants' nominations form the first part of a two-stage elimination process, whereas in *Survivor* they directly determine eliminations.

The rest of this paper is laid out as follows. Section 2 provides background on Big Brother. Section 3 describes the data and empirical strategy. Section 4 presents the results. Section 5 provides a concluding discussion.

2. BACKGROUND ON BIG BROTHER

Big Brother is a reality TV show with a gameshow-like format. While many different versions have been produced internationally, this paper concentrates solely on the British show, which has run since 2000. Although the format is subject to occasional twists (see Section 3) in general it proceeds as follows. In each series of the show, contestants live together in a house for a period of weeks or months, filmed constantly, unable to leave and with no contact with the outside world. At regular intervals – usually once a week – each housemate is required to nominate a specified number of others (normally two) to face eviction. The housemates who receive the most nominations (generally those finishing equal-second or higher in the nominations rankings, although this threshold is sometimes lowered) subsequently face a public vote. Of these, the person – or, in occasional twists, more than one person – receiving the lowest public support to remain in the house is evicted. Usually, nominations are made in secret and housemates are forbidden from discussing amongst themselves who they have nominated or plan to nominate; although all housemates are told in advance which contestants will face the public vote for a given eviction, they are not informed how many nominations each received or who nominated whom. These secrecy rules have, however, sometimes been suspended. In the final round of the series no nominations take place and all housemates face the public vote, with the one receiving the most votes deemed the winner and scooping a large cash prize, typically around £100,000.

In addition to the 17 regular series of Big Brother that aired up to the end of the 2016, there were also 18 series with celebrity contestants. The basic format remains unchanged between the two versions, although the celebrity series are shorter, with more frequent nominations and evictions. Celebrities receive participation fees, and the winner's cash prize is donated to a charity of their choice. The environment remains one of high stakes, however; surviving in the show for longer, and ultimately winning, boost a celebrity's fame and image, which is likely to lead to substantial future financial gain. This study uses data from both the regular and celebrity series.

There are, therefore, material consequences to any discrimination in contestants' nominations in both the regular and celebrity versions of the show. Nominating an individual makes them more likely to face the next public vote, thereby reducing their chance of winning the cash prize (in the regular show) and also restricting their likelihood of having a long run in the house and enjoying the associated benefits of fame and, potentially, enhanced self-esteem (in both versions of the show). If particular groups encounter disproportionately high nomination rates, this places them at a material disadvantage.

The main concerns about using gameshows and reality TV for behavioural research relate to the representativeness of contestants and, therefore, the external generalisability of findings. Table 1 addresses contestants' demographic representativeness. The nomination observations within this paper's dataset are broken down according to the demographics of the contestants making them (presenting proportions of observations, rather than of contestants, accounts for the fact that types of contestants who survive in the show for more rounds are more strongly represented in the data⁴). Where available, data from the 2011 UK census are also presented

⁴ The proportions are re-calculated at the contestant, rather than observation, level in Online Appendix A. The proportions are not much different from in Table 1. The proportion of nominations made by males is somewhat higher than the proportion of male contestants, because females tend to get evicted more rapidly by the public (see Lane, 2019).

Table 1: Breakdown of nomination choices in dataset by demographics of nominators

	Regular Series			Celebrity Series			Britain (2011 census)		
Variables	Mean (SD)	Min	Max	Mean (SD)	Min	Max	Mean (SD)	Min	Max
Male	0.543	0	1	0.505	0	1	0.491	0	1
White	0.769	0	1	0.836	0	1	0.872	0	1
Age	26.4 (6.93)	18	59	38.4 (13.2)	18	82	39.5 (N/A)	0	90+
From Greater London	0.250	0	1				0.129	0	1
From non- London South	0.196	0	1				0.313	0	1
From Midlands	0.118	0	1				0.160	0	1
From North	0.237	0	1				0.236	0	1
From outside England	0.196	0	1				0.161	0	1
Higher education	0.386	0	1				N/A		

Notes: See Section 3.1 for definitions of the variables. Regional and class variables are not coded for celebrity series.

for these demographic variables. Like many reality programmes, Big Brother disproportionately features young adults, although in the celebrity series this is barely the case. In other respects, however, contestants are fairly demographically representative of Britain; males contribute just over half the nomination choices in the dataset, and whites contribute around four fifths. In the regular series, contestants represent diverse geographical

backgrounds that are reasonably nationally representative, although Londoners are more strongly represented and other southerners less strongly represented than in the wider population (this is not coded for the celebrity series).⁵

Although the above suggests that contestants are fairly representative on certain observable characteristics, unobservables may be a different matter. Indeed, certain personality types are very likely to be overrepresented on Big Brother. Most obviously, those prepared to place themselves in such an environment will tend to be disproportionately extroverted, exhibitionistic and in search of fame. Although little research has been conducted on the relationship between discrimination and personality type, what evidence does exist would not support a clear argument that Big Brother contestants should be more or less discriminatory than the wider population on the basis of the aforementioned traits: Corr et al (2015) found no consistent association between extroversion and discrimination; Ekehammar and Akrami (2003) also found extroversion to be uncorrelated with prejudice. Big Brother contestants are also likely to be disproportionately competitive; it is theoretically possible, though empirically uncertain, that more competitive personalities may be associated with inflated tendencies to discriminate (see e.g. McDonald et al, 2012).

Conceivably, the producers' decisions over who to accept on the show could skew the levels of particular types of discrimination. For example, they could handpick racially or sexually prejudiced applicants, or applicants representing negative stereotypes associated with particular identity groups, if such individuals were thought to be a good source of entertainment. However, as I show in Section 4.4, similarities between the behaviour of regular and celebrity series contestants cast doubt over such an interpretation.

⁵ Note that one caveat to the comparisons drawn from Table 1 is that statistics from the UK census relate to the population of all ages, whereas contestants on Big Brother can only represent the adult population.

3. DATA AND EMPIRICAL STRATEGY

Nomination data was taken from Wikia (2017), an entertainment fandom website, with the exception of the tenth celebrity series, for which it was missing. For this series, the data is taken from Wikipedia (2017). As a precautionary measure resulting from using these potentially unreliable sources, I cross-checked 200 nominations from 10 series by watching online footage of them.⁶ On no occasion did I find inconsistencies with my dataset, which suggests it is of a reliable nature.

The dataset comprises information on 1,919 sets of nomination choices by 461 contestants from across the 35 series. Within each set of nomination choices, there is one observation for each housemate who the nominator could potentially nominate. The dependent variable, *Nominated*, is binary: it takes the value of 1 if the housemate is nominated by the given nominator, and 0 otherwise. In total, there are 17,449 observations in the dataset.

In Big Brother, twists are occasionally introduced which temporarily alter the format of nominations and evictions as described in Section 2. Certain housemates are on occasion prohibited from casting nominations, or from being nominated – for example, it is occasionally decreed that a housemate will automatically face the public vote and therefore cannot be nominated. The dataset takes this into account; within each set of nominations, an

⁶ The nominations were randomly selected, subject to the constraint that footage of the relevant broadcasts was available online. The footage was accessed in February 2017 (Youtube, 2017 – see references for webpage addresses). The nominations come from the following rounds of voting: regular series 3, week 5; regular series 6, week 10; regular series 7, week 2; regular series 14, week 7; regular series 16, week 3; celebrity series 3, week 2; celebrity series 5, week 3; celebrity series 10, week 2; celebrity series 17, week 1; celebrity series 18, week 1.

observation is only recorded for each housemate who is eligible to be selected by the nominator in question.

I exclude data on some nomination choices where a format twist alters either the consequences of a nomination (at least as understood by the nominator) or the nature of the decision-making agent choosing it in such a way that the setting is not meaningfully comparable to that from which the rest of the data is drawn. I exclude:

- Cases where nominations are made by a friend or relative on behalf of a housemate.
- Cases where nominations are made by a temporary houseguest, who is not eligible to win the show, or by a housemate who has already been evicted and therefore cannot win.
- Cases where nominations are made by the group decisions of two or more housemates (the exception to this is where a pair of twins competes as a single contestant, in which case they are treated as one housemate in the data).
- Cases where housemates are required to make 'nominations', but the nomination relates to something other than eviction, and housemates are aware that this is the case (for instance, in the first week of the fifth regular series housemates nominated others to lose access to their belongings).
- One case where one housemate had been forewarned about a twist which would lead to the contestant who received the most nominations in that round of voting being the only housemate exempt from facing the public vote. In this case, nomination decisions by and relating to this particular housemate are excluded.
- Cases where nominations are made unwittingly (for instance, if Big Brother decrees that a housemate will be considered to have nominated the first person they touch on a particular day, but does not inform the housemate of this).

-Cases where a format twist takes place and the data source does not provide sufficient information on the twist as to make clear which housemates were eligible to be nominated by which others.

Still included in the data, however, are:

-Cases where a twist will lead to a set of nominations having non-standard consequences, but housemates are not aware of this at the time of making their decisions (for instance, twists have been introduced where the nominated housemates will face a public vote over whom to move to a secret area within the house for a designated period of time, rather than over whom to evict).

-Cases where housemates nominate which others they want to stay in the house, as opposed to which they want to face eviction. In this case, *Nominated* takes the value of 1 for those not nominated to stay, and 0 for those nominated to stay.

-Cases where a nomination has a greater amount of power than usual. This includes cases where housemates vote on whom to directly evict from the house, skipping the public vote stage. It also includes cases where one housemate is given the power to select another who will automatically face the public vote, regardless of how many other nominations they receive, or even who will automatically face the public vote in every subsequent week until they are evicted.

-Cases where a nomination must be administered in a non-standard way (for example, by the nominator touching the nominee, rather than announcing their name), and nominators are made aware of this.

Each housemate's decision over whom to nominate on a given occasion takes the form of a discrete choice problem. Each housemate must select between alternatives (i.e. potential nominees) where their utility from selecting a particular alternative depends upon its attributes (i.e. the potential nominee's personal characteristics) and these attributes vary between alternatives. As such, conditional logit regressions represent the appropriate modelling technique. The conditional logit estimates the effects that the attributes of an alternative have on the probability of this alternative being selected from among a given set. In the present case, it estimates the effects that a potential nominee's personal characteristics have on the probability of them being nominated from the set of potential nominees available in a given nomination decision. The results of the conditional logit are not biased by differences between rounds in the number of individuals a housemate must nominate, nor in the number of potential nominees, nor in the proportion of a particular type (e.g. race, gender) of potential nominees, as these variables are held constant across all observations within a particular set of nomination choices. Standard errors in the models are corrected for heteroscedasticity, with each series treated as providing a cluster of observations.

3.1. INDEPENDENT VARIABLES

Data is available from Wikia on housemates' age, home place and occupation (for the tenth celebrity series, data on age is missing from Wikia, so it is taken from Wikipedia instead). This information is submitted by the contestants themselves and broadcast when they enter the house. I used photos on Wikia to code housemates' gender and race. The models I estimate include the following independent variables:

Different Gender: A dummy variable equal to 1 if the potential nominee shares the same gender as the nominator, and equal to 0 otherwise.⁷

Age Difference: The modulus of the distance in years between the potential nominee's age and the nominator's age.

Non-white: A dummy variable taking the value of 1 if a potential nominee is non-white and 0 if they are white. It is generally straightforward to observe which housemates are white, although to minimise any possible biases in such identifications I coded this variable before collecting the nominations data in order to be able to make borderline decisions blind to the effects they would have on my results. I did not seek to code the race of non-white housemates. The potential nominee is non-white in only 21.4% of cases, and non-white contestants represent a wide variety of different racial groups, with many being mixed race, which would often make coding this variable rather tricky. When analysing the effect of race difference, I will therefore drop nominations made by non-white housemates. On the reduced sample, the *Non-white* variable will then represent race difference between nominator and potential nominee.

Different Educational Level: I split the sample into high and low educational levels, according to whether or not housemates' self-recorded occupations usually require university education. Current university students are placed in the high educational level. I code this variable only for contestants in the regular series, as the nature of many celebrities' self-reported occupations (usually in the entertainment industry) make it unlikely that this variable could be coded for them with any reliability. *Different Educational Level* is a dummy

⁷ On the rare instances of contestants being transgender, I have coded their gender according to the category they appear to self-identify with.

variable equal to 1 if the potential nominee's educational level is different from that of the nominator, and equal to 0 if it is the same.

Different Region: I group housemates into geographic regions, according to their self-identified home place. Housemates are categorised as being from the north of England, the midlands, Greater London, the rest of the south of England excluding Greater London, or from outside England. The English regions are based on definitions in the 2011 UK census: the north of England contains the areas defined as North East, North West, and Yorkshire and The Humber; the midlands contain the areas defined as East Midlands and West Midlands; the south, excluding London, contains the areas defined as the South East, South West and East. *Different Region* takes the value of 1 if the potential nominee is categorised as being from a different region from the nominator, and 0 if they are categorised as being from the same region. When analysing this variable I will drop nominations made by housemates from outside England, as they do not represent a coherent regional in-group.⁸ I do not code this variable for celebrities as it is unlikely to reflect a strong sense of identity. For instance, a high proportion of the celebrities have listed as their home place somewhere within Greater London or Los Angeles, where the British and American entertainment industries are concentrated, but it is likely many of these people originate from elsewhere.

4. RESULTS

4.1. GENERAL PATTERNS OF DISCRIMINATION

Table 2 presents the results of conditional logit regressions run on the dependent variable

Nominated. Odds ratios on the independent variables indicate the effects these variables have

⁸ Thus, while the geographical focus for this paper is generally Britain, when investigating regional discrimination and regional differences in behaviour, it is on English decision-makers. Too few contestants on Big Brother have been from each of the other constituent countries of Britain for them to be separately coded.

on the odds of an individual being nominated from within a given set of available nominees (where the odds represent the ratio of the probability of being nominated to the probability of not being nominated). An odds ratio above 1 means a variable increases the odds (and therefore the likelihood) of one being nominated, while an odds ratio below 1 means it reduces it. Model (1) is run on the entire dataset. An odds ratio of 1.086 on *Different Gender* implies that, across all series, potential nominees whose gender differs from that of the contestant nominating have higher odds of being nominated than those whose gender is the same by a factor of 1.086. However, this variable does not reach conventional levels of statistical significance, so it cannot be claimed that any gender discrimination is evident in the data.

In contrast, *Age Difference* is significant at the 1% level, strongly suggesting the likelihood of an individual being nominated is greater the larger their distance in age from the contestant nominating. An odds ratio of 1.023 implies that a one year increase in age difference is associated with a 2.3% increase in the odds of being nominated. Assuming linearity, the model implies, for instance, that a contestant with 10 years' difference in age from the person nominating has 1.255 times higher odds of being nominated, and a contestant with 20 years' difference in age has 1.576 times higher odds of being nominated, than another contestant who is the same age as the person nominating.

Model (1) also estimates *Non-white* to be significant at the 1% level, demonstrating that being non-white increases a housemate's likelihood of being nominated. While this represents discrimination in general, the specific effect of race difference on nomination choices is estimated by model (2), which excludes all data on nominations by non-white contestants and thus estimates how much more likely white housemates are to nominate non-whites than whites. The model finds race to be a highly significant explanatory variable; a

non-white person has 1.313 times higher odds than a white person of being nominated by a white contestant.⁹

Table 2: Conditional logit regressions on the odds of being nominated

	Dependent variable: Nominated			
	(1) Whole sample	(2) White contestants	(3) Regular Series	(4) Regular Series – English
Different Gender	1.086 (0.0567)	1.066 (0.0564)	1.036 (0.0685)	1.005 (0.0584)
Age Difference	1.023*** (0.00469)	1.022*** (0.00521)	1.026*** (0.00662)	1.023*** (0.00565)
Non-white	1.271*** (0.104)	1.313*** (0.115)	1.351*** (0.121)	1.380*** (0.114)
Different Education Level			1.136 (0.103)	1.159 (0.106)
Different Region				1.073 (0.105)
Pseudo R ²	0.0086	0.0088	0.0088	0.0090
Observations	17,449	13,768	12,135	9,751

*Notes: Table 2 presents conditional logit models, with odds ratios presented. Note that an odds ratio of more than 1 indicates a positive effect, while an odds ratio of less than 1 indicates a negative effect. The dependent variable indicates whether or not an individual is nominated by a given contestant in a given round. Model (1) includes the nomination choices of all contestants; Model (2) includes only the nomination choices of white contestants; Model (3) includes only the nomination choices of regular series contestants; Model (4) includes only the nomination choices of regular series contestants whose home region is in England. Standard errors, in parentheses, are corrected for heteroscedasticity, clustering by series. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

⁹ An equivalent model, reported as Model (1) in Table B1 in Online Appendix B, including only data on the nomination choices of non-white contestants, finds that such contestants do not significantly discriminate between whites and non-whites. While this is based on a smaller sample size than other models, it is a conceptually unsurprising result, as the non-white individuals in the dataset represent various different races and therefore do not constitute a coherent identity group likely to favour its own members.

The effects of differences in educational level and home region on nomination choices are estimated using data only from the regular Big Brother series. Model (3) estimates a positive but insignificant odds ratio on *Different Education Level*, indicating that nominators are not significantly more likely to nominate contestants from a different educational class than those from their own. Model (4) investigates the effects of regional backgrounds. It excludes data from the nominations of non-English housemates, whose backgrounds are disparate and not coded as belonging to specific regions.¹⁰ The variable *Different Region* is positive but insignificant, suggesting that sharing a housemate's regional background does not make an individual significantly less likely to be nominated by them. There is therefore no significant evidence of regional or educational discrimination. This may in part be due to testing them using smaller sample sizes, but note that the odds ratios on *Different Education Level* and *Different Region* are much closer to 1 than those on *Non-white*.

4.2. ANALYSIS OF RACIAL DISCRIMINATION WITHIN DIFFERENT WHITE SUB-GROUPS

I now consider how levels of racial discrimination differ between different white sub-groups. I re-run the conditional logit regressions, with *Different Gender*, *Age Difference* and *Non-White* as independent variables, on specific subsets of the data representing the nomination choices of particular demographic groups. I separately consider: male and female nominators; nominators aged 18-25, 26-40 and 41+; nominators from London, the midlands, the non-London south, and the north; and nominators coming from high and low educational levels. In all cases the sample excludes non-white nominators; for the regional and education-based groups it also excludes nominators from the celebrity series. Table 3 reports the odds ratio

¹⁰ Of the 19.6% of nominations made by non-English housemates, 26.6% are made by Welsh housemates, 21.1% by Scottish housemates, 2.5% by housemates from Jersey, 34.3% by Irish housemates, and 15.4% by housemates from outside the British Isles.

estimated on the *Non-white* variable by the regression focusing on the behaviour of each subgroup. The significance of differences between the odds ratios estimated for different subgroups is calculated by running pooled models with interaction terms; where differences are found to be significant this is indicated by connecting lines at the right hand side of the table. The full output of all regressions is presented in Online Appendix C.

Table 3 shows that the racial discrimination exhibited by white males is strongly significant, while for white females it is not significant. This difference between genders is found to be significant at the 5% level. Stronger racial discrimination is found by white housemates aged 18-25 than those aged 26-40 or 41+ (with the discrimination exhibited by the latter group not significant), but none of the differences in behaviour between any of these groups are estimated as significant. Regarding region, white housemates from London and the midlands display relatively weak and insignificant racial discrimination (though the insignificance may in part be due to sample size); the odds ratios are higher and significant for housemates from the non-London south and the north. Racial discrimination by white northerners is stronger than that of white Londoners, significant at the 5% level. Regarding educational level, whites of both high and low educational levels discriminate significantly against non-whites, and the difference between the two groups is not significant.

Table 3: Racial discrimination in nominations by sub-groups of white contestants

Sub-group	Odds ratio on Non-white	
<u>Gender</u>		
Male	1.492***	(0.146)
Female	1.112	(0.128)
] **	
<u>Age range</u>		
18-25	1.502***	(0.122)
26-40	1.282**	(0.147)
41+	1.115	(0.265)
<u>Region</u>		
London	1.239	(0.211)
Midlands	1.312	(0.172)
South (non-London)	1.420**	(0.212)
North	1.732***	(0.222)
] **	
<u>Educational level</u>		
High educational level	1.365**	(0.198)
Low educational level	1.402***	(0.164)

*Notes: Table 3 presents the effect of being non-white on the odds of being nominated by contestants belonging to various white sub-groups, as estimated by conditional logit regressions including data only from the choices of members of the applicable groups. The models run on regional and social class sub-groups exclude data from celebrity series. Note that an odds ratio of more than 1 indicates a positive effect, while an odds ratio of less than 1 indicates a negative effect. Significance of differences between the odds ratios of different models are estimated by running pooled models with interaction terms. Standard errors, in parentheses, are corrected for heteroscedasticity, clustering by series. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

4.3. ANALYSIS OF GENDER AND AGE DISCRIMINATION WITHIN DIFFERENT SUB-GROUPS

I replicate the approach of the previous subsection to investigate how levels of gender and age discrimination differ between sub-groups. The same regressions are run, with *Different Gender*, *Age Difference* and *Non-White* as independent variables, but now the nomination

choices of non-white housemates are also included in the data. Table 4 reports the odds ratios estimated on *Different Gender* (on the left hand side) and *Age Difference* (on the right hand side) in each regression. As above, pooled models with interaction terms are run to investigate whether the odds ratios estimated for separate sub-groups are significantly different, with connecting lines to the right of the odds ratios indicating where this is the case. The full output of all regressions is again presented in Online Appendix C.

The left hand side of Table 4 shows there are few significant differences between different sub-groups in terms of gender discrimination, and most sub-groups are not found to significantly favour either their own or the opposite gender. However, strong regional differences do emerge. Northerners are found to exhibit opposite-gender favouritism – they are more likely to nominate housemates of their own gender than of the other – and in this respect their behaviour differs from that of Londoners and other southerners, both at the 1% level.

While strongly significant discrimination on the basis of age difference is found amongst both males and females, it is found to be significantly stronger amongst females. Important differences between age groups also emerge. While 18-25 year olds and 26-40 year olds significantly discriminate on the basis of age difference, those aged 41 and above do not; in this respect, the behaviour of the 41+ group is found to significantly differ from that of the two other age groups. This suggests the age-based discrimination found across the whole sample is driven primarily by from the behaviour of the younger housemates towards the older.¹¹ Significant discrimination on the basis of age difference is found amongst housemates from the north and midlands, but not amongst those from London or the rest of the south: the difference in behaviour between northerners and Londoners is significant at the

¹¹ Further evidence for this comes from Model (2) in Table B1, Online Appendix B, which includes a potential nominee's age as an independent variable as well as their age difference from the nominator. Both variables are significant (at the 5% level or stronger), indicating that in addition to housemates' preference for nominating those whose age is distant from their own, there is an independent preference for nominating older people.

5% level. Housemates of high and low educational levels both significantly discriminate on the basis of age difference, and do not significantly differ from each other in this behaviour.

Table 4: Gender and age discrimination in nominations by sub-groups of contestants

Sub-group	Odds ratio on Different Gender		Odds ratio on Age Difference	
<u>Gender</u>				
Male	1.153	(0.0997)	1.018*** (0.00527)] **
Female	1.010	(0.0923)	1.029*** (0.00567)	
<u>Age range</u>				
18-25	0.988	(0.0719)	1.035*** (0.00646)] ***] **
26-40	1.200**	(0.104)	1.027*** (0.00991)	
41+	1.079	(0.148)	0.990 (0.00969)	
<u>Region</u>				
London	1.129	(0.091)	1.015 (0.0135)] **
Midlands	0.985	(0.154)	1.050** (0.0221)	
South (non-London)	1.153	(0.146)	1.005 (0.0136)	
North	0.784*	(0.0989)	1.033*** (0.0122)	
<u>Educational level</u>				
High educational level	0.952	(0.112)	1.035*** (0.00652)	
Low educational level	1.090	(0.0639)	1.020** (0.00955)	

*Notes: Table 4 presents the effect of gender and age difference on the odds of being nominated by contestants belonging to various sub-groups, as estimated by conditional logit regressions including data only from the choices of members of the applicable groups. The models run on regional and social class sub-groups exclude data from celebrity series. Note that an odds ratio of more than 1 indicates a positive effect, while an odds ratio of less than 1 indicates a negative effect. Significance of differences between the odds ratios of different models are estimated by running pooled models with interaction terms. Standard errors, in parentheses, are corrected for heteroscedasticity, clustering by series. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

4.4. DOES BEHAVIOUR DIFFER BETWEEN REGULAR AND CELEBRITY SERIES?

In Section 2, I discuss the issue of how generalizable behaviour in gameshows is to the

external world. Here, I offer some evidence in favour of the generalizability of my results, through investigating whether discriminatory behaviour differs between the regular and celebrity versions of Big Brother. If levels of discrimination on the show were the product of the housemate selection process, one would expect differences to appear between the versions, as each operates very different procedures for choosing its contestants. For every regular series, thousands of members of the public apply and the show's producers are able to select which small number are successful. For the celebrity series, in contrast, the producers invite and offer to pay famous people to participate, and these individuals decide whether or not to accept the invitations; judging by the very obscure nature of many of the contestants' celebrity, it is reasonable to assume that many rejections from more famous invitees occur. Therefore, while it may be possible for the producers to bias the selection process of the regular series to lead to particular levels of discrimination (for instance, by handpicking racially or sexually prejudiced applicants, or applicants representing negative stereotypes associated with particular identity groups, in order to create entertaining television), it is unlikely that the same would occur in the celebrity series.

I estimate whether discriminatory behaviour differs between the regular and celebrity series by re-running the conditional logit regression on the whole sample, and including interaction terms. These results are presented in Table 5. The variables *Non-white*, *Different Gender* and *Age Difference* respectively represent the levels of discrimination nominators display against housemates who are non-white, of the opposite gender, or of a different age to them, in the regular series. The interaction terms between *Celebrity* and these variables indicate how much stronger or weaker such levels of discrimination are in the celebrity series. For instance, the odds ratio of 1.163 on *Celebrity x Different Gender* indicates the disadvantage of being of a different gender to the nominator relative to being of the same gender, in terms of the odds of being nominated, is 1.163 times stronger in the celebrity series

than in the regular series. None of the interaction terms have odds ratios which reach conventional levels of significance. A test of joint significance on the three interaction terms also returns a null result ($p=0.219$), confirming that the hypothesis of discriminatory behaviour being indistinguishable between celebrity and regular series housemates cannot be rejected.

Table 5: Conditional logit regression on odds of being nominated

Dependent variable: Nominated	
	Whole sample
Non-white	1.339*** (0.115)
Different Gender	1.036 (0.0671)
Age Difference	1.026*** (0.00653)
Celebrity x Non-white	0.810 (0.181)
Celebrity x Different Gender	1.163 (0.113)
Celebrity x Age Difference	0.996 (0.00911)
Pseudo R ²	0.0093
Observations	17,449

*Notes: Table 5 presents a conditional logit model, with odds ratios presented. Note that an odds ratio of more than 1 indicates a positive effect, while an odds ratio of less than 1 indicates a negative effect. The dependent variable indicates whether or not an individual is nominated by a given contestant in a given round. Standard errors, in parentheses, are corrected for heteroscedasticity, clustering by series. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

A further robustness check is presented in Online Appendix B, where a similar approach is used to test whether housemates' nomination behaviour significantly differs between the years 2000-2010 and 2011-2016. Big Brother moved from Channel 4 to Channel 5 in 2011, and certain aspects of the show changed noticeably (for instance, the daily

highlights show introduced a more over-the-top narrative style). It is therefore plausible that there were also changes in producers' preferences over contestant types. However, Model (3) in Table B1 shows the levels of race, gender and age discrimination do not significantly differ between the two periods. A joint significance test on the three interactions terms returns a null result ($p=0.263$).

5. CONCLUSION

This paper has measured discrimination in the nomination choices of contestants on the British version of Big Brother. Discrimination is found on the basis of race and age, but not gender, region of origin or education level.¹² A ten-year age difference between two housemates results in a similar level of discrimination as does the two belonging to different races. Given the high stakes, the economic consequences of such discrimination are important; ethnic minorities and old people are nominated more often and are therefore *ceteris paribus* likely to be eliminated earlier, reducing their expected material returns from participating on the show.

These results mirror previous research showing strong economic discrimination occurring on the basis of race (e.g. Zschirnt and Ruedin, 2016) and age (e.g. Riach and Rich, 2010), and relatively weak gender discrimination occurring in non-labour-market contexts (Lane, 2016). Focusing specifically on Britain, the results suggest that after decades of non-white immigration race still remains a defining identity characteristic in the country. However, individuals do not appear to have a clear tendency to favour those from the same geographical region or educational background, suggesting that regional and class identities are now relatively weak in Britain. This may be a reflection of levels of geographical and

¹² The insignificance of this study's results on gender, region of origin and education level does not rule out the possibility that discrimination does occur along these lines but at levels too weak to be statistically identified; indeed, the odds ratios on all variables are in directions consistent with discrimination against out-groups.

social mobility in the country being higher today than at times during the past.

Various demographic differences emerge from the data. Males are more prone to racial discrimination than females, which supports the ‘male warrior hypothesis’ that men are more hostile than women to outsiders (McDonald et al, 2012). Conversely, however, females have a greater tendency to discriminate on the basis of age difference. The regional differences which emerge are striking at times; Londoners and northerners significantly differ in each of the three respects that they are compared. Londoners do not significantly engage in either racial or age discrimination, whereas northerners strongly engage in both. This, arguably, chimes with the ‘liberal metropolitan elite’ concept. Meanwhile, northerners have a significantly greater tendency than Londoners for favouritism towards the opposite gender.

On the other hand, no differences emerge between the tendencies of more or less highly educated individuals. Findings on age are also not necessarily what one would expect. Where it might be expected that older contestants would display more racial discrimination, it is in fact measured to be stronger amongst the youngest, although the difference is not significant. Younger housemates are also significantly more likely to discriminate on the basis of age difference than older ones are. It is worth noting that older housemates are relatively rare, so the discrimination they face from the younger may be in part related to their minority status in the house.

This paper is not able to confirm the underlying motivations beneath the various forms of discrimination analysed herein. One possibility is that discrimination in Big Brother is largely the consequence of homophily, the tendency for people to associate with and form positive relationships with those who share similar characteristics (see e.g. McPherson et al, 2001). This might be the case because in Big Brother – unlike other reality TV shows like Survivor – contestants’ wellbeing during their time in the house does not depend on the practical skills of others. In such a mundane setting they may be likely to nominate primarily

along friendship lines. If so, the results would suggest the presence of strong homophily on the basis of race and age, but not on the basis of the other identity types.¹³ It would mean that the economic consequences of the racial and age discrimination among Big Brother housemates (exclusion from the material benefits of prizemoney and fame) are the result of exclusion of racial minorities and older people from the friendship groups of the white, young majority of contestants. These are not dissimilar from the economic consequences of discrimination resulting from homophily in the outside world: if, for instance, nepotism towards friends is made in hiring decisions, the result can be the loss of earnings for out-groups excluded from homophilous friendship networks.

Somewhat relatedly, it should be noted that romantic relationships (actual or hoped for) may motivate discrimination along some identity lines. In particular, romantic interest may partly explain why we do not see a particular tendency to nominate those of the opposite gender. A lack of romantic interest may also partly explain the tendency for the younger housemates to nominate the older.

However, beyond friendships and romantic interests, other strategic criteria for nominations cannot be excluded. Moreover, whether or not we consider the discrimination in Big Brother to be driven by homophily, we are not able to discern which of the two traditional categories of economic discrimination – taste-based or statistical discrimination – to label it under. For instance, the white housemates may have developed friendships with other white housemates either because they had an intrinsic preference for doing so, or because they saw it as somehow advantageous towards their probability of being victorious.

¹³ In fact, this would be consistent with McPherson et al (2001), who in their seminal review article argue that 'Homophily in race and ethnicity creates the strongest divides in our personal environments, with age, religion, education, occupation, and gender following in roughly that order.'

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Online Appendix A: Breakdown of contestants in dataset by demographics

	Regular Series			Celebrity Series			Britain (2011 census)		
Variables	Mean (SD)	Min	Max	Mean (SD)	Min	Max	Mean (SD)	Min	Max
Male	0.489	0	1	0.495	0	1	0.491	0	1
White	0.744	0	1	0.835	0	1	0.872	0	1
Age	26.6 (7.03)	18	59	39.0 (13.7)	18	82	39.5 (N/A)	0	90+
From Greater London	0.252	0	1				0.129	0	1
From non- London South	0.218	0	1				0.313	0	1
From Midlands	0.115	0	1				0.160	0	1
From North	0.229	0	1				0.236	0	1
From outside England	0.179	0	1				0.161	0	1
Higher education	0.397	0	1				N/A		

Notes: See Section 3.1 for definitions of the variables. Regional and class variables are not coded for celebrity series.

Online Appendix B: Further Regressions

Table B1: Conditional logit regressions on odds of being nominated

	Dependent variable: Nominated		
	(1) Non-White	(2) Whole sample	(3) Whole Sample
Different Gender	1.181 (0.151)	1.080 (0.0567)	1.046 (0.0853)
Age Difference	1.027*** (0.00600)	1.013** (0.00505)	1.031*** (0.00627)
Age		1.016*** (0.00492)	
Non-white	1.074 (0.227)	1.297*** (0.106)	1.173* (0.0999)
Channel 5 x Different Gender			1.085 (0.104)
Channel 5 x Age Difference			0.988 (0.00897)
Channel 5 x Non-white			1.204 (0.201)
Pseudo R ²	0.0098	0.0127	0.0096
Observations	3,681	17,449	17,449

*Notes: Table B1 presents conditional logit models, with odds ratios presented. Note that an odds ratio of more than 1 indicates a positive effect, while an odds ratio of less than 1 indicates a negative effect. The dependent variable indicates whether or not an individual is nominated by a given contestant in a given round. Model (1) includes only the nomination choices of white contestants; Model (2) includes the nomination choices of all contestants. Standard errors, in parentheses, are corrected for heteroscedasticity, clustering by series. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

Online Appendix C: Full output of regressions reported in Tables 3 and 4

Table C1: Regressions reported in Table 3, Gender panel

Dependent variable: Nominated			
	(1) White Males	(2) White Females	(3) All white
Different Gender	1.141 (0.0980)	0.980 (0.109)	1.065 (0.0578)
Age Difference	1.017** (0.00684)	1.027*** (0.00667)	1.022*** (0.00521)
Non-white	1.492*** (0.146)	1.112 (0.128)	1.109 (0.125)
Male x Non-white			1.354** (0.158)
Pseudo R ²	0.0104	0.0102	0.0097
Observations	7,398	6,370	13,768

*Notes: Table C1 presents conditional logit models, with odds ratios presented. Note that an odds ratio of more than 1 indicates a positive effect, while an odds ratio of less than 1 indicates a negative effect. The dependent variable indicates whether or not an individual is nominated by a given contestant in a given round. Model (1) includes only the nomination choices of white males; Model (2) includes only the nomination choices of white females; Model (3) includes the nomination choices of both, with an interaction term. Standard errors, in parentheses, are corrected for heteroscedasticity, clustering by series. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

Table C2: Regressions reported in Table 3, Age panel

Dependent variable: Nominated				
	(1) White 18-25	(2) White 26-40	(3) White 41+	(4) All white
Different Gender	0.973 (0.0738)	1.200** (0.0989)	0.990 (0.144)	1.065 (0.0559)
Age Difference	1.038*** (0.00744)	1.027** (0.0113)	0.987 (0.0101)	1.023*** (0.00512)
Non-white	1.502*** (0.122)	1.282** (0.147)	1.115 (0.265)	1.460*** (0.117)
26-45 x Non-white				0.868 (0.109)
41+ x Non-white				0.725 (0.169)
Pseudo R ²	0.0222	0.0112	0.0029	0.0093
Observations	5,956	5,409	2,403	13,768

*Notes: Table C2 presents conditional logit models, with odds ratios presented. Note that an odds ratio of more than 1 indicates a positive effect, while an odds ratio of less than 1 indicates a negative effect. The dependent variable indicates whether or not an individual is nominated by a given contestant in a given round. Model (1) includes only the nomination choices of whites aged 18-25; Model (2) includes only the nomination choices of whites aged 26-40; Model (3) includes only the nomination choices of whites aged 41 and above; Model (4) includes the nomination choices of all, with interaction terms. Standard errors, in parentheses, are corrected for heteroscedasticity, clustering by series. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

Table C3: Regressions reported in Table 3, Region Panel

Dependent variable: Nominated					
	(1) Regular Series - White London	(2) Regular Series - White Midlands	(3) Regular Series - White South (non- London)	(4) Regular Series - White North	(5) Regular Series - All white English
Different Gender	1.066 (0.112)	0.940 (0.172)	1.241** (0.127)	0.794* (0.106)	0.997 (0.0590)
Age Difference	1.020 (0.0229)	1.047* (0.0250)	0.994 (0.0188)	1.036*** (0.0133)	1.025*** (0.00732)
Non-white	1.239 (0.212)	1.312 (0.249)	1.420** (0.212)	1.732*** (0.222)	1.228 (0.213)
Midlands x Non-white					1.015 (0.323)
South x Non-white					1.164 (0.236)
North x Non-white					1.412** (0.234)
Pseudo R ²	0.0045	0.0220	0.0084	0.0254	0.0109
Observations	1,782	1,090	1,877	2,581	7,352

*Notes: Table C3 presents conditional logit models, with odds ratios presented. Note that an odds ratio of more than 1 indicates a positive effect, while an odds ratio of less than 1 indicates a negative effect. The dependent variable indicates whether or not an individual is nominated by a given contestant in a given round. Model (1) includes only the nomination choices of whites from London in the regular series; Model (2) includes only the nomination choices of whites from the Midlands in the regular series; Model (3) includes only the nomination choices of whites from the non-London South in the regular series; Model (4) includes the nomination choices of all whites from England in the regular series, with interaction terms. Standard errors, in parentheses, are corrected for heteroscedasticity, clustering by series. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

Table C4: Regressions reported in Table 3, Educational Level panel

Dependent variable: Nominated			
	(1) Regular Series White High Education	(2) Regular Series White Low Education	(3) Regular Series All white
Different Gender	0.955 (0.137)	1.079 (0.0542)	1.031 (0.0684)
Age Difference	1.040*** (0.00805)	1.014 (0.0124)	1.025*** (0.00791)
Non-white	1.365** (0.198)	1.402*** (0.164)	1.411*** (0.171)
High Education x Non-white			0.954 (0.175)
Pseudo R ²	0.0156	0.0062	0.0085
Observations	3,758	5,569	9,327

*Notes: Table C4 presents conditional logit models, with odds ratios presented. Note that an odds ratio of more than 1 indicates a positive effect, while an odds ratio of less than 1 indicates a negative effect. The dependent variable indicates whether or not an individual is nominated by a given contestant in a given round. Model (1) includes only the nomination choices of whites with high educational level in the regular series; Model (2) includes only the nomination choices of white with low educational level in the regular series; Model (3) includes the nomination choices of both, with an interaction term. Standard errors, in parentheses, are corrected for heteroscedasticity, clustering by series. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

Table C5: Regressions reported in Table 4, Gender panel

Dependent variable: Nominated			
	(1) Males	(2) Females	(3) All
Different Gender	1.153 (0.0997)	1.010 (0.0923)	1.010 (0.0911)
Age Difference	1.018*** (0.00527)	1.029*** (0.00567)	1.029*** (0.00566)
Non-white	1.422*** (0.135)	1.101 (0.109)	1.268*** (0.105)
Male x Different Gender			1.143 (0.163)
Male x Age Difference			0.988** (0.00508)
Pseudo R ²	0.0093	0.0108	0.0093
Observations	9,278	8,171	17,449

*Notes: Table C5 presents conditional logit models, with odds ratios presented. Note that an odds ratio of more than 1 indicates a positive effect, while an odds ratio of less than 1 indicates a negative effect. The dependent variable indicates whether or not an individual is nominated by a given contestant in a given round. Model (1) includes only the nomination choices of males; Model (2) includes only the nomination choices of females; Model (3) includes the nomination choices of both, with interaction terms. Standard errors, in parentheses, are corrected for heteroscedasticity, clustering by series. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

Table C6: Regressions reported in Table 4, Age panel

Dependent variable: Nominated				
	(1) 18-25	(2) 26-40	(3) 41+	(4) All
Different Gender	0.988 (0.0719)	1.200** (0.104)	1.079 (0.148)	0.991 (0.0717)
Age Difference	1.035*** (0.00646)	1.027*** (0.00991)	0.990 (0.00969)	1.034*** (0.00652)
Non-white	1.426*** (0.101)	1.216* (0.147)	1.109 (0.249)	1.294*** (0.117)
26-45 x Different Gender				1.213* (0.141)
41+ x Different Gender				1.087 (0.160)
26-45 x Age Difference				0.993 (0.0109)
41+ x Age Difference				0.957*** (0.0117)
Pseudo R ²	0.0184	0.0109	0.0022	0.0126
Observations	7,929	6,705	2,815	17,449

*Notes: Table C6 presents conditional logit models, with odds ratios presented. Note that an odds ratio of more than 1 indicates a positive effect, while an odds ratio of less than 1 indicates a negative effect. The dependent variable indicates whether or not an individual is nominated by a given contestant in a given round. Model (1) includes only the nomination choices of housemates aged 18-25; Model (2) includes only the nomination choices of housemates aged 26-40; Model (3) includes only the nomination choices of housemates aged 41 and above; Model (4) includes the nomination choices of all, with interaction terms. A linear restriction test finds a significant difference between the variables 26-45 x Age Difference and 41+ x Age Difference ($p=0.011$). Standard errors, in parentheses, are corrected for heteroscedasticity, clustering by series. *** $p<0.01$, ** $p<0.05$, * $p<0.1$*

Table C7: Regressions reported in Table 4, Region Panel

Dependent variable: Nominated					
	(1) Regular Series - London	(2) Regular Series - Midlands	(3) Regular Series - South (non- London)	(4) Regular Series - North	(5) Regular Series - All English
Different Gender	1.129 (0.0907)	0.985 (0.154)	1.153 (0.141)	0.784* (0.099)	1.147* (0.0878)
Age Difference	1.015 (0.0135)	1.050** (0.0221)	1.005 (0.0136)	1.033*** (0.0121)	1.016 (0.0132)
Non-white	1.165 (0.214)	1.335** (0.187)	1.319** (0.184)	1.671*** (0.194)	1.366*** (0.115)
Midlands x Different Gender					0.857 (0.131)
South x Different Gender					1.004 (0.158)
North x Different Gender					0.678*** (0.0990)
Midlands x Age Difference					1.034 (0.0329)
South x Age Difference					0.990 (0.0171)
North x Age Difference					1.016** 0.00828)
Pseudo R ²	0.0034	0.0207	0.0046	0.0226	0.0111
Observations	13,038	1,435	2,380	2,876	9,751

Notes: Table C7 presents conditional logit models, with odds ratios presented. Note that an odds ratio of more than 1 indicates a positive effect, while an odds ratio of less than 1 indicates a negative effect. The dependent variable indicates whether or not an individual is nominated by a given contestant in a given round. Model (1) includes only the nomination choices of housemates from London in the regular series; Model (2) includes only the nomination choices of housemates from the Midlands in the regular series; Model (3) includes only the nomination choices of housemates from the non-London South in the regular series; Model (4) includes the nomination choices of all housemates from England in the regular series, with interaction terms. A linear restriction test finds a significant difference between the variables South x Different Gender and North x Different Gender ($p < 0.001$). Standard errors, in parentheses, are corrected for heteroscedasticity, clustering by series. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table C8: Regressions reported in Table 4, Educational Level panel

Dependent variable: Nominated			
	(1) Regular Series High Education	(2) Regular Series Low Education	(3) Regular Series All
Different Gender	0.952 (0.112)	1.090 (0.0639)	1.090 (0.0639)
Age Difference	1.035*** (0.00652)	1.020** (0.00955)	1.020** (0.00957)
Non-white	1.329* (0.203)	1.344*** (0.144)	1.338*** (0.117)
High Education x Different Gender			0.874 (0.100)
High Education x Age Difference			1.015 (0.0109)
Pseudo R ²	0.0122	0.0063	0.0086
Observations	4,686	7,449	12,135

*Notes: Table C8 presents conditional logit models, with odds ratios presented. Note that an odds ratio of more than 1 indicates a positive effect, while an odds ratio of less than 1 indicates a negative effect. The dependent variable indicates whether or not an individual is nominated by a given contestant in a given round. Model (1) includes only the nomination choices of housemates with high educational level in the regular series; Model (2) includes only the nomination choices of housemates with low educational level in the regular series; Model (3) includes the nomination choices of both, with interaction terms. Standard errors, in parentheses, are corrected for heteroscedasticity, clustering by series. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

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