

Disability Discrimination in the Italian Rental Housing Market: A Field Experiment with Blind Tenants, by Luca Fumarco

Appendix A – Additional Experiment Details

In this online appendix, I provide more details on both the randomization process and the submission of applications.

Randomization process

The random assignment of the three characteristics to each fictitious applicant occurred *ex ante*. I entered the three identities (that is, Andrea Rossi, Francesco Russo, and Alessandro Ferrari) into a spreadsheet on which they were repeated approximately 330 times each; after that, I randomly ordered the identities by drawing without resampling using a normal distribution. Afterwards, I prepared a list on which the three applicants' statuses (that is, married tenants, married tenants with blind tenant plus guide dog, and married tenants with pet dog) were repeated approximately 330 times each, and again I randomly ordered them by drawing without resampling using a normal distribution. Thereafter, I paired the list of applicants' statuses with that of applicants' identities. Finally, for all of the fictitious applicants I also randomly determined the general location of the apartment for which they should apply (that is, the region of the apartment and whether the apartment was in a metropolitan city or not).¹ The quantity of applicants per region reflects the proportion of the national population living in that region, and in each region the number of applicants per metropolitan city reflects the proportion of the regional population living in that city.

Submission of applications

Fictitious applications were sent following the list of applicants' identities with assigned apartment location. Applications were sent to the most recent advertisements to minimize the probability of contacting advertisers whose apartments had already been rented out.

A series of standard criteria was set regarding which advertisements should not be contacted. Advertisements for apartments smaller than 40 square meters and for those more expensive than 1,500€ per month were not taken into consideration. The size restriction was adopted because of the Italian law that legislates the maximum number of tenants per square

¹ Similar to the two previous steps, I first created the list of randomly ordered locations, and then I paired this list with the list of applicants.

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meter;² this limit does not apply to pets. The rent restriction was adopted to avoid rent outliers.³ Advertisements that explicitly discouraged dog owners from applying were not taken into consideration. Advertisements on shared housing units were mostly posted by university students who searched for other student housemates, so they were not contacted.

² Ministerial Decree, June 20, 1975, art. 5, and its modification in 1986.

³ The estimated average monthly rent in Italy is 1,000€. Source: number.com.

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Appendix B – Additional Descriptive Statistics

This online appendix reports additional statistics on invitation and rejection variables.

Table B1 Invitation rates for the groups of tenants, by advertiser type.

Tenants' groups	Invitation rates by advertiser type					
	Housing brokers			Apartment owners		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
	(1)	(2)	(3)	(4)	(5)	(6)
A (Not blind, no dog)	138	0.819	0.386	191	0.764	0.425
B (Blind, guide dog)	133	0.812	0.392	191	0.555	0.498
C (Not blind, pet dog)	148	0.709	0.455	182	0.577	0.495

Note: In the panel “Housing brokers,” columns (1)-(2)-(3) report, respectively: number of observations and means and standard deviations of groups’ invitation rates from housing brokers. In the panel “Apartment owners,” columns (4)-(5)-(6) report the equivalent statistics for apartment owners.

There is one fact worth mentioning in Table B1. Housing brokers invite applicants at a higher rate compared to apartment owners, independently from the type of tenant. A possible reason could be that the interaction with applicants is part of the housing broker’s daily job, while apartment owners interact with candidate tenants in their spare time.

Table B2 Rejection rates for the groups of applicants.

Tenants' groups	Rejection rate		
	N	Mean	Std. Dev.
	(1)	(2)	(3)
A (Not blind, no dog)	334	0.021	0.143
B (Blind, guide dog)	332	0.057	0.233
C (Not blind, pet dog)	333	0.075	0.264

Note: Columns (1)-(2)-(3) report, respectively: number of observations and means and standard deviations of groups’ negative answer rates.

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Table B3 Rejection rates for the groups of applicants, by advertiser type.

Tenants' groups	Rejection rates by advertiser type					
	Housing brokers			Apartment owners		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
	(1)	(2)	(3)	(4)	(5)	(6)
A (Not blind, no dog)	138	0.014	0.120	191	0.026	0.160
B (Blind, guide dog)	133	0.022	0.149	191	0.084	0.278
C (Not blind, pet dog)	148	0.074	0.263	182	0.077	0.267

Note: In the panel “Housing brokers,” columns (1)-(2)-(3) report, respectively: number of observations and means and standard deviations of groups’ negative answer rates from housing brokers per group of applicants. In the panel “Apartment owners,” columns (4)-(5)-(6) report the equivalent statistics for apartment owners per group of applicants. For each group of tenants, the total number of observations in the two panels is lower than that reported in Table 1 because of missing information on the advertiser type.

Table B4 Counts of invitations, nonresponses, and rejections for the groups of applicants.

Tenants' groups	Invitations	Nonresponses	Rejections
	(1)	(2)	(3)
A (Not blind, no dog)	262	65	7
B (Blind, guide dog)	221	92	19
C (Not blind, pet dog)	211	97	25

Note: Columns (1)-(2)-(3) report, respectively: number of invitations, nonresponses, and rejections per group of applicants.

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Table B5 Counts of invitations, nonresponses, and negative answers for the groups of applicants, by advertiser type.

Tenants' groups	Housing brokers			Apartment owners		
	Invitations (1)	Nonresponses (2)	Rejections (3)	Invitations (4)	Nonresponses (5)	Rejections (6)
A (Not blind, no dog)	113	23	2	146	40	5
B (Blind, guide dog)	108	22	3	106	69	16
C (Not blind, pet dog)	105	32	11	105	63	14

Note: In the panel “Housing brokers,” columns (1)-(2)-(3) report, respectively: number of invitations, nonresponses, and negative answers from housing brokers per group of applicants. In the panel “Apartment owners,” columns (4)-(5)-(6) report the equivalent statistics from apartment owners per group of applicants. For each group of tenants, the total number of observations in the two panels is lower than that reported in Table 1 because of missing information on the advertiser type.

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Appendix C – Heterogeneity Analyses

This online appendix reports estimates from heterogeneity analyses. I investigate whether the level of discrimination varies based on two characteristics of the housing unit: vicinity to dog-friendly amenities and presence of furniture.

Vicinity to dog-friendly amenities

The level of discrimination could vary with the vicinity to dog-friendly amenities, such as public or private gardens, if apartment owners discriminated against blind tenants assisted by guide dogs out of concern for the dogs' wellbeing. Nonetheless, it is worth mentioning that even if this concern were genuine, differential treatment based on the presence of the guide dog would represent illegal disability discrimination. In this dataset, there are two proxies for the availability of the housing unit to dog-friendly amenities: the apartment being in a metropolitan city, and the population density of the city where the apartment is located; the idea is that there are fewer green areas in densely populated cities. The dummy for the apartment being in a metropolitan city is already present in model (1); in this additional analysis it is also interacted with both $Blind_i$ and Dog_i . In the alternative model specification, when the population density is used, this variable is introduced alone and interacted with both $Blind_i$ and Dog_i ; in this case, the dummy for the apartment being in a metropolitan city is dropped and the population density is demeaned and rescaled by being divided by 1,000. The results are reported in Table C1 and Table C2, respectively; in general, these tables suggest that the vicinity of the apartment to dog-friendly amenities does not affect the level of discrimination: the estimates of the interaction effects are close to zero and mostly not statistically significant.

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Table C1 Linear probability model estimates, interactions with metropolitan city.

	Housing brokers			Apartment owners		
	(1.A)	(1.B)	(1.C)	(2.A)	(2.B)	(2.C)
Outcome: Invitation						
Constant	0.825***	0.700***	0.713***	0.795***	0.867***	0.837***
(Not blind, no dog)	(0.033)	(0.161)	(0.195)	(0.034)	(0.060)	(0.075)
β_1^{\wedge}	-0.018	-0.028	-0.035	-0.239***	-0.254***	-0.263***
(Blind, guide dog)	(0.050)	(0.051)	(0.055)	(0.067)	(0.069)	(0.071)
β_2^{\wedge}	-0.107**	-0.118**	-0.113**	-0.194***	-0.221***	-0.241***
(Not blind, pet dog)	(0.049)	(0.048)	(0.050)	(0.038)	(0.042)	(0.040)
β_3^{\wedge}	-0.075	-0.130	-0.161	-0.195**	-0.201**	-0.176
(Metro)	(0.135)	(0.134)	(0.139)	(0.090)	(0.096)	(0.107)
β_4^{\wedge}	0.101	0.135	0.174	0.187	0.162	0.147
(Blind, guide dog)×(Metro)	(0.147)	(0.148)	(0.150)	(0.138)	(0.143)	(0.146)
β_5^{\wedge}	0.007	0.008	0.033	0.064	0.077	0.059
(Not blind, pet dog)×(Metro)	(0.186)	(0.179)	(0.183)	(0.139)	(0.146)	(0.149)
Control variables	N	Y	Y	N	Y	Y
Additional characteristics	N	N	Y	N	N	Y
R squared	0.017	0.032	0.075	0.049	0.063	0.125
N	419	409	409	564	525	525

Note: Missing apartment characteristics, including the type of agent, cause the total sample to be smaller than 999 observations. Group A, which comprises married tenants, is the reference group. Robust standard errors corrected for day of inquiry are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

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Table C2 Linear probability model estimates, interactions with population density.

	Housing brokers			Apartment owners		
	(1.A)	(1.B)	(1.C)	(2.A)	(2.B)	(2.C)
Outcome: Invitation						
Constant	0.815***	0.667***	0.691***	0.761***	0.834***	0.839***
(Not blind, no dog)	(0.032)	(0.161)	(0.193)	(0.034)	(0.057)	(0.077)
β_1^{\wedge}	-0.003	-0.011	-0.007	-0.207***	-0.223***	-0.236***
(Blind, guide dog)	(0.046)	(0.047)	(0.051)	(0.065)	(0.064)	(0.066)
β_2^{\wedge}	-0.106**	-0.120***	-0.111**	-0.184***	-0.210***	-0.231***
(Not blind, pet dog)	(0.041)	(0.040)	(0.044)	(0.040)	(0.042)	(0.040)
β_3^{\wedge}	-0.034	-0.040*	-0.051**	-0.025	-0.031	-0.058**
(Metro)	(0.025)	(0.023)	(0.025)	(0.020)	(0.020)	(0.022)
β_4^{\wedge}	0.045	0.047	0.053*	0.030	0.033	0.038
(Blind, guide dog)×(Density)	(0.028)	(0.029)	(0.030)	(0.026)	(0.026)	(0.027)
β_5^{\wedge}	0.043	0.048	0.057*	0.013	0.023	0.028
(Not blind, pet dog)×(Density)	(0.031)	(0.031)	(0.033)	(0.028)	(0.028)	(0.028)
Control variables	N	Y	Y	N	Y	Y
Additional characteristics	N	N	Y	N	N	Y
R squared	0.022	0.035	0.081	0.042	0.057	0.130
N	419	409	409	564	525	525

Note: Missing apartment characteristics, including the type of agent, cause the total sample to be smaller than 999 observations. Group A, which comprises married tenants, is the reference group. Robust standard errors corrected for day of inquiry are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Presence of furniture

The level of discrimination could vary with the presence of furniture, if apartment owners discriminated against blind tenants assisted by guide dogs out of concern that dogs could damage the furniture. However, also in this case, differential treatment based on the presence

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of the guide dog would represent illegal discrimination. There is already a dummy for the apartment being furnished in model (1); in this analysis, this variable is also interacted with both $Blind_i$ and Dog_i . The results are reported in Table C3 and suggest that the presence of the furniture does not appear to influence the level of discrimination: the estimates of the interaction effects are close to zero and never statistically significant.

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Table C3 Linear probability model estimates, interactions with furniture.

	Housing brokers			Apartment owners		
	(1.A)	(1.B)	(1.C)	(2.A)	(2.B)	(2.C)
Outcome: Invitation						
Constant	0.792***	0.694***	0.712***	0.720***	0.841***	0.818***
(Not blind, no dog)	(0.043)	(0.165)	(0.197)	(0.066)	(0.077)	(0.010)
β_1^{\wedge}	0.025	0.028	0.037	-0.191	-0.224*	-0.248*
(Blind, guide dog)	(0.054)	(0.057)	(0.060)	(0.120)	(0.124)	(0.128)
β_2^{\wedge}	-0.120*	-0.114	-0.114	-0.151	-0.174*	-0.207*
(Not blind, pet dog)	(0.064)	(0.070)	(0.071)	(0.103)	(0.104)	(0.104)
β_3^{\wedge}	0.057	0.051	0.070	0.073	0.053	0.042
(Metro)	(0.055)	(0.051)	(0.062)	(0.076)	(0.083)	(0.088)
β_4^{\wedge}	-0.067	-0.075	-0.094	-0.031	-0.005	0.013
(Blind, guide dog)×(Furniture)	(0.082)	(0.075)	(0.076)	(0.128)	(0.138)	(0.139)
β_5^{\wedge}	0.009	-0.013	-0.000	-0.061	-0.051	-0.038
(Not blind, pet dog)×(Furniture)	(0.100)	(0.101)	(0.102)	(0.127)	(0.132)	(0.139)
Control variables	N	Y	Y	N	Y	Y
Additional characteristics	N	N	Y	N	N	Y
R squared	0.019	0.031	0.074	0.041	0.061	0.123
N	419	409	409	564	525	525

Note: Missing apartment characteristics, including the type of agent, cause the total sample to be smaller than 999 observations. Group A, which comprises married tenants, is the reference group. Robust standard errors corrected for day of inquiry are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

These two heterogeneity analyses should also be considered with a grain of salt because of a possible correlation between variables. However, the pairwise correlations between variables in Table 4 in the paper seem to rule out this possibility.

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Appendix D – Rejection Rate as Outcome Variable

This online appendix reports estimates from one additional robustness checks. In this robustness check the model specification is similar to (1), but the outcome variable is now a dummy variable that equals 1 if the applicant has received a direct negative answer. The estimates are reported below in Table D1.

Table D1 Linear probability model estimates, rejection rate as outcome variable.

	Housing brokers			Apartment owners		
	(1.A)	(1.B)	(1.C)	(2.A)	(2.B)	(2.C)
Outcome: Rejection						
Constant	0.014	0.077	0.025	0.026**	-0.044*	-0.037
(Not blind, no dog)	(0.0102)	(0.105)	(0.110)	(0.012)	(0.024)	(0.033)
β_1^{\wedge}	0.008	0.002	0.002	0.058**	0.061**	0.058**
(Blind, guide dog)	(0.014)	(0.012)	(0.014)	(0.024)	(0.024)	(0.024)
β_2^{\wedge}	0.056***	0.060**	0.065***	0.051*	0.053*	0.043*
(Not blind, pet dog)	(0.022)	(0.023)	(0.024)	(0.025)	(0.028)	(0.024)
Control variables	N	Y	Y	N	Y	Y
Additional characteristics	N	N	Y	N	N	Y
R squared	0.020	0.030	0.111	0.011	0.045	0.121
N	419	409	409	564	525	525

Note: Missing apartment characteristics, including the type of agent, cause the total sample to be smaller than 999 observations. Group A, which comprises married tenants, is the reference group. The reference region is Lombardy, in columns (1.C) and (2.C). Robust standard errors corrected for day of inquiry are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.