Ethnic-based asymmetries in home ownership and home loans a comparison between Māori and New Zealand Europeans (Pākehā)

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Introduction

This paper reports results from a multi-study examination of differences in homeownership and loans between Māori and Pākehā (New Zealand Europeans). Data from two large-scale studies in New Zealand (MIFAS and NZAVS) offer clear evidence showing that, compared to Pākehā, Māori are less likely to own their home, even after holding constant a set of key demographic covariates (e.g., income, education, employment). When comparing the rates of homeownership between Māori and Pākehā, results show that the latter are almost twice as likely to own a home than the former. Furthermore, the second set of analyses showed than those who report only Māori ethnicity[1] are significantly less likely to have a home loan/mortgage than Māori of mixed ethnicity (i.e., Māori-Pākehā). NOTE: The purpose of the document is to complement the Waitangi Tribunal Housing Policy and Services Inquiry (Wai 2750) and inform a related claim (Wai 2805). Dr Joaquín Bahamondes conducted the statistical analyses in this report. The co-authors (who comprise the Māori Identity and Financial Attitudes Study/MIFAS research group) provided oversight, review and comment. For further queries, contact Carla Houkamau at c.houkamau@auckland.ac.nz

[1] In this report, we use the term sole Māori to refer to those people who identified Māori as their only ethnic group and 'mixed Māori' to refer to those who identified as Māori as *one of their ethnicities* as part of multiple ethnicities (in this case that ethnicity is Pākehā or NZ European). We use the terms for ease of communication rather than writing out "a person who identifies with the ethnic group Maori only" throughout the report. For a review of classifications of ethnic groups and associated terminology see Cormack, D & Robson C. (2010). Classification and output of multiple ethnicities: issues for monitoring Māori health. Wellington: Te Rōpū Rangahau Hauora a Eru Pōmare.

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Context (General overview)

Disparities between Māori and Pākehā are pervasive. They are found, for instance, in key domains such as education, employment and health (Houkamau, Stronge & Sibley, 2017).[i] In 2015, Houkamau and Sibley[ii] published a report showing that looking Māori predicted a lower likelihood of home ownership. In this report, we extend these analyses by drawing on two large-scale studies in New Zealand; namely, the New Zealand Attitudes and Values Study (NZAVS T10, 2018[iii]), and the Māori Identity and Financial Attitudes Study (MIFAS, T9, 2017)[iv]. These datasets include a wide range of measures across samples of thousands of Māori and Pākehā New Zealanders.

When comparing the rates of home ownership between Māori and Pākehā, results show that the latter are almost twice as likely to own a home than the former ($\chi^2_{(1)} = 752.292$, *Phi* = –.135, $p < .001$). A similar pattern is observed when comparing the likelihood of having a home loan between Māori of a mixed ethnicity with those who identify as Māori only. Specifically, mixed Māori (who also have Pākehā ethnicity) are significantly more likely than those who identify only as Māori to have a home loan ($\chi^2_{(1)} = 76.818$, *Phi* = .109, $p < .001$). Figure 1 displays the rates of home ownership (Panel 1, NZAVS data) and home loan (Panel 2, MIFAS data).

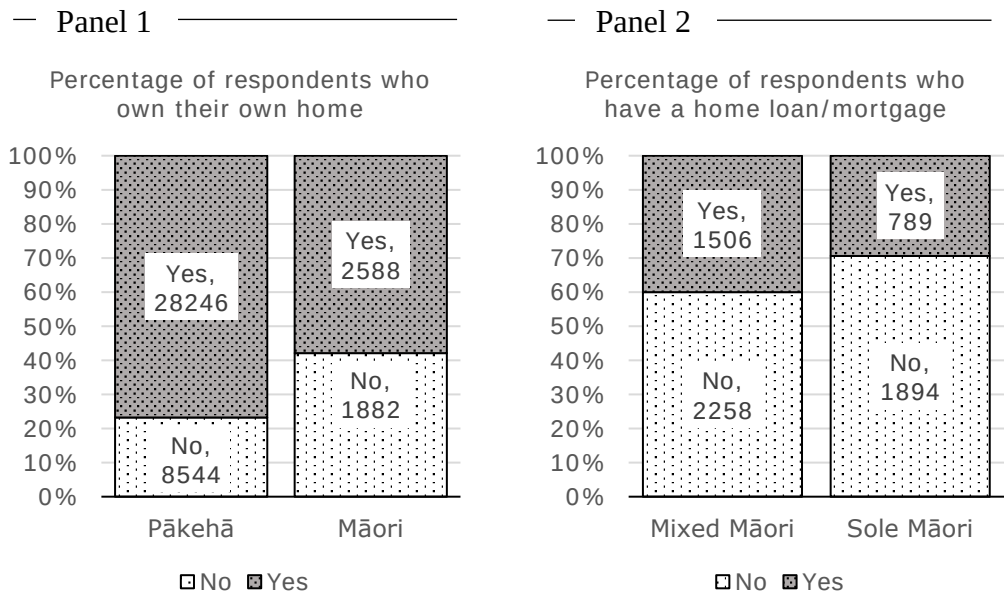

Figure 1. Home ownership and home loan/mortgage as a function of ethnicity.
Note. Panel 1 is NZAVS T10 (2018) data, Panel 2 is MIFAS T9 (2017) data.

Technical overview of statistical tests

Throughout this report, evidence is presented in the form of numerical indicators. Table 1 outlines a brief definition, meaning and interpretation for each of the statistics used.

Table 1. *Statistical coefficients used in this report*

Symbol	Name	Definition
χ^2	Chi squared	Statistic that tests whether the *observed* distribution of responses in the data resembles an *expected* (symmetrical) distribution of responses between two groups (e.g., Māori/NZ Europeans).
φ	Phi	A standardization of χ^2 that results in an effect size indicator for associations between binary-response variables (e.g., Māori/NZ Europeans; yes/no) that falls somewhere in between 0.0 (no associations or difference) and 1.0 (perfect association or difference).
b	Beta coefficient	Regression coefficient that indicates the amount of change in *log* odds of a given outcome as a function of a one-unit change in a predictor. Odds Ratios allow a more intuitive interpretation, derived from the *b* coefficient. A positive coefficient indicates that a higher score in the predictor is associated with a *higher* probability of being a case (e.g., responding "yes", instead of "no"), whereas a negative coefficient signals that higher scores in the predictor are associated with a *lower* probability.
OR	Odds Ratio	Indicator of the likelihood of reporting a particular answer (e.g., yes) relative to a baseline (e.g., no). When the predictor is quantitative (e.g., age), the specific score in the odds ratio indicates the times the likelihood increases by every one-unit change in the predictor. A *higher* likelihood is indicated by scores > 1.00 (e.g., 1.24), and *lower* probabilities by < 1.00 (e.g., 0.72).
99% CI	99% Confidence Intervals (OR)	Limits that indicate the accuracy of the Odds Ratio. If 1.00 is not found within the bounds of the confidence intervals, we can expect—with relative confidence—that the ratio reflects a significant difference.
t	*t*-value	The test statistic used for significance testing. The effect is considered to be significant when the *observed* t-value is higher than the *critical* t-value reflecting the threshold of a $p < .01$ probability (see below).
p	*p*-value (probability)	In the context of regression, the *p*-value is the probability that the observed effect *b* is statistically equivalent to 0 (i.e., no effect). Under a strict threshold of $p < .01$ (the one used in this report), the effect is considered statistically significant (i.e., different from 0). Thus, the null hypothesis of no effect is rejected, given that the probability of the observed effect being equivalent to 0 is smaller than 1% (sufficiently unlikely to confidently conclude that there is an effect). Similarly, in Chi squared tests, the *p*-value reflects the probability of the data showing that there are no differences between groups (null hypothesis. Interpretation mirrors that of regression.

All results reported below are the outcomes of logistic regression models. These were estimated in order to predict the probability of either owning a home (0 = no, 1 = yes) or having a home loan (0 = no, 1 = yes). We took a conservative approach by using Maximum Likelihood with robust estimation of the standard errors, and a threshold of $p <. 01$ for attaining statistical significance. Furthermore, in order to isolate the unique effect of ethnicity on home ownership and having a home loan above and beyond other potential variables that could explain this association, we followed Houkamau and Sibley's (2015) approach and included the same set of demographic controls (see Table 2). Thus, given the strict conditions we have imposed to our analyses, we can be confident that the significant associations reported here are reliable.

Table 2. *Demographic controls included in logistic regression models*

Control	Measurement (response) scale
Gender	0 = female, 1 = male
Age	Years
Income	$10,000 NZD units
Education	0 = no certificate, 11 = Doctorate
Employment	0 = no, 1 = yes
Religion	0 = no, 1 = yes
Parent	0 = no, 1 = yes
Relationship	0 = no, 1 = yes
Urban	0 = rural, 1 = urban
NZ (mesh-block) Deprivation index	0 = low, 1 = high deprivation
Auckland Region	0 = no, 1 = yes

We report 6 different models, clustered within 4 studies. The first two models compare the rates of home ownership between Māori and Pākehā (Study 1a) and mixed Māori (with Pākehā) and sole Māori (Study 1b). Study 2 replicates Study 1b, but examining probabilities of having a home loan, instead of home ownership, and tests whether perceiving one's appearance as more Māori is associated with a lower likelihood of having a home loan. Subsequently, Study 3 analyses whether Māori who do not have a home loan are more likely to perceive themselves as being discriminated against because of their ethnicity. Study 4a replicates the latter by analyzing the same effects for home ownership, instead of having a home loan. Finally, Study 4b further examines whether Pākehā who do not own their own home feel they are discriminated against because of their ethnicity (see Table 3 for a summary of dataset and sub-samples used in each study).

Table 3. *List of studies included in the report*

Study	Dataset	Sub-sample	
		Target group	*n*
Study 1a	NZAVS	Māori, Pākehā	39,156
Study 1b	NZAVS	Mixed and sole Māori	4,086
Study 2	MIFAS	Mixed and sole Māori	4,868
Study 3	MIFAS	Māori	4,895
Study 4a	NZAVS	Māori	4,050
Study 4b	NZAVS	Pākehā	34,684

Study 1a: Comparisons in home ownership between Māori and Pākehā

In Study 1a, we analyzed data from 39,156 Māori and Pākehā participants included in the NZAVS time 10 (2018). Specifically, we tested whether the probabilities of owning one's home varied as a function of people's ethnicity (Māori or Pākehā), while controlling for the effect of our key covariates. Results show that Māori (relative to Pākehā) had a significantly smaller likelihood of (partially or fully) owning their home, even when controlling for the effect of relevant covariates in the model (b = –.660, SE = .005, $OR_{unadjusted}$ = 0.517, 99% CI of $OR_{unadjusted}$ = [0.461, 0.579], t = –14.912, p <. 001). That is, Māori people have a smaller likelihood of owning a home than Pākehā, *above and beyond* the effects of income, education, employment status, urban (relative to rural) residence, meshblock-level deprivation, and other (see Table 4).

Table 4. *Slopes and odds ratios for model (Study 1a) predicting likelihood of owning (partially or fully) one's own home.*

	Logistic regression predicting probability of home ownership (0 no, 1 yes)					
	B	***SE***	***OR***	**99% CI of *OR***	***t***	***p***
Intercept/Threshold	4.903	.094				
Gender (0 female, 1 male)	–0.276	.032	0.759	[0.700, 0.823]	–8.728*	< .001
Age (years)	0.081	.001	1.084	[1.080, 1.088]	62.553*	< .001
Income ($10,000 units)	0.061	.003	1.063	[1.054, 1.071]	20.039*	< .001
Education (ordinal 0-11)	0.085	.006	1.089	[1.073, 1.105]	14.867*	< .001
Employment (0 no, 1 yes)	0.620	.037	1.859	[1.688, 2.047]	16.570*	< .001
Religion (0 no, 1 yes)	–0.123	.032	0.884	[0.814, 0.959]	–3.876*	< .001
Parent (0 no, 1 yes)	0.730	.032	2.076	[1.909, 2.257]	22.484*	< .001
Relationship (0 no, 1 yes)	1.304	.034	3.683	[3.374, 4.021]	38.327*	< .001
Urban (0 rural, 1 urban)	0.006	.039	1.006	[0.909, 1.113]	0.147	.883
NZ deprivation index 2013 (1-10)	–0.051	.006	0.950	[0.936, 0.964]	–8.888*	< .001
Auckland Region (0 no, 1 yes)	–0.533	.034	0.587	[0.538, 0.640]	–15.762*	< .001
Māori (0 Pākehā, 1 Māori)	–0.660	.044	0.517	[0.461, 0.579]	–14.912*	< .001

Notes. Fit indices for model: R^2 = .473, *SE* = .006, *z* = 76.184, *p* <. 001; *OR* = Odds Ratio; * *p* <. 001; *n* = 39,156.

Study 1b: Comparisons in home ownership between sole and mixed ethnicity Māori

In Study 1b, we analyzed a subset of the sample, including only Māori participants (*N* = 4,086). Here, we examine whether having a mixed Māori and Pākehā ethnicity was associated with a higher likelihood of owning one's home compared to those of sole Māori ethnicity. As with our previous model, we controlled for the effects of our key covariates.

Results from Study 1b show that, as expected, those of sole Māori ethnicity had a significantly smaller likelihood of (partially or fully) owning their home than Māori of mixed ethnicity (i.e., Māori-Pākehā) after controlling for the effect of the same key covariates from Study 1a (b = –.521, SE = .092, $OR_{unadjusted}$ = 0.594, 99% CI of $OR_{unadjusted}$ = [0.468, 0.753], t = –5.641, p <. 001). Table 5 summarizes the effects of the overall model.

Table 5. *Slopes and odds ratios for model (Study 1b) predicting likelihood of owning (partially or fully) one's own home among Māori.*

	Logistic regression predicting probability of home ownership (0 no, 1 yes)					
	B	***SE***	***OR***	**99% CI of *OR***	***t***	***p***
Intercept/Threshold	4.404	.259				
Gender (0 female, 1 male)	–0.061	.088	0.941	[0.750, 1.180]	–0.693	.488
Age (years)	0.070	.004	1.073	[1.063, 1.083]	19.461*	< .001
Income ($10,000 units)	0.054	.008	1.056	[1.033, 1.079]	6.424*	< .001
Education (ordinal 0-11)	0.071	.015	1.074	[1.032, 1.118]	4.635*	< .001
Employment (0 no, 1 yes)	0.786	.097	2.195	[1.709, 2.819]	8.094*	< .001
Religion (0 no, 1 yes)	–0.229	.083	0.795	[0.641, 0.986]	–2.746	.006
Parent (0 no, 1 yes)	0.465	.094	1.592	[1.249, 2.030]	4.932*	< .001
Relationship (0 no, 1 yes)	1.364	.087	3.913	[3.131, 4.891]	15.755*	< .001
Urban (0 rural, 1 urban)	–0.216	.104	0.806	[0.616, 1.055]	–2.064	.039
NZ deprivation index 2013 (1-10)	–0.088	.015	0.915	[0.881, 0.951]	–5.895*	< .001
Auckland Region (0 no, 1 yes)	–0.523	.092	0.593	[0.468, 0.751]	–5.703*	< .001
Sole Māori (0 Mixed, 1 Sole)	–0.521	.092	0.594	[0.468, 0.753]	–5.641*	< .001

Notes. Fit indices for model: R^2 = .440, *SE* = .018, *z* = 25.109, *p* <. 001; *OR* = Odds Ratio; * *p* <. 001; *n* = 4,086.

Study 2: Comparisons in home loan/mortgage between sole and mixed ethnicity Māori

Study 2 analyses data from 4,868 Māori participants included in the MIFAS T9 (2017). Particularly, in this model we conducted a follow-up examination, replicating our test from Study 1b, and that from Houkamau and Sibley's (2015) study but analyzing probabilities of having a home loan/mortgage, instead of home ownership. More specifically, we tested whether having a mixed Māori and Pākehā ethnicity, as well as perceived (Māori) appearance, were associated with a higher likelihood of having a home loan compared to those of sole Māori ethnicity. For our models using data from the MIFAS, we controlled for the effects of several dimensions of subjective Māori identification, in addition to our key demographic covariates.

Results show that, when compared to Māori of mixed ethnicity (i.e., Māori-Pākehā), those of sole Māori ethnicity had a significantly smaller likelihood of having a home loan/mortgage (b = –.275, SE = .079, $OR_{unadjusted}$ = 0.760, 99% CI of $OR_{unadjusted}$ = [0.619, 0.932], t = –3.461, p =. 001), even after controlling for the same relevant covariates reported in Study 1a and 1b. Unexpectedly, the effect of perceived appearance on having a home loan was unreliable given the available statistical power of our model (b = 0.046, SE = .019, $OR_{unadjusted}$ = 1.047, 99% CI of $OR_{unadjusted}$ = [0.995, 1.101], t = 2.344, p =. 019). Table 6 summarizes all results for Study 2.

Table 6. *Slopes and odds ratios for model (Study 2) predicting likelihood of having a home loan among Māori.*

	Logistic regression predicting probability of having home loan/mortgage (0 no, 1 yes)					
	B	***SE***	***OR***	**99% CI of *OR***	***t***	***p***
Intercept/Threshold	2.441	.275				
Gender (0 female, 1 male)	–0.131	.070	0.877	[0.732, 1.051]	–1.865	.062
Age (years)	0.008	.003	1.008	[1.001, 1.015]	2.846	.004
Income ($10,000 units)	0.038	.008	1.039	[1.017, 1.060]	4.745*	< .001
Education (ordinal 0-11)	0.043	.013	1.043	[1.009, 1.079]	3.270*	< .001
Employment (0 no, 1 yes)	1.290	.093	3.633	[2.862, 4.610]	13.943*	< .001
Religion (0 no, 1 yes)	–0.027	.070	0.973	[0.813, 1.165]	–0.391	.696
Parent (0 no, 1 yes)	0.785	.099	2.193	[1.699, 2.831]	7.926*	< .001
Relationship (0 no, 1 yes)	0.836	.082	2.307	[1.866, 2.851]	10.166*	< .001
Urban (0 rural, 1 urban)	–0.209	.077	0.811	[0.665, 0.990]	–2.709	.007
NZ deprivation index 2013 (1-10)	–0.036	.013	0.965	[0.934, 0.997]	–2.842	.004
Auckland Region (0 no, 1 yes)	–0.284	.096	0.753	[0.588, 0.963]	–2.966	.003
Group Membership Evaluation	0.041	.039	1.042	[0.942, 1.151]	1.048	.295
Cultural Efficacy	–0.040	.032	0.961	[0.886, 1.043]	–1.259	.208
Interdependent Self-Concept	–0.071	.033	0.932	[0.856, 1.014]	–2.150	.032
Spirituality	0.001	.028	1.001	[0.932, 1.076]	0.044	.965
Socio-political Consciousness	–0.034	.031	0.966	[0.892, 1.047]	–1.094	.274
Authenticity Beliefs	–0.041	.028	0.960	[0.892, 1.033]	–1.431	.153
Perceived Appearance	0.046	.019	1.047	[0.995, 1.101]	2.344	.019
Whānau Efficacy	–0.055	.030	0.946	[0.876, 1.022]	–1.843	.065
Sole Māori (0 Mixed, 1 Sole)	–0.275	.079	0.760	[0.619, 0.932]	–3.461*	< .001

Notes. Fit indices for model: R^2 = .258, *SE* = .016, *z* = 16.117, *p* <. 001; *OR* = Odds Ratio; * *p* <. 001; *n* = 4,868.

Perceptions of ethnic-based discrimination and home ownership/loan

There are marked differences in subjective perceptions of discrimination among Māori and Pākehā. Figure 2 shows that, according to NZAVS data, roughly 5% of Pākehā report that they are more (rather than less) discriminated against because of their ethnicity. Over 20% of Māori, on the other hand, report they are targets of ethnic-based discrimination. Interestingly, data from our two independent Māori samples (NZAVS and MIFAS) show an almost identical pattern (see Figure 2). The subsequent tests examine the associations of perceptions of ethnic-based discrimination and having a home loan or owning one's home.

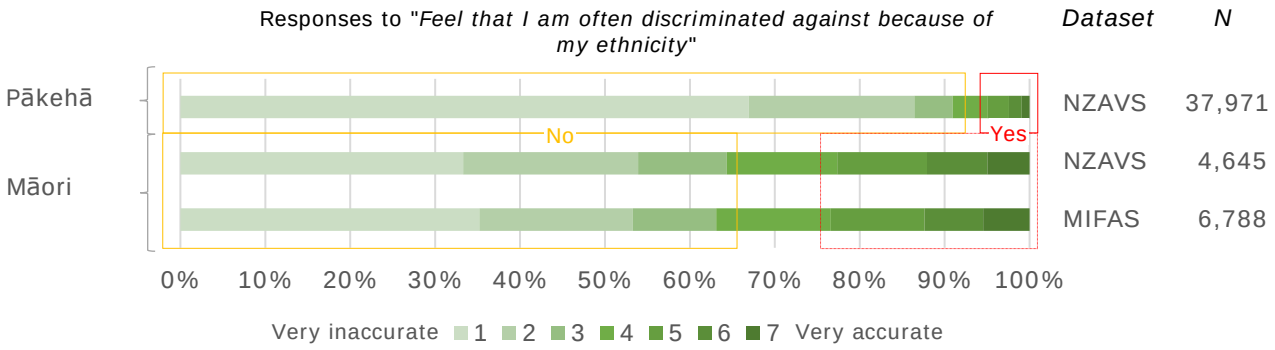

Figure 2. Rates of perceptions of discrimination because of one's ethnicity.

Study 3: Home loan/mortgage and perceptions of discrimination

Study 3 examined the effect of perception of ethnic-based discrimination on having a home loan among 4,895 Māori participants from the MIFAS. To these ends, we conducted a logistic regression including perceived discrimination, along with the set of key demographic covariates.

Unexpectedly, the effect of our target variable was non-significant. In other words, perceptions of discrimination among Māori was not associated with having a home loan (b = –.015, SE = .019, $OR_{unadjusted}$ = 0.985, 99% CI of $OR_{unadjusted}$ = [0.937, 1.036], t = –0.772, p =.440) while controlling for key demographic covariates. Results from the overall model for Study 3 are summarized in Table 7.

Table 7. *Slopes and odds ratios for model (Study 3) predicting likelihood of having a home loan among Māori.*

	Logistic regression predicting probability of having home loan/mortgage (0 no, 1 yes)					
	B	***SE***	***OR***	**99% CI of *OR***	***t***	***p***
Intercept/Threshold	2.317	.270				
Gender (0 female, 1 male)	–0.141	.070	0.869	[0.725, 1.040]	–2.012	.044
Age (years)	0.008	.003	1.008	[1.000, 1.015]	2.731	.006
Income ($10,000 units)	0.037	.008	1.038	[1.017, 1.059]	4.679*	< .001
Education (ordinal 0-11)	0.049	.013	1.050	[1.015, 1.086]	3.760*	< .001
Employment (0 no, 1 yes)	1.266	.092	3.547	[2.797, 4.499]	13.717*	< .001
Religion (0 no, 1 yes)	–0.036	.070	0.965	[0.806, 1.154]	–0.516	.606
Parent (0 no, 1 yes)	0.775	.098	2.170	[1.686, 2.792]	7.909*	< .001
Relationship (0 no, 1 yes)	0.873	.082	2.393	[1.936, 2.958]	10.605*	< .001
Urban (0 rural, 1 urban)	–0.191	.077	0.826	[0.678, 1.007]	–2.483	.013
NZ deprivation index 2013 (1-10)	–0.040	.012	0.961	[0.931, 0.993]	–3.164	.002
Auckland Region (0 no, 1 yes)	–0.277	.095	0.758	[0.594, 0.969]	–2.912	.004
Group Membership Evaluation	0.029	.039	1.029	[0.932, 1.137]	0.750	.453
Cultural Efficacy	–0.048	.032	0.953	[0.879, 1.034]	–1.511	.131
Interdependent Self-Concept	–0.069	.033	0.933	[0.857, 1.016]	–2.104	.035
Spirituality	0.002	.028	1.002	[0.932, 1.077]	0.068	.945
Socio-political Consciousness	–0.036	.032	0.964	[0.889, 1.046]	–1.146	.252
Authenticity Beliefs	–0.039	.028	0.961	[0.894, 1.034]	–1.398	.162
Perceived Appearance	0.029	.019	1.030	[0.980, 1.081]	1.538	.124
Whānau Efficacy	–0.057	.030	0.945	[0.875, 1.020]	–1.909	.056
Perceived Ethnic-based Discrimination	–0.015	.019	0.985	[0.937, 1.036]	–0.772	.440

Notes. Fit indices for model: R^2 = .257, *SE* = .016, *z* = 16.165, *p* <. 001; *OR* = Odds Ratio; * *p* <. 001; *n* = 4,895.

Study 4a: Home ownership and perceptions of discrimination among Māori

Study 4a replicates the test conducted in Study 3 in a sample of 4,050 Māori participants from the NZAVS. Although we estimated a similar model, the outcome variable in this study is home ownership—rather than having a home loan. Following the previous procedure, we included the full set of key demographic covariates.

Contrary to results from Study 3, Study 4a shows that the effect of perceived discrimination among Māori was significant. In other words, Māori who do not own their home are more likely to perceive themselves as targets of discrimination because of being Māori (b = –.108, SE = .021, $OR_{unadjusted}$ = 0.898, 99% CI of $OR_{unadjusted}$ = [0.850, 948], t = –5.076, p <.001), even after controlling for key demographic covariates. Results from the overall model for Study 4a are summarized in Table8.

Table 8. *Slopes and odds ratios for model (Study 4a) predicting likelihood of owning (partially or fully) one's own home among Māori.*

	Logistic regression predicting probability of having home loan/mortgage (0 no, 1 yes)					
	B	***SE***	***OR***	**99% CI of *OR***	***t***	***p***
Intercept/Threshold	4.128	.259				
Gender (0 female, 1 male)	–0.080	.088	0.923	[0.735, 1.159]	–0.905	.366
Age (years)	0.068	.004	1.071	[1.061, 1.081]	19.147*	< .001
Income ($10,000 units)	0.055	.008	1.056	[1.033, 1.079]	6.453*	< .001
Education (ordinal 0-11)	0.081	.015	1.084	[1.042, 1.128]	5.209*	< .001
Employment (0 no, 1 yes)	0.788	.098	2.199	[1.709, 2.830]	8.047*	< .001
Religion (0 no, 1 yes)	–0.248	.084	0.781	[0.629, 0.968]	–2.963	.003
Parent (0 no, 1 yes)	0.487	.095	1.627	[1.274, 2.079]	5.124*	< .001
Relationship (0 no, 1 yes)	1.359	.087	3.894	[3.113, 4.871]	15.642*	< .001
Urban (0 rural, 1 urban)	–0.224	.105	0.800	[0.610, 1.048]	–2.128	.033
NZ deprivation index 2013 (1-10)	–0.097	.015	0.908	[0.873, 0.943]	–6.493*	< .001
Auckland Region (0 no, 1 yes)	–0.536	.092	0.585	[0.462, 0.741]	–5.831*	< .001
Perceived Ethnic-based Discrimination	–0.108	.021	0.898	[0.850, 0.948]	–5.076*	< .001

Notes. Fit indices for model: R^2 = .439, *SE* = .018, *z* = 24.917, *p* <. 001; *OR* = Odds Ratio; * *p* <. 001; *n* = 4,050.

Study 4b: Home ownership and perceptions of discrimination among Pākehā

Finally, Study 4b was conducted in order to examine whether the effect of perceived discrimination observed in Study 4a was unique amongst Māori. Thus, we analyzed data from 34,684 Pākehā participants sampled as part of the NZAVS. As in Study 4a, in Study 4b we estimated the association between home ownership and perceptions of being a target of ethnic-based discrimination among Pākehā. Again, we controlled for the effects of all our key demographic covariates.

Results show that Pākehā who do not own their home report feeling significantly more targeted because of their ethnicity than those who do own their home (b = –0.060, SE = .013, $OR_{unadjusted}$ = 0.942, 99% CI of $OR_{unadjusted}$ = [0.910, 0.975], t = –4.421, p < .001)—these effects were observed above and beyond the effects of key demographic covariates. Table 9 summarizes results for Study 4b.

Table 9. *Slopes and odds ratios for model (Study 4b) predicting likelihood of owning (partially or fully) one's own home among Pākehā.*

	Logistic regression predicting probability of home ownership (0 no, 1 yes)					
	B	***SE***	***OR***	**99% CI of *OR***	***t***	***p***
Intercept/Threshold	4.974	.104				
Gender (0 female, 1 male)	–0.285	.034	0.752	[0.688, 0.822]	–8.266*	< .001
Age (years)	0.082	.001	1.086	[1.082, 1.090]	59.163*	< .001
Income ($10,000 units)	0.061	.003	1.063	[1.054, 1.072]	18.680*	< .001
Education (ordinal 0-11)	0.084	.006	1.088	[1.071, 1.106]	13.490*	< .001
Employment (0 no, 1 yes)	0.573	.041	1.774	[1.595, 1.974]	13.858*	< .001
Religion (0 no, 1 yes)	–0.072	.035	0.930	[0.850, 1.018]	–2.066	.039
Parent (0 no, 1 yes)	0.780	.035	2.182	[1.995, 2.386]	22.432*	< .001
Relationship (0 no, 1 yes)	1.278	.037	3.588	[3.258, 3.951]	34.167*	< .001
Urban (0 rural, 1 urban)	0.042	.043	1.043	[0.934, 1.165]	0.984	.325
NZ deprivation index 2013 (1-10)	–0.037	.006	0.963	[0.948, 0.979]	–5.887*	< .001
Auckland Region (0 no, 1 yes)	–0.520	.037	0.594	[0.541, 0.653]	14.169*	< .001
Perceived Ethnic-based Discrimination	–0.060	.013	0.942	[0.910, 0.975]	–4.421*	< .001

Notes. Fit indices for model: R^2 = .467, *SE* = .007, *z* = 69.756, *p* <. 001; *OR* = Odds Ratio; * *p* <. 001; *n* = 34,684.

Summary and conclusions

A set of tests with two large, independent samples clearly shows Pākehā are significantly more likely to own their own home than Māori. Likewise, Māori of mixed (Māori-Pākehā) ethnicity are much more likely to own their home and have a home loan than those of sole Māori ethnicity. The effect of perceived (Māori) appearance was unreliable. Māori who do not own their own home are significantly more likely to see themselves as targets of ethnic-based discrimination. Interestingly, Pākehā who do not own their home were also more likely to perceive themselves as being discriminated against because of their ethnicity. Notably, all these results held even when controlling for income, education, regional (mesh-block level) deprivation, employment status, and others (see Table 2 for full list of statistical controls).

[i] Houkamau, C. A., Stronge, S., & Sibley, C. G. (2017). The prevalence and impact of racism toward indigenous Māori in New Zealand. *International Perspectives in Psychology: Research, Practice, Consultation, 6*(2), 61-80. doi:10.1037/ipp0000070

[ii] Houkamau, C. A., & Sibley, C. G. (2015). Looking Maori predicts decreased rates of home ownership: institutional racism in housing based on perceived appearance. *PLoS ONE*, 10: e0118540.

[iii] *The New Zealand attitudes and values study*. (n.d.). https://www.psych.auckland.ac.nz/en/about/new-zealand-attitudes-and-values-study.html

[iv] Houkamau, C. A., Sibley, C., & Henare, M. (2019). Te Rangahau O Te Tuakiri Māori Me Ngā Waiaro Ā-Pūtea | The Māori Identity and Financial Attitudes Study (MIFAS)-Background, Theoretical Orientation And First-Wave Response Rates. *MAI Journal:A New Zealand Journal of Indigenous Scholarship*, 8(2).