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LANGUAGE USE IS CONNECTED TO INDICATORS OF WELLBEING: EVIDENCE FROM THE NATIONAL ABORIGINAL AND TORRES STRAIT ISLANDER SOCIAL SURVEY 2014–15

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Abstract

Aboriginal and Torres Strait Islander Australians have repeatedly asserted that individuals, families and communities can achieve better life outcomes if they maintain or develop knowledge and use of Indigenous languages. However, the evidence that rigorously quantifies the relationship between the use of Indigenous languages and wellbeing is limited. Applying cross-sectional regressions analysis to data from the 2014–15 National Aboriginal and Torres Strait Islander Social Survey (NATSISS), this study examines the link between the use of Indigenous languages and a range of wellbeing indicators. Since Indigenous languages are spoken to different extents in different places, and living in an area where one's own language is widely spoken may have different effects on wellbeing from residing in a place where only a few people speak the language, the NATSISS sample is disaggregated into two language ecologies. The first comprise areas where new and/or traditional Indigenous languages are

frequently spoken as a first language, and the second consists of areas where most people speak English as a first language and Indigenous languages are spoken as a second or subsequent language.

After controlling for English language proficiency and range of individual and family-level characteristics, we find that speaking an Indigenous language is significantly associated with greater cultural attachment, social connectedness and positive emotional wellbeing. Indigenous language speakers are also more likely than English-only speakers to report that they earn income from producing art and craft and participating in cultural activities. However, Indigenous language use is also associated with increased experiences of discrimination and difficulties accessing services.

Our findings suggest that speaking Indigenous languages is strongly associated with indicators of wellbeing relating to actions over which Indigenous individuals, families and communities can exert agency and self-determination (for example, indicators relating to culture, identity, emotional feelings and connection to Country). In contrast, Indigenous language use is less consistently correlated with those wellbeing outcomes which are most strongly determined by external structural forces. For example, employment, education and health outcomes are strongly determined by access to labour market opportunities, education and healthcare services, respectively, factors which are largely beyond Indigenous control. While Indigenous language maintenance and revival are important in their own right, the findings of this study suggest that implementation of certain non-language policies may be improved by addressing the needs and aspirations of Indigenous people to speak their own languages.

Keywords: Indigenous Australians, language use, wellbeing, culture, Indigenous languages, language ecologies

Supporting Online Appendixes

Additional material that support this paper has been made available in a set of Supporting Online Appendixes. These are available at https://doi.org/10.25911/5db958d716387

Acknowledgments

Acronyms

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
ASCL	Australian Standard Classification of Languages
ATAR	Australian Tertiary Admission Rank
DoCA	Department of Communications and the Arts
EL1	English Language 1 (or English L1)
EL2	English Language 2 (or English L2)
HET	Heterogeneous
IARE	Indigenous Area
IL	Indigenous Language
IL1	Indigenous Language 1 (or Indigenous L1)
IL2	Indigenous Language 2 (or Indigenous L2)
NATSISS	National Aboriginal and Torres Strait Islander Social Survey
NHMRC	National Health and Medical Research Council
NILR	National Indigenous Language Report
NL	New Languages
NSW	New South Wales
NT	Northern Territory
OLS	ordinary least squares
SA	South Australia
SA1	Statistical Area Level 1
TAS	Tasmania
TL2	Traditional Language 2 (or Traditional L2)
TN	Traditional and New languages
VIC	Victoria
QLD	Queensland
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
WA	Western Australia

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Introduction

In recognition of the importance of Indigenous languages to Indigenous cultures, identities, worldviews and ways of living, 2019 has been declared the International Year of Indigenous Languages. Indigenous language use is a fundamental right of Indigenous peoples, with the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) asserting that Indigenous Peoples have rights 'to revitalize, use, develop and transmit to future generations' their languages (article 13, clause 1), rights to education in their own languages (article 14), and representation of their own language in state-owned media (article 16). But beyond the right to speak Indigenous languages, Aboriginal and Torres Strait Islander Australians have repeatedly asserted that individuals, families and communities can achieve better life outcomes if they maintain or develop knowledge and use of Indigenous languages (see, for example, Standing Committee on Aboriginal and Torres Strait Islander Affairs 2012).

The links between Indigenous language use and wellbeing are complex and multifaceted. Nevertheless, prior survey research provides evidence of strong relationships between Indigenous language use and different indicators of Indigenous wellbeing in Australia (Rowley et al. 2008; Dockery 2010; Stephens 2010; Biddle & Swee 2012). However, previous survey-based literature has been constrained by the limited attention it has paid to the context of language use. Different types of Indigenous languages are spoken in different amounts in different places (Angelo et al. 2019). Consequently, the relationship between Indigenous language use and wellbeing may depend on language community. Living in an area where one's own language is widely spoken may have different effects on wellbeing from residing in a place where only a few people speak the language. However, the existing literature does not take into account such contextual differences.

This study builds upon previous survey-based research to examine the links between Indigenous language use and wellbeing. We advance the empirical literature by using relatively recent data and by using more sophisticated measures of Indigenous language use. Specifically, we examine the relationships between language use and indicators of wellbeing with respect to individual language repertoires and regional-level language ecologies.

At the level of individuals' language repertoires, we distinguish between four different levels of self-reported Indigenous language proficiency:

i) main language spoken at home is English and the person does not speak or understand an Aboriginal and/or Torres Strait Islander language
ii) main language spoken at home is English and the person speaks or understands a few words of an Aboriginal and/or Torres Strait Islander language
iii) main language spoken at home is English and the person speaks or understands an Aboriginal and/or Torres Strait Islander language well, or
iv) main language spoken at home is an Aboriginal and/or Torres Strait Islander language.

Furthermore, we also characterise individuals' language repertoires on the basis of their English language proficiency. We investigate English language proficiency in order to identify contexts of language use where Indigenous engagement and access may be hindered by a lack of services or market opportunities available in the languages people speak.

At the regional level, we draw on the language ecology concept described by Angelo et al. (2019). Language ecology refers to the languages spoken in a particular place. It reflects the geographic and cultural diversity within the Indigenous population in terms of the kind of language situations in which individuals live. The recognition of diverse language ecologies within quantitative research into Indigenous language use is important

because the absence of such recognition risks hiding potential effects of language use that occur in particular ecologies. A focus on the national picture may mask effects of language use that only occur within particular language ecologies. In the context of this specific study, we hypothesise that relationships between Indigenous language use and wellbeing will vary according to the ecology in which the language is used.

In this paper, we distinguish between two regional language ecologies. The first language ecology refers to areas where new and/or traditional Indigenous languages[1] are frequently spoken as a first language (Indigenous L1, or IL1 frequent). In our model, this consists of remote and very remote areas of Queensland, Western Australia (WA) and the Northern Territory (NT). The second language ecology indicates areas where the predominant Indigenous language use pattern is speaking English as a first language and perhaps speaking an Indigenous language as a second language (Traditional L2 or TL2; English L1 or EL1). In our model, this comprises New South Wales (NSW), Victoria, Tasmania and the Australian Capital Territory (ACT), as well as non-remote areas of South Australia (SA) and WA and major cities and inner regional areas of Queensland. While we would prefer to use a richer language ecology model, we are limited by both the sample size and the geographical detail of the survey data we use. It is worth noting that outer regional Queensland, remote/very remote SA and non-remote NT are not easily classified into language ecology regions, as the geographical units available in the survey data we use contain highly heterogeneous language ecologies.[2] Consequently, Queensland outer regional, SA remote/very remote and NT non-remote are excluded from both language ecology subsamples but are included in the full sample. Combined, these three excluded regions account for 5% of the adult National Aboriginal and Torres Strait Islander Social Survey (NATSISS) sample.[3]

By applying cross-sectional regression analysis to data from the 2014–15 NATSISS, this study examines the link between the use of Indigenous languages and a range of wellbeing indicators. After controlling for English language proficiency and an array of observable individual, household and area-level characteristics, results show that users of Indigenous languages are more likely than English-only speakers to identify themselves with a clan or tribal group, participate in cultural events, live on traditional Country, regularly visit homelands when they live away from them, and actively engage in traditional activities such as hunting and fishing. Use of Indigenous languages is also associated with a higher level of social connectedness (such as frequent contact with friends and relatives, and receiving support from people outside the household), social efficacy (having a say in the community on important matters) and emotional wellbeing (such as being full of life and energy). There is also evidence that use of Indigenous languages is associated with earning income from the production of cultural goods and services, specifically, Indigenous language speakers are more likely than English-only speakers to report that they earn income from arts and cultural activities.

Some evidence points to barriers that may undermine the earnings and health outcomes of Indigenous language users. Indigenous language speakers are more likely than English-only speakers to be unemployed and to report having difficulties accessing health services. A further investigation of the sources of barriers shows that Indigenous language speakers in IL1 frequent and TL2 areas provide different reasons for difficulty accessing public services. In the former, inadequate availability of services and limited English skills are the

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[1] Following Angelo et al. (2019), we define 'traditional' Indigenous languages as those Aboriginal and Torres Strait Islander languages that have been spoken since before colonisation of Australia, while 'new' Indigenous languages are those Aboriginal and Torres Strait Islander languages that have developed since colonisation of Australia, by language contact processes which have brought together influences from a number of different language sources. Traditional Indigenous languages include languages which have a large number of first language speakers such as Yolŋu Matha and Pitjantjatjara, as well as languages being learnt in a revival context such as Gumbaynggirr. New Indigenous languages include well-recognised and widespread languages like Kriol and Yumplatok, the two most widely spoken Indigenous languages according to Census data, as well as other languages that are recognised locally as a way of speaking but do not have standardised names or appear in official classifications of Indigenous languages.
[2] Remote and very remote SA, for example, includes the Anangu Pitjantjatjara Yankunytjatjara lands where Pitjantjatjara is the main language of everyday use, the multilingual town of Coober Pedy, and a number of towns where English is the main language of everyday use.
[3] See Table A1.5 in Supporting Online Appendix 1 for details on the language ecology classifications. Throughout this document, the term 'IL1 speakers' refers to people speaking Indigenous language(s) as their first language, whereas the term 'IL2 speakers' refers to those who speak English as their first language and Indigenous language(s) as second or subsequent languages.

most frequent reasons, whereas in the latter, cultural inappropriateness of existing services and lack of trust towards service providers seem to be the most important barriers to services. Furthermore, Indigenous language users were more likely to report experiencing racial discrimination than those who speak English only.

Literature review

Language is a means for communication, a marker of identity and a means to connect with and express culture and history (Hansen & Liu 1997; Battiste 1998), where identifying oneself with a group evokes increased self-esteem and life satisfaction (Phinney 1991). Language use not only increases involvement in cultural practices (e.g. ceremonies, songs, stories) but also promotes service utilisation, where communicating with service providers in one's own language builds trust and understanding (Anderson et al. 2003).

There is a heterogeneous literature that documents the connections between Indigenous language use and wellbeing, both in Australia and internationally. We do not seek to review this literature thoroughly in this study. Instead, we draw on Angelo et al.'s (2019) differentiation between three types of connection between language use and wellbeing depending on context of use to inform our understanding of the language use and wellbeing connection. Angelo et al. (2019) describe the wellbeing benefits of 'languages for being', 'languages for engagement and access', and 'languages for livelihoods'. 'Languages for being' refers to the benefits Indigenous language use has for identity, cultural engagement and social and emotional wellbeing. In contrast, 'languages for engagement and access' refers to the relationship between the language in which services and education are provided and the languages an individual speaks. Where there is a mismatch between the two – for example, where services are not available in an Indigenous language, and an individual does not speak sufficient English to access that service – then wellbeing outcomes may suffer. The third, 'languages and livelihoods', recognises the potential connections between Indigenous language knowledge and economic opportunities through, for example, land and sea management, arts and cultural production, cultural tourism or language service provision. We consider all three types of connection between Indigenous language use and wellbeing in this study. We refer the reader to Angelo et al. (2019) for a detailed discussion of this typology, as well as a thorough and critical review of the Indigenous language use and wellbeing literature.

In this paper we do not seek to rehearse or intervene in the important debates about the nature of Indigenous wellbeing and how best to measure it (Yap & Yu 2016, 2019; Butler et al. 2019; Fleming, Manning 2019). The wellbeing concept operationalised here includes both elements of objective and subjective wellbeing, and includes some items which are general and others which are specific to the Indigenous context. Furthermore, we note the important academic debate about which attributes or capabilities are components or domains of wellbeing, and which are determinants of wellbeing (e.g Stiglitz, Sen & Fitoussi 2009; for a critical review see Atkinson 2013). However, in this paper we do not attempt to disentangle the contributors to wellbeing from the constituents of wellbeing. Rather, we are concerned with establishing the correlations between indicators of wellbeing broadly construed and Indigenous language use. Because we do not seek to make causal claims about these relationships, differentiating between the determinants and domains of wellbeing is only of secondary importance.

Some prior research between Indigenous language use and wellbeing in Australia has taken a similar approach, finding that language use is correlated with indicators of emotional wellbeing and health outcomes. In particular, previous studies which used slightly different measures of language use have found mixed relationships between language use and emotional wellbeing. Dockery (2010) shows that better fluency in an Indigenous language is associated with increased happiness, reduced mental health problems, and reduced alcohol abuse. On the other hand, Biddle and Swee (2012) find that speaking or understanding an Indigenous language is positively correlated with sadness, whereas currently learning an Indigenous language is positively associated with happiness. In remote Australia, Cunningham and Paradies (2012) find that people speaking languages

other than English are less likely to report psychological distress than those speaking only English. More consistently positive results have also been found for physical health and health risk factors. Dockery (2010) found that language use was associated with greater self-assessed health and reduced alcohol abuse rates. A study by the Australian Bureau of Statistics (ABS 2011) also revealed that Indigenous people aged 15–24 years who speak Indigenous languages are less likely to have shown health risk behaviours such as consuming alcohol at risky levels or using illicit substances. Rowley et al. (2008) note that the likelihood of exposure to health risks such as obesity, diabetes and cardiovascular diseases is lower among Indigenous people who live in communities where traditional languages and cultural practices are maintained than those who live elsewhere across the NT.

Indigenous language use is also found to have a link with economic participation. Guenther and McRae-William (2014) find a close association between Indigenous language use and the distribution of sectoral employment among the Indigenous workforce in very remote areas. The authors show that public administration and safety is a predominant source of employment for all Indigenous people, while the second largest employer for speakers of Indigenous languages is health care and social assistance, whereas the second largest for those speaking English is mining. It is unclear if this correlation is due to the direct effects of Indigenous language use on employment prospects, or if it reflects the presence of an Indigenous fly-in fly-out workforce who reside in language ecology regions where English is spoken as a first language (Markham & White 2013). Stephens (2010) notes that speaking an Indigenous language is associated with an increased probability of being out of the labour force or participating in the former Community Development Employment Projects (CDEP). Hunter and Gray (2001) find that people speaking an Indigenous language were more likely to be in CDEP employment and were less likely to be in non-CDEP employment.

Evidence from other countries also shows a strong link between Indigenous language use and wellbeing. For example, a study in Canada shows that the absence of cultural continuity, which includes the loss of indigenous languages, is found to have been strongly associated with high rates of youth suicide and school dropouts (Chandler et al. 2003). Hallett, Chandler and Lalonde (2007) take into account other markers of cultural continuity (measured by communities' degree of control over the provision of services, self-governance and success in claiming traditional lands) in their model and show that having a conversational knowledge of an indigenous language has an independent and strong negative association with group-level suicide rates for First Nations Canadians. Whitbeck et al. (2004) show that 'enculturation' (which includes knowledge and use of an indigenous language) has a negative effect on alcohol abuse for indigenous women living on reservations in the United States and Canada. Herman-Stahl, Spencer and Duncan (2003), using an index for 'cultural orientation' (which includes fluency in native languages) find that indigenous adults in South Dakota who are less oriented to their culture are more likely to be heavy drinkers than those oriented toward indigenous cultures. Similarly, Coe et al. (2004), by constructing a 'traditionalism' score that includes indigenous language usage as a component, find that a high level of 'traditionalism' is associated with lower levels of health-risk factors such as smoking and obesity among women living on a Hopi reservation.

Data sources

This paper uses data from the 2014–15 NATSISS. The NATSISS has been conducted by the ABS in 1994, 2002, 2008 and 2014–15.[4] The surveys were designed to be nationally representative of the Indigenous population in all States and Territories of Australia living in private dwellings and includes samples from discrete Aboriginal and Torres Strait Islander communities. The survey uses a complex sample design intended to produce representative and reasonably precise estimates for all States and Territories, and for the Torres Strait.

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[4] The 1994 National Aboriginal and Torres Strait Islander Survey was a precursor to both the NATSISS and the National Aboriginal and Torres Strait Islander Health Survey.

Indigenous status (Aboriginal and/or Torres Strait Islander) is self-identified by respondents during a face-to-face interview (ABS 2016). The sample size of Aboriginal and/or Torres Strait Islander people in the 2014–15 NATSISS was 11 178, including both adults and children who live in private dwellings across Australia except: (i) Statistical Area Level 1 (SA1) divisions with no Aboriginal and Torres Strait Islander households according to the Census; (ii) some SA1s in remote and very remote areas with a small number of Aboriginal and Torres Strait Islander households; and (iii) some discrete Aboriginal and Torres Strait Islander communities with a small number of Aboriginal and Torres Strait Islander households. Due to the complex survey design, sample weights are provided that weight the responses to match 2014–15 projections based on the 2011 Indigenous Estimated Residential Population.

Data are not available for all wellbeing and language use measures for people younger than 15 years. Therefore, this study uses only the sample for those aged 15 years and over. This age group constitutes 7022 individuals, of whom 2511 are from IL1 frequent areas, and 4511 are from TL2,EL1 areas.

Methods

This study takes a regression approach to identifying correlations between Indigenous language use and a variety of wellbeing indicators, while controlling for personal, household and geographical characteristics that may also affect wellbeing. Specifically, it uses a series of cross-sectional generalised linear models to examine the correlations between Indigenous languages use and wellbeing indicators. The model specification is as follows:

$$Wellbeing_i = \alpha L_i + X_i'\beta + \varepsilon_i$$

where, Li is language use; Xi is a set of observable variables that may affect wellbeing; α is our parameter of interest that shows the relationship between language use and wellbeing; β is a vector of parameters, including an intercept term, associated with Xi; and ε_i is an error term. The exact functional form of the regression model depends on the outcome (wellbeing) variables. In most of the specifications, the outcome variable is a binary (0/1) variable, and a logit model is used. Where the outcome variable is a continuous variable (e.g. personal income), an ordinary least squares (OLS) model is used.

Given the shortcomings in measuring language use in the NATSISS (see Supporting Online Appendix 1 for a detailed discussion of the language data) we use information on main language spoken at home, use of Indigenous languages as a second language, and English proficiency to generate the following indicators of individual-level language use (data are provided in Table 1):

- **English only**: main language spoken at home is Standard Australian English and does not speak or understand an Aboriginal and/or Torres Strait Islander language
- **English L1, some Indigenous L2**: main language spoken at home is English and speaks or understands a few words of an Aboriginal and/or Torres Strait Islander language
- **English L1, Indigenous L2**: main language spoken at home is English and does speak or understand well an Aboriginal and/or Torres Strait Islander language
- **Indigenous L1**: main language spoken is an Aboriginal and/or Torres Strait Islander language.

The NATSISS shows that less than 10% of people aged 15 and over report that they are currently learning an Indigenous language. However, since more than two-thirds of these individuals reported to have been speaking a few words of an Indigenous language and fall under the 'English L1; some Indigenous L2' category, we have not included language learning in our specifications as a control variable to avoid the problem of statistical multicollinearity.

Our measures of self-reported English proficiency are defined as follows:

- **Fluent English**: main language spoken at home is English OR main language spoken at home is an Aboriginal and/or Torres Strait Islander language and reports no difficulties understanding and/or being understood by English language speakers;
- **Limited English**: main language spoken at home is an Aboriginal and/or Torres Strait Islander language and reports difficulties understanding and/or being understood by English language speakers.

Self-reported English proficiency is important in this analysis for two primary reasons. First, its inclusion in statistical models estimating the association between wellbeing and Indigenous language use is important because it ensures that estimates of the impact of Indigenous language use are not impacted by the correlation between Indigenous language use and English proficiency. Second, the results for English proficiency are important in their own right. A relationship between wellbeing outcomes and English proficiency may be indicative of contexts of language use where services or market opportunities are unavailable for those without English fluency. Consequently, we encourage readers to interpret correlations between English proficiency and wellbeing outcomes as indicative of a lack of language appropriate services.[5]

Table 1. Language repertoires (number of adults in the sample) by language ecology region, NATSISS 2014–15

	Language ecology region	
	Indigenous L1 frequent	TL2,EL1
Indigenous language repertoire		
English only	349	2447
English L1, some Indigenous L2	780	1652
English L1, Indigenous L2	369	372
Indigenous L1	982	79
English proficiency		
Fluent English	1858	4455
Limited English	325	43

The wellbeing variables used in the study are presented in Table A1.1, Supporting Online Appendix 1. To account for the multidimensionality of wellbeing and to avoid providing an oversimplified view of the relationships between wellbeing and Indigenous language use, we include a wide range of wellbeing indicators in the empirical analysis. While 35 wellbeing indicators are considered in total, they are grouped into nine broad categories. These categories are included for ease of communication but are somewhat arbitrary, as several

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[5] We also note that the self-report data on English proficiency in the NATSISS may overstate the average English proficiency of the Indigenous population. In terms of our results, this is likely to reduce (i.e. understate) the magnitude and strength of any estimated association between English proficiency and wellbeing.

wellbeing indicators could fall into multiple categories. Consequently, differences in the number of wellbeing indicators across the seven categories do not have any statistical interpretation.

We were limited in the outcome variables that could be analysed to those that are available in NATSISS 2014–15. Consequently, wellbeing indicators that may be more relevant to the life aspirations and wellness of Indigenous peoples could not be analysed. Therefore, our results should not be generalised and interpreted in terms of relationships between Indigenous language use and wellbeing 'in general' or for particular categories of wellbeing variables. In other words, while differences in the statistical significance of the relationship with language use across wellbeing variables within a given category help to understand the sensitivity of the estimated results for changes in wellbeing measurements, they should not be interpreted as showing an overall strong or weak correlation between Indigenous language use and that specific category.

Except for measures of personal income and life satisfaction, all outcome variables are binary coded (i.e. the possible values are 'yes' or 'no'). The 'yes' values are not necessarily indicative of better wellbeing. Rather, they are as indicated in Table A1.1 (Supporting Online Appendix 1). For instance, for measures of positive emotional feelings (such happiness and full of life) high values are given a 'yes' value and low values are given a 'no' value. On the other hand, for negative emotional feelings (for example, psychological distress) high values take 'yes' and low values take 'no'. It should be noted that swapping the labelling between 'yes' and 'no' does not change the size of the correlation between the wellbeing variables and Indigenous language use, it only changes the direction of the correlation.

Three models were estimated for each outcome variable. Model 1 is for the whole sample, Model 2 is for individuals in IL1 frequent areas and Model 3 for individuals living in TL2, EL1 areas. Each specification typically includes language use variables as well as controls for sex, age, age-squared, social marital status, education, labour force status, whether ever been removed from natural family, number of Indigenous persons in the household, household financial stress and resources, unmet housing need, number of stressors experienced in the last 12 months, State/Territory and remoteness.[6] The exact control variables included in each specification depends on the outcome variable. For example, employment models exclude labour force status because employment is one of the components of labour force status. The full list of control variables for each outcome variable is listed in Tables A1.2–A1.4, Supporting Online Appendix 1. We expect that the effect of language use on wellbeing will differ depending on the context, namely the language ecology of the area where the individual lives. To identify this relationship, we run regression models first for the whole sample, then separately for individuals living in different language ecology areas. This allows for language use and individuals' and households' characteristics to have different impacts on wellbeing in different language ecology areas. Models for sub-samples based on language ecology regions exclude controls for State/Territory and remoteness.

Results

This section presents results for each of the outcome variables using the baseline specification. Results are presented as predicted outcomes (either probabilities or values, depending on the outcome variable), where the predicted outcomes for each language-use category are calculated for each individual in the sample, then averaged across the sample. Full regression results are shown in Supporting Online Appendix 2.

All the results presented in this section have the same basic format. Each figure shows average predicted probabilities calculated from the estimates of logit models or predicted values from OLS regressions. Predicted probabilities are reported for language repertoires (four categories) and for self-reported English proficiency, first for the full sample and then disaggregated by language ecologies. 'English-only' and 'Fluent English' are the

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[6] As a robustness check, we also specified a second set of models that include cultural variables as additional control variables. For the sake of brevity these results are not included in this manuscript, but are available upon request.

base categories against which the other categories in the respective language groups are compared. Taking Fig. 2 as an example, the model predicts that for the total Indigenous population – all other control variables held constant – 61% of English-only speakers participate in cultural activities, compared with 79% of those who speak Indigenous languages to some extent as a second language, 82% of those who speak Indigenous languages well as a second language and 90% of those who speak Indigenous languages as their main language. Holding constant whether an individual speaks Indigenous languages, the model also predicted that 81% of those who speak English well participate in cultural activities, compared with 83% of those who have limited English. The results for the different language ecology regions can be interpreted as the predicted probability of participating in cultural activities for each type of language repertoire for the group of people who live in that language ecology region.

Asterisks indicate whether the underlying coefficients in the model are statistically different from the comparison group at the conventional 5% level. Specifically, in the case of language repertoires, asterisks indicate that speaking Indigenous languages is associated with a statistically significantly higher likelihood of participating in cultural activities than speaking only English. In the case of self-reported English proficiency, the asterisks indicate that limited English is associated with a statistically significantly higher likelihood of identifying with a clan, language or tribal group. It is important to note that the presence or absence of a relationship between use of an Indigenous language and a wellbeing outcome in our model does not imply causality. If we see the results in Fig. 2, for example, it may be that speaking an Indigenous language increases the likelihood of participating in cultural activities, or that active participation increases the likelihood that someone speaks an Indigenous language, or both. We cannot determine the direction of causality from our models. The statistical significance may also be reflecting other underlying correlations between language and something more complex that we cannot control for in our regressions (e.g. 'culture' as construed more broadly than allowed for by the NATSISS indicators). For example, if speaking an Indigenous language as a first language is associated with poorer employment outcomes, even after controlling for English language proficiency, it may reflect that IL1 speakers of Indigenous languages are more likely to live in areas where there are fewer employment opportunities, rather than an underlying causal relationship between IL1 Indigenous language use and employment.

Similarly, readers should not interpret non-statistically significant relationships between language use and wellbeing as evidence that such linkages do not exist in reality. There are many reasons why real connections between Indigenous language use and wellbeing will be missed in our study, including study design, survey instruments and sample sizes. It is likely that there will be many relationships between language use and wellbeing that are not evident in our results, and readers should bear in mind that an absence of evidence does not equate to evidence of absence.

Cultural identity and participation

Indigenous language use is clearly associated with stronger cultural identification and participation. Speakers of Indigenous languages – either as a main or second language – are significantly more likely to report identifying with a clan, tribal or language group (Fig. 1) than English-only speakers. This association holds in both language ecology areas. Limited English is also associated with a higher likelihood of identifying with clan, tribal or language group in areas where people frequently speak Indigenous languages as their main language, but there is no significant association between English proficiency and identification in TL2, EL1 areas.

We do not make causal claims about the relationship between Indigenous language use and identity here. Clearly, speaking an Indigenous language is likely to enhance an individual's sense of Indigenous identity, but it is equally true that those with a strong sense of Indigenous identity are more likely to be motivated to speak or learn an Indigenous language. We also note that the language variables measured in NATSISS do not necessarily relate to an individual's heritage or ancestral language which would be most closely tied to

identification with a specific Indigenous ethno-linguistic polity, but rather relate to languages of every day communication. Therefore, the language use–identity nexus is likely to be bidirectional, mediated by a range of contextual factors, and only approximately captured by the data available in NATSISS. Nevertheless, it is clear that a strong and positive relationship exists between the two, a connection that is present in both areas where Indigenous languages are spoken frequently as a first language and areas where Indigenous languages are mostly spoken as a second or subsequent language.

Fig. 1. Predicted probability of identifying with a clan, tribal or language group, by language use
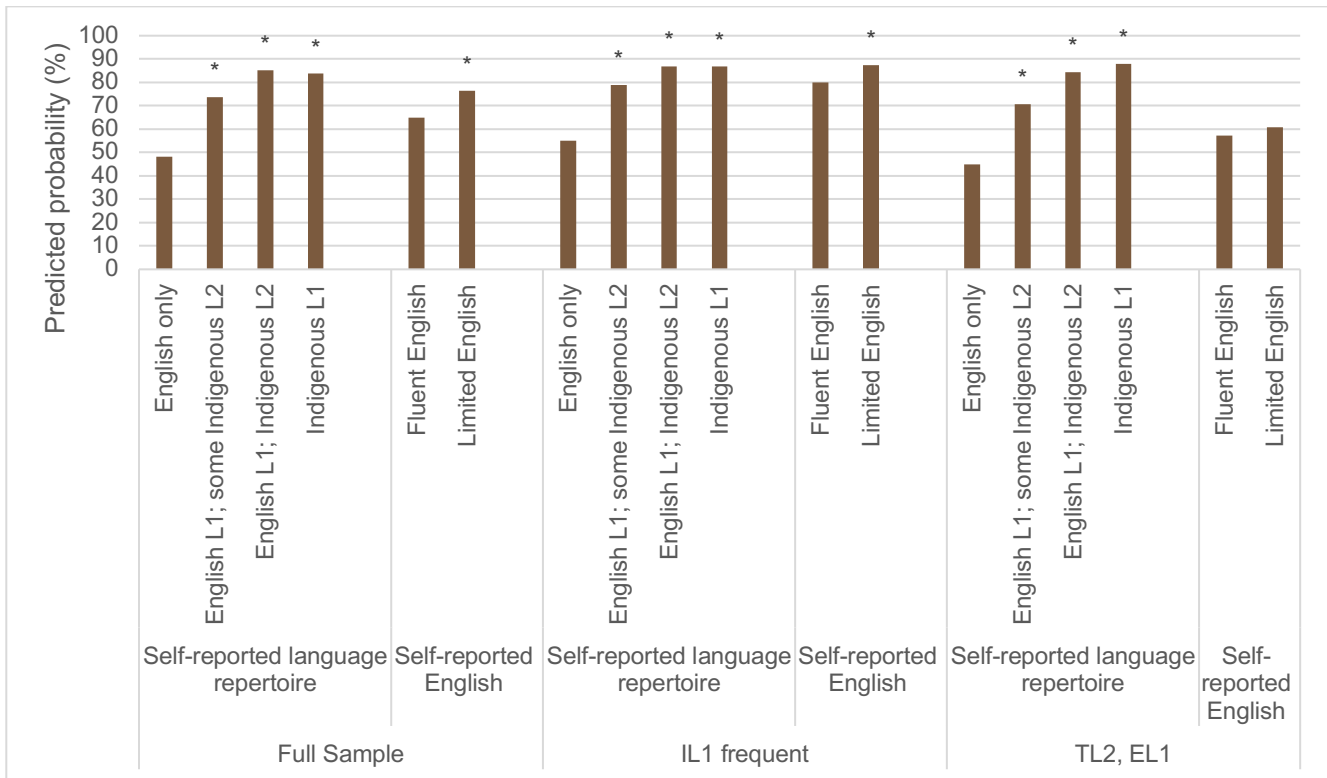
Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.1).
Source: NATSISS 2014–15.

Indigenous language use is associated with a statistically significantly higher likelihood of participating in cultural activities and events (Fig. 2 and Fig. 3). Speakers of Indigenous languages – either as a main or second language – are substantially more likely to report participating in cultural activities such as arts, crafts, dance and music than English-only speakers, in aggregate and in both language ecology areas. The relationship between Indigenous language use and involvement in cultural events such as ceremonies and festivals is also statistically significant. There is no statistically significant relationship between English proficiency and participation in cultural activities or events.

Fig. 2. Predicted probability of participating in cultural activities (e.g. art, craft, music or dance) in the previous 12 months, by language use
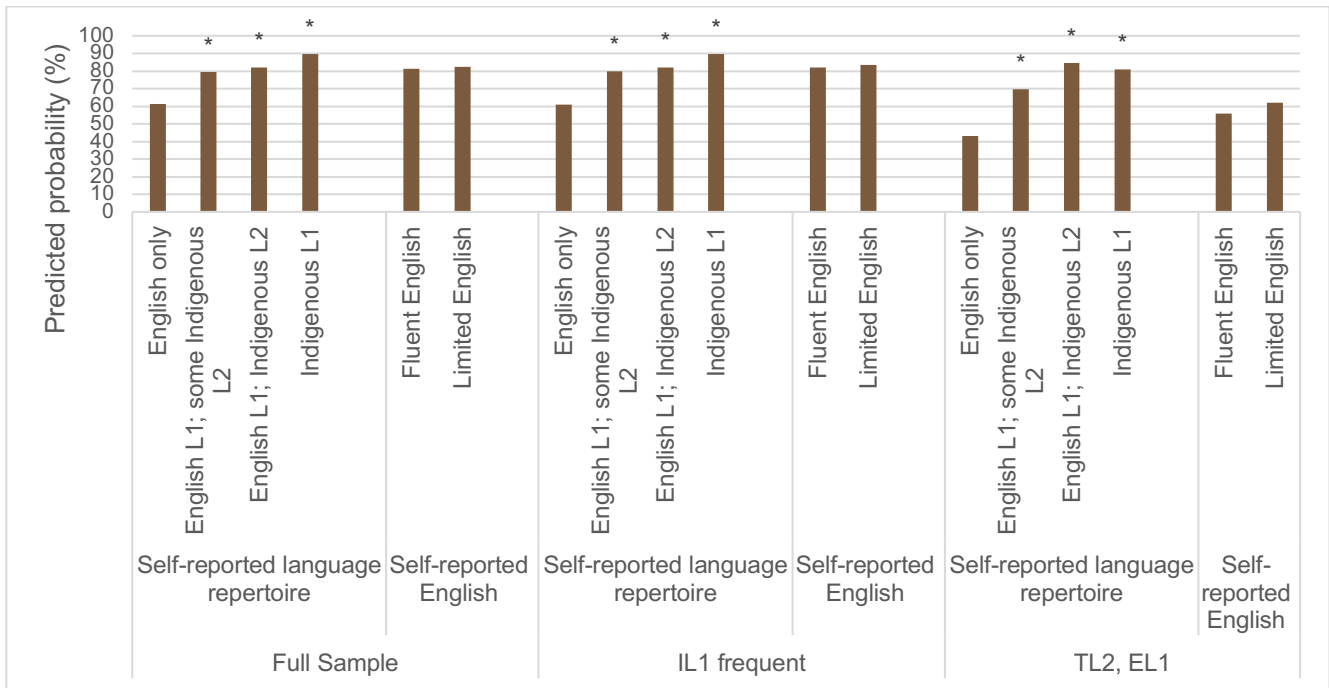
Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.2).
Source: NATSISS 2014–15.

Fig. 3. Predicted probability of being involved in cultural events (e.g. festivals and ceremonies) in the last 12 months, by language use
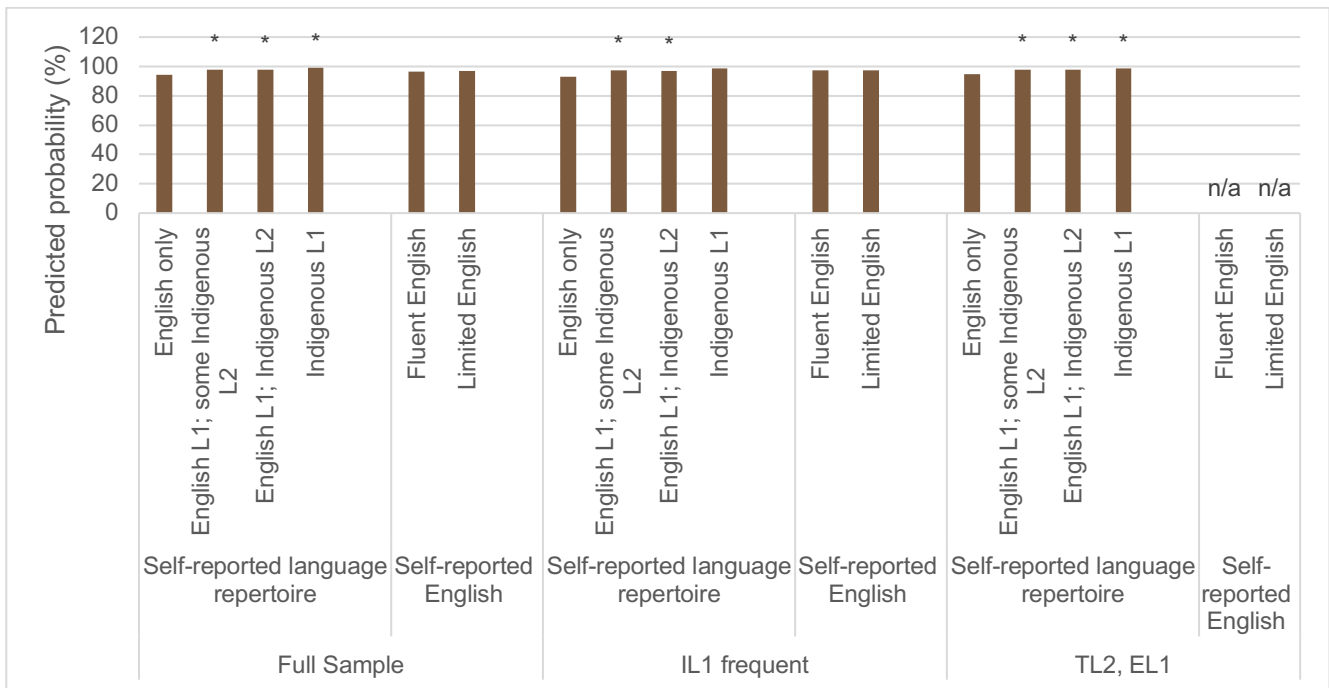
Note: Full regression results are shown in Supporting Online Appendix 2 (2. A3).
Source: NATSISS 2014–15.

Connection to Country

There is a positive and statistically significant relationship between Indigenous language use and participation in activities that connect people to Country. Indigenous language use is also associated with a higher probability of living on homelands (Fig. 4). This holds for all Indigenous language users in IL1 areas, but only for those who speak an Indigenous language as a second language in TL2, EL1 areas.

Fig. 4. Predicted probability of living on homelands, by language use
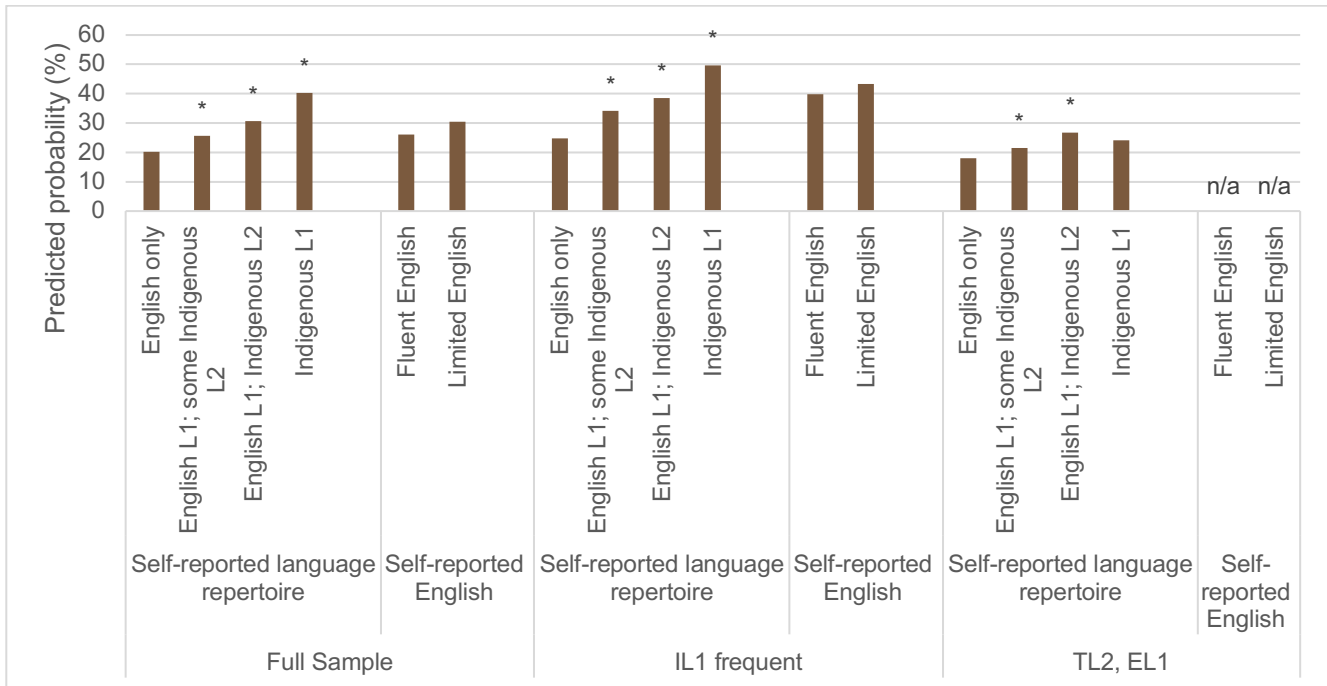
Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.4).
Source: NATSISS 2014–15.

Among the population who do not live on homelands, speaking an Indigenous language well as a first or second language is associated with a higher likelihood of visiting homelands at least once per year (Fig. 5). This relationship holds in both language ecology areas.

Speakers of Indigenous languages are also more likely to participate in hunting, fishing and gathering activities (Fig. 6). The likelihood of participating in hunting, fishing and gathering increases with the level of proficiency in Indigenous language. For example, compared with English-only speakers, those who speak only some Indigenous language as a second language are 15 percentage points more likely, those who speak an Indigenous language well as a second language are 25 percentage points more likely, and those who speak an Indigenous language as their main language are 31 percentage points more likely to participate in hunting, fishing and gathering.

Fig. 5. Predicted probability of regular visits to homelands for population who do not live on homelands, by language use
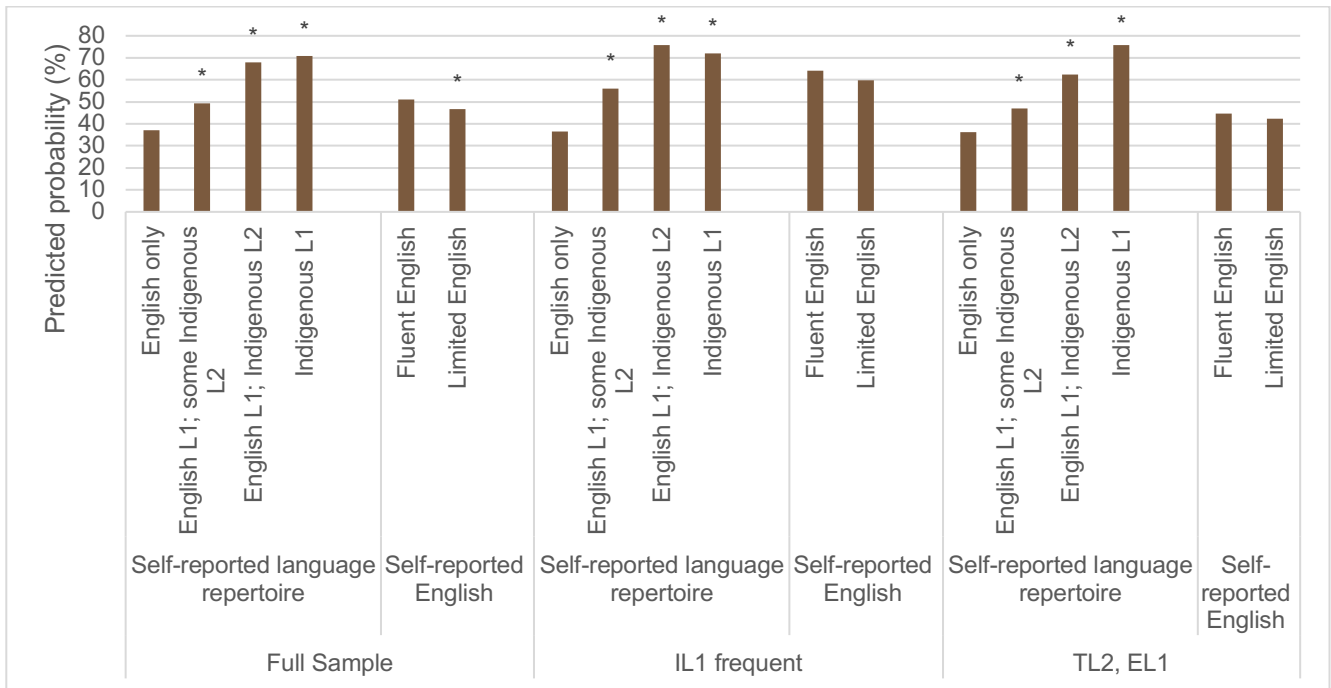
Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.5).
Source: NATSISS 2014–15.

Fig. 6. Predicated probability of participating in hunting, fishing or gathering activities in last 12 months, by language use
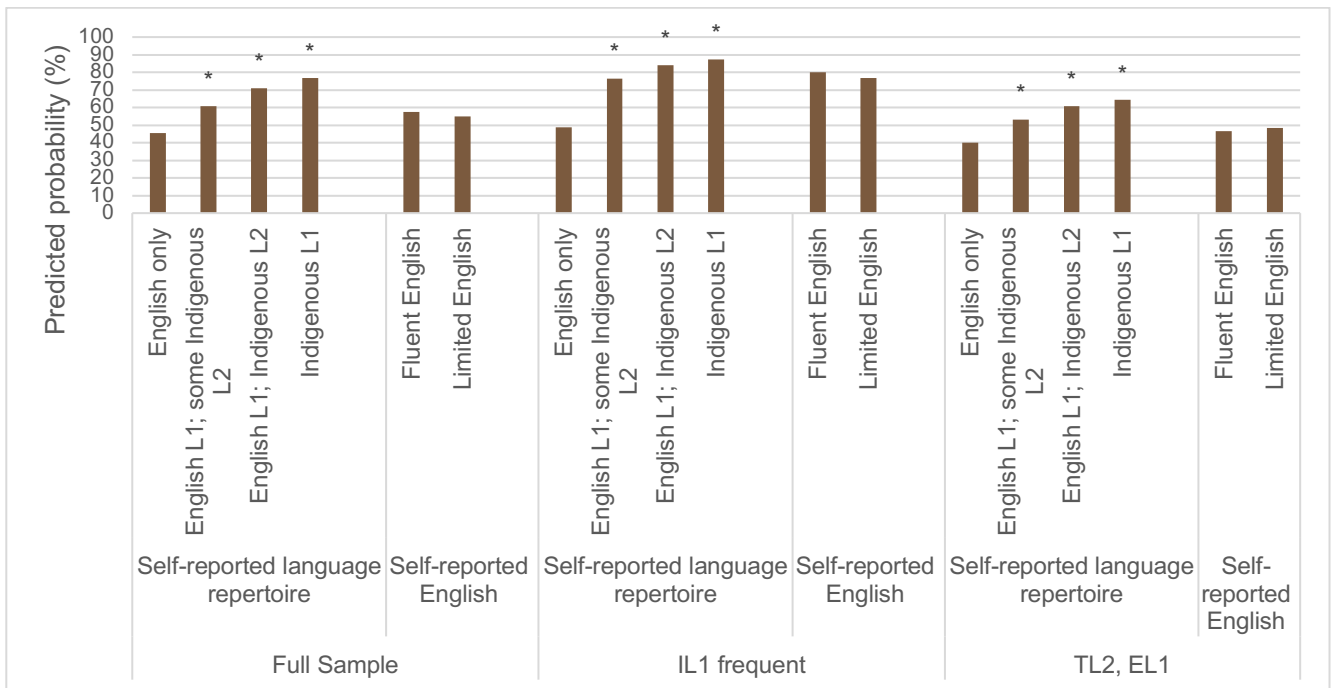
Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.6).
Source: NATSISS 2014–15.

Emotional wellbeing and mental health

IL1 Indigenous language speakers report significantly higher positive emotional wellbeing (feeling happy, full of life, etc.) than English-only speakers in both language ecology areas (Fig. 7), with the difference between IL1 Indigenous language speakers and English-only speakers particularly pronounced in TL2, EL1 regions. There is also some evidence that use of Indigenous language is positively associated with reported life satisfaction (Fig. 9). By contrast, IL1 speakers in TL2 areas are more likely than English-only speakers to report high psychological distress (Fig. 8). Such contradicting results may arise from a reporting bias. Alternatively, it is possible that this correlation results from a 'diaspora effect', in which individuals who speak an Indigenous language as a first language have migrated away from IL1 areas, and now contend with physical distance from kin and social distance from neighbours.

These results should be interpreted with caution, however. As Le Grande et al. (2017) note, the measure of psychological distress has not been validated for the Indigenous population and has only been modified slightly from the mainstream measure. Neither the measure of positive emotional wellbeing nor that of life satisfaction appear to have been validated for use with Indigenous peoples in Australia. Consequently, the meaning of these results is unclear.

Fig. 7. Predicted probability of reporting high positive emotional wellbeing, by language use
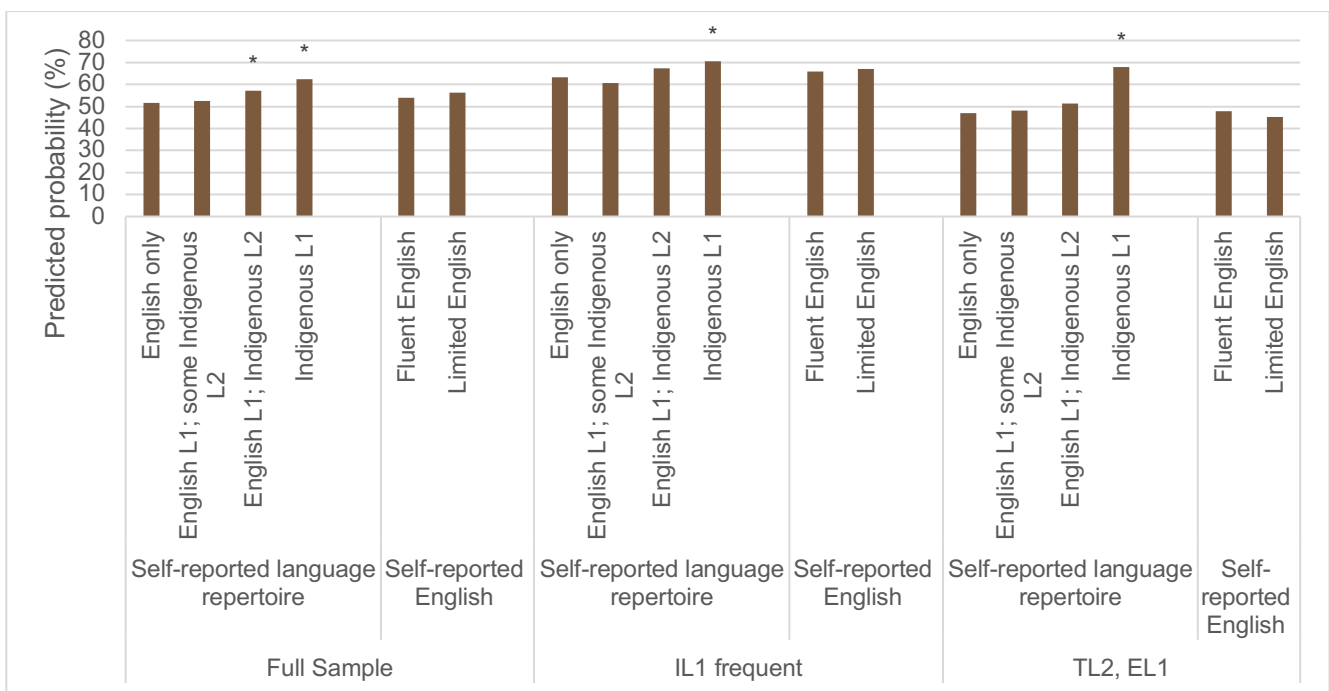
Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.7).
Source: NATSISS 2014–15.

Fig. 8. Predicted probability of reporting extreme psychological distress (high or very high score on K5 scale), by language use
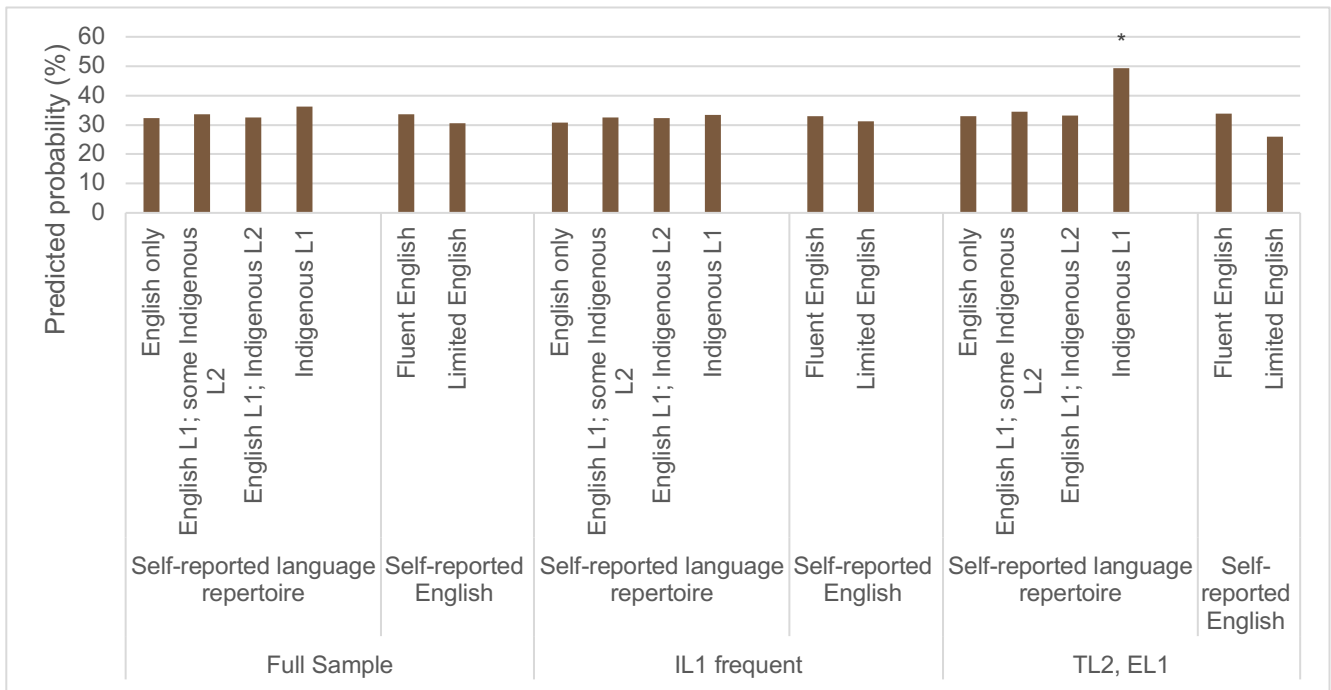
Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.8).
Source: NATSISS 2014–15.

Fig. 9. Predicted overall life satisfaction on a scale from 1 completely unsatisfied, to 10 completely satisfied, by language use

Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.9).
Source: NATSISS 2014–15.

Speakers of Indigenous languages are less likely to report being diagnosed with a mental health condition than English-only speakers (Fig. 10). Specifically, IL1 speakers of Indigenous languages are 6 percentage points less likely to report mental health diagnoses than English-only speakers in IL1 frequent areas, and less than 8 percentage points in the national sample. In the NATSISS, diagnosis with a mental health condition is defined as diagnosis with one or more of the following long-term health conditions: depression or feeling depressed; anxiety or feeling anxious or nervous; behavioural or emotional problems; or harmful use of, or dependence on, drugs or alcohol. Those who speak an Indigenous language well as a second language are also significantly less likely to report being diagnosed with a mental illness than English-only speakers in TL2, EL1 areas. This difference may be indicative of Indigenous language use having a protective effect on mental health. Equally, it may be that Indigenous language speakers may express mental ill-health in distinctive ways that are not recognised by non-Indigenous mental health professionals. For example, Brown et al. (2012) show that while Aboriginal men in Central Australia experience symptoms of depression, these symptoms are expressed in a manner that is quite different to non-Indigenous descriptions of depressive symptoms. However, it is unlikely that this association is due to the differential geographic accessibility of health services because we adjust for remoteness in the analysis, and because the association occurs both within and between our two language ecology groups.

Once Indigenous language use has been controlled for, there is no significant relationship between English proficiency and any of the emotional wellbeing measures used in the analysis. In other words, while Indigenous language use was related to emotional wellbeing, English proficiency was not.

Fig. 10. Predicted probability of reporting being diagnosed with a mental health condition, by language use

Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.10).
Source: NATSISS 2014–15.

Physical health

There is only very limited evidence of any significant relationship between Indigenous language use and physical health. There is no statistically significant relationship between Indigenous language use and self-reported good health (Fig. 11). Likewise, there appears to be no significant relationship between Indigenous language use and the likelihood of being diagnosed with a long-term health condition (Fig. 12).

Fig. 11. Predicted probability of reporting good, very good or excellent health, by language use
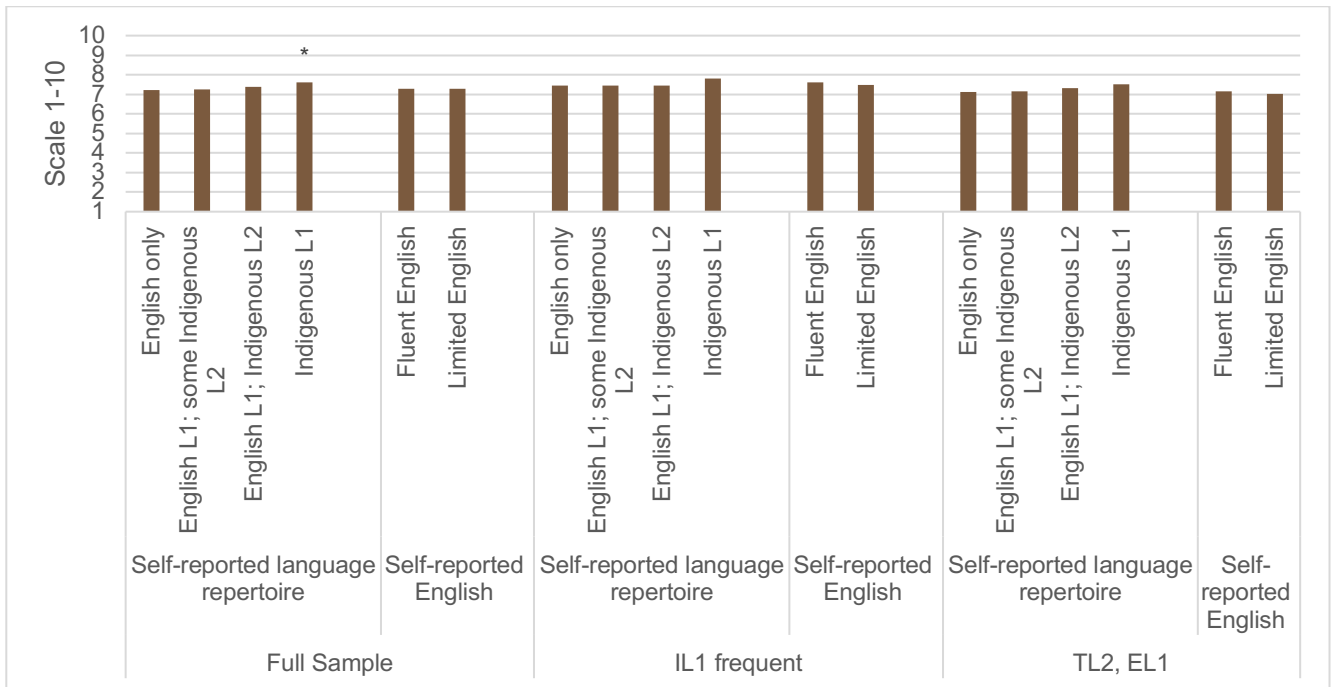

Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.11).
Source: NATSISS 2014–15.

Fig. 12. Predicted probability of reporting being diagnosed with long-term physical health condition, by language use

Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.12).
Source: NATSISS 2014–15.

By contrast, there appear to be stronger relationships between various self-reported health behaviours and Indigenous language use. There is a clear positive relationship between Indigenous language use and reporting eating sufficient fruit and vegetables (Fig. 13). This is inversely related to English proficiency. Some of this relationship appears to be due to greater participation in hunting/gathering, which is also positively related to fruit and vegetable intake (see Supporting Online Appendix 2). However, the relationship between Indigenous language use and fruit and vegetable intake remains after cultural variables (such as involvement in selected cultural events and participation in hunting, fishing and gathering) are included in the specification.[7] It is unclear what factors are driving this relatively consistent pattern of associations between Indigenous language use and self-reported nutritional intake. We believe these findings suggest that more detailed follow-up research is needed to unpack the nature of these relationships.

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[7] Results can be available on request.

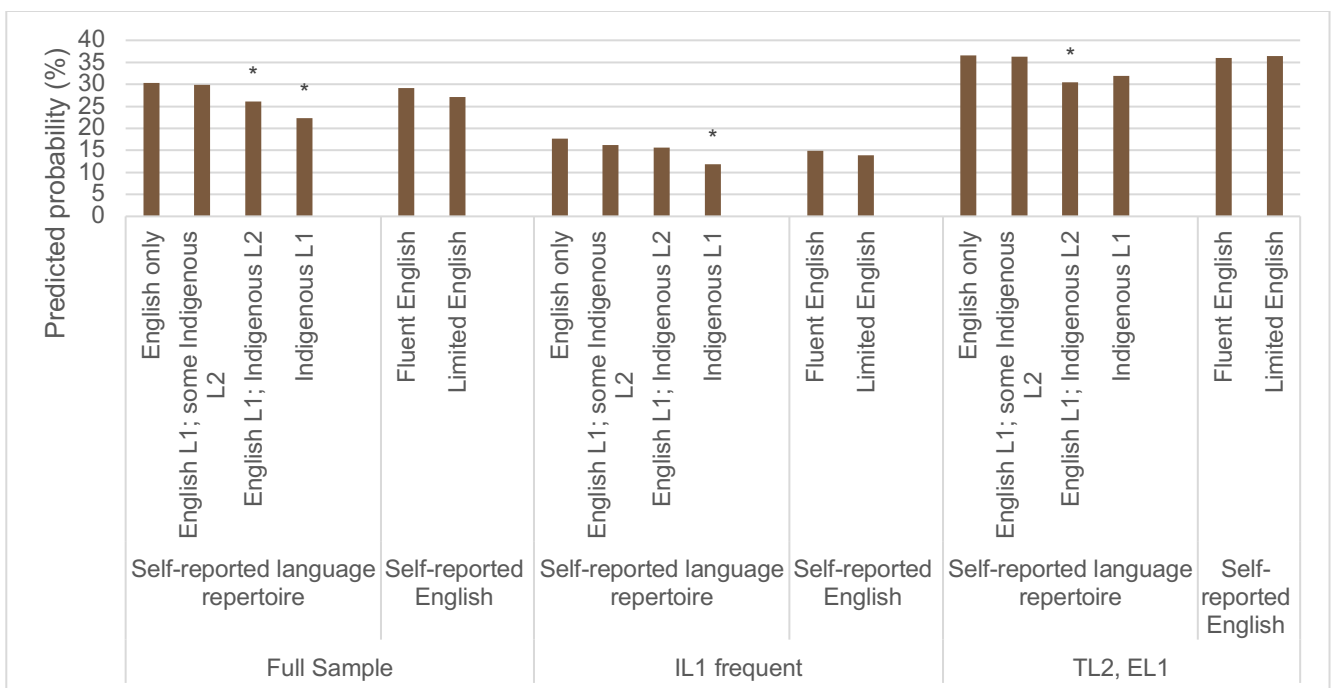**Fig. 13.** Predicted probability that reports meeting NHMRC guidelines for fruit and/or vegetable consumption, by language use
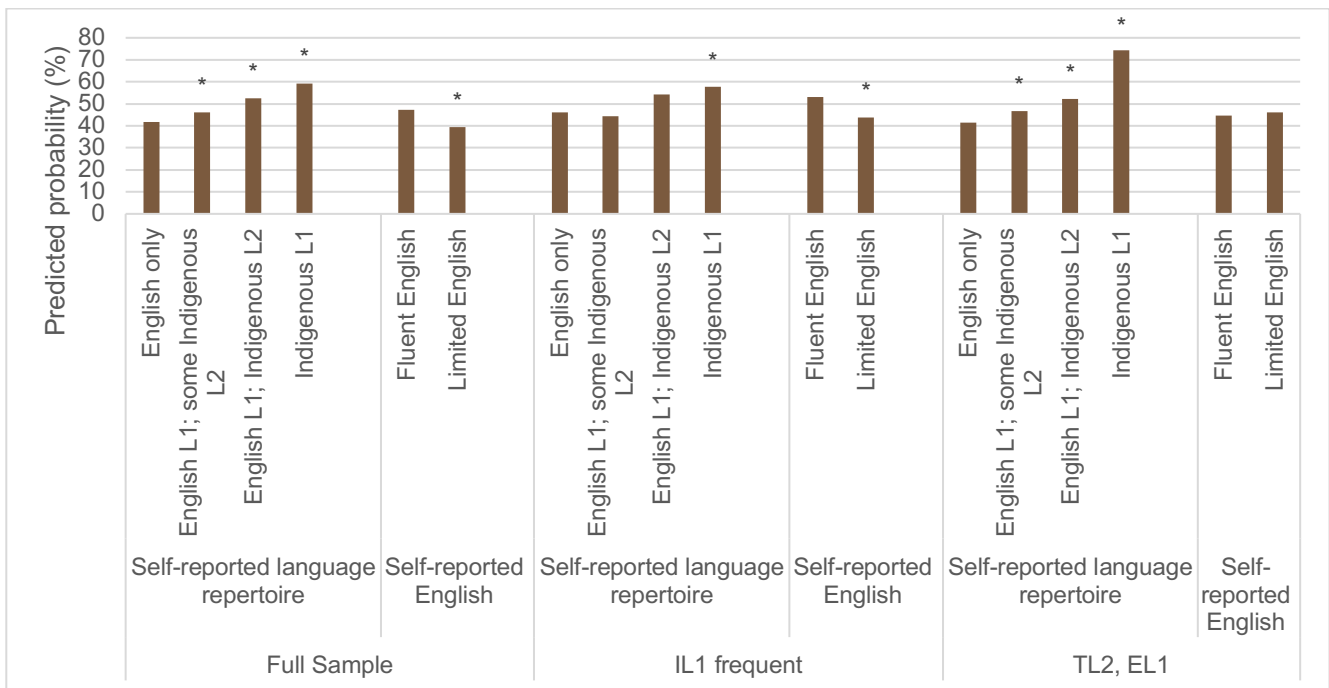
Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.13).
Source: NATSISS 2014–15.

IL1 Indigenous language speakers are significantly less likely than English-only speakers to drink at risky levels (Fig. 14), possibly because they are more likely to live in dry communities. IL1 Indigenous language speakers are also less likely to be daily smokers in TL2, EL1 areas (Fig. 15). IL2 Indigenous language speakers are significantly more likely to smoke daily than English-only speakers in IL1 frequent areas. There is no statistically significant relationship between being an IL2 Indigenous language speaker and risky drinking behaviour.

Fig. 14. Predicted probability that reports drinking alcohol at risky level, by language use

Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.14).
Source: NATSISS 2014–15.

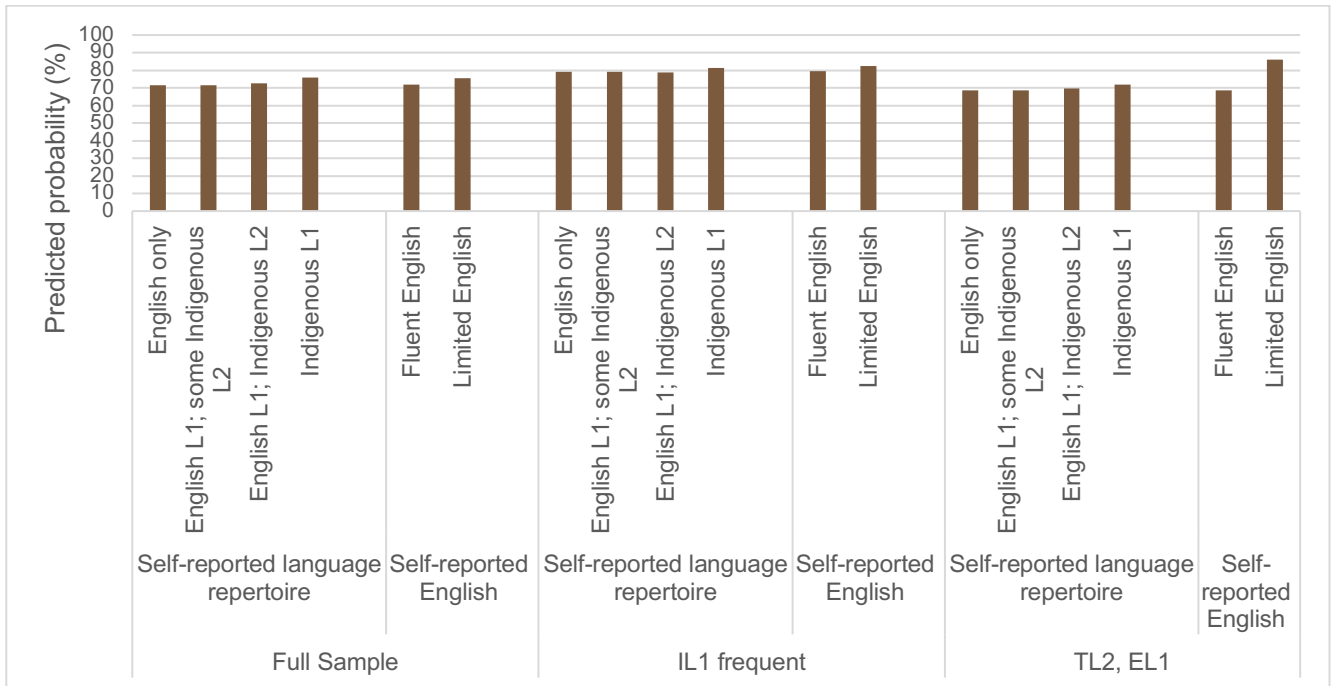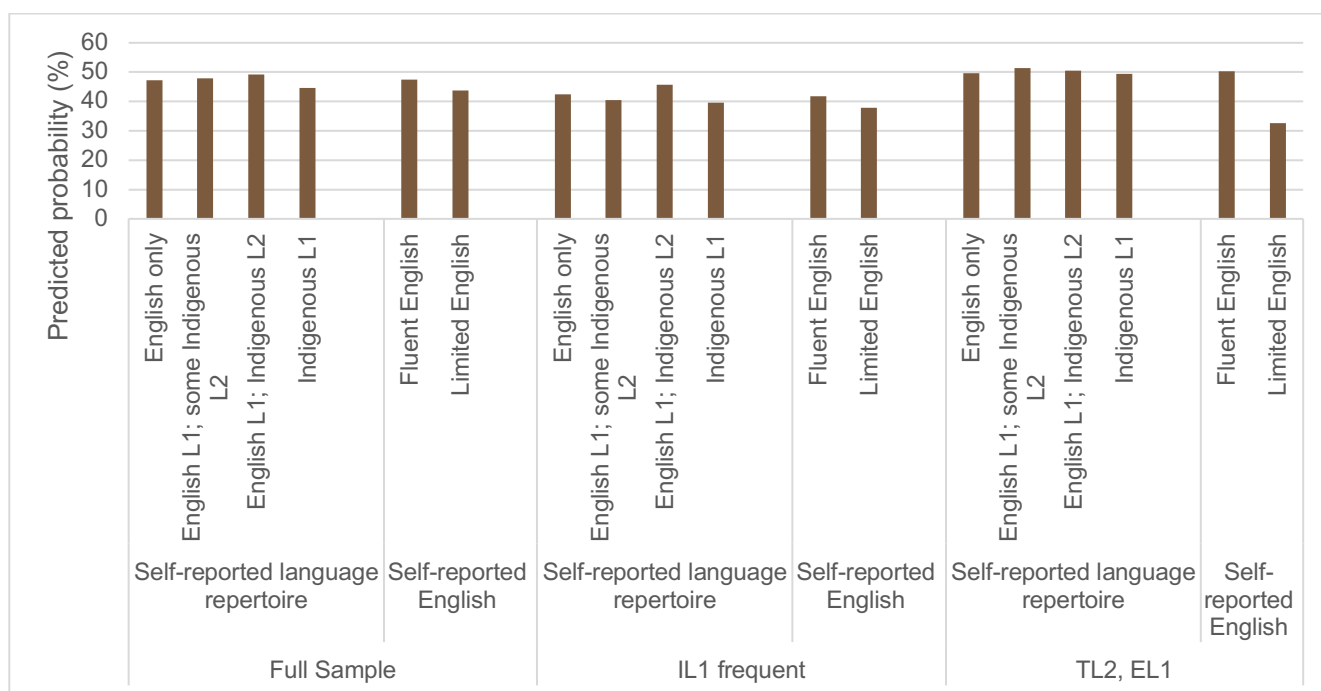**Fig. 15.** Predicted probability that reports smoking at least daily, by language use
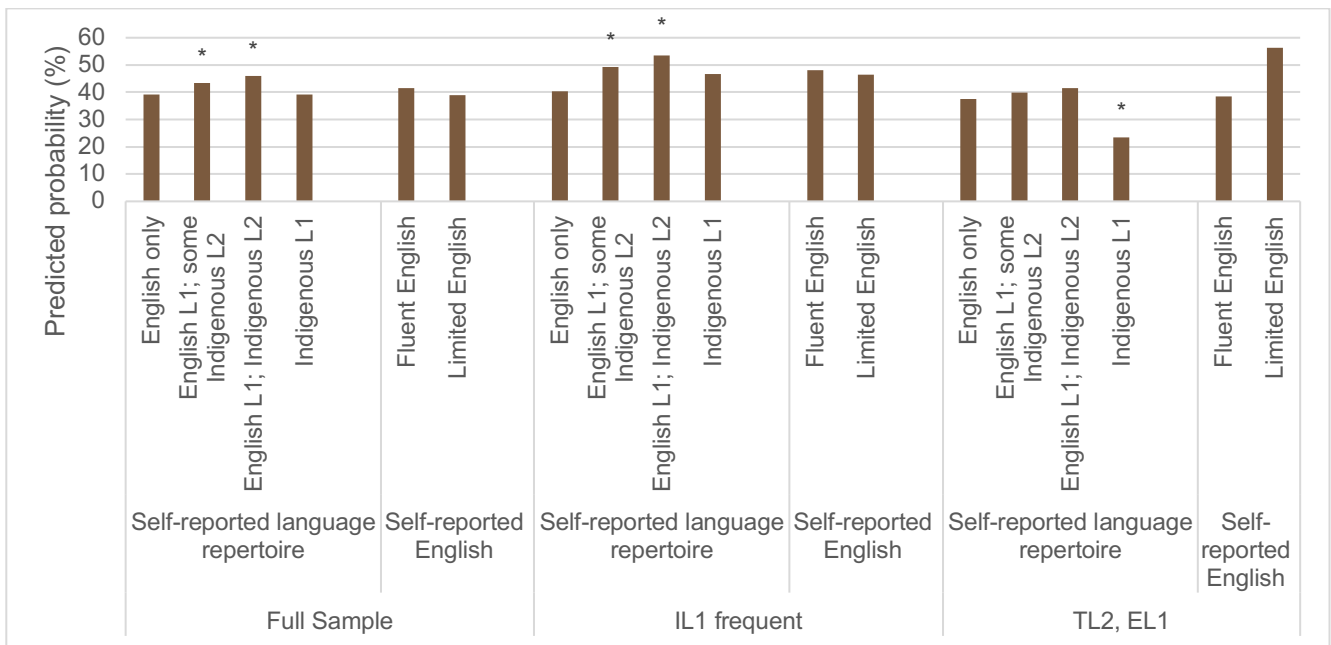
Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.15).
Source: NATSISS 2014–15.

Social wellbeing

Indigenous language use is generally associated with higher reported social connectedness. Those who speak an Indigenous language as well as a second language and those who speak an Indigenous language as their main language are significantly more likely to report having frequent contact with friends and family outside their households (Fig. 16). For L2 speakers of Indigenous languages, this relationship is evident in both language ecology areas, while for those who speak an Indigenous language as their main language, the relationship is only statistically significant in IL1 frequent areas.

**Fig. 16.** Predicted probability that reports having frequent contact with friends and family outside household, by language use

Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.16).
Source: NATSISS 2014–15.

Overall, Indigenous language users are also significantly more likely to report that they feel like they have a say in their community (Fig. 17). However, this result stems in part from the relatively strong relationship between speaking an Indigenous language as a second language in a TL2, EL1 area and feeling like you have a say in your community. The predicted probabilities for this group are substantially higher than for the English-only group and for other groups in IL1 frequent areas. By contrast, in IL1 frequent areas, there is no significant relationship between use of Indigenous languages and feeling like you have a say in your community.

In IL1 frequent areas, speaking an Indigenous language as a first or second language is also associated with a small but significantly higher probability of being able to get support from outside the household at a time of crisis than English-only speakers (Fig. 18). In other areas and in aggregate there is no significant difference in the reported availability of social support by language use, nor by English proficiency.

Fig. 17. Predicted probability that reports feeling like has a say in community, by language use
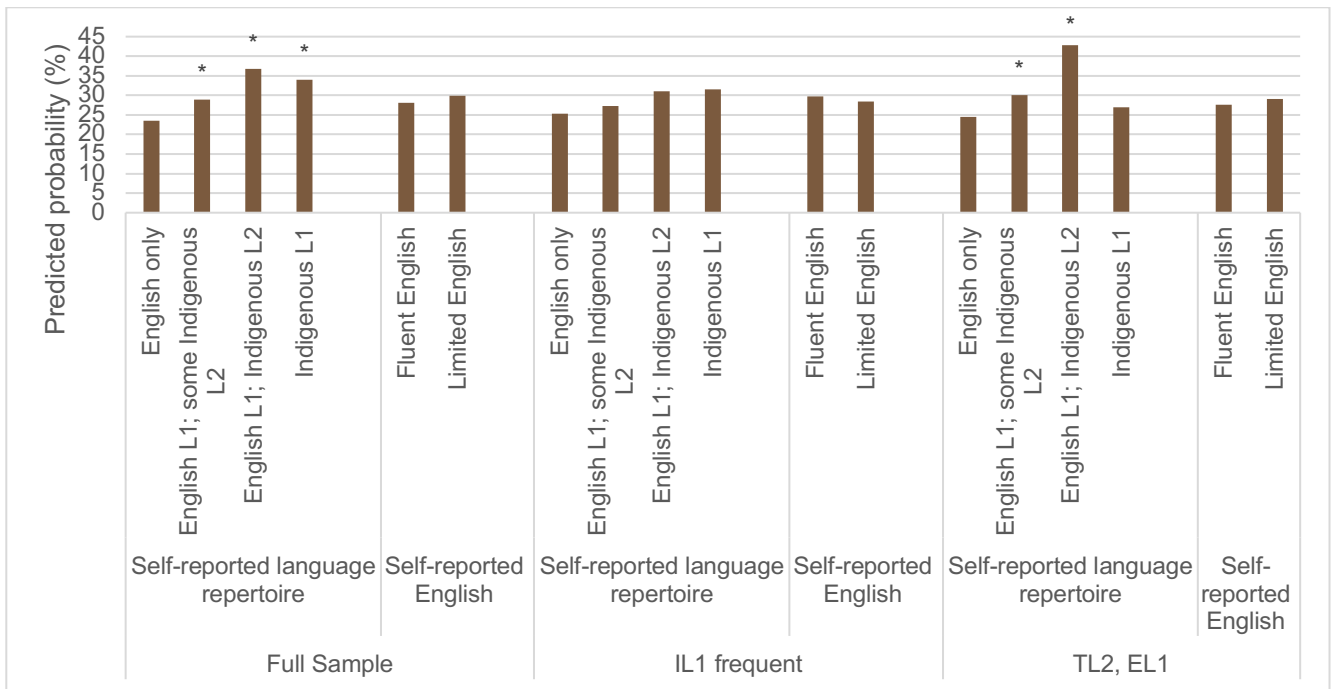
Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.17).
Source: NATSISS 2014–15.

Fig. 18. Predicted probability that reports getting support from outside household, by language use
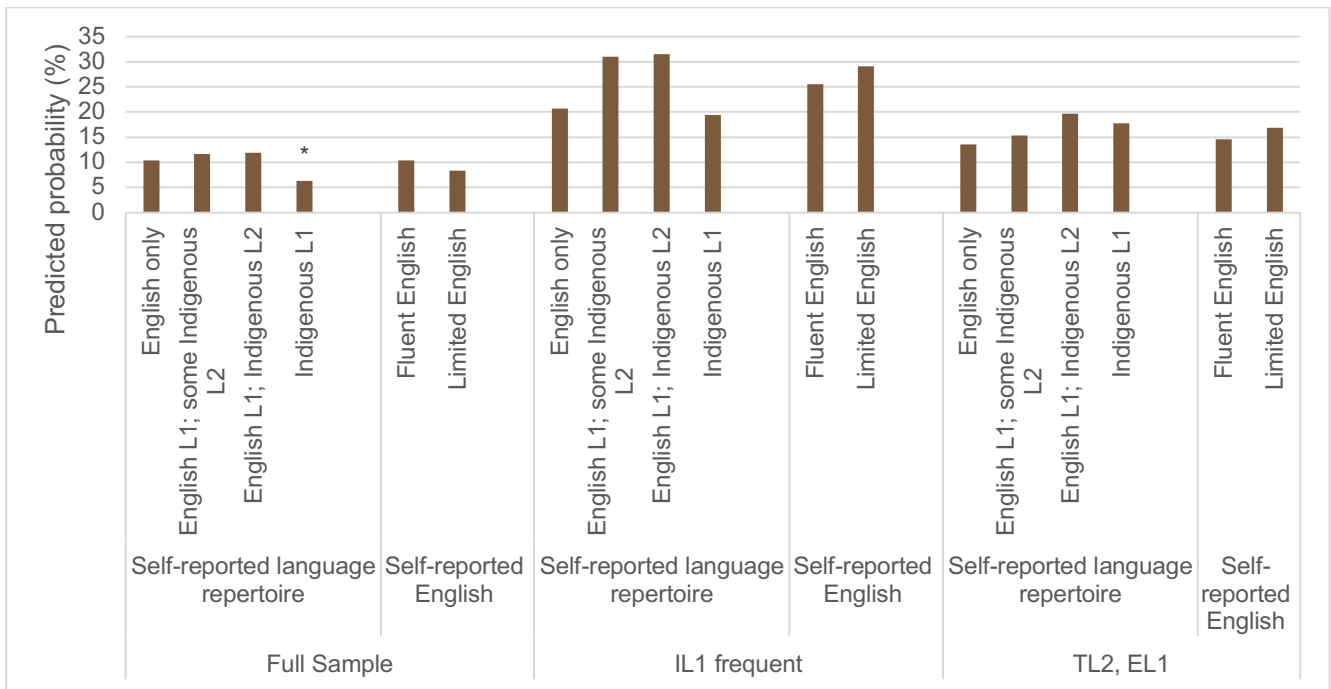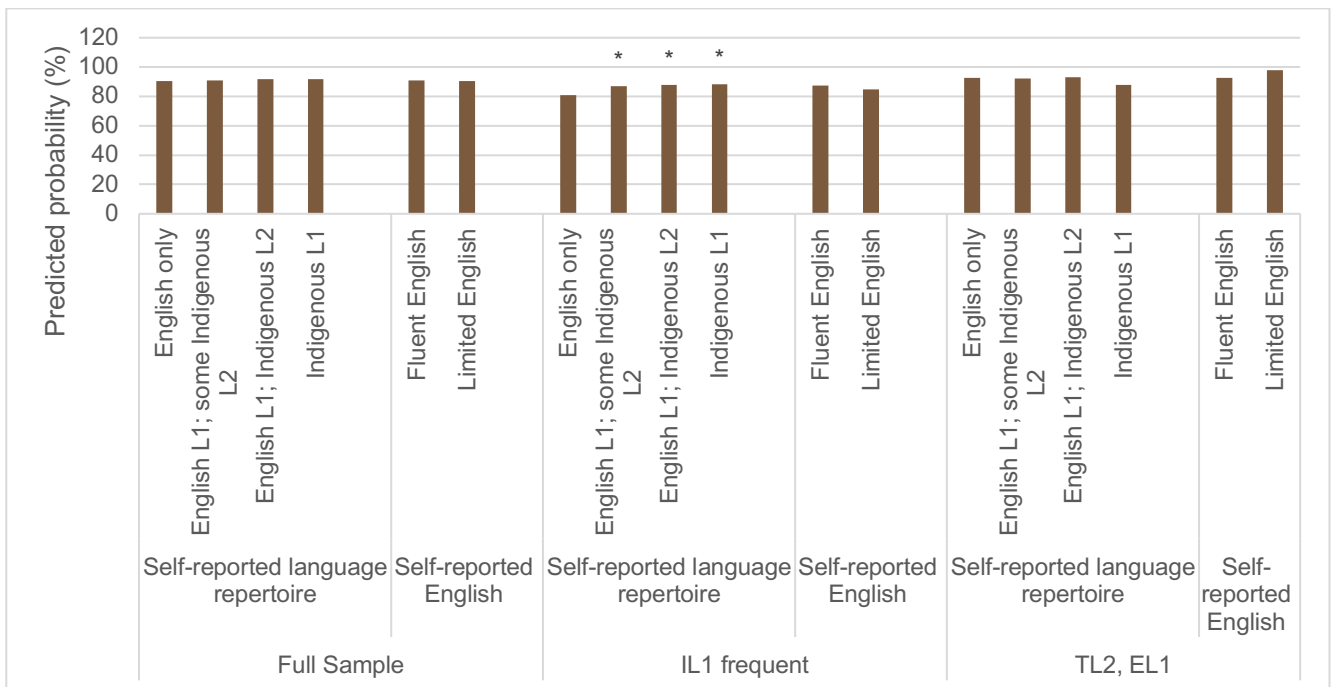

Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.18).
Source: NATSISS 2014–15.

Education

The relationship between Indigenous language use and the likelihood of completing Year 12 is ambiguous (Fig. 19). The predicted probability of completing Year 12 is generally lower for those who report limited English than those with fluent English, although the effects are not statistically significant. There is no statistically significant relationship of Indigenous language use with Year 12 completion in TL2, EL1 areas, nor for IL1 Indigenous language speakers in either area. However, in IL1 frequent areas those who report speaking an Indigenous language well as their second language are significantly less likely to have completed Year 12 than English-only speakers in aggregate, although those who speak an Indigenous language as a first language are as likely as English-only speakers to have completed Year 12.

The cause of this correlation is unclear, and we would caution readers to interpret this result carefully. These data do not support the conclusion that speaking an Indigenous language as a mother tongue or that bilingual education are acting as impediments to completion because those who speak an Indigenous language as their first language complete Year 12 at the same rate as English-only speakers. Furthermore, this relationship in the Indigenous population nationally appears to be driven by those in language ecology areas where Indigenous languages are frequently spoken as a first language. Further research is needed to understand the nature of this relationship.

Limited English skills are associated with a significantly lower likelihood of completing a post-school qualification for the general Indigenous population as well as in IL1 frequent areas (Fig. 20). This may be illustrative of a need for access to higher education in Indigenous languages in parts of the country where Indigenous languages are frequently spoken as first languages.

Fig. 19. Predicted probability of completing Year 12, population aged 19 years and over, by language use

Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.19).
Source: NATSISS 2014–15.

Fig. 20. Predicted probability of completing post-school qualification at Certificate level 3 or above, population aged 19 years and over, by language use
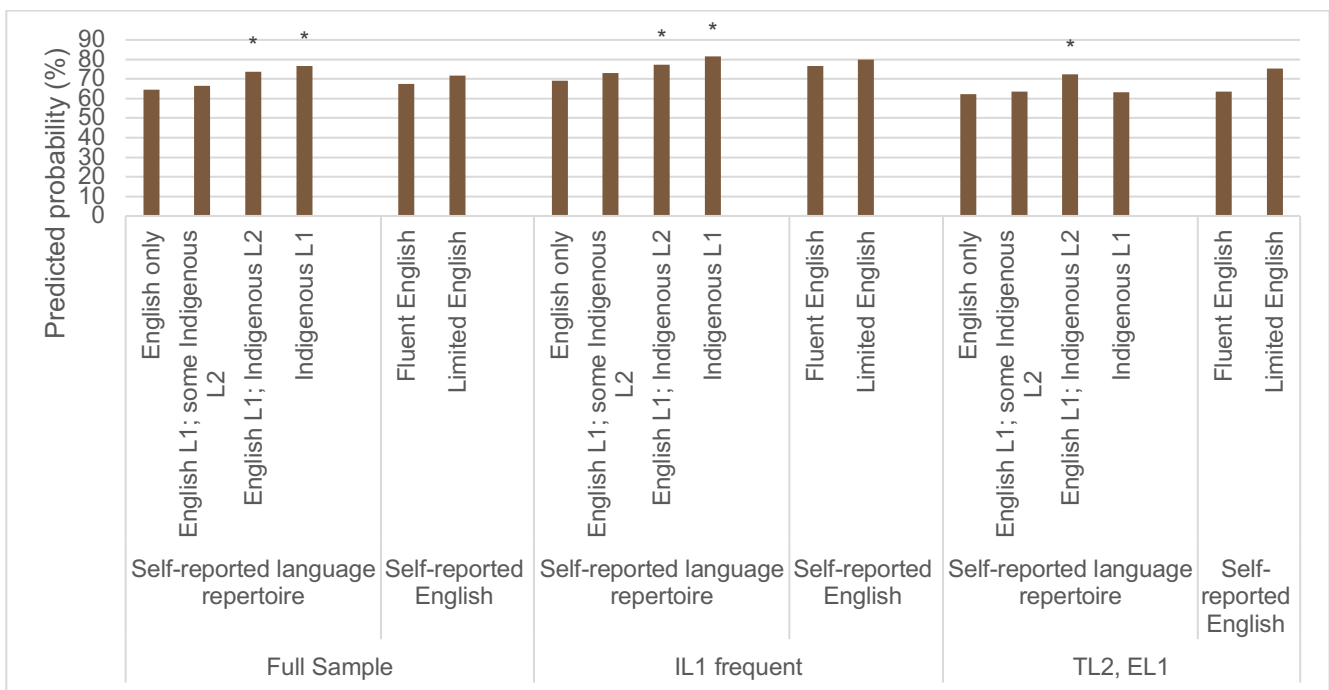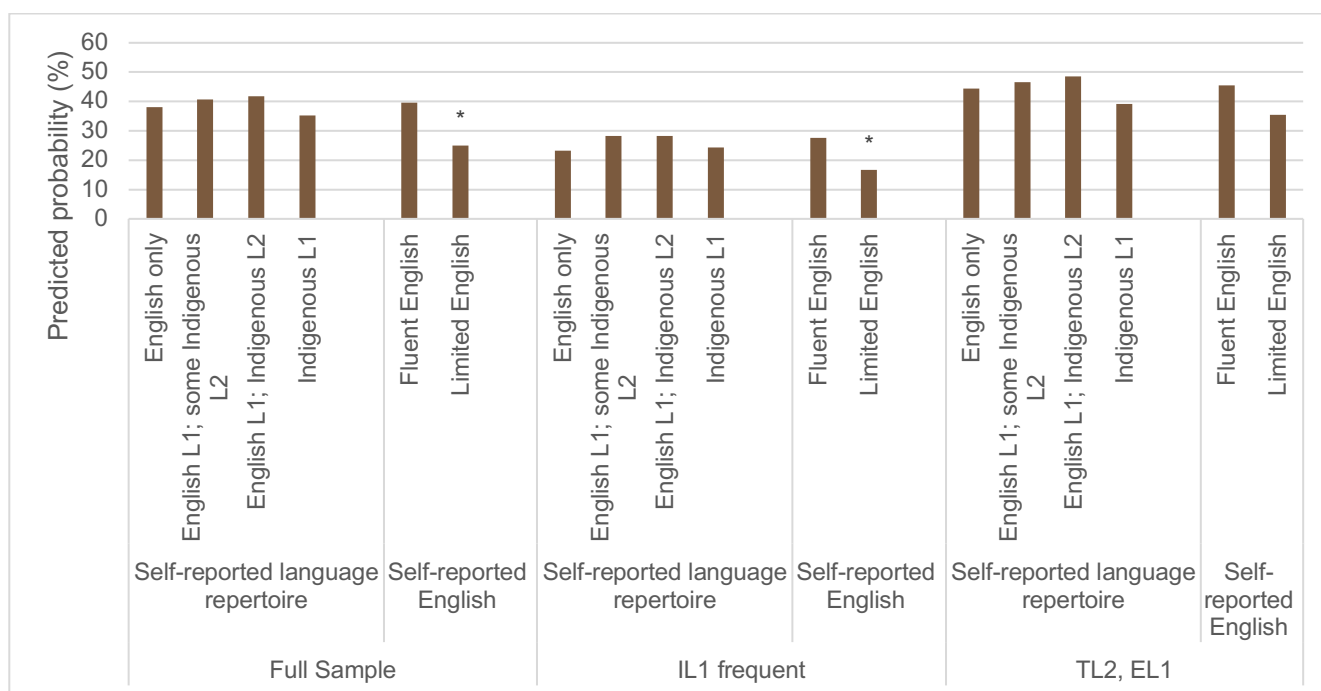

Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.20).
Source: NATSISS 2014–15.

Economic wellbeing

There is clear evidence that speaking an Indigenous language is associated with substantial increases in the probability of receiving income from sale of arts and crafts and from paid engagement in cultural activities (Fig. 21 and Fig. 22). The likelihood of receiving income from sale of arts and crafts, and the likelihood of paid participation in cultural activities increases with Indigenous language proficiency. Those whose first language is an Indigenous language are most likely to receive income from sale of arts and crafts and doing cultural activities, and those who speak an Indigenous language as their second language are also more likely to do so than English-only speakers. The likelihood of receiving income from commercial arts production is higher for all language groups in IL1 frequent areas than for the same groups in TL2, EL1 areas. By contrast, those in TL2, EL1 areas are slightly more likely to receive income from participation in cultural activities (e.g. performance, participation in cultural organisations) than those in IL1 frequent areas, possibly reflecting greater opportunities for cultural employment in non-remote areas. The relationship between Indigenous language use and income from sale of arts and crafts, and doing cultural activities is slightly less pronounced, but remains large and statistically significant once other cultural variables are included (Supporting Online Appendix 2).

In IL1 frequent areas, there is evidence that those with limited English are more likely to receive income from sale of arts and crafts and doing cultural activities than those with fluent English. This suggests that these activities may provide a means of generating income for those who may be excluded from the formal economy by their limited English skills.

Fig. 21. Predicted probability of receiving income from arts activities, by language use

Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.21).
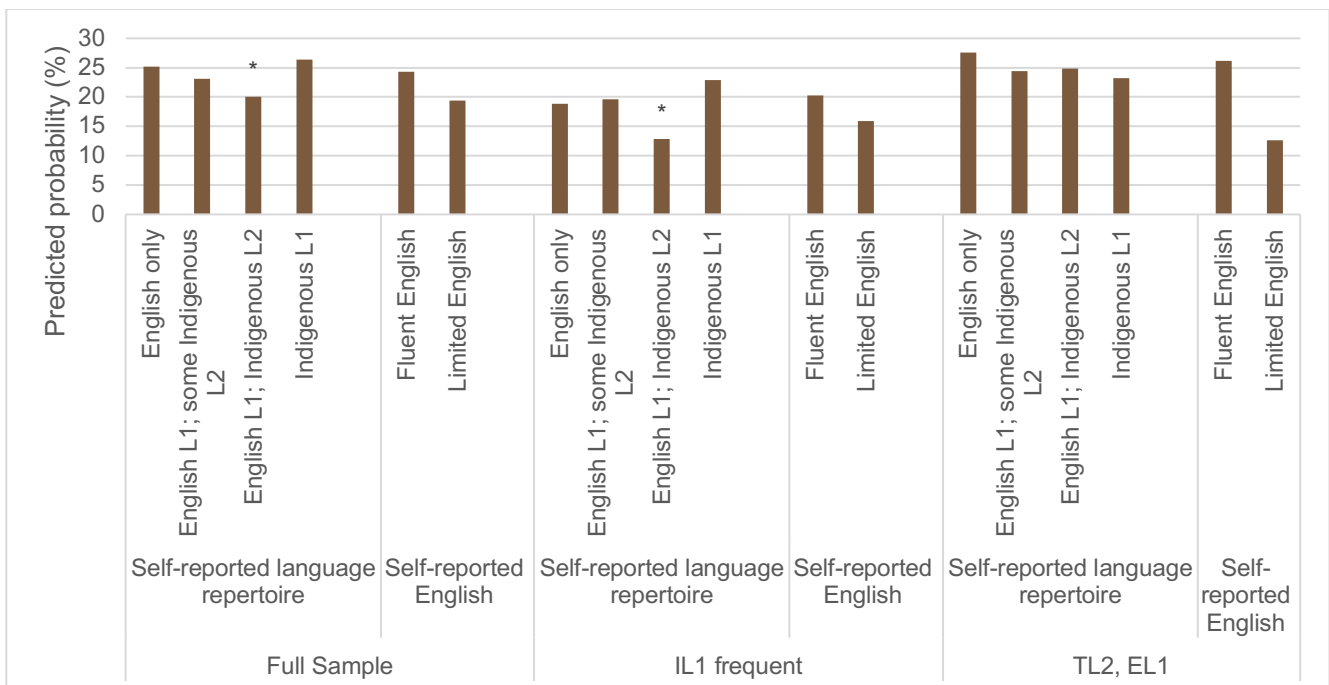Source: NATSISS 2014–15.

Fig. 22. Predicted probability of receiving income from cultural activities, by language use
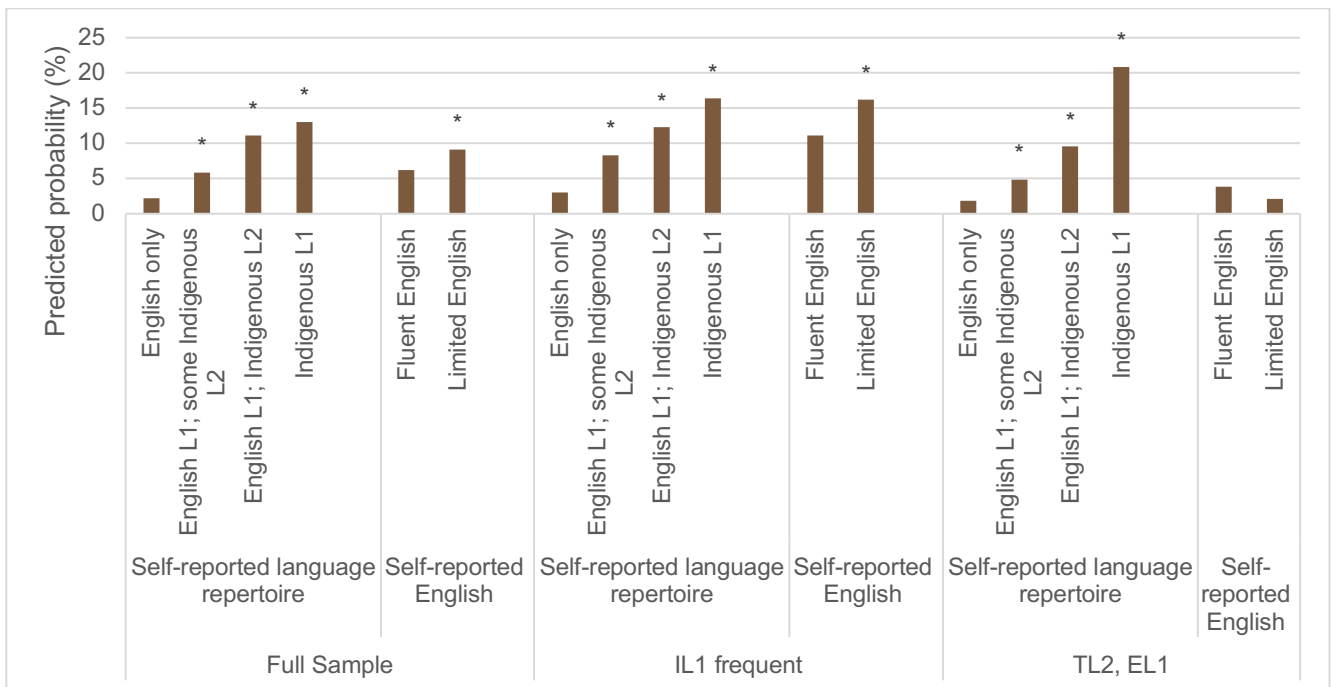
Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.22).
Source: NATSISS 2014–15.

The probability of being employed in food, accommodation, arts or recreational services industries – a proxy for the tourism sector – does not appear to be statistically related to Indigenous language use (Fig. 23). This is

likely due in part to our small sample size. In TL2, EL1 areas, the relationship between Indigenous language use and employment in these industries appears to be in the same direction as found in Fig. 21 and Fig. 22, but the differences between Indigenous language users and English-only speakers are not statistically significant.

Likewise, there is little significant relationship between Indigenous language use and the overall probability of being employed (Fig. 24). The only exception to this is that IL1 speakers of Indigenous languages are less likely to be employed than English-only speakers. This result is only statistically significant for the whole sample and likely stems in part from the fact that IL1 speakers of Indigenous languages are more likely than other groups to live in remote areas with limited employment opportunities.

Finally, there is no significant relationship between Indigenous language use and personal income (Fig. 25). It may be that the greater opportunities provided to Indigenous language users to generate income from arts and cultural activities are offset by other disadvantages in the formal labour market so that the net effect on income is negligible. This does not mean that income from arts production and paid cultural participation do not contribute to Indigenous financial welfare. Rather, they are likely to contribute to the livelihoods of those who would otherwise have lower than average incomes, all else being equal.

Fig. 23. Predicted probability of being employed in food, accommodation, arts or recreational services industries, population aged 20–64 years, by language use
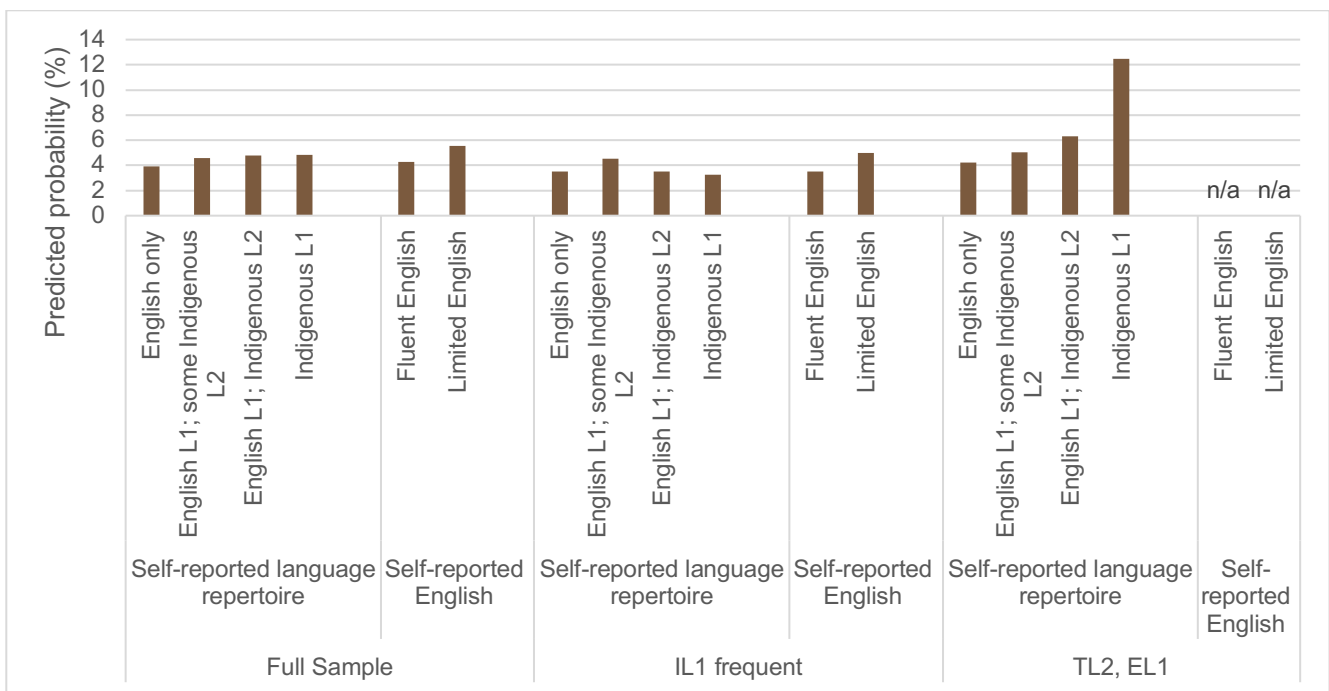
Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.23).
Source: NATSISS 2014–15.
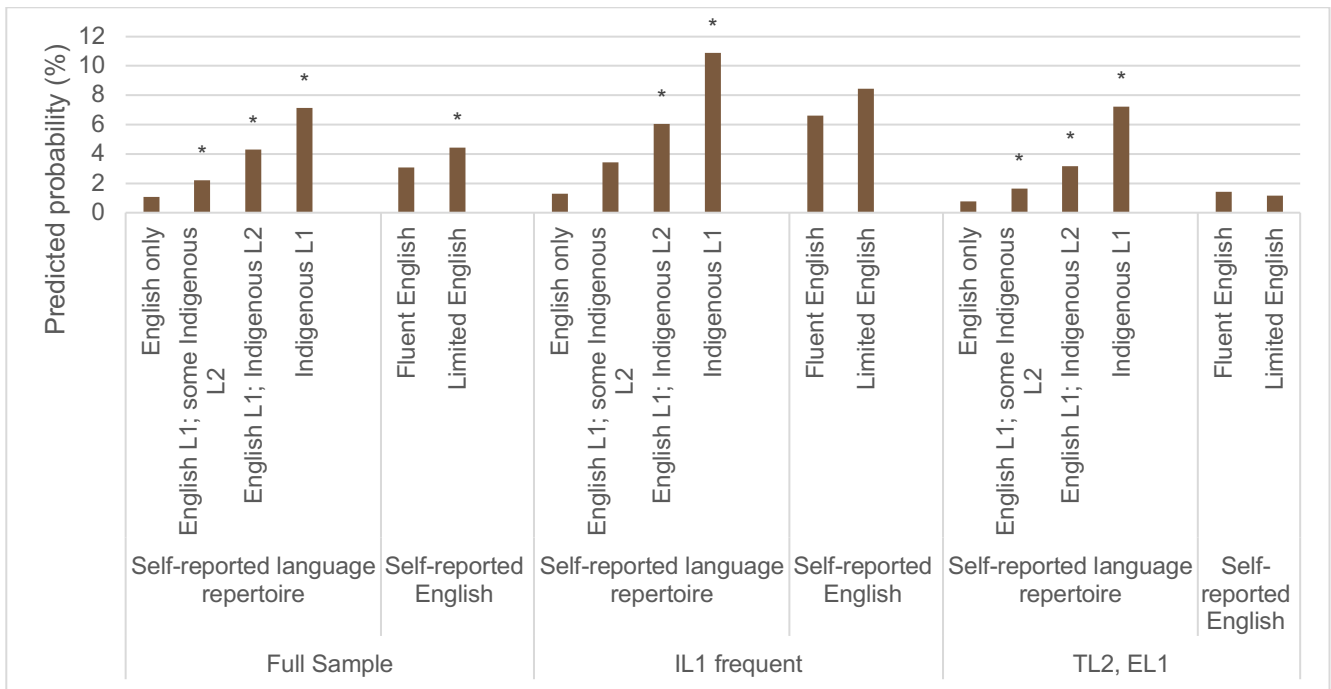
Fig. 24. Predicted probability of being employed, population aged 20–64 years, by language use
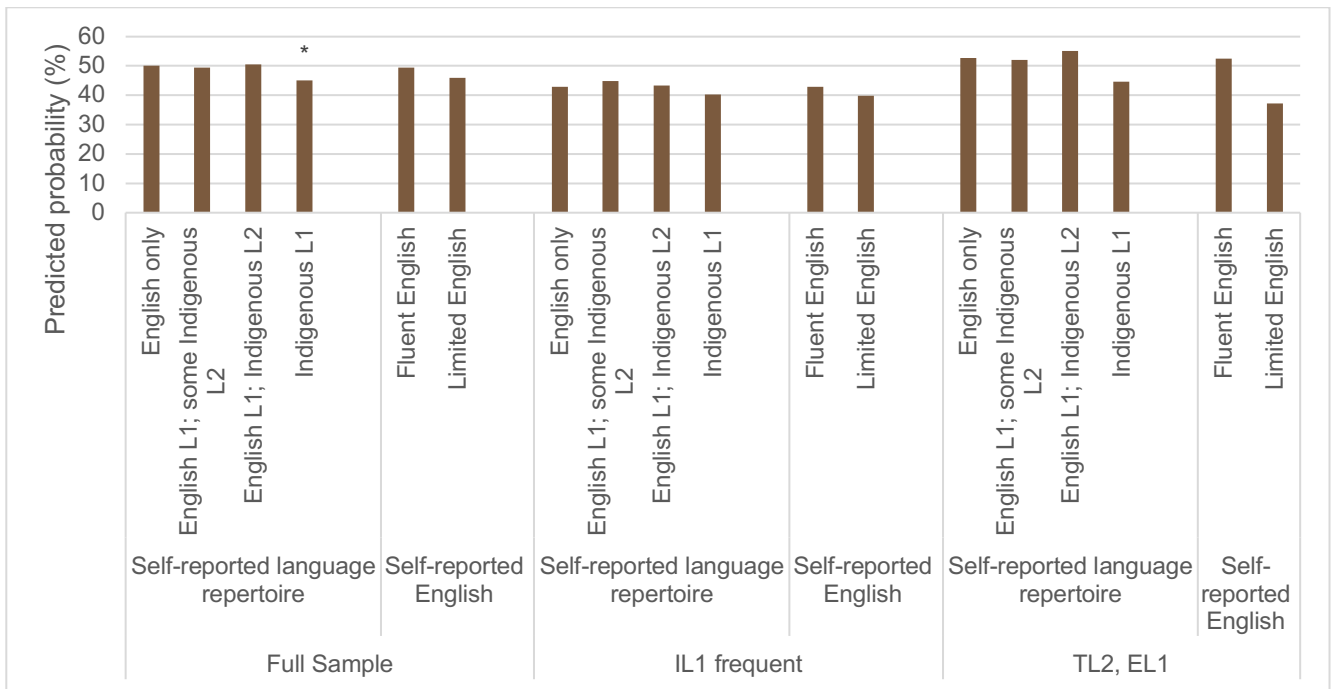
Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.24).
Source: NATSISS 2014–15.

Fig. 25. Predicted personal weekly income, by language use
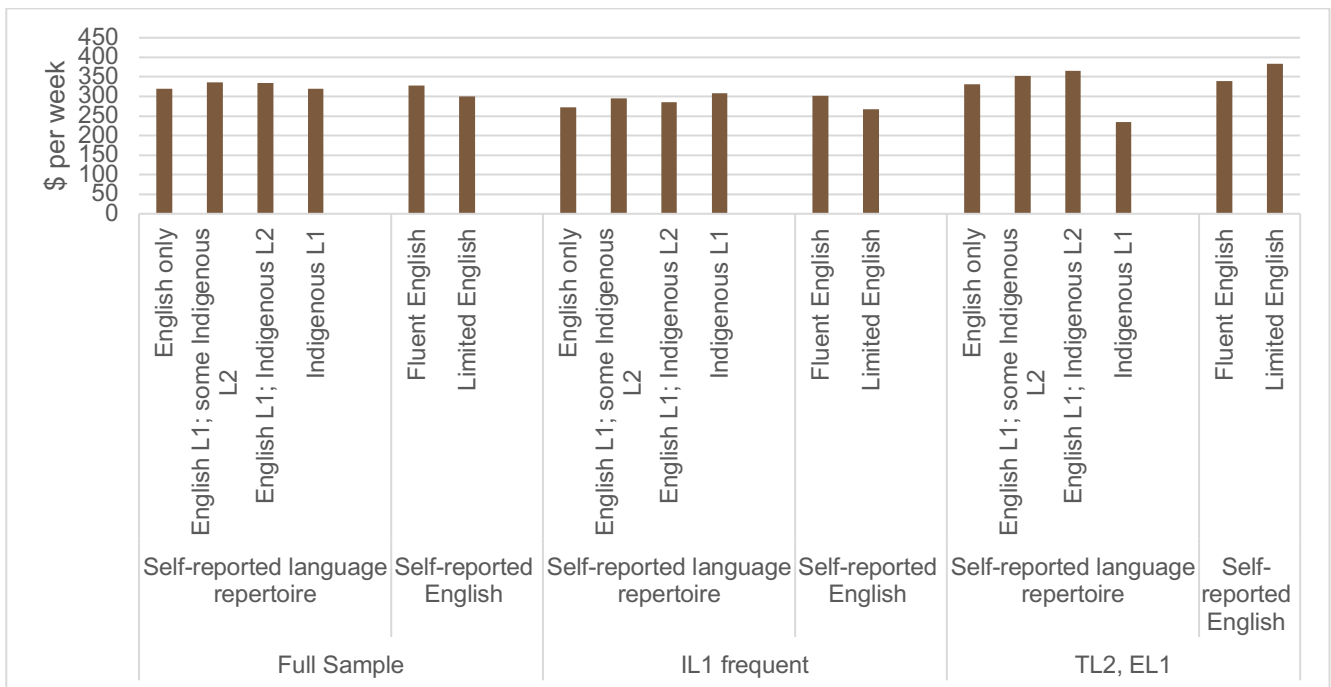
Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.25).
Source: NATSISS 2014–15.

Racism, justice and safety

Indigenous language users are significantly more likely than English-only speakers to report that they have been treated unfairly because they are Aboriginal or Torres Strait Islander in the last 12 months (Fig. 26), which is the measure of discrimination used in the NATSISS. In TL2, EL1 regions, this relationship is evident for L2 speakers of Indigenous languages, with the probability of reporting experiences of discrimination increasing with increased Indigenous language proficiency among those for whom English is the main language spoken at home. This correlation is likely to result from language use increasing the visibility of Indigeneity to non-Indigenous people in TL2, EL1 regions. In contrast, in IL1 frequent regions only those who speak some words of an Indigenous language as their second language are significantly more likely to report unfair treatment than English-only speakers. In both regions, because these data are self-reported it is also possible that Indigenous language users perceive or report discrimination differently, which may affect these results.

Fig. 26. Predicted probability of reporting unfair treatment in last 12 months, by language use

Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.26).
Source: NATSISS 2014–15.

L2 speakers of Indigenous languages are significantly more likely to report having been arrested (Fig. 27) or incarcerated (Fig. 28) than English-only speakers. This relationship typically holds in TL2, EL1 regions but not in IL1 frequent areas, where there is no significant relationship between Indigenous language use and a history of arrest or incarceration. There is also evidence that those living in TL2, EL1 areas with limited English are significantly more likely to have been incarcerated than those with fluent English. As shown in Fig. 18, this is perhaps related to the lesser levels of social support found in TL2, EL1 areas as opposed to IL1 frequent areas. It is important to note that the NATSISS does not sample people who are currently incarcerated so the results in this section should be viewed with some caution.

Fig. 27. Predicted probability of reporting has ever been arrested, by language use

Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.27).
Source: NATSISS 2014–15.

Fig. 28. Predicted probability of reporting has ever been incarcerated, by language use
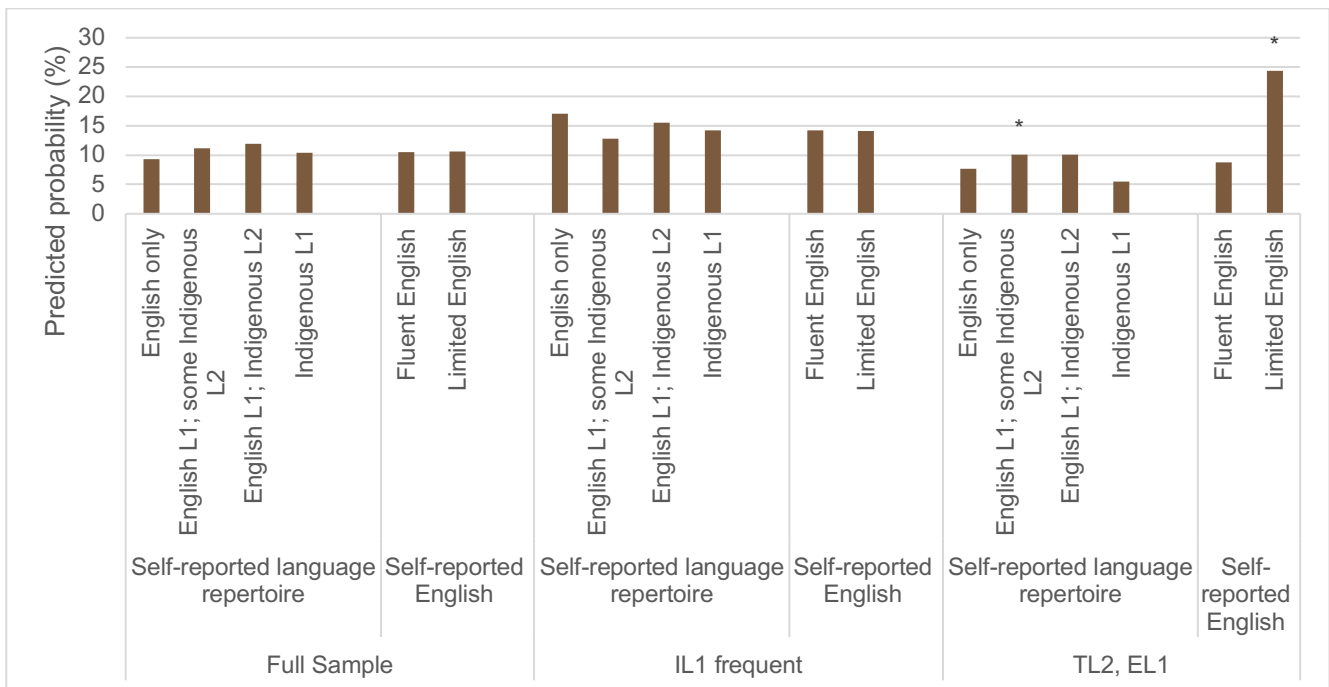
Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.28).
Source: NATSISS 2014–15.

Access to services

IL1 speakers of Indigenous languages are significantly more likely to report having problems accessing services than English-only speakers (Fig. 29). This relationship is in part because the majority of this group live in IL1 frequent areas where the services are more limited, and the average level of problems accessing services is higher than in TL2, EL1 areas. However, even within IL1 frequent areas, IL1 speakers of Indigenous languages are significantly more likely to report problems accessing services. Indigenous language use is not significantly related to the likelihood of reporting problems accessing government services by those who receive income from government payments or allowances (Fig. 30). However, in both language ecology areas people with limited English proficiency report more problems accessing government services than people with fluent English.

Fig. 29. Predicted probability of reporting any problems accessing services, by language use
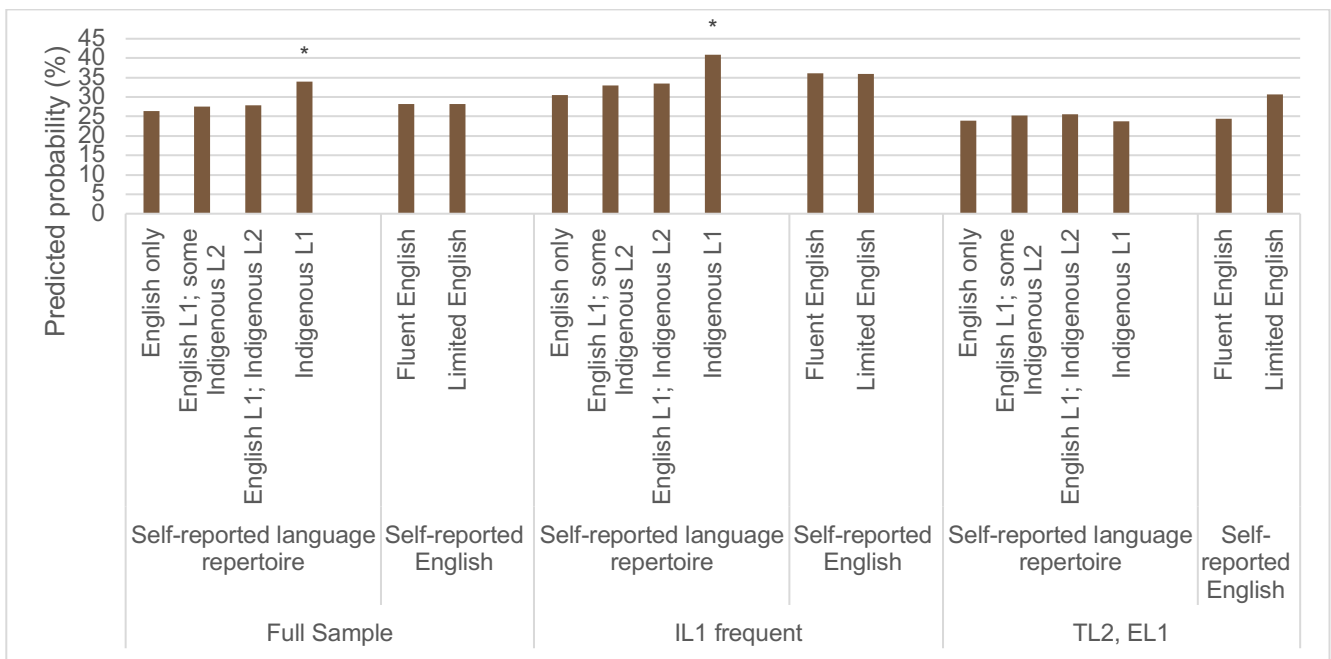
Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.29).
Source: NATSISS 2014–15.

**Fig. 30.** Predicted probability of reporting problems accessing government services if receives government payments or allowances as main sources of income, by language use
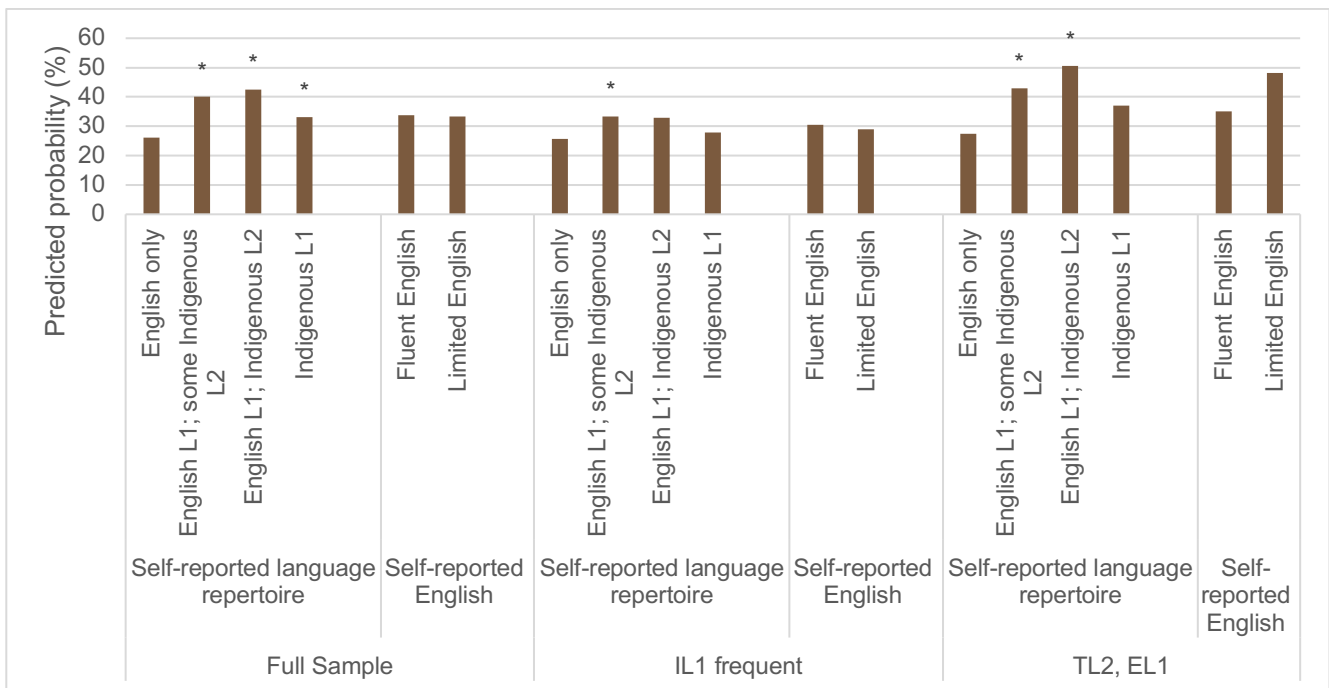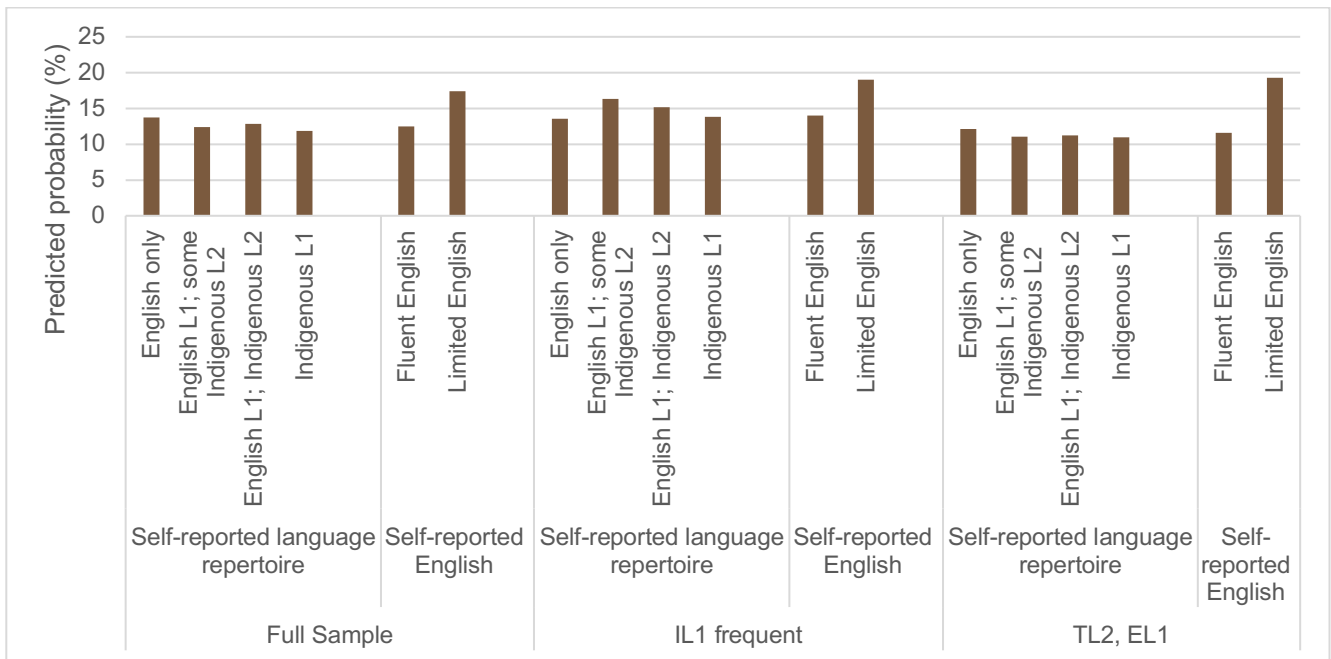

Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.30).
Source: NATSISS 2014–15.

Among those with a long-term health condition, IL1 speakers of Indigenous languages are significantly more likely to report having problems accessing healthcare and medical services than English-only speakers (Fig. 31). While this relationship is not statistically significant for the language ecology area samples, the predicted values suggest that this is driven in part by the high level of problems accessing services reported in IL1 frequent areas where a large proportion of this group lives.

Fig. 31. Predicted probability of reporting problems accessing healthcare and medical services if reports having a diagnosed long-term health condition, by language use
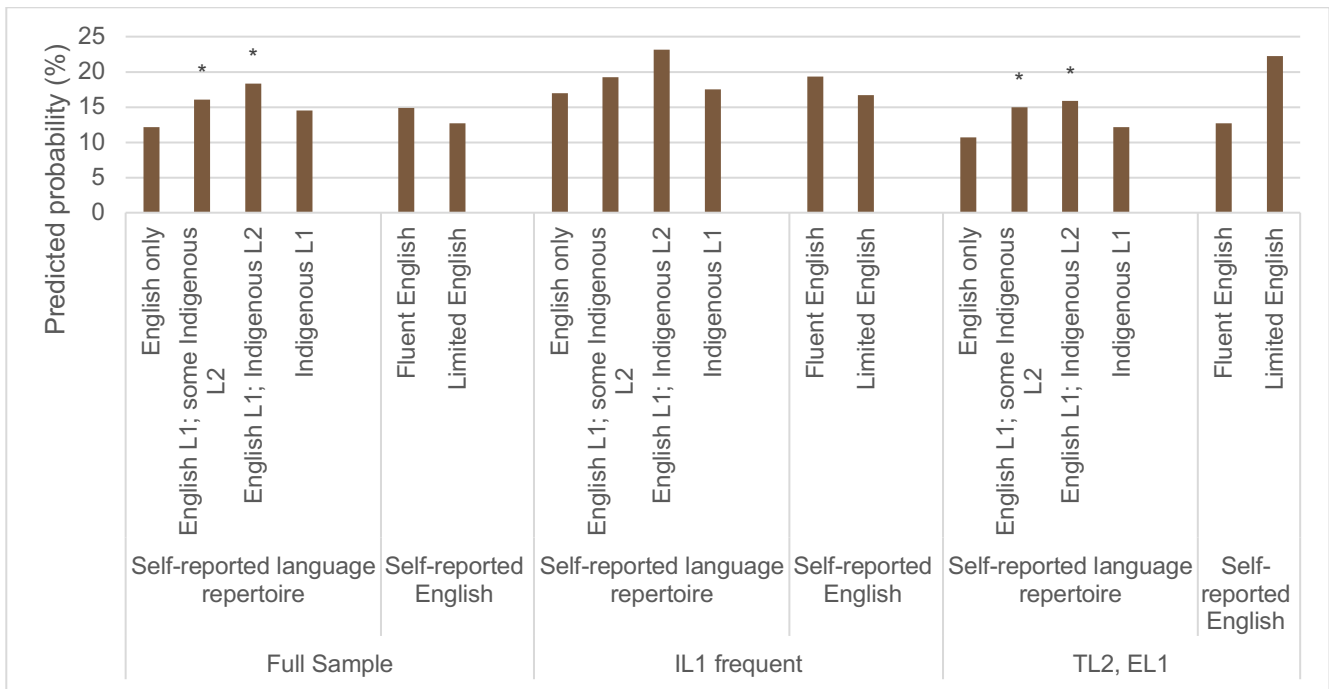

Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.31).
Source: NATSISS 2014–15.

Among the population who have been arrested in the last 12 months, there is no significant difference in the likelihood of accessing legal services by Indigenous language use or English proficiency (Fig. 32). However, among the population who have experienced physical violence in the last 12 months, those Indigenous language users (particularly L2 speakers in TL2, EL1 areas) and those with limited English are significantly less likely to have accessed legal services than English-only speakers (Fig. 33). This suggests that there are substantive problems accessing legal services for victims of violence who have limited English skills, which could be due to a lack of language services or a lack of culturally appropriate services more generally.

Fig. 32. Predicted probability of reporting accessing legal services if reports being arrested in the last 12 months, by language use
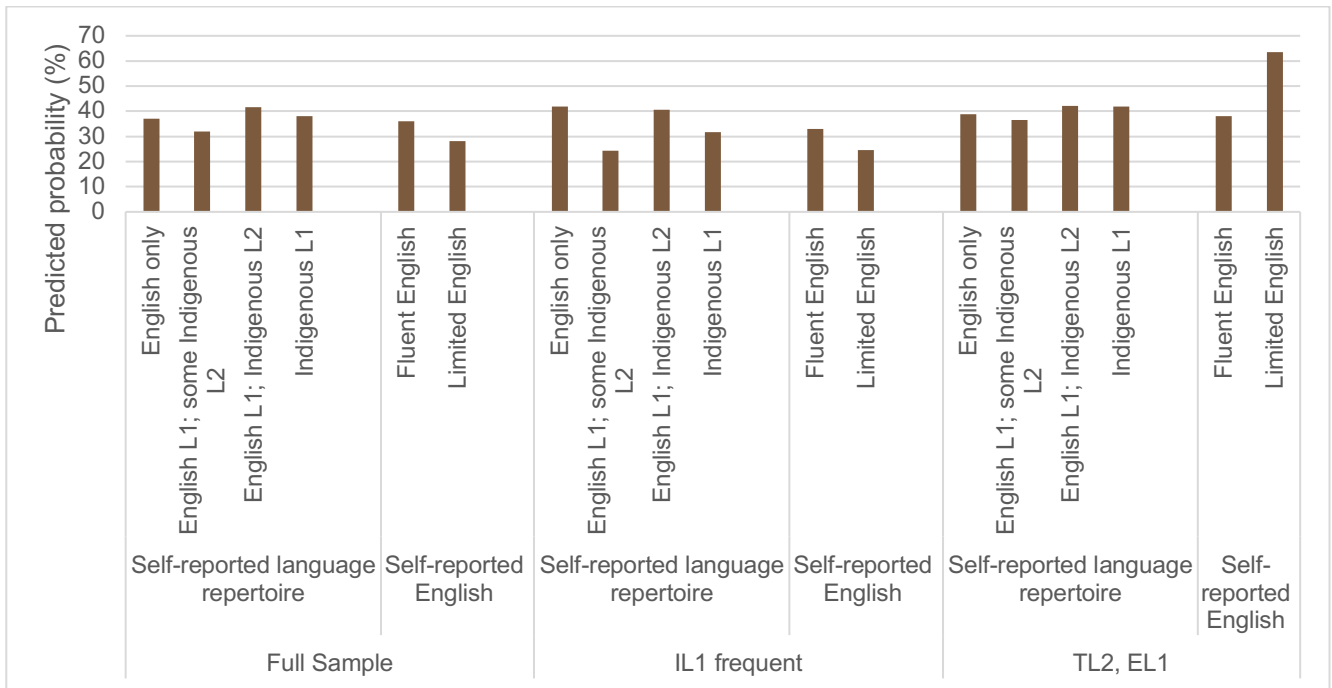
Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.32).
Source: NATSISS 2014–15.

Fig. 33. Predicted probability of reporting accessing legal services if reports experiencing violence in the last 12 months, by language use
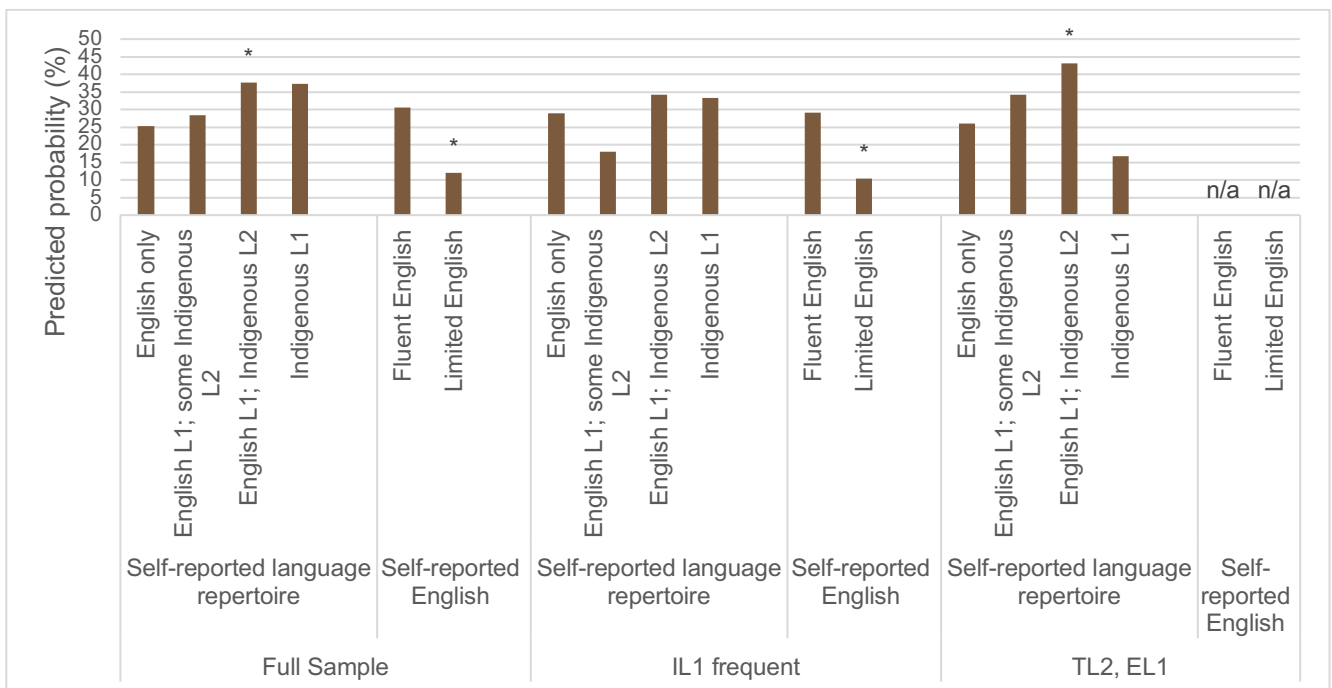
Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.33).
Source: NATSISS 2014–15.

Indigenous language use is not statistically related to the likelihood of reporting problems with accessing housing services for those who are currently renting (Fig. 34). However, those with limited English are significantly more likely to report such problems, both in aggregate and in IL1 frequent areas.

Fig. 34. Predicted probability of reporting problems accessing housing services if household currently rents dwelling, by language use
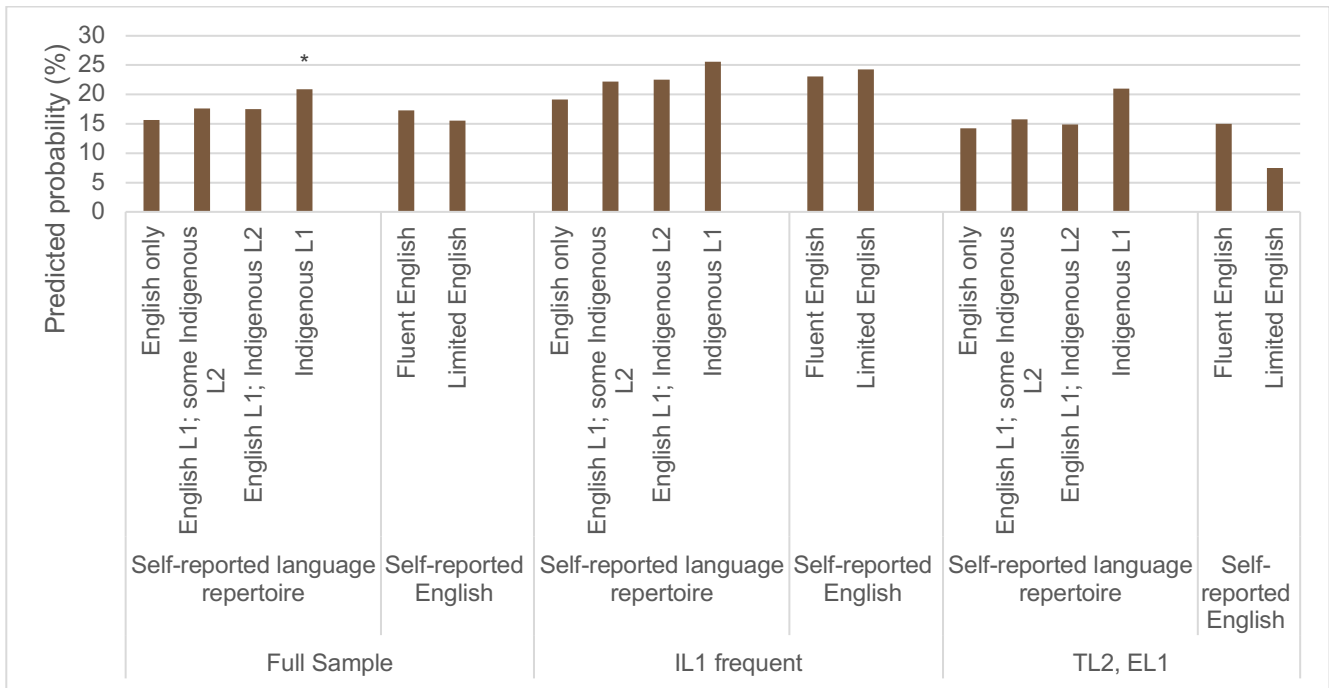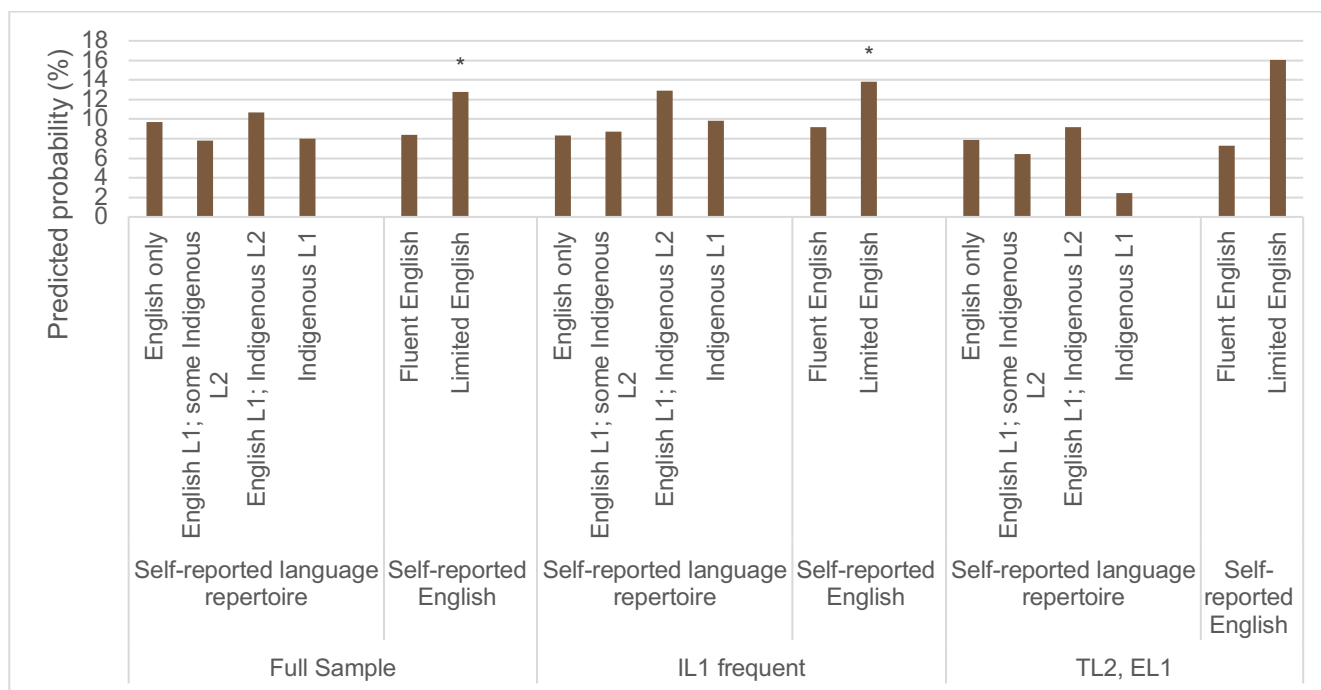

Note: Full regression results are shown in Supporting Online Appendix 2 (Table A2.34).
Source: NATSISS 2014–15.

Summary of key results

This study examines the link between use of Indigenous languages and a range of wellbeing indicators. It uses data from the 2014–2015 NATSISS. Indigenous languages are spoken to different extents in different places and, to the extent that an Indigenous language is used as a means of everyday communication, we investigate the possibility that the relationship between use of Indigenous language(s) and wellbeing depends on local language ecology. Living in areas where one's own language is widely spoken can have different effects on wellbeing from residing in places where only a few people speak the language. To account for such heterogeneity, we disaggregate the sample by language ecology.

After controlling for English language proficiency and an array of individual, household and geographic characteristics, we find that Indigenous language users are more likely than English-only speakers to identify themselves with a clan or tribal group, participate or be involved in cultural events, live on traditional Country, regularly visit homelands when they live away from them, and actively engage in traditional activities such as hunting and fishing. Use of Indigenous languages is also associated with higher reported social connectedness: measured by having frequent contact with friends and relatives, receiving support from people outside the household and having a say in the community on important matters. Indigenous language use is also significantly associated with a higher level of emotional wellbeing (such as being full of life and energy) and a lower probability of being diagnosed with mental health issues.

These findings are consistent with the general view that language is a marker of identity and connects people with their lands, histories, and traditional laws and cultures. Specifically, they reaffirm the claim by Warlpiri-patu-kurlangu Jaru in their submission to a parliamentary inquiry (Standing Committee on Aboriginal and Torres Strait Islander Affairs 2012:11):

> Knowing that our own language and culture play the biggest role in growing our spirit, our connection to our land and the stories of our grandmothers and grandfathers. With our language we know where we belong, we know the names from our Country and Jukurrpa. Young people can't lead a good, healthy and happy life without this. Language and culture come first. When kids feel lost and their spirit is weak then they can't learn well or be healthy.

However, we caution against the potential interpretation of Indigenous language use as a proxy for Indigenous cultural identity. Although increasinged levels of Indigenous language fluency are correlated with higher rates of identification with an Indigenous language group, tribe or clan, rates of cultural identification are high across the entire sample. Almost half of those who do not report speaking or understanding any words in an Indigenous language still report identifying with a clan, tribal or language group. Indigenous language proficiency is not equivalent to Indigenous cultural affiliation, although the two are closely related.

Speaking an Indigenous language also appears to create earning opportunities from the production of cultural goods and services. We find that Indigenous language users are more likely than English-only speakers to earn income from arts and cultural activities (the probability is higher for IL1 speakers). To the extent that speaking an Indigenous language indicates increased sense of belonging and connection to Indigenous cultures, speakers of Indigenous languages are better positioned in markets where Indigenous cultural knowledge is valued than English-only speakers. Our findings show that the effect of language use on the likelihood of earning income from arts and cultural practices is independent of remoteness and language ecology.

The significant positive association between speaking an Indigenous language and being paid for cultural production does not seem to translate into higher personal income. Estimates for the income model show that speaking an Indigenous language does not have a significant association with self-reported weekly personal income. This may be linked to the combination of two possible effects that operate in opposite directions, with cultural production increasing the incomes of some Indigenous language speakers, while limited English proficiency and racial discrimination may act to reduce incomes resulting from mainstream employment. There is evidence that Indigenous language speakers who are employed are more likely to work in jobs that allow for cultural responsibilities (see Table A3.4, Supporting Online Appendix 3). Furthermore, Indigenous language users who are employed and who have been involved in cultural events in the previous 12 months work fewer weekly hours than their counterparts with no involvement in cultural events (see Table A3.4, Supporting Online Appendix 3). These results are consistent with Altman's (2009) description of the 'hybrid economy' in remote Australia.

Despite engaging in fewer health-risk behaviours, IL1 speakers do not have better self-reported health status than those who speak only English. Since health may be affected by environmental factors such as access to health services, engagement in fewer health-risk behaviours does not guarantee good health. We further investigated this issue by investigating the relationship between Indigenous language use and access to health services. We restrict the sample to those who report being diagnosed with long-term health problems, as people with good health may not normally seek treatments. We find that people speaking an Indigenous language are more likely than English-only speakers to have trouble accessing healthcare services. Clearly, any relationship between physical health and Indigenous language use is likely to be indirect, complex and mediated by an array of structural factors that could not be directly addressed in this study.

Furthermore, in areas where Indigenous languages are frequently spoken as a first language, Indigenous language use is significantly associated with difficulty in accessing a range of services, including but not limited to health services. This is likely due to the relationship between provision of services only in English, the type of complex English used in service provision, the scarcity of accessible interpreter services, and the lack of high-quality English-as-a-second-language learning provision in remote areas.

We further investigated whether speaking Indigenous languages is associated with structural disadvantages and identify two main barriers to service accessibility. The first is related to the quality and structure of the local economy. It seems employment opportunities and health services are under-provisioned in areas where Indigenous languages are widely spoken. In IL1 frequent areas, for example, more than half of Indigenous persons who reported having difficulties accessing services mention inadequate availability of services as an important reason for the difficulties (see Table A3.1, Supporting Online Appendix 3). The second is related to the level of cultural competency. Even when services are physically available at the community level, Indigenous people may be required to speak English, or they may find the services culturally inappropriate. We find that, in IL1 frequent areas, people with limited English skills are less likely to have access to legal services (when experiencing violence), and more likely to have difficulties accessing housing services (for those who live in rental properties). In TL2 areas, on the other hand, speakers of Indigenous languages are more likely to report that they have been unfairly treated because of their Indigenous background. They are also more likely to report cultural inappropriateness of services and lack of trust in service providers as important barriers to services (see Tables A3.2 and A3.3, Supporting Online Appendix 3).

Limitations

There are some limitations to this study that we would like to acknowledge. First, the language variable in NATSISS does not differentiate between traditional languages such as Warlpiri (spoken as the first language of about a few thousand people) or Kaurna (currently being revived, and spoken by few) and new languages such as Kriol or Yumplatok (each spoken by about 20 000 people). It is possible the relationships between language use and wellbeing will vary between traditional languages and new languages, but it is not possible to investigate this using the available NATSISS data. Second, the sample size for those who speak Indigenous languages as a first language is very small, especially in TL2, EL1 areas, which may reduce the precision of the estimated effect of the use of Indigenous languages on indicators of wellbeing. To the extent that languages have different levels of recognition by the public, their speakers may have different access to services and resources, which may, in turn, result in different wellbeing outcomes. Third, most of the outcome variables and the language variables are self-reported: there might be measurement errors arising from reporting bias. Fourth, we are limited to using the indicators of wellbeing provided by the NATSISS. We have interpreted wellbeing very broadly, adopting the framework of Angelo et al. (2019). Nevertheless, we recognise that the indicators we have utilised are poor substitutes for measures of wellbeing that are defined according to Indigenous ontologies and epistemologies (e.g. Yap & Yu 2016). Fifth, although the empirical models control for an array of observable individual, household and area characteristics, some unobserved factors may still obscure the estimated effects of Indigenous language use on wellbeing. In some cases, the relationship between language use and wellbeing may also go in a reverse direction. For instance, while speaking Indigenous languages connects people with culture, active involvement in cultural practices may also motivate people to learn and speak Indigenous languages. Therefore, the results do not necessarily imply causal relationships.

Lessons for language data collection in future surveys

This study has identified several shortcomings relating to survey data on use of Indigenous languages that we believe are worthy of further discussion. The first problem with language questions in the main data sources relates to the way that the word 'language' is used in the survey questions and interpreted by respondents. The NATSISS asks respondents 'what language do you mainly speak at home?. This question has shortcomings for multilingual respondents who may speak more than one language at home and for whom there might not be one clear 'main' language. Language use may vary depending on the context (e.g. where respondents are currently living, who is currently part of the household) and may even change over the course of the day depending on who they talk to and what they are talking about. Forcing a single response to this question results in undercounting Indigenous language use in that, with increasing numbers of Indigenous people marrying outside their linguistic community, one partner may not speak the respondent's first language. In this situation, a respondent may not speak their first language at home but may speak it when meeting with other speakers of their first language. Furthermore, respondents who speak more than one language at home may have difficulty identifying their 'main' language. Future surveys should consider modifications enabling multiple responses to be given to language use questions, both in terms of languages spoken or understood, the level of proficiency in each of these languages, and which of these languages was the respondents' first language or mother tongue.

Second, the answer to language use questions may also reflect how respondents identify in terms of language heritage rather than day-to-day language use. For example, respondents might identify with a traditional language and name it as their main language even if it is not their everyday language of communication. Survey questions about language use should specify that they relate to everyday communication, rather than heritage or ancestral languages that might be used less frequently. Information on respondents' affiliations with particular clans, tribes, nations or language groups is interesting and important in its own right, but should not be confused with the language of day-to-day speech.

Third, standardised nomenclature and language recognition of all Indigenous languages is yet to be achieved, leading to variability in responses and in interpretations of these responses. This is especially problematic for new Indigenous languages. New Indigenous languages are under-represented on most classifications of languages including the Australian Standard Classification of Languages (ASCL) against which survey responses are often coded. Respondents may assert that they speak an Indigenous language which is a new language, but this might not be understood by data collectors or analysts. Similarly, respondents may not have a name for their language, because it is relatively new, localised, and not officially recognised, or there may be several ways of naming the same language. Other respondents might not identify as speaking a new language to survey interviewers because it has not been accorded any official acknowledgement or recognition (e.g. in schools). Some respondents might feel that others will value such a response natively or they may not consider it a valid language to identify with for official purposes. Additional effort to include new Indigenous languages on the ASCL, and site-specific changes to data collection and coding prompts may be required to ensure that the use of new Indigenous languages is adequately recognised by social surveys.

Fourth, the way in which the NATSISS unit record data is coded prevents researchers from differentiating between traditional and new Indigenous language repertoires. This is problematic because these language types may have different relationships to wellbeing, and different implications for service accessibility. Future surveys should, at minimum, recode languages in such a way as to differentiate between new and traditional Indigenous languages. We expect that this would require improving the ASCL's coverage of new languages as a pre-requisite. Ideally, researchers would be enabled to access data relating to the specific language reported by respondents in an environment where respondents' privacy and confidentiality is ensured such as the ABS's modern DataLab analytical environment.

Finally, there is a lack of language ecology data in NATSISS. We have attempted to address this by developing our own geographical classification of the large geographical regions indicated in the survey data. Our adoption of a language ecology approach has enabled us to identify the diverse relationships between Indigenous language use and wellbeing indicators across Australia. However, the precise geographical location in which survey respondents live is obscured in NATSISS, which means that we could only make very crude generalisations about language ecology areas. The erasure of geographical data makes it impossible to attach ecological data about local language use to survey responses, despite the available safeguards to privacy afforded by the ABS's DataLab analytical environment. In future, Indigenous population surveys could consider making more detailed geographical information available to researchers under highly supervised and restricted conditions that facilitate the simultaneous analysis of language ecology and language repertoire data without compromising respondent confidentiality. We believe that this would generate further significant research findings, and would make the most of the significant public investment in data sets like the NATSISS.

Concluding comments

First of all, this report documents links between indicators of wellbeing and the use of Indigenous languages. After controlling for English language proficiency and an array of observable individual, household and area-level characteristics, results show that users of Indigenous languages are more likely than English-only speakers to identify themselves with a clan or tribal group, participate or be involved in cultural events, live on traditional Country, regularly visit homelands when they live away from them, and actively engage in traditional activities such as hunting and fishing. Use of Indigenous languages is also associated with a higher level of social connectedness (such as frequent contact with friends and relatives, receiving support from people outside the household), social efficacy (having a say in the community on important matters) and emotional wellbeing (such as being full of life and energy). There is also evidence that use of Indigenous languages creates earning opportunities from the production of cultural goods and services – specifically, Indigenous language speakers are more likely than English-only speakers to report that they earn income from arts and cultural activities.

Some evidence points to structural barriers that may undermine the positive outcomes for Indigenous language users. Indigenous language speakers are more likely than English-only speakers to be unemployed and to report having difficulties accessing health services. Further investigation of the sources of barriers shows that Indigenous language speakers in IL1 frequent and TL2 areas provide different reasons for difficulty accessing public services. In the former, inadequate availability of services and limited English skills are the most frequent reasons, whereas in the latter, cultural inappropriateness of existing services and lack of trust towards service providers seem to be the most important barriers to services. Furthermore, the use of Indigenous languages is associated with increased exposure to racism, especially for those living in parts of Australia where Indigenous languages are infrequently spoken as a first language. This association may result from Indigenous language use increasing the visibility of Indigeneity to non-Indigenous people. It suggests that the existing imperative for policies to counter racism among non-Indigenous people may become more urgent in a context of widespread Indigenous language revival. As has been reiterated throughout this report, these relationships are not necessarily causal in nature, so effects may be due to related but unspecified factors.

The findings in this study point to important implications. Most importantly, Indigenous language use is linked to better wellbeing outcomes. Our findings suggest that speaking Indigenous languages is strongly associated with indicators of wellbeing relating to actions over which Indigenous individuals, families and communities can exert agency and self-determination. In contrast, Indigenous language use is weakly and inconsistently correlated with wellbeing outcomes which are most strongly determined by external structural forces. While Indigenous language maintenance and revival are important in their own right, the findings of this study suggest that implementation of certain non-language policies may be improved by addressing the needs and aspirations of Indigenous people to speak their own languages.

Second, this report demonstrates the importance of considering 'language ecologies', the geographic and social contexts surrounding language use. The linkages between language use and wellbeing are themselves contextually dependent. In order to work with the language data as it exists and within the parameters established for its use (e.g. protecting individuals' privacy), the researchers have developed new approaches to using language survey data. Operationalising the concept of language ecologies marks a step forward from simple enumeration. Hitherto, government policies have not usually required language data that describes Aboriginal and Torres Strait Islander language ecologies or differentiates language revival, language shift and language maintenance contexts. We hope that this study has demonstrated the need for both policy and research to be sensitive to the vital importance of contextual language ecology.

Finally, the report demonstrates that the available language data is severely constrained in terms of its ability to make definitive claims about the links between Indigenous language use and wellbeing. Obtaining quality language data is a complex and long-term endeavour, but it is essential if good policy is to be developed. This study therefore constitutes a call, in the International Year of Indigenous Languages, to do better in this area.

References

Anderson LM, Scrimshaw SC, Fullilove MT, Fielding JE, Normand J & Services TFoCP (2003).Culturally competent healthcare systems: A systematic review. *American Journal of Preventive Medicine*, 24(3):68–79.

Angelo D, O'Shannessy C, Simpson J, Kral I, Smith H & Browne E (2019). 'Well-being and Indigenous Language Ecologies(WILE): a strengths-based approach (National Indigenous Languages Report Pillar 2)', Canberra, ARC Centre of Excellence for the Dynamics of Language, Australian National University.

Atkinson S (2013).Beyond components of wellbeing: The effects of relational and situated assemblage. *Topoi*, 32(2):137–144.

ABS (Australian Bureau of Statistics) (2011). *A focus on children and youth*, cat. no. 4725.0, ABS, Canberra.

—— (2016). *National Aboriginal and Torres Strait Islander Social Survey: User Guide, 2014–15*, cat.no. 4720.0, *Australian Bureau of Statstics*, Canberra.

Battiste M (1998).Enabling the autumn seed: toward a decolonized approach to Aboriginal knowledge, language, and education. *Canadian Journal of Native Education*, 22(1):16–27.

Biddle N & Swee H (2012).The relationship between wellbeing and Indigenous land, language and culture in Australia. *Australian Geographer*, 43(3):215–232.

Brown A, Scales U, Beever W, Rickards B, Rowley K. & O'Dea K (2012).Exploring the expression of depression and distress in aboriginal men in central Australia: a qualitative study. *BMC Psychiatry*, 12(1):97.

Butler TL, et al. (2019). Aboriginal and Torres Strait Islander people's domains of wellbeing: a comprehensive literature review. *Social Science & Medicine*, 233:138–157.

Chandler M, Lalonde C, Sokol B, Hallett D & Marcia J (2003). Personal persistence, identity development, and suicide: A study of native and non-native North American adolescents. *Monographs of the Society for Research in Child Development*, 68(2):1–138.

Coe K, et al. (2004). Traditionalism and its relationship to disease risk and protective behaviors of women living on the Hopi reservation. *Health Care for Women International*, 25(5):391–410.

Cunningham J & Paradies YC (2012). Socio-demographic factors and psychological distress in Indigenous and non-Indigenous Australian adults aged 18-64 years: analysis of national survey data. *BMC Public Health*, 12(95):1–15.

Dockery AM (2010). Culture and wellbeing: The case of Indigenous Australians. *Social Indicators Research*, 99(2):315–332.

Fleming C, Manning M & Miller A (Eds) (2019). *Routledge handbook of Indigenous wellbeing*, Routledge, London.

Guenther J & McRae-William E (2014). 'Does education and training for remote Aboriginal and Torres Strait Islander lead to 'real' jobs? Evidence from the 2011 Census', Paper presented at the AVETRA 17th International Conference, Gold Coast, Australia. www.avetra.org.au/wp-content/uploads/2014/05/

Hallett D, Chandler MJ & Lalonde CE (2007). Aboriginal language knowledge and youth suicide. *Cognitive Development*, 22(3):392–399.

Hansen JG & Liu J (1997). Social identity and language: theoretical and methodological issues. *Tesol Quarterly*, 31(3):567–576.

Herman-Stahl M, Spencer DL & Duncan JE (2003). The implications of cultural orientation for substance use among American Indians. *American Indian and Alaska Native Mental Health Research*, 11(1):46–66.

Hunter B & Gray M (2001). Indigenous labour force status re-visited: factors associated with the discouraged worker phenomenon. *Australian Journal of Labour Economics*, 4(2):111–133.

Le Grande M, et al. (2017). Social and emotional wellbeing assessment instruments for use with Indigenous Australians: a critical review. *Social Science & Medicine*, 187:164–173.

Markham F & White J (2013). The quiet revolution? *Arena Magazine*, (124):41.

Phinney JS (1991).Ethnic identity and self-esteem: a review and integration. *Hispanic Journal of Behavioral Sciences*, 13(2):193–208.

Rowley, K.G. et al. (2008). Lower than expected morbidity and mortality for an Australian Aboriginal population:10-year follow-up in a decentralised community. *Medical Journal of Australia*, 188(5):283–287.

Standing Committee on Aboriginal and Torres Strait Islander Affairs (2012). *Our land our languages: language learning in Indigenous communities*,,Canberra, Parliament of the Commonwealth of Australia.

Stephens BJ (2010).The determinants of labour force status among Indigenous Australians. *Australian Journal of Labour Economics*, 13(3):287–312.

Stiglitz JE, Sen A & Fitoussi J-P (2009). *Report by the commission on the measurement of economic performance and social progress*. Retrieved from https://perma.cc/83GQ-FCZH

Whitbeck B, Chen X, Hoyt, DR & Adams GW (2004). Discrimination, historical loss and enculturation: culturally specific risk and resiliency factors for alcohol abuse among American Indians. *Journal of Studies on Alcohol*, 65(4):409–418.

Yap M & Yu E (2016). Operationalising the capability approach: developing culturally relevant indicators of indigenous wellbeing–an Australian example. *Oxford Development Studies*, 44(3):315–331.

—— (2019). The Yawuru way. In Fleming C, Manning M & Miller A (eds), *Routledge handbook of Indigenous wellbeing*, Routledge, London.

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