

NATIONAL VOCATIONAL EDUCATION
AND TRAINING RESEARCH PROGRAM

RESEARCH REPORT

Cultural dimensions of Indigenous participation in vocational education and training: new perspectives

Alfred Michael Dockery

CENTRE FOR LABOUR MARKET
RESEARCH AND CURTIN UNIVERSITY



Australian Government
Department of Industry, Innovation
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About the research

Cultural dimensions of Indigenous participation in vocational education and training: new perspectives

Alfred Michael Dockery, Centre for Labour Market Research and Curtin University

Using data from the 2008 National Aboriginal and Torres Strait Islander Social Survey, this research provides new evidence on the interrelationships between Indigenous Australians' connection with their traditional culture and the nature of their engagement with vocational education and training (VET). The study builds on previous work by the author, *Cultural dimensions of Indigenous participation in education and training* (2009).

In particular, a more defined measure of culture has been developed, one which identifies four separate dimensions of cultural engagement: participation in cultural events; cultural identity; language; and participation in traditional economic activities. Previous findings relating to past educational attainments and participation in training are reassessed. The links between cultural attachment and current participation in education, as well as the benefits derived from education and training, are also explored.

Key messages

- Stronger cultural identity appears to promote greater participation and achievement in education and training.
- Compared with the earlier work, the evidence in this study of a causal effect flowing from cultural identity to outcomes is stronger. However, the extent of other unobserved factors, such as individual motivation and access to resources, is not clear.
- Regardless of whether individuals live in remote or non-remote areas, and irrespective of their degree of cultural attachment, the results show very strong increases in the likelihood of employment and income with additional years of completed education.
- Language is an issue: participation in education and training is higher for those without English language difficulties and who do not speak Indigenous languages. Lower income and employment outcomes are observed for those who speak an Indigenous language compared with those who do not, irrespective of gender or remoteness.

The poor outcomes for those who speak an Indigenous language are contrary to international studies of Indigenous culture in Canada and New Zealand.

Tom Karmel
Managing Director, NCVET

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Executive summary

This report provides new evidence on the interrelationships between Indigenous Australians' affiliation with their traditional culture and the nature of their engagement with vocational education and training (VET). It aims to enhance our understanding of the causal channels through which culture shapes VET participation and outcomes, and vice versa, and builds on previous work presented in the author's 2009 publication, *Cultural dimensions of Indigenous participation in education and training*, in a number of ways. Most importantly, richer measures of culture are developed which capture separate elements of the broader concept of 'cultural attachment'. Using these measures and more recent data, previous findings relating to past educational attainment and participation in training are reassessed. Evidence is also presented on the links between cultural attachment and current participation in education and on the benefits Indigenous Australians derive from education and training, conditional upon remoteness and cultural attachment.

A review of international studies of the link between indigenous people's engagement with their culture and socioeconomic outcomes suggests a generally positive influence of stronger cultural attachment across a range of domains. The main mechanism through which this 'enculturation' effect is believed to operate is by encouraging a strong sense of self-identity, or a stronger sense of persistence of self-identity through time, which promotes resilience and guards against the internalisation of the stresses associated with discrimination and past traumas.

An analysis of the questions relating to culture contained in the 2008 National Aboriginal and Torres Strait Islander Social Survey (NATSISS) identified four separate elements of 'cultural attachment': participation in cultural events; cultural identification; Indigenous language use; and participation in traditional economic activities. Of particular interest are the results pertaining to cultural participation, as opposed to cultural identity. The single measure of cultural attachment used in previous work closely aligned with cultural participation. Results using this measure are likely to be influenced by reverse causation (higher educational attainment and participation in VET leading to greater participation in cultural events) or omitted variable bias (some common but unobserved factor, such as motivation, affecting both VET and cultural engagement). The measure of the separate cultural identity dimension, which is based on recognition of homelands or traditional country, identification with a clan, tribal or language group and the perceived importance of attending cultural events, is far less susceptible to this methodological challenge. Further, the cultural identity measure closely aligns with the concept of self-identity, which the literature highlights as the key mechanism through which cultural attachment might promote better socioeconomic outcomes.

Cultural participation is found to have strong positive associations with a range of indicators of achievement and participation in VET and in the labour market. For the reasons set out above, it is hard to draw any conclusions from this with regard to causal relationships. Certainly, the results give no credibility to any view that participating in Indigenous culture is somehow incompatible with educational achievement. By contrast, it is argued the results for cultural identity do provide some evidence of a causal, enabling effect. This is most apparent in the case of current participation in education, which will largely be driven by better school retention in remote areas. It also applies to past educational attainment and recent participation in training for females in non-remote areas. Analyses of Indigenous people's fields of study and the types of training undertaken

suggest this relationship is not purely a result of Indigenous Australians accessing the VET system for cultural pursuits.

The incentives for Indigenous Australians to undertake education and training are investigated through the association between educational attainment and three labour market outcome variables: labour force participation, the probability of being employed for those participating in the labour market, and income for those working full-time. The results show very strong gains associated with additional years of completed education, irrespective of whether individuals live in remote or non-remote areas, and irrespective of their degree of cultural attachment. Although there is evidence of inferior outcomes associated with some elements of cultural attachment – notably for those speaking an Indigenous language – the estimated returns from each year of education are still very substantial for all groups. Thus, no evidence is found that Indigenous Australians in remote areas or with stronger cultural attachment lack the incentive to participate in vocational education and training due to inadequate returns from gaining higher qualifications.

A major concern for policy is the markedly poorer outcomes for those who speak an Indigenous language. This applies across the spectrum of indicators: educational attainment; participation in education and training; labour force participation; employment propensity; and income. This will be at least in part due to the inability to adequately control for remoteness in the modelling. The 2008 National Aboriginal and Torres Strait Islander Social Survey allows locations to be classified only as remote or non-remote. This will mean that any positive associations with cultural identity, Indigenous language use and traditional economic activities will be understated and any negative associations overstated. With the exception of the findings relating to speaking Indigenous languages, the results presented in this report are compatible with the hypothesis that stronger cultural identity promotes greater participation and achievement in education and training.

Compared with the earlier work, the evidence of a causal effect transmitted from self-identity to outcomes is stronger. The existing literature suggests these findings may arise through a combination of associations between individuals' cultural identity and their outcomes and associations at the community level, whereby those communities with a stronger commitment to cultural continuity also provide an environment more conducive to participation in education and training. Where it is viable for curricula and models of delivery of education and training to incorporate elements that affirm and accommodate Indigenous people's culture, it follows that such practices are also likely to realise improved outcomes for Indigenous Australians.

Introduction

This report continues an investigation into the role of culture in shaping Indigenous Australians' participation in vocational education and training. In *Cultural dimensions of Indigenous participation in education and training*, the precursor to this report, analyses of data from the 2002 National Aboriginal and Torres Strait Islander Social Survey found evidence that Indigenous people's engagement with their traditional culture tends to promote participation in VET (Dockery 2009). In part this is because education and training is complementary to cultural pursuits, but there are also reasons to believe that cultural attachment itself has an enabling effect in educational endeavours. These findings also suggest that some success has been achieved in efforts to make the delivery of VET culturally appropriate. However, it is still clear that lower access to VET in remote areas results in Indigenous Australians facing a degree of trade-off between the maintenance of traditional culture and participation in VET. There is still a great deal to be done if Indigenous Australians are to achieve levels of educational attainment comparable with their non-Indigenous counterparts.

Three important areas were identified for further work. Two of these involve the estimation of further empirical parameters of interest: the returns from education and training in terms of employment outcomes and earnings; and the impact of cultural attachment on current participation in education and training, as opposed to past attainment of qualifications or completion of courses. The third area relates to enhancing the conceptualisation of 'cultural attachment' and the causal channels through which engagement with traditional culture affects life's outcomes for Indigenous Australians. A further development is that, since that earlier monograph was completed, data from the 2008 National Aboriginal and Torres Strait Islander Social Survey have been released, with the empirical investigation into these new areas based upon the more recent unit record file from the 2008 survey. In addition, key findings from the previous research are tested – and confirmed – using the more recent data.

To explore the potential mechanisms through which engagement with Indigenous culture may impact upon outcomes, the following section contains a review of the international literature focusing on studies of indigenous peoples, which were not addressed in the earlier monograph (Dockery 2009). This is followed by a reappraisal of the measurement of Indigenous culture, using the National Aboriginal and Torres Strait Islander Social Survey data, where four separate dimensions of cultural engagement are identified: participation in cultural events; cultural identity; language; and participation in traditional economic activities. This sets out how these are to be measured for the purposes of the empirical modelling. The identification of these four factors as being distinct and constituent elements of attachment to Australian Indigenous culture is found to hold across different subsections of the population, as defined by age, gender and whether living in remote or non-remote Australia.

An analysis of the associations between these dimensions of culture and prior educational attainment and participation in a vocational training course confirms previous findings of a positive association between culture and participation in VET. This is then shown to extend to current participation in formal education. Importantly, positive associations between culture and engagement in education and training are found to apply not only to the participation dimension of culture, but extend also to cultural identification. The final empirical chapter investigates the possibility of different incentives for participating in education and training for Indigenous Australians with varying strengths of engagement with their culture and for those living in remote versus non-remote Australia. These

incentives – or returns – are measured in terms of the estimated effects of increased educational attainment on employment prospects and income.

Overall, the refinement of the measurement of cultural attachment and the additional empirical findings presented in this report provide stronger evidence of a causal effect, in which elements of Indigenous culture foster participation and achievement in vocational education and training. The formulation of education and training policy and curricula should not be undertaken with a mindset that sees traditional culture as something that Indigenous people need to ‘trade off’ in order to achieve better educational outcomes, but rather as something that should be drawn upon wherever possible to enhance their educational experiences and outcomes. The notable exception lies in the clear evidence that people whose first language is an Indigenous language face ongoing barriers to participation in VET and to labour market success. These arguments and other reflections on the implications of the findings are discussed in more detail in the concluding section.

Indigenous cultures and socioeconomic outcomes

This section reviews the existing literature and evidence that might contribute to our understanding of how Indigenous Australians' engagement with their culture may impact upon socioeconomic outcomes. The context in which the term 'culture' is used here, which relates specifically to indigenous cultures and their persistence within a 'mainstream' culture, is well encapsulated by the definition offered by Guiso, Sapienza and Zingales:

we define culture as those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation. (Guiso, Sapienza & Zingales 2006, p.2)

To this is added that these beliefs, customs and values are likely to be characterised by unique symbols, text and language, which in themselves play a role in distinguishing the group's distinctive identity (Throsby 2001).

A small literature exists in economics which attempts to relate differences in culture at the individual (micro) level and societal (macro) level to social and economic outcomes. A general deficiency in this literature, as highlighted by Guiso, Sapienza and Zingales (2006), is that few studies explicitly state the causal mechanisms through which culture is thought to impact upon outcomes. More often, observed differences in outcomes between nations, races or religious denominations are *ex poste* labelled as 'cultural' differences. The testing of *a priori* hypotheses of transmission mechanisms between culture and outcomes is clearly preferable to *ex poste* explanations. A review of this literature can be found in Dockery (2010), with a specific discussion of the relationship between Indigenous culture and educational outcomes in Australia in Dockery (2009). The review here will not go over that same ground, but will concentrate on the literature relating specifically to attachment to traditional culture for indigenous peoples living within an economically dominant 'mainstream' culture.¹

The key channel identified in this literature by which cultural attachment may impact upon outcomes, particularly those of disadvantaged Indigenous populations, is that of self-identity. According to Wexler (2009, p.267), who cites in support a number of studies relating to indigenous youth in North America, 'studies have consistently found robust correlations between positive affiliation and engagement with their culture and Indigenous young people's well being and resilience'. Houkamau and Sibley (2011, p.379) note that, for the Maori people of New Zealand, the positive effects associated with re-engagement with cultural roots are so well accepted that interventions to improve Maori outcomes are based upon a 'culture-as-cure' model, founded on international models for indigenous peoples.

Zimmerman et al. (1994) define enculturation as 'the process by which individuals learn about and identify with their traditional ethnic culture' (p.199) and 'an affirmation of one's heritage rather than a focus on fitting into the majority culture', which contrasts with acculturation, 'a process by which

¹ Dockery (2011), which looks at the impact of culture on a range of objective and subjective measures of wellbeing, is based upon the research undertaken for this report and utilises similar measures of culture to those developed here. Consequently, a similar literature review and discussion of the development of measures of the four separate dimensions of cultural attachment appears in that paper, with acknowledgment of the support provided by NCVER in funding this program of research. It should be stressed that 'traditional' culture does not imply a culture that has not changed, but one that has intergenerational roots in those past practices, beliefs and values.

an ethnic minority assimilates to the majority culture' (p.201). From a factor analysis of a small survey of Native American youth, they identify cultural affinity (pride and interest in traditional culture), family activities and Native American identity as components of enculturation. Some evidence is found that cultural affinity promotes self-esteem and that cultural identity combined with high self-esteem is a protective factor against alcohol and substance use, while cultural identity combined with low self-esteem is associated with higher risk of alcohol and substance abuse. Whitbeck et al. (2004) also find that enculturation guards against alcoholism among Native American Indians. Enculturation, they argue, provides resilience by preventing individuals from internalising the stress associated with historical loss and trauma.

Houkamau and Sibley (2011) note that the hypothesised enculturation effect for New Zealand Maori is most often attributed to resilience gained through positive cultural identity, but that little actual empirical evidence exists on the causal mechanisms. They propose that enculturation will have opposing effects on wellbeing. On the one hand, it will have a positive effect on personal wellbeing, through an increased sense of identity or 'embeddedness' with community and the access to networks and resources that this brings. In contrast, they predict enculturation will heighten awareness of the socioeconomic disadvantage and past traumas experienced by Maori as a group, leading to increased dissatisfaction with the state of the nation and society. Support for this 'opposing outcomes model' is found through a small, cross-sectional survey measuring wellbeing in personal and national domains, and employing an instrument developed to measure aspects of Maori cultural identity and engagement. Dockery (2010, 2011) finds a positive relationship between Indigenous Australians' attachment to their traditional culture and a diverse range of indicators. These cover health, school completion, being arrested, alcohol abuse and employment and include the independent positive effects of a measure of 'cultural identity' similar to the one developed in the following chapter upon subjective wellbeing (Dockery 2011).

Perhaps the most important evidence on the effect of culture and the critical intermediary role of self-identity has also been established in the work of the developmental psychologist, Michael Chandler, and his colleagues. While Chandler's most relevant work to this report (Chandler et al. 2003) relates to suicide rates among Canadian youth, the findings suggest a much more general, or intrinsic, role for a sense of persistence of the self in the psychological wellbeing of humankind, indigenous and non-indigenous alike, which has its parallels at the community level. A causal mechanism through which cultural attachment is believed to impact upon the outcome is clearly defined, *a priori*: cultural identification and preservation promotes a strong sense of persistence of self-identity through time, which in turn guards against suicide.

All individuals must deal, in one way or another, with the paradox of facing inevitable change through time and yet also persisting as the same person through time. In a program of research extending over ten years, Chandler and others have explored the different ways in which young people reconcile this paradox (see Chandler 2000 for a more philosophical discussion). Briefly, two main 'tracks' of strategy are identified which young people employ to reconcile the fact that they at once face immutable change but somehow persist as the same individual through time: Essentialist strategies and Narrative strategies. Essentialist strategies rely on finding some lasting core or attribute that stands outside, or 'defeats', time, such as one's DNA, fingerprints or soul, and therefore does not change. This allows individuals to identify themselves, or to understand how others identify them, as the same individual through time. In contrast, strategies in the Narrative track emphasise not what remains the same, but emphasise that by adopting these strategies change can be embraced: 'they take time seriously' (Chandler et al. 2003, p.38). Life is seen as a series of episodes or an unfolding story, and their

ancestral history, social class and the people around them, such as parents and teachers, contribute to the setting of their story.

In carefully controlled studies based on interviews with youth from Euro-American backgrounds, Chandler et al. showed a clear relationship between diagnosed suicide risk and the degree of sophistication of individuals' understanding of their identity persistence over time. Those lacking a coherent view of their persistence through time were far more likely to be assessed as high suicide risks, and those with more sophisticated views of their continuity far less likely. The relationship holds for both the Essentialist and Narrative tracks, but it was when the researchers began applying the same interview techniques to samples of indigenous youth that the Narrative track of strategies emerged. This was because, as their later studies validated, youth from Euro-American and middle-class backgrounds were far more likely to adopt Essentialist strategies, while Canadian aboriginal youth were far more likely to adopt Narrative strategies.

Suicide rates for aboriginal youth in British Columbia are reported to be 8.3 times higher for males and 20 times higher for females than for non-aboriginal youth (Chandler et al. 2003, p.54). This is not because the Narrative strategies are less effective in guarding against suicide than are Essentialist strategies, but because aboriginal youth are simply at greater risk of losing 'the thread that tethers together their past, present and future' (2003, p.2) and of losing a sense of control over their future outcomes. Indigenous cultures in Canada, as elsewhere, have suffered the undermining of their cultural norms and values, face an uncertain future and have lost empowerment over that future. Chandler et al. hypothesise 'continuity problems that work to undermine commitments to the future at all of these levels are jointly at work, not just in the lives of individual young persons but at the level of whole cultures' (2003, p.63), and this is borne out by evidence at the community level. Aboriginal communities for which there is evidence of a greater commitment to cultural continuity – in preserving a shared past and creating a collective future – are found to have significantly lower rates of youth suicide. The markers of commitment of cultural continuity included land claims, the extent of self-government, indigenous input into education, police and protective services and health, and the presence of specific cultural facilities. In later work, Hallett, Chandler and Lalonde (2007) found the proportion of the people fluent in an Indigenous language to be an even stronger marker of cultural persistence in communities and a strong predictor of youth suicide rates.

The clear implication is that cultural continuity at the community level helps the young members of that community to develop a stronger sense of persistence of their self-identity through time and safeguards them against losing their own sense of self-persistence. It is true that the outcomes relating to education and training, which are the focus of this study, are somewhat removed from the tragedy of youth suicide. The significance of Chandler's work for this study lies in its potential to provide an understanding of how cultural attachment promotes improved outcomes. If a strong sense of continuity of self-identity safeguards young people against taking their own lives, it may also have positive impacts in other domains in which people 'invest' in their futures, such as education, health, a career and relationships with family and community. The impact of losing that sense of self-continuity is likely to continue into adulthood: Chandler et al. speak of the 'expectation that young people who somehow lose the thread of their own and others' personal continuity in time will also behave in ways that show a lack of appropriate care and concern for their own future well-being' (2003, p.50). Indeed they are now collecting data on other indicators expected to be sensitive to cultural continuity, nominating school completion rates and academic achievement as two such variables.

Measuring culture

The empirical assessment of the relationship between culture and participation in education and training requires some measure of culture. The precursor to this report, Dockery (2009), relied on a factor analysis of a range of survey questions contained in the 2002 National Aboriginal and Torres Strait Islander Social Survey relating to respondents' engagement with cultural activities and networks. A single measure (the 'factor score') was generated from the dominant factor, which was then calculated for all individuals. There are a number of reasons to believe that such a measure may have significant limitations:

- The single measure of cultural attachment ignores the fact that culture is a rich concept and is likely to be multidimensional. Expanding the dimensions of cultural attachment included in the multivariate models may provide greater insight into the mechanisms through which cultural attachment provides an enabling effect – to help open up the 'black box' of cultural attachment.
- 'Cultural attachment' may have quite different meanings for different subgroups of Indigenous Australians, particularly by gender and remoteness. This suggests not only that the outcomes be modelled separately for each group, but that the generation of the measures of cultural attachment (that is, the factor analysis) be conducted separately for each group.
- On a technical point, the set of variables included for the factor analysis in the initial work contained a number of quite closely related variables, which can potentially be problematic in factor analyses.

Consequently, additional time is devoted here to investigating different dimensions of 'cultural attachment', again through factor analysis, and the applicability of such measures across different subgroups. The items relating to culture in the 2008 National Aboriginal and Torres Strait Islander Social Survey are not entirely the same as those contained in the 2002 data. Some significant new questions asked are the frequency with which individuals attend cultural events and the importance they attach to attending cultural events. Table 1 presents the list of variables included in the factor analysis, along with their means. Questions relating to attendance at cultural events were also asked with respect to sports carnivals and funerals. These have been omitted from the factor analysis following feedback on the earlier NCVET report questioning the cultural significance of sporting carnivals and pointing out that attendance at funerals may often be an obligation rather than a true reflection of individuals' preferences.

As with the 2002 data, there is one dominant factor with a high Eigenvalue; however, three other factors returned Eigenvalues of greater than 1 and, following that rule of thumb, are retained for further analysis (see table 2).

The loadings in the rotated coefficient matrix provide four readily interpretable factors, or elements of cultural attachment; henceforth termed participation, identification, language and traditional economic activities (or just traditional activities). Two points to note are that each individual element fits comfortably within our definition of 'culture', as relating to the unique values and preferences of Indigenous Australians, which may be characterised by unique symbols, text or language. Second, the identity factor, which is most strongly associated with recognising homelands, identifying with a clan, tribal or language group, and the importance to the individual and frequency of attendance at cultural events, is clearly a close parallel to the concept of self-identity, described in the literature as being pivotal to the mechanism through which enculturation affects outcomes for indigenous peoples

and to wellbeing more broadly. Cronbach's alpha, a measure of the internal consistency of the sub-components of the factors, shows acceptable levels for the participation, identity and language factors. The statistic suggests a borderline level of consistency between the fishing, hunting and gathering elements of the traditional economic activity factor, possibly due to the differing roles of men and women in these activities.

Table 1 Cultural variables included in exploratory factor analysis and weighted means

Variable	Mean
Speaks an Indigenous language at home	0.11
Speaks an Indigenous language	0.19
Identifies with clan, tribal or language group	0.62
Recognises homelands or traditional country	0.72
<i>Cultural events attended in past 12 months</i>	
Ceremonies	0.16
NAIDOC week activities	0.36
Festival or carnival involving arts, craft, music or dance	0.23
Involved with Aboriginal or Torres Strait Islander organisation	0.18
<i>Participated in cultural activities in past 12 months</i>	
Fishing	0.45
Hunting	0.22
Gathering wild plants or berries	0.16
ATSI arts or craft	0.17
Performed ATSI music, dance or theatre	0.11
Wrote or told ATSI stories	0.15
Importance of attending cultural events (1 very important, 2 important, 3 not important, 4 not important at all)	2.90
How often attends cultural events (1 = daily to 7 = less than once per year)	2.47

Notes: Number observations = 7823. Unless otherwise stated, all variables are binary (1 = yes, 0 = no) dummies. Means are weighted by the person weight provided by the Australian Bureau of Statistics (ABS). ATSI = Aboriginal and Torres Strait Islander.

Table 2 Rotated factor pattern, cultural variables

	Factor 1 Participation	Factor 2 Identity	Factor 3 Language	Factor 4 Traditional activities
Cultural events attended: festival	0.687	0.184	0.035	0.045
Participated in cult. activities: storytelling	0.638	0.121	0.139	0.155
Participated in cult. activities: performance	0.629	-0.007	0.209	0.126
Cultural events attended – Aboriginal organisation	0.628	0.284	-0.159	-0.049
Participated in cult. activities: art/craft	0.625	0.104	0.044	0.131
Cultural events attended – ceremonies	0.542	0.147	0.367	0.103
Cultural events attended – NAIDOC week	0.489	0.437	-0.252	-0.078
Recognises homelands or traditional country	0.037	0.784	0.145	0.081
Identifies with clan, tribal or language group	0.159	0.765	0.199	0.026
Importance of attending cultural events	0.363	0.640	0.098	0.221
How often attends cultural events	0.408	0.510	0.094	0.398
Speaks an Indigenous language at home	0.048	0.118	0.884	0.075
Speaks an Indigenous language	0.134	0.197	0.847	0.122
Participated in cult. activities: fishing	0.038	0.101	-0.090	0.839
Participated in cult. activities: hunting	0.119	0.117	0.400	0.691
Participated in cult. activities: gathering	0.417	0.058	0.330	0.507
Eigenvalue	5.048	1.896	1.257	1.127
Cronbach's alpha (standardised)	0.762	0.761	0.834	0.653

Notes: Derived using SAS factor procedure with the principal components and varimax rotation options; n = 7823. Questions on attendance at cultural events and participation in cultural activities relate to the past 12 months.

A number of steps were taken to explore the validity of these four factors in representing the constituent components of Indigenous cultural attachment and their comparability across different contexts. First, means for the factor scores are compared for a number of sub-populations: males and females, Indigenous persons living in remote and non-remote Australia, and three age cohorts: 15–30; 31–45; 46 years and over. Second, the factor analysis was undertaken separately for these same subgroups.

In table 3 the standardised factor scores from the original factor analysis are used to calculate mean values for each of the four factors across these groups. Each factor is standardised to have a mean of zero and standard deviation of 1. It can be seen that there are quite significant differences in cultural attachment between groups. While there are no significant differences in the remote and non-remote factor scores for participation, those in remote areas have, on average, significantly higher scores in terms of identification, language and engagement in traditional activities.

Table 3 Standardised cultural factor scores: means by remoteness, gender and age cohort

(a) Means for Indigenous people in remote and non-remote areas

Cultural factor	Mean, non-remote	Mean, remote	T-test (remote vs non-remote)
Participation	-0.02	-0.04	p=0.41
Identity	-0.21	0.39	p<0.01
Language	-0.27	0.59	p<0.01
Traditional activities	-0.20	0.50	p<0.01
Observations	5188	2635	

Notes: means calculated using ABS-provided person weights.

(b) Means for Indigenous male and females

Cultural factor	Mean, females	Mean, males	T-test (males vs females)
Participation	0.08	-0.14	p<0.01
Identity	-0.04	-0.08	P=0.11
Language	-0.08	-0.03	p<0.02
Traditional activities	-0.18	0.15	p<0.01
Observations	4443	3380	

Notes: means calculated using ABS-provided person weights.

(c) Means by age cohort

Cultural factor	Mean, aged 15–30 yrs	Mean, aged 31–45 yrs	Mean, aged 46+ yrs
Participation	-0.08***	0.08	-0.05***
Identity	-0.18***	0.10	-0.05***
Language	-0.09	-0.11	0.07***
Traditional activities	0.00**	0.07	-0.16***
Observations	3084	2424	2315

Notes: means calculated using ABS-provided person weights; ***, ** and * indicate significantly different to the mean for 31 to 45-year-olds, at the 1%, 5% and 10% level, respectively.

The most pronounced differences by gender are that Indigenous women are more likely to participate in cultural activities and events, while Indigenous men are more likely to participate in traditional economic activities. Compared with Indigenous persons aged 31 to 45 years, both younger and older persons display lower scores for participation, identity and traditional activities. The young, in particular, display markedly lower scores on the identity factor. For older Indigenous Australians, the

lower score on participation and traditional activities may reflect a reduced capacity to engage in these activities and events. Older persons score higher on the language factor.

The categorisation of geographic regions is of particular concern. Given that variation in geographic regions is likely to be coupled by variation in outcomes, a major limitation of the 2008 National Aboriginal and Torres Strait Islander Social Survey confidentialised unit record file (CURF) is that remoteness is categorised into only two levels. In contrast, the initial release of the CURF for the 2002 survey allowed separate identification of those in major cities, inner regional areas, outer regional areas and those in remote/very remote areas. Including Indigenous persons living in major cities and those in outer regional areas in one category is most certain to be problematic, although it is possible to further differentiate by geography within some states.

Along with variation in the degree of cultural attachment among subgroups, another important consideration is whether or not the conceptual meaning of 'culture' is consistent across these Indigenous populations. More specifically, for the methodology proposed here, the question is whether it is valid to see the four factors of participation, identity, language and traditional activities as being constituent components of 'culture' for Indigenous people across different contexts. To assess this, the factor analysis was run separately for the subgroups discussed above: Indigenous people living in remote and non-remote areas, males and females, and by the three age cohorts. The results are reported in appendix tables A1 to A3. For ease of comparison with the results for the full population as reported in table 2, the variables (rows) are kept in the same order as in table 2, and for each group the factors are reported from left to right in order of the highest Eigenvalues. Cells are shaded where that variable has the highest loading across the identified factors and that loading is 0.5 or greater.

If the factor pattern is similar to that in table 2, the shading should follow the same pattern, with the shaded blocks moving diagonally downwards from left to right. As it happens for all subgroups, there is one dominant factor – participation in cultural activities and events – with a high Eigenvalue of around 5 and three other factors with eigenvalues between 1 and 2. Importantly, for each subgroup the resultant factors do align with those designated above as participation, identity, language and traditional activities, and there are similar loadings with individual variables for those factors. There are some minor differences. For example, how often an individual attends cultural events has the highest loading on the identity factor in non-remote areas, but loads most heavily on traditional activities for those in remote areas. Thus attending such events seems to be similar to undertaking traditional activities for those in remote areas, but for those in non-remote areas is more complementary to expressions of identity, such as recognising homelands and identifying with a clan, tribal or language group. In remote areas, the identity factor also explains a lower proportion of variance in the pattern of responses across the cultural variables.

Overall, while there are differences in the ordering of the factors in terms of the variance explained, the similarity of variable loadings strongly suggests that the factors are valid and consistent measures of different aspects of 'cultural attachment' across main groupings of the population. This suggests that the same measures can be used when modelling outcomes for these different subgroups. However, when including all groups together, there may be grounds for standardising the measures within groups. For example, table 3a shows that Indigenous people in remote areas tend to have much higher scores for the identity factor. Hence, it may be that a measure of 'strong cultural identity' should be based on a lower factor score for people in non-remote areas than for those in remote areas.

Specification of culture variables

Following from these results, there are several options for generating variables that capture the four dimensions of cultural attachment. One is to use all the variables included in the factor analysis and derive factor scores for each individual based on the coefficients reported in table 2. A second option is to base the variables only on the highly loading variables for each factor, again using the factor loadings as weights to derive the final variable. A third option is to base the variables only on the highly loading variables, but to use discretion in the weights applied rather than the factor loadings. This latter option is perhaps the least ‘technically’ correct but has the advantage of providing a much more straightforward and intuitively appealing interpretation of the constructed variables than is the case with factor scores. It is considered justifiable given the clear empirical and intuitive differentiation between the highly correlated and lesser correlated variables. The case in point is the language factor. Two variables stand apart from all others in correlating highly with this factor: speaking an Indigenous language at home and speaking an Indigenous language. Having identified language as a distinct component of cultural attachment, it makes sense simply to capture this factor through these two variables.

Variables measuring each of the identified elements of cultural attachment are constructed as follows:

- *Participation*: as shown in table 2, there are strong correlations between the first seven variables listed, with coefficients ranging from 0.69 to 0.49. From these an index ranging from 0 to 7 is calculated and represents the number of such events the respondent participated in or attended in the past 12 months. Four dummy variables based on the value of this index are derived and represent the level of cultural participation: strong (5 or more), medium (2 to 4), weak (1 only) and minimal (zero). These values are chosen so that the dummy variables, as best as possible, translate to quartiles of the distribution for the index.
 - Attendance at NAIDOC week celebrations has the weakest correlation with these, and this also correlates reasonably strongly with the identity factor. The attendance at NAIDOC week events has been retained to contribute to the participation variable, but it is acknowledged that a case could be made to omit it.
- *Identity*: the variable ‘how often attends cultural events’ loads heavily on the identity factor, but also with the participation factor. Intuitively it would also seem more closely aligned with participation. Three variables are used to capture the cultural identity factor: recognition of homelands or traditional country, identification with a clan, tribal or language group and the importance the individual attaches to attending cultural events. Importantly, each of these can be considered relatively fixed personal traits and not subject to the problem of ‘endogeneity’, whereby outcomes may actually cause variation in these variables. Better health or getting a job, for example, may enable participation but would be unlikely to impact upon these indicators of cultural identification. This is a further consideration in not including how often an individual attends cultural events in the measurement of the identity factor. The importance of attending cultural events is transformed to a dummy variable equal to 1 if the individual responded ‘very important’, and zero otherwise. The three variables are then summed, giving an index ranging from 0 to 3. This is converted into four dummy variables of strong (index = 3, that is, recognises homelands, identifies with group and sees attendance at cultural events as very important), moderate (index = 2), weak (index = 1) and minimal (index = 0).

- *Language*: two dummy variables are entered to capture language: speaks an Indigenous language at home, and a mutually exclusive variable for those who do speak an Indigenous language but not as the main language spoken at home.
- *Traditional economic activities*: this is captured by a dummy variable taking on a value of 1 if the individual undertook any of the activities of fishing, hunting or gathering, and zero otherwise.

Culture and the Stolen Generation

In work with the 2002 National Aboriginal and Torres Strait Islander Social Survey, an attempt was made to utilise the ‘exogenous’ variation in cultural attachment associated with being a member or descendant of the Stolen Generation in an instrumental variables model to address the challenge of endogeneity in the estimated effects of cultural attachment on participation in education and training. However, members of the Stolen Generation were found to have stronger cultural attachment, after controlling for the basic characteristics of age, gender and remoteness. This was contrary to the expectation that the forced removal of children from their families would result in a severance in cultural ties and, hence, in lower measured cultural attachment. Given the uncertainty in how to interpret the differences in measured cultural attachment between the two groups, the approach of using this variation as an instrument was not pursued.

Having moved from a uni-dimensional measure of cultural attachment to a multidimensional one that encompasses the separate factors of participation, identity, language and traditional economic activities, it is possible to further explore this unexpected finding of the stronger cultural attachment of the members and descendants of the Stolen Generation. In the 2008 National Aboriginal and Torres Strait Islander Social Survey, respondents are asked whether they or any of their relatives had been removed from their natural families by welfare or the government, or taken away to a mission. Where applicable, they are then further asked which of their relatives had been removed. Here, membership of the Stolen Generation is extended to include those who indicated that they were removed themselves and those who indicated their siblings, parents or grandparents had been removed. Note that the interviewers first checked with respondents to determine whether it was appropriate to ask them questions on this topic; those who preferred not to answer these questions are omitted from the analysis.

One-third of respondents to these questions were classified as being of the Stolen Generation (including descendants). Table 4 shows the means between the groups for the constructed measures of the four different aspects of culture. This richer picture of the constituent elements of ‘cultural attachment’ now casts some light on the previous finding. A straight comparison of means reveals that the Stolen Generation are much less likely to speak an Indigenous language at home, or to speak an Indigenous language at all, but they are more likely to participate in cultural events and to have a stronger sense of identity. The finding with respect to identity also holds with respect to the individual components of the index: those of the Stolen Generation are more likely to report recognising their homelands, identifying with a clan, tribal or language group and considering it important to attend cultural events. There is no difference with respect to participation in traditional economic activities.

Table 4 The Stolen Generation and cultural attachment

Cultural variable	Variable range	Means		t-test for $\mu_1-\mu_2$ (signif.)
		Not Stolen Gen. (n = 4651)	Stolen Gen. (n = 2292)	
Participation (number of events)	0 to 7	1.21	1.84	<0.001
<i>Language</i>				
Speaks Indigenous language at home	0/1	0.16	0.06	<0.001
Speaks an Indigenous language	0/1	0.24	0.19	<0.001
Identity	0-3	1.63	1.99	<0.001
Traditional economic activities	0/1	0.51	0.52	0.157

These results hold when remoteness, gender and age are controlled for through simple regression modelling, and in these models those of the Stolen Generation are also found to be more likely to engage in traditional economic activities. It seems that forced removal led to discontinuation of Indigenous languages; however, on all other factors it has led to greater cultural attachment. One explanation may be that the sense of loss and injustice felt by members of the Stolen Generation has resulted in their taking active steps to re-engage with their culture, possibly as a means to address the internalisation of associated stress and trauma, and that this has more than compensated for any initial severance of cultural engagement and identity. However, it is also possible that the results are influenced by a selection effect: those who engage with their culture and pursue cultural identification may be more likely to know of their past and hence more likely to identify as members or descendants of the Stolen Generation.

Culture and participation in VET – validation of findings from the 2002 National Aboriginal and Torres Strait Islander Social Survey

The key finding of the previous study (Dockery 2009) was of a positive association between Indigenous peoples' engagement with their traditional culture and educational attainment and recent participation in training. Analyses of the field of study in education and of the type of VET course undertaken suggested that this arises as a consequence of both an enabling effect of cultural engagement and from Indigenous people utilising the VET system in cultural pursuits. Before exploring the relationships between culture and current participation in VET, and between cultural attachment and the returns from education, it is of interest to revisit these relationships. In part this is simply because the 2008 survey provides a second source of data with which it is possible to validate these unique findings. More importantly, the more nuanced measures of cultural attachment may shed greater light on the nature of the causal relationships between Indigenous culture and participation in education and training. As highlighted in the literature review, of particular interest in this regard is the independent effect of the dimension of cultural identity, as opposed to the dimension of participation, where these had previously been subsumed within a composite measure of 'cultural attachment'.

Educational attainment

The dependent variable for highest level of educational attainment is specified as a continuous variable taking on discrete values from 1 to 7, representing the following ordered categories:

- postgraduate degree
- university degree
- diploma/associate diploma
- certificate III/IV
- Year 12 or equivalent
- Year 10 or equivalent, including certificate i/ii and certificate not defined
- Year 9 or lower (including 'did not go to school').

Given the nature of this variable, an ordered probit model is estimated, with the cultural variables described above included as explanatory variables. The set of other explanatory variables is restricted to those that can reasonably be considered 'exogenous' to the relationship being studied between culture and the outcome variable: gender, age, remoteness, marital status and having experienced removal of, or from, natural families. This is because the main interest is in the 'gross' relationship between culture and the dependent variables, not the residual effect once potentially mediating variables are controlled for. By way of example, we could include financial prosperity as an explanatory variable, but to the extent to which cultural attachment may influence financial

prosperity, we want this full effect to be captured in the coefficients on the cultural variables. The sample used for estimation is restricted to persons aged 25 and over, as many younger people will still be en route to their highest level of educational attainment.

The results are presented in table 5. As would be expected, there are very strong cohort effects, with younger cohorts of Indigenous Australians achieving higher-level qualifications, and this applies to both remote and non-remote areas. The definition for removal from natural family applied is all those who were themselves removed, or who had parents, grandparents/great-grandparents or siblings separated from their natural families. The results suggest that in remote areas those from the Stolen Generation, defined this way, achieved marginally higher educational attainment.

Turning to the cultural variables, participation in cultural events and activities seems strongly correlated with the achievement of higher levels of education. Caution needs to be taken in interpreting these results, as this association is the most likely to arise either from reverse causation or omitted variable bias. Reverse causation refers to the possibility that those with higher levels of education may be more inclined to engage in their culture. An omitted variable bias would arise if some other attribute that has not been controlled for in the model, possibly motivation, causes an increase in both educational attainment and cultural participation. The results for other cultural dimensions are less susceptible to this problem and, as noted, the identity measure is carefully constructed to minimise this effect. Strong cultural identity is found to be associated with higher educational attainment, relative to those with minimal cultural identity. Separate estimation for the samples in remote and non-remote Australia indicates that this association applies only in non-remote areas.

Speaking an Indigenous language is clearly associated with lower educational attainment, and this effect is most pronounced for Indigenous people for whom an Indigenous language is the language spoken at home. If a variable indicating that the individual has difficulty communicating in English language is included, it also has a strong negative association with educational attainment, but accounts for only a small proportion of the results observed for speaking Indigenous languages. Engagement with traditional economic activities is associated with higher educational attainment, and this applies primarily in remote areas.

An alternative specification for educational attainment was tested, whereby the dependent variable was specified as a linear variable representing the number of post-primary years of education completed. The results are robust to this alternative specification. It is important to note that, because of the coarse classification of geographical location into only remote and non-remote, the positive associations with traditional culture can confidently be expected to be understated (and negative associations overstated). Most obviously, the incidence of speaking an Indigenous language at home is far higher in remote areas, where access to education has historically been, and continues to be, far more limited.

To allow for possible differential effects by gender, the models are estimated separately by remoteness and gender. For brevity, only the results for the culture-related variables are presented, and these can be found in appendix table A4. The full set of regressors shown in table 5 was included in these models. The association between participation in cultural events and activities seems to apply uniformly across these groups, as does the barrier to educational attainment that arises from speaking an Indigenous language at home. The positive relationship between stronger cultural identity and educational attainment appears now to be limited not just to non-remote areas, as was observed in table 5, but specifically to females in non-remote areas.

Table 5 Highest level of education attained: probit results

Parameter	All		Non-remote		Remote	
	Coefficient	Sign.	Coefficient	Sign.	Coefficient	Sign.
Remote	-0.39	***				
Male	-0.07	**	-0.01		-0.18	***
Married	0.18	***	0.22	***	0.10	*
Age: 25–34 years	–		–		–	
35–44 years	-0.04		-0.07		0.02	
45–54 years	-0.17	***	-0.17	***	-0.17	**
55–59 years	-0.43	***	-0.36	***	-0.63	***
60–64 years	-0.71	***	-0.56	***	-1.10	***
65 years and over	-1.06	***	-0.86	***	-1.61	***
Removal from natural family	-0.01		-0.06		0.13	**
<i>Cultural participation</i>						
Strong	0.72	***	0.74	***	0.64	***
Moderate	0.43	***	0.47	***	0.35	***
Weak	0.11	***	0.14	***	0.02	
Minimal	–		–		–	
<i>Cultural identity</i>						
Strong	0.11	**	0.16	***	-0.06	
Moderate	0.04		0.06		-0.14	
Weak	-0.06		-0.07		-0.13	
Minimal	–		–		–	
<i>Indigenous language</i>						
Speaks at home	-0.51	***	-0.60	***	-0.47	***
Speaks	-0.07		0.00		-0.14	*
Traditional activities	0.09	***	0.06		0.18	***

Observations	5707		3751		1956	
Log likelihood	-8612	***	-6016	***	-2538	***

Notes: ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.
Six intercept terms (not reported) all significant at the 1% level.

Education by field of study

Analysis of the 2002 data found some significant differences in the fields of study of those with post-school qualifications. Those Indigenous persons with stronger measured cultural attachment seem to have been drawn to study in the fields of ‘education’ and ‘society and culture’ and less likely to gain qualifications in the fields of ‘food, hospitality and personal services’ and ‘engineering and related technologies’. The 2008 survey again classifies field of highest educational qualification into 12 different categories. The most common fields reported for individuals’ highest post-school qualification were ‘management and commerce’, ‘society and culture’, ‘engineering and related technologies’ and ‘health’.

To investigate the cultural effects on field of qualification, 12 corresponding binary logit models were estimated for the probability of the individual having completed their qualification in each field among those who have gained post-school qualifications. In addition to the cultural variables, these were conditional upon a set of basic controls: gender, age and level of qualification. Rather than report the full results of all these models, table A5 summarises the results pertaining to the four sets of variables that capture different elements of cultural attachment for each of the 12 fields of study.

The estimated coefficients on the cultural variables are presented only when significantly different from zero at the 10% level, and the coefficients are presented in odds ratio form.

Broadly speaking, the findings observed for the 2002 data hold, with the added dimensions of cultural attachment providing a richer picture. Indigenous people who participate in cultural events are more likely to have completed their highest qualification in fields of ‘management and commerce’, ‘society and culture’ and, to some degree, ‘education’ but much less likely in the field of ‘engineering and related technologies’. The measure of cultural identity has few clear associations. In direct contrast to cultural participation, stronger cultural identity is associated with being less likely to have qualifications in ‘management and commerce’. Surprisingly, cultural identity seems unrelated to the likelihood of having gained qualifications in ‘society and culture’ and, along with speaking an Indigenous language, is the main factor for the previously observed negative association between culture and having gained qualifications in ‘food, hospitality and personal services’. Stronger cultural identity is positively associated with the likelihood of having gained the highest qualification in the field of ‘agriculture, environment and related studies’, as is participation in traditional economic activities. It seems somewhat surprising that participation in traditional economic activities is positively associated with completing studies in the fields of ‘engineering and related technologies’ and ‘agriculture, environment and related studies’, yet negatively associated with completing qualifications in ‘society and culture’ and ‘creative arts’.

Finally, speaking Indigenous languages is associated with the completion of studies in the fields of ‘health’ and ‘education’, possibly due to people speaking such languages being more likely to enter careers in which they provide these services to other Indigenous people. It must be noted that caution needs to be taken in interpreting such results, since the studies will have been completed in the past, while the cultural variables are measured contemporaneously. Many of the observed relationships could also be driven by differences in remoteness, but remoteness has not been controlled for because we do not know whether the individual’s remoteness status applied at the time they completed their highest qualification. Further, caution needs to be exercised in interpreting the results for the fields of ‘natural and physical sciences’ and ‘information technology’, as the low count of people nominating those fields makes the validity of the fitted model questionable in those cases. (Note the estimation sample for these models was restricted to the 2689 individuals who reported having a post-school qualification; the number reporting each field of qualification is reported in appendix table A5.)

Participation in training

Participation in vocational training is captured by a binary variable based on whether or not the respondent indicated they had completed any training in the past 12 months for the purposes of work or to get a job. The sample for analysis includes all persons aged 15 to 64, but those who are still in school are excluded. The results (table 6) are presented in the form of odds ratios. The odds ratio of 0.65 for the remote variable in the first model, for example, indicates that on average an Indigenous person in a remote area is 35% (or $1 - 0.65$) less likely to have completed a vocational training course in the past 12 months than someone in a non-remote area, while a 20 to 24-year-old (odds ratio of 1.21) is 21% more likely to have completed a course than someone from the omitted category of 25 to 34-year-olds.

Key determinants of participation in vocational training relate to educational attainment and labour force status. Indigenous people with higher educational attainment are much more likely to have participated in training in the past year, as are persons in full-time employment compared with those in part-time employment. Persons outside the labour force are most unlikely to have participated in

training, and the unemployed are only around one-third as likely to have participated in training as those in full-time employment. Having been affected by the policies of removing children from their natural families seems to be positively associated with undertaking work-related training.

Turning to the dimensions of cultural attachment, active participation in cultural events and activities again has a large positive association with participation in training. Stronger cultural identification is also associated with having participated in training and, as with educational attainment, this effect of identity appears to be limited to those living in non-remote areas. Speaking Indigenous languages is associated with a much lower likelihood of having completed vocational training in the past year. This seems to be an effect over and above that associated with limited English proficiency. Engaging in the traditional economic activities of fishing, hunting or gathering has a modest positive association with having completed a training course for those in non-remote areas.

Results for the cultural variables from models estimated separately by gender and remoteness are reported in appendix table A6. As with educational attainment, it seems that the outcomes are most sensitive to cultural attachment for females. There is a very large association between cultural participation and completion of a training course for females, irrespective of location, and for males in non-remote areas. Stronger identity with traditional culture is important for males and females in non-remote areas, but the effect is greater for females. Participation in traditional economic activities is also associated with a greater likelihood of having completed a course for both genders, but in non-remote areas only. Speaking an Indigenous language at home seems to reduce the chance of having completed a course, irrespective of gender or location.

Table 6 Probability of having completed a vocational training course in past 12 months: logit model estimates (odds ratios)

Parameter	All		Non-remote		Remote	
	Odds ratio	Sign.	Odds ratio	Sign.	Odds ratio	Sign.
Remote	0.65	***				
Male	1.00		0.96		1.09	
Married	1.06		1.01		1.24	*
Age: 15–19 years	1.13		1.12		1.11	
20–24 years	1.21	*	1.17		1.24	
25–34 years	–		–		–	
35–44 years	1.03		1.06		0.95	
45–54 years	1.02		1.05		0.90	
55–59 years	0.65	***	0.61	***	0.74	
60–64 years	0.74		0.88		0.47	*
Removal from natural family	1.21	***	1.13		1.33	**
Has English difficulties	0.75		0.83		0.75	
<i>Educational attainment</i>						
University degree	2.66	***	2.75	***	2.40	***
Diploma	3.00	***	3.37	***	1.87	**
Certificate III or IV	1.87	***	1.76	***	2.34	***
Completed Year 12	1.44	***	1.53	***	1.27	
Year 10/cert. I or II	–		–		–	
Year 9 or lower	0.86	*	0.84	*	0.87	
<i>Labour force status</i>						
Employed full-time	–		–		–	
Employed part-time	0.61	***	0.65	***	0.51	***
– and CDEP (main job)	0.67	***	1.11		0.61	***
Unemployed	0.34	***	0.38	***	0.26	***
Not in labour force	0.08	***	0.09	***	0.05	***
<i>Cultural participation</i>						
Strong	1.87	***	1.85	***	1.52	*
Moderate	1.46	***	1.64	***	1.12	
Weak	1.21	**	1.22	**	1.08	
Minimal	–		–		–	
<i>Cultural identity</i>						
Strong	1.31	**	1.52	***	0.88	
Moderate	1.44	***	1.38	***	1.24	
Weak	1.05		1.04		0.94	
Minimal	–		–		–	
<i>Indigenous language</i>						
Speaks at home	0.43	***	0.33	**	0.55	***
Speaks	0.76	**	0.75	*	0.84	
Traditional activities	1.11		1.22	***	0.84	

Observations	6764		4471		2293	
Log likelihood	2090	***	1368	***	623	***

Notes: ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.
CDEP = Community Development Employment Program.

Type of training completed

For those who completed vocational training in the past 12 months, the type of training undertaken was recorded under ten separate categories with an ‘other training’ category. Ignoring this last

category, by far the most common type of training reported was 'health and safety training'. Other common types included 'computer and office training', 'management/supervision training' and 'trade or labouring training'. Models similar to those reported in table 6 were estimated, where the dependent variable is the probability of having completed that particular type of training. As with fields of qualification analysed above, there is a large number of models estimated and the same approach as before is taken: reporting only a summary table of coefficients for the cultural variables and their associated significance levels (see bottom panel, table A5).

In a number of respects the estimation of these models and the interpretation of the results for the type of vocational course completed are more straightforward than is the case for field of study of highest qualification. The first difference to note is that the types of training categories are not mutually exclusive, as people could have completed multiple training courses. Hence the effect of one factor, such as cultural identity, does not have to be interpreted as being in competition with other types of training – a large positive association with one type of training does not necessitate negative associations with other types. Second, because the outcome variable is a recently determined one, as opposed to an historical one, it is more reasonable to include other contemporaneously measured variables among the explanatory variables. Hence the number of explanatory variables can be expanded, as in table 6, and, importantly, this includes controls for remoteness and employment status.

Greater cultural participation is found to be associated with a greater likelihood of completing a range of types of training: 'management/supervision training', 'computer or office training', 'literacy training', 'numeracy training' and 'music, art or craft training'. In contrast, among those completing a vocational training course, a greater degree of cultural participation reduces the likelihood of completing 'trade or labouring training' or 'transport, plant and machinery operation training'. One potential interpretation of this result is that cultural participation is associated with the pursuit or accumulation of general training. 'General training' is used here in the spirit of Becker (1964), as being training which would increase the trainee's productivity in many firms and contrasts with specific training, which is only likely to increase productivity in the host or training firm. Clearly, literacy and numeracy training represent general training (or education); similarly, management training and computer training may be expected to be largely general in nature. Training in machine operation is more likely to be specific to a particular firm or occupation, as perhaps trade and labouring training may be. Such a pattern of findings may arise if general training is relatively more common in those jobs which Indigenous people hold as a result of their cultural obligations, knowledge or connections, such as in community governance and administrative roles. Such cultural 'capital' would be less likely to lead to jobs where there is a relatively greater focus on technical training.

Based on these findings, a tentative hypothesis is put forward, that stronger participation in Indigenous cultural activities goes hand in hand with engagement in general training, as opposed to specific training. Even if this were to be so, however, a number of potential interpretations are possible and this could not be taken to imply that cultural participation has a causal effect on participation in general vocational education and training. Unobserved individual traits, such as motivation or common peer-group effects, may drive both participation in cultural events and general training. Indigenous people may utilise training to engage in their culture or training itself may facilitate participation in cultural activities. Certainly the finding with respect to 'music, art or craft training' is consistent with Indigenous Australians drawing upon the VET system as one avenue to pursue their cultural interests. This is further reinforced by a strong positive association between speaking an Indigenous language at home and having completed 'music, art or craft training'.

As with previous work, these endogeneity issues would seem to preclude identification of an enabling effect, in which cultural attachment, when measured on the basis of active participation, promotes better vocational outcomes. However, the separate measurement of the cultural identity factor now does provide evidence of such an enabling effect of culture. Stronger identification – recognising homelands, identifying with a tribal or language group and seeing attendance at cultural events as very important – is very strongly associated with a greater propensity to complete numeracy training and, to a lesser extent, literacy training. This evidence is now strongly suggestive of a causal effect running from Indigenous cultural identification to engagement in vocational training, and hence one likely to improve outcomes in the mainstream labour market and other life domains. Although the reported odds ratios are very large, for example, those with stronger cultural identity being estimated to be around seven times more likely to have completed numeracy training, it should be remembered that this is from a low base. Literacy training was the type of course for only around 6% of those who completed a VET course. Positive associations are also observed between cultural identification and ‘trade or labour training’, ‘transport, plant and machinery operation training’ and ‘health and safety training’.

Cultural identity is negatively associated with training in ‘sales and personal service training’. Taken with the negative effect of cultural identity on the likelihood of completing (highest) post-school qualifications in ‘management and commerce’ and ‘food, hospitality and personal services’, this may reflect some inconsistency between the behaviours expected in Western capitalism models of business and sales, and Indigenous cultural values and relationships.

Among results not reported, for those who completed a VET course in the past 12 months, working in a Community Development Employment Program (CDEP) job significantly reduces the likelihood of that training having been ‘occupational health and safety training’. Otherwise no other impacts of the Community Development Employment Program and type of training undertaken are identified. It is also noteworthy that those with English language difficulties who completed training do not display a higher propensity for that training to have been ‘literacy training’.

Current participation in education

The previous sections and the analysis of the earlier (2002) National Aboriginal and Torres Strait Islander Social Survey data concentrated on two main indicators of VET outcomes: highest level of education attained and whether or not the individual had completed a VET course in the 12 months leading up to the survey. A further potential indicator is *current* participation in education. As with educational attainment, for a variety of possible reasons a positive association is to be expected between participation in education and the participation dimension of culture. As higher educational attainment is generally seen as a successful socioeconomic outcome, and participation in education an investment in the future, the evidence reviewed earlier would also suggest that stronger cultural identity may promote school retention, educational achievement and subsequent participation.

There were slight differences in the wording of the survey questions relating to current participation in education in remote and non-remote areas. In remote areas, the individual was asked ‘Are you currently studying for a trade certificate, diploma, degree or any other educational qualification?’ In non-remote areas, the question was worded ‘Are you now studying at a school, college, TAFE, university or some other school?’ For the ages 15 to 24 years, the proportion of Indigenous Australians who reported to be currently studying in formal education is shown in figure 1. Those in school are included, and hence school retention is an important component of the figures up until around age 17. Current participation is estimated to drop from around 92% for 15-year-olds, to around one-quarter of people aged 20, and both school retention and post-school participation are lower in remote areas. The apparent rebound in the estimated participation rate in non-remote areas after the age of 22 is likely to be a result of ‘noise’ in the data, as the figures are calculated using the person weights. Overall, the participation rate is around 13% for persons in their 20s, and beyond this just under 10% for those aged from 30 to 55, and dropping off to close to zero for those aged 65 years and over.

To analyse the factors affecting current participation, the probability of being currently enrolled in formal education is modelled for all persons aged 15 and over. Given that the bulk of participation in formal education occurs in the years up until age 24, it could be argued that participation should be modelled separately for this group, as the results for a younger group hold most policy relevance. It is also problematic to include highest level of education attained among the explanatory variables, as most observations relate to individuals still in the process of achieving those education qualifications. As it turns out, however, the results for the parameters of most interest are quite consistent, whether the estimated sample is youth (aged 15–24) or the full adult sample. In preference to reporting multiple sets of results, only the results for the full sample are presented, and results specific to 15 to 24-year-olds are noted where there are significant variations. The key findings are also robust to the inclusion of variables for prior educational attainment in these models.

Similarly, the labour force status variables are largely redundant, although these might well be included if one was looking separately at participation among older cohorts. Consequently, a reduced form model is estimated with basic demographics and with a more detailed breakdown of age to take account of the school and post-school pathways. This is in the form of a binary logit model of the likelihood of the individual currently participating in formal education.

Figure 1 Participation rate in formal education by age, 15 to 24-year-olds, 2008 NATSISS



Notes: Proportions calculated using person weights provided by the ABS.

The strong link between age and participation in formal education is clear from the estimated odds ratios (see table 7). The results also show the likelihood of participating in education to be lower in remote areas (by around 40%), for males (by around 20%), and for those with English language difficulties and who speak Indigenous languages. When the models are estimated only for youth (aged 15–24), the main difference is that the participation rates are not significantly different for males and females, and thus the higher level of participation for females occurs primarily within older cohorts.

For Indigenous persons living in both remote and non-remote areas, there is a very strong association between participation in cultural events and participation in formal education. Those who reported participating in five or more cultural events in the past 12 months were around 30% more likely to be participating in education than those who had not participated in any cultural events, and the likelihood of being enrolled in education seems to increase roughly directly with the number of cultural events participated in. This association may be largely or wholly driven by omitted variables, such as motivation. However, a positive association between cultural identity and educational participation is identified, and this is in addition to that associated with cultural participation. This effect is much stronger in remote areas, where those with strong or moderate cultural identity are estimated to be around twice as likely to be enrolled in formal education as those with minimal identity. Moreover, this result holds when the sample is restricted to persons aged 15 to 24 years. Again, it is more difficult to dismiss the hypothesis that the results pertaining to cultural identity are indicative of an enabling effect of cultural attachment on educational retention and participation later in life. Following from the work by Chandler and others, this association might be driven not only by individual-level effects, but also by community-level effects. Individuals may have both a stronger sense of cultural identity and achieve better educational outcomes if they live in communities with a stronger commitment to cultural continuity. This may also explain the stronger relationship observed in remote areas, where community-level variation will be most pronounced.

Table 7 Probability of being enrolled in formal education at the time of the survey: logit model estimates (odds ratios)

Parameter	All		Non-remote		Remote	
	Odds ratio	Sign.	Odds ratio	Sign.	Odds ratio	Sign.
Remote	0.58	***				
Male	0.81	***	0.89		0.63	***
Married	0.81	**	0.73	***	1.14	
Age: 15 years	9.35	***	6.50	***	22.82	***
16 years	2.51	***	1.99	***	4.82	***
17 years	–		–		–	
18 years	0.51	***	0.50	***	0.52	
19 years	0.23	***	0.19	***	0.40	**
20 years	0.23	***	0.18	***	0.45	
21–24 years	0.14	***	0.12	***	0.19	***
25–29 years	0.10	***	0.08	***	0.18	***
30–34 years	0.08	***	0.07	***	0.13	***
35–44 years	0.07	***	0.06	***	0.14	***
45–54 years	0.06	***	0.06	***	0.07	***
55–64 years	0.04	***	0.03	***	0.08	***
65 years and over	0.00	***	0.00	***	0.01	***
Removal from natural family	0.99		0.97		1.11	
Has English difficulties	0.54	*	0.80		0.56	*
<i>Cultural participation</i>						
Strong	4.20	***	5.04	***	2.70	***
Moderate	1.99	***	2.28	***	1.52	**
Weak	1.51	***	1.52	***	1.51	**
Minimal	–		–		–	
<i>Cultural identity</i>						
Strong	1.32	**	1.22		2.10	**
Moderate	1.17		1.07		1.96	**
Weak	1.06		1.05		1.31	
Minimal	–		–		–	
<i>Indigenous language</i>						
Speaks at home	0.66	**	0.69		0.73	
Speaks	0.75	**	0.58	***	1.06	
Traditional activities	0.85	**	0.88		0.70	**
Observations	7634		5096		2538	
Log likelihood	1925	***	1416	***	465	***

Notes: ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.

The returns from education and training

For a number of reasons, undertaking education and training is expected to lead to improved labour market outcomes. This is most commonly expressed in terms of the Human Capital Model (Becker 1964), in which participation in education and general skills formation is seen to improve individuals' productivity and thereby enhance their employment prospects and the wage they command. In addition to any such direct productivity effects, higher educational attainment and the acquisition of formal qualifications signal individuals' abilities to employers and assist those individuals to negotiate the requirements for entry into occupations and further progression along career pathways.

It is therefore expected that, all other things equal, individuals with higher levels of educational attainment will be more likely to participate in the labour market and, once participating, be more likely to secure employment and earn higher wages than those with lower levels of formal educational attainment. Each of these associations with educational attainment can be seen as forms of returns from – or benefits from – education and training, although the term 'return from' is most commonly used in reference to financial rewards.

The return from education is particularly pertinent to the issue of Indigenous disadvantage in education and training. It has been argued that one of the main reasons for lower rates of school retention to Year 12 and lower participation in post-school education and training observed for Indigenous people in remote Australia is that there is a limited return associated with undertaking education and training in these areas. While enhancing human capital may often be seen as the key to addressing socioeconomic disadvantage, it has been argued that it will be of limited relevance in remote communities, which have little in the way of a formal labour market (see Austin-Broos 2011, p.109). A similar argument might be formulated that attachment to Indigenous culture and traditional lifestyles may stifle incentives for educational attainment. As mainstream education generally does not teach traditional Indigenous knowledge or law, nor impart skills useful for traditional economic activities, those who place relatively more emphasis on fulfilment in these areas relative to mainstream economic outcomes may be expected to see less relevance in the attainment of formal qualifications in the mainstream education system.

These hypotheses are investigated through three sets of models: a labour force participation model, an employment model and an income equation. The labour force participation model is estimated for all persons aged 15 to 64 years who have left school; it estimates the probability of being in the labour market (that is, either employed or unemployed), as opposed to not being in the labour market at the time of the survey. The employment model estimates the probability of an individual being employed conditional upon participating in the labour market; that is, the probability of being employed as opposed to unemployed. As the dependent variables for the participation and employment models are dummy variables, binary logit models are used for the estimation. The income equation models personal gross weekly income from all sources for persons in full-time work. The approach taken in modelling income requires some explanation and justification and is discussed in more detail below.

Participation and employment

As different variables are known to have differing impacts upon labour force participation for males and females, all participation models are estimated separately by gender. The presence of dependent children, and particularly children of preschool age, is one such factor, and typically has a very strong negative effect on participation for women. In the National Aboriginal and Torres Strait Islander Social Survey data, there is no definitive indicator of whether or not an individual is living with their own dependent children or of the age of their dependent children. Instead, as best as is possible with the available variables relating to family type and the individual's position in the household, people are classified into four categories: married with dependent children aged 0 to 15; married without dependent children; single with dependent children; and single without dependent children. This risks incorrectly classifying some persons but, given the importance of this factor to labour force participation, it is considered preferable to include these additional variables in the participation model. A variable for whether or not the individual has a disability which restricts their employment is also included.

The effect of educational attainment is captured through a proxy for the number of years of education the individual has completed. No information is available on primary school attendance, so this relates only to post-primary education. One year of education is attributed to each year of high school completed, and additional years of education are attributed according to the highest non-school qualification held. One-half of a year is assumed for completion of a certificate level I/II or certificate 'not further defined', one year for a certificate level III/IV, two years for an advanced diploma/diploma, three years for a bachelor degree and five years for postgraduate qualifications. The resulting years of post-primary education variable ranges from zero to 10, and has a mean of 3.4 for the estimation sample (3.6 for Indigenous people living in non-remote areas and 3.1 in remote areas). The same set of independent variables is included in the participation models (table 8a for females, 8b for males) and the employment models (table 9). Separate employment models by gender are not estimated, as differential gender effects relate primarily to the decision to participate, rather than to the probability of gaining employment once an individual enters the labour market.

As reported in table 8, the results for all demographic variables have the expected signs in terms of their influence on participation. Overall, participation rates for the sample used in the estimation were 54% for women and 75% for men. For Indigenous women, the presence of a dependent child under the age of 15 strongly suppresses labour force participation, particularly in the case of sole parents. Male sole parents are also much less likely to be in the labour force, but in contrast to women, married men with dependent children are much more likely to participate in the labour market when compared with their unmarried counterparts with no children. For Indigenous women labour force participation peaks in the 35–44 age bracket, irrespective of remoteness, while for men in non-remote Australia the peak in participation occurs considerably earlier. Persons with a disability are less likely to participate in the labour force and, as expected, the effect is greater the more severe the limitation.

Interpretation of the results for the employment models is less straightforward, since they reflect a combination of impacts on participation and on employment status, given participation. For example, the results reported in table 9 imply that the probability of being employed increases dramatically for older persons. This reflects people in the oldest age brackets dropping out of the labour force rather than becoming unemployed, so that, by and large, only those who are employed remain in the labour force. The results suggest that those who are married and who have no disability have better

employment prospects. People who speak Indigenous languages seem to be both less likely to participate in the labour force and to have poorer employment prospects when they do.

The results for the years of education variable suggest extremely strong increases in the likelihood of labour force participation according to level of education. The odds ratio is close to 1.5 and highly significant, irrespective of gender and location. The literal interpretation of this effect is that the probability of a person being in the labour force increases by around 50% for each additional year of education they have completed. Although this effect is unlikely to be uniform across the range of the variable – the impact of an increase in education from three to four years is likely to be different from an increase of, say, nine to ten years – there is no escaping the conclusion that the effect is a very large one. In the employment model (table 9), the results similarly suggest a large positive influence of further years of education, which is highly significant and consistent for remote and non-remote Australia. Taken together, the models imply that the completion of further years of education and formal qualifications are associated with very large increases in employment opportunities for Indigenous Australians, and that this is no less so in remote areas.

Turning to the dimensions of cultural attachment, there is a significant and positive association between cultural participation and labour force participation for males only in non-remote areas, but a much stronger association for females and one that is more pronounced in remote areas. In contrast, participating in traditional economic activities is strongly associated with labour force participation for men, but not for women. It seems that participation in cultural activities is more likely to be a component of female employment, particularly in remote areas, while for men traditional economic activities are more likely to be undertaken in conjunction with employment. The employment model also shows a positive association between participation in cultural events and the likelihood of being employed, and in separate estimates this is found also to apply primarily to women. There are few significant results for the variables capturing cultural identity, but where they are significant, the implication is that stronger cultural identity is associated with lower participation and employment rates, and this is mostly driven by the results for males in non-remote areas. There seems to be evidence, therefore, that Indigenous men experience some tension between pursuing and gaining employment in the formal labour market and maintaining their Indigenous cultural identity.

Table 8 Probability of participating in the labour force at the time of the survey: logit model estimates

(a) Females

Parameter	All		Non-remote		Remote	
	Odds ratio	Sign.	Odds ratio	Sign.	Odds ratio	Sign.
Remote	0.99					
<i>Family status</i>						
Married, dep. children	0.47	***	0.44	***	0.49	***
Married, no dep. children	1.28	**	1.44	**	1.14	
Single, dep. children	0.34	***	0.31	***	0.44	***
Single, no dep. children	–		–		–	
<i>Age</i>						
5–19 years	0.47	***	0.52	***	0.35	***
20–24 years	0.51	***	0.48	***	0.60	**
25–34 years	0.72	***	0.67	***	0.82	
35–44 years	–		–		–	
45–54 years	0.78	*	0.66	***	1.02	
55–59 years	0.40	***	0.31	***	0.64	
60–64 years	0.13	***	0.10	***	0.19	***
<i>Disability status</i>						
None	–		–		–	
Severe/profound	0.36	***	0.32	***	0.43	***
Other limitation	0.85	**	0.75	***	1.04	
Removal from natural family	1.02		0.94		1.36	**
Has English difficulties	0.78		0.45		0.75	
Years of education	1.48	***	1.48	***	1.50	***
<i>Cultural participation</i>						
Strong	2.24	***	1.79	***	3.74	***
Moderate	1.59	***	1.52	***	1.73	***
Weak	1.24	**	1.17		1.40	**
Minimal	–		–		–	
<i>Cultural identity</i>						
Strong	1.08		1.11		1.32	
Moderate	0.80	**	0.84		0.94	
Weak	0.86		0.95		0.86	
Minimal	–		–		–	
<i>Indigenous language</i>						
Speaks at home	0.83		0.52		0.91	
Speaks	0.79	*	0.68	*	0.93	
Traditional activities	1.06		1.05		1.06	
Observations	3792		2524		1268	
Log likelihood	798	***	554	***	286	***

Notes: ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.

Table 8 Probability of participating in the labour force at the time of the survey: logit model estimates (cont'd)

(b) Males

Parameter	All		Non-remote		Remote	
	Odds ratio	Sign.	Odds ratio	Sign.	Odds ratio	Sign.
Remote	1.25	*				
<i>Family status</i>						
Married, dep. children	2.21	***	2.27	***	2.02	***
Married, no dep. children	2.58	***	3.09	***	2.08	***
Single, dep. children	0.57	**	0.52	**	0.62	
Single, no dep. children	–		–		–	
Age: 15–19 years	0.42	***	0.58	***	0.18	***
20–24 years	1.23		1.70	**	0.63	
25–34 years	1.21		1.60	**	0.77	
35–44 years	–		–		–	
45–54 years	0.69	**	0.65	**	0.77	
55–59 years	0.42	***	0.36	***	0.49	*
60–64 years	0.24	***	0.17	***	0.37	**
<i>Disability status</i>						
None	–		–		–	
Severe/profound	0.13	***	0.11	***	0.14	***
Other limitation	0.48	***	0.46	***	0.44	***
Removal from natural family	0.90		0.83		1.03	
Has English difficulties	0.67		2.51		0.73	
Years of education	1.49	***	1.52	***	1.56	***
<i>Cultural participation</i>						
Strong	1.38		1.71	*	1.08	
Moderate	1.03		0.81		1.42	
Weak	0.93		0.81		1.20	
Minimal	–		–		–	
<i>Cultural identity</i>						
Strong	0.85		0.87		0.53	
Moderate	0.80		1.02		0.43	**
Weak	0.78		0.93		0.42	*
Minimal	–		–		–	
<i>Indigenous language</i>						
Speaks at home	0.71	*	0.58		0.63	**
Speaks	0.87		0.92		0.81	
Traditional activities	1.58	***	1.43	***	2.36	***

Observations	2905		1923		982	
Log likelihood	692	***	509	***	230	***

Notes: ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.

Table 9 Probability of being employed: logit model estimates for labour force participants

Parameter	All		Non-remote		Remote	
	Odds ratio	Sign.	Odds ratio	Sign.	Odds ratio	Sign.
Remote	1.41	***				
Male	1.14		1.15		1.15	
<i>Family status</i>						
Married, dep. children	1.40	***	1.45	**	1.27	
Married, no dep. children	1.50	***	1.60	**	1.24	
Single, dep. children	0.69	**	0.66	**	0.76	
Single, no dep. children	–		–		–	
Age: 15–19 years	0.36	***	0.34	***	0.37	***
20–24 years	0.51	***	0.42	***	0.92	
25–34 years	0.63	***	0.65	***	0.62	**
35–44 years						
45–54 years	1.84	***	1.77	***	2.08	**
55–59 years	2.65	***	2.22	**	3.62	**
60–64 years	16.52	***	9.38	**	>99.99	
<i>Disability status</i>						
None	–		–		–	
Severe/profound	0.70	*	0.73		0.67	
Other limitation	0.73	***	0.71	***	0.85	
Removal from natural family	0.71	***	0.65	***	0.91	
Has English difficulties	1.45		1.86		1.41	
Years of education	1.37	***	1.38	***	1.36	***
<i>Cultural participation</i>						
Strong	1.55	**	1.74	**	1.28	
Moderate	1.25	*	1.28		1.18	
Weak	1.28	**	1.22		1.39	
Minimal	–		–		–	
<i>Cultural identity</i>						
Strong	0.70	**	0.72		0.82	
Moderate	0.58	***	0.54	***	0.79	
Weak	0.75	*	0.80		0.64	
Minimal	–		–		–	
<i>Indigenous language</i>						
Speaks at home	0.83		0.16	***	1.06	
Speaks	0.73	**	0.59	**	0.93	
Traditional activities	0.98		0.94		1.13	
Observations	4221		2833		1388	
Log likelihood	393	***	322	***	98	***

Notes: ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.

To investigate whether the impacts of educational attainment on labour force participation and employment vary according to the various dimensions of cultural attachment, models were estimated separately for the following samples:

- those with strong or moderate cultural participation and those with weak or minimal cultural participation
- those with strong or moderate cultural identity and those with weak or minimal cultural identity
- those who speak an Indigenous language and those who do not speak an Indigenous language

- those who participated in traditional economic activities in the past 12 months and those who had not.

In addition, interaction terms between the cultural variables and years of education were tested in the models reported in tables 8 and 9. Full regression results are not reported, given the large number of models estimated, but can be summarised as follows.

In general, the benefits of additional years of education to labour force participation and employment outcomes are lower for Indigenous Australians with stronger attachment to their culture; however, there are still large and positive gains associated with further education and training. The differences are minimal between those with high and low levels of participation in cultural events and for those with strong and weak cultural identity. Across all the groups differentiated by their level of cultural participation and cultural identity, the lowest estimates of the effect of one additional year of education is still to increase the likelihood of participating in the labour force by 40%, and to increase the probability of being employed by 36%.

However, the gains in the likelihood of participating in the labour force and in the likelihood of being employed that are associated with further education are smaller for those who speak an Indigenous language compared with those who do not. The statistical significance of these differences is confirmed through the significance of the interaction terms and applies to both men and women. Those who have participated in traditional economic activities also appear to receive smaller gains in employment opportunities, with smaller gains in participation for women. To reiterate, in all samples the estimated effects of further years of education are still large and highly significant – they are just smaller for those who speak an Indigenous language and who participate in traditional economic activities.

Income

The standard approach to estimating the returns from education is through a ‘Mincer’ wage equation, in which the natural logarithm of wages is the dependent variable in an ordinary least squares regression, and a variable (or variables) capturing level of education is included among the independent variables. The coefficients on the dependent variables can be interpreted as their impact on the individuals’ wages. However, the unit record file for the 2008 National Aboriginal and Torres Strait Islander Social Survey does not report actual earnings. It reports personal gross weekly income in total and records all sources of income and the principal source of income, but only the gross weekly dollar amount is known, not the actual amount from each source.

As actual wages are not known, it is not possible to directly model the impact of years of education or educational attainment on wages. Instead, all full-time employees are selected and the log of their gross weekly income is modelled. This income is potentially comprised of wages, business income, government pensions and allowances, income from the Community Development Employment Program and other income. It is possible that educational attainment would enhance income capacity in these areas as well as in terms of wages; for example, through improved investment strategies, an understanding of the welfare system and better business skills. In addition, the fact that income from welfare is included does help to address a key policy issue: whether or not the welfare system reduces incentives to invest in education and training. If higher earnings from employment are largely offset by reduced welfare payments, this will be reflected in a low estimated return from education using this ‘income’ specification.

With the dependent variable in log form, the coefficients reported in table 10 can be interpreted as the percentage change in income associated with a one-unit increase in the independent variable. For

example, the coefficient of 0.128 for the male dummy in the first model implies that the incomes for male full-time workers are 12.8% higher than for female full-time workers. The coefficient on years of education is highly significant and implies 6.2% higher incomes for each additional year of post-primary education completed. Importantly, the income premium associated with years of education is actually higher for persons living in remote Australia, at 6.9%, compared with 5.8% for persons living in non-remote Australia. As with the findings from the participation and employment models, this is not consistent with the argument that Indigenous people in remote areas face a lower incentive to invest in education and training. Given the unorthodox specification used here, it is difficult to suggest what a 'reasonable' rate of return would be. Depending upon the range of controls included, Australian estimates of the wage premium associated with an increased year of education for full-time workers would typically lie in the vicinity of 8–12%. Considering that the income measure being modelled here includes welfare payments that will fall as earned income increases, the estimated coefficients on additional years of education appear to represent quite a substantive return for Indigenous Australians.

Apart from the lower incomes apparent for the younger cohorts, few other results are significant. There is little evidence of direct effects between the variables capturing dimensions of cultural attachment and income, with the exception of much lower incomes – in the vicinity of 30% lower – for those who speak an Indigenous language at home. Further models were again estimated to test for differences in the return from education conditional upon cultural characteristics. These provide no evidence of differential returns from education for persons with stronger or weaker attachment to Indigenous culture: all estimates suggest returns in the vicinity of 6% higher incomes per additional year of education. Although individuals who speak Indigenous languages at home were found to have markedly lower incomes, the estimated *return* from additional years of education is estimated to be just as high for those who speak an Indigenous language.

Table 10 Income regression results: persons aged 15–64 years and employed full-time (dependent variable = logarithm of gross weekly income)

Parameter	All		Non-remote		Remote	
	Coeff.	Sign.	Coeff.	Sign.	Coeff.	Sign.
Intercept	6.433	***	6.447	***	6.462	***
Remote	-0.024					
Male	0.128	***	0.139	***	0.119	**
Married	0.061	**	0.054	*	0.062	
Age: 15–19 years	-0.544	***	-0.640	***	-0.315	***
20–24 years	-0.189	***	-0.210	***	-0.141	
25–34 years	-0.071	**	-0.088	**	-0.030	
35–44 years	–		–		–	
45–54 years	0.009		0.009		0.000	
55–59 years	-0.026		0.005		-0.067	
60–64 years	-0.108		-0.120		-0.096	
<i>Disability status</i>						
None	–		–		–	
Severe/profound	-0.048		-0.059		-0.049	
Other limitation	-0.009		-0.012		-0.002	
Removal from natural family	0.027		0.008		0.074	
Has English difficulties	-0.068		0.000		-0.064	
Years of education	0.062	***	0.058	***	0.069	***
<i>Cultural participation</i>						
Strong	0.051		0.054		0.010	
Moderate	0.038		0.028		0.035	
Weak	0.029		0.082	**	-0.087	
Minimal	–		–		–	
<i>Cultural identity</i>						
Strong	0.003		0.040		-0.092	
Moderate	-0.013		0.003		-0.109	
Weak	-0.044		-0.054		-0.072	
Minimal	–		–		–	
<i>Indigenous language</i>						
Speaks at home	-0.370	***	-0.285		-0.315	***
Speaks	-0.020		-0.046		0.042	
Traditional activities	0.028		0.039		-0.020	
Observations	2067		1444		623	
F Value	18.16	***	15.12	***	4.83	***
R-Square	0.1698		0.1826		0.1504	
Adj R-Sq	0.1604		0.1705		0.1192	

Notes: ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.

Conclusion and discussion

This report presents the results of research and analysis that is embedded in a wider program of investigation into the links between Indigenous Australians' attachment to their culture and socioeconomic outcomes. The ultimate objective of this program is to improve our understanding of the nature of Indigenous disadvantage, therefore assisting in the design of policy and interventions to promote the wellbeing of Australia's first peoples. Indigenous participation in vocational education and training is potentially an important part of this wider picture. In the Council of Australian Governments (COAG) framework for overcoming Indigenous disadvantage, education and training features prominently as a strategic area for action and is among the outcomes indicators (Steering Committee for the Review of Government Service Provision 2011, p.2.1). That is, education outcomes are seen as both one of the many manifestations of Indigenous disadvantage and a potential means for addressing disadvantage; or in the language of the Commonwealth Government's current 'Closing the Gap' agenda, education outcomes are both a 'target' and a 'building block'.

Evidence for Indigenous Australians and for other indigenous peoples around the world also points to the pivotal role of cultural identity in shaping wellbeing. An important contribution of this report has been to expand on the concept of cultural attachment used in earlier work and to distinguish four distinct dimensions to cultural attachment: participation in cultural events; cultural identity; Indigenous language use; and traditional economic activities. That these four dimensions represent distinct, constituent components of a broader concept of cultural attachment seems to hold across different socio-demographic contexts by gender, age and remoteness.

The measure developed to capture the cultural identity dimension correlates with recognition of homelands or traditional country; identification with a clan, tribal or language group; and the perceived importance of attending cultural events. Empirically isolating this factor as a key component of cultural attachment is important in two respects. First, it appears to be closely aligned to the concept of self-identity or cultural identity, which the literature highlights as being important to psychological wellbeing, and as providing a possible causal link between enculturation and positive outcomes in a range of domains. Second, from a methodological perspective, associations between this measure and outcome variables are less susceptible to the charge of reverse causality or omitted variable bias. Unlike the cultural participation dimension, which corresponds closely to the measure of attachment to traditional culture used in previous work (Dockery 2009, 2010), it seems reasonable to assume that the cultural identity measure is an exogenous variable in the models of VET and labour market outcomes.

The results from multivariate models of outcomes almost invariably show very strong and positive correlations between Individuals' participation in cultural events and a range of outcome variables. These include (past) educational attainment, participation in a training course in the preceding 12 months, current enrolment in formal education, participation in the labour force and employment opportunity. These effects tend to be larger for Indigenous people living in non-remote areas. As noted, however, caution should be taken in interpreting this as evidence of a causal relationship progressing from cultural engagement to outcomes. Higher educational attainment or participation in education and training and other labour market activities may be the 'cause' of participation in some cultural activities and events. Alternatively, other unobserved factors, such as motivation or the access to resources that close culturally based networks bring, may simultaneously influence cultural participation and outcomes in VET and the labour market.

It is the results for cultural identity that provide the strongest evidence of an enabling effect: whereby having a stronger sense of cultural identity promotes participation in education and training. This relationship seems to be limited to females in non-remote areas for past educational attainment and recent participation in a training course, but for current enrolment in formal education the effect is particularly strong for the full population in remote areas. The positive effect of cultural identity will be largely realised as school retention in remote areas and progression from school into further education and training. One explanation for this relationship is that Indigenous Australians access education and training specifically to engage with their culture. However, the data on field of study and type of training courses undertaken are inconsistent with this explanation. Individuals with a stronger sense of cultural identity are not more likely to have completed their highest qualification in the field of 'society and culture' or 'creative arts'; nor are they more likely to have undertaken 'music, art or crafts training' when they have recently completed a training course. Stronger cultural identity is instead most robustly associated with having undertaken a course in numeracy, literacy and trade and labouring training, all of which seem vocationally oriented rather than culturally oriented and hence likely to improve outcomes in the mainstream labour market.

The one set of findings which seem inconsistent with the enculturation hypothesis is the widespread evidence of negative associations between Indigenous language use and VET and labour market outcomes, and these persist irrespective of gender and remoteness. This is most pronounced for those who speak an Indigenous language at home, but some detrimental effects are observed for those who speak an Indigenous language even when this is not the language they use at home. Hallett, Chandler and Lalonde (2007) and Houkamau and Sibley (2011, p.381) have noted the use of indigenous languages as contributing to positive self-identity for Canadian youth and New Zealand Maori, respectively. Why the opposite effect should apply in the case of Indigenous Australians is not clear. Possibly, knowledge and use of Indigenous languages is neither supported nor respected to the same extent in Australia, such that speaking an Indigenous language at home contributes to a negative sense of self-identity – one associated with lower self-esteem and self-efficacy – rather than a positive one. Alternatively, speaking an Indigenous language may partly proxy poorer English language skills.

However, these associations with Indigenous language use may be strongly influenced by the imperfect controls for remoteness. Indigenous language use is likely to increase strongly with remoteness, while access to VET and to labour market opportunities declines. The simple remote versus non-remote controls in the 2008 National Aboriginal and Torres Strait Islander Social Survey data are unlikely to adequately control for this, leaving language use to proxy for remoteness. This will apply also to the results for cultural participation and cultural identity, but in those cases the bias can be expected to lead only to an understatement of the positive effects of these dimensions of cultural engagement. This inability to adequately control for remoteness represents a significant weakness of the 2008 survey unit record file when compared with 2002 data, which allowed analysts to identify remoteness at four levels (major cities, inner regional, outer regional and remote/very remote). The results pertaining to the effect of participation in traditional economic activities are ambiguous, showing positive effects in some models and negative effects in others with respect to VET outcomes, and a large positive association with labour force participation for men. These estimates are similarly likely to be biased away from findings of positive VET and labour market effects.

A further important empirical result is the evidence of strong incentives for Indigenous Australians to invest in education and training. Substantial benefits in terms of employment opportunity and income accrue to Indigenous Australians as a result of the completion of additional years of schooling and post-school qualifications. This applies to Indigenous people living in both remote and non-remote

Australia, although it cannot be claimed to apply in very remote communities, where it has been argued that such incentives are lacking due to the absence of a formal labour market. There is some evidence that the returns from education are generally lower for those with stronger cultural attachment, notably in terms of employment opportunity for those who speak indigenous languages. A number of interpretations for this result can be envisaged. VET may be less effective for those with stronger cultural attachment, such that it has a smaller effect on outcomes. This may arise through the imperfect controls for remoteness noted above, or the delivery of VET being less appropriate for those with stronger cultural attachment. Alternatively, VET may be equally as effective, but Indigenous people with stronger cultural attachment channel more of the benefits into cultural activities rather than pursuing mainstream economic outcomes. In any case, we must not lose sight of the fact that the estimated returns from further years of education and training are large for all groups analysed.

From the perspective of policy and practice, the key message from this analysis is that the evidence is now clearer that cultural identity is something that can be harnessed to improve VET outcomes for Indigenous Australians and should not be seen as something that, of itself, somehow militates against educational achievement. The findings are supportive of measures to make the delivery of education and training more accommodating of Indigenous people's cultural obligations. However, it is clear that lower access to education and training in more remote areas already creates such a tension (see Dockery 2009). To promote a positive sense of cultural identity for Indigenous students in education settings requires respect for and affirmation of Indigenous students' culture. Coupled with evidence that a positive sense of identity is important for wellbeing more generally, the case can be made that material and activities to support this should be incorporated into curricula wherever possible. Chandler et al. (2003) noted the narrative strategies employed by indigenous Canadian youth in understanding their persistence through time. If young Indigenous Australians adopt similar strategies, positive self-identity is likely to be fostered through an appreciation of and respect for kinship structures, attachment to place and knowledge of the stories and law of their ancestors, and this may help lay the foundation for future educational success.

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Appendix tables

Table A1 Rotated factor patterns by remoteness

	Non-remote (n = 5188)				Remote (n = 2635)			
	Participation	Identity	Traditional activities	Language	Participation	Traditional activities	Language	Identity
Cultural events attended: festival	0.715	0.175	0.029	-0.018	0.648	0.060	-0.015	0.146
Participated in cult. activities: storytelling	0.638	0.128	0.181	0.161	0.602	0.204	0.127	0.075
Participated in cult. activities: performance	0.608	0.012	0.136	0.207	0.629	0.204	0.191	-0.045
Cultural events attended – Aboriginal org.	0.634	0.292	-0.020	-0.066	0.632	-0.056	-0.218	0.224
Participated in cult. activities: art/craft	0.620	0.137	0.099	0.026	0.571	0.208	0.126	-0.007
Cultural events attended – ceremonies	0.628	0.106	0.097	0.103	0.473	0.174	0.366	0.165
Cultural events attended – NAIDOC week	0.527	0.450	-0.122	-0.091	0.420	-0.022	-0.420	0.301
Recognises homelands or traditional country	0.031	0.794	0.104	0.136	0.034	0.109	0.099	0.751
Identifies with clan, tribal or language group	0.173	0.769	0.033	0.119	0.122	0.076	0.215	0.739
Importance of attending cultural events	0.408	0.647	0.117	0.011	0.255	0.423	0.061	0.540
How often attends cultural events	0.490	0.528	0.250	-0.063	0.238	0.610	0.010	0.314
Speaks an Indigenous language at home	0.002	0.037	-0.050	0.833	0.130	0.038	0.875	0.172
Speaks an Indigenous language	0.189	0.137	0.109	0.780	0.128	0.123	0.836	0.240
Participated in cult. activities: fish	0.011	0.135	0.754	-0.108	0.060	0.753	-0.102	0.012
Participated in cult. activities: hunt	0.114	0.054	0.788	0.088	0.092	0.737	0.294	0.119
Participated in cult. activities: gathering	0.431	0.017	0.531	0.187	0.412	0.561	0.219	0.071
Eigenvalue	4.84	1.46	1.34	1.24	4.48	1.81	1.25	1.19

Note: Derived using SAS Factor Procedure with the principal components and varimax rotation options. Questions on attendance at cultural events and participation in cultural activities relate to the past 12 months.

Table A2 Rotated factor patterns by gender

	Males (n = 3380)				Females (n = 4443)			
	Participation	Language	Identity	Traditional activities	Participation	Identity	Language	Traditional activities
Cultural events attended: festival	0.698	0.091	0.172	0.030	0.666	0.211	-0.031	0.085
Participated in cult. activities: storytelling	0.669	0.155	0.078	0.182	0.600	0.174	0.132	0.137
Participated in cult. activities: performance	0.652	0.214	0.053	0.060	0.640	-0.044	0.180	0.137
Cultural events attended – Aboriginal org.	0.675	-0.096	0.208	-0.011	0.566	0.361	-0.213	-0.053
Participated in cult. activities: art/craft	0.597	0.050	0.078	0.184	0.637	0.134	0.035	0.138
Cultural events attended – ceremonies	0.545	0.420	0.174	0.095	0.555	0.138	0.297	0.073
Cultural events attended – NAIDOC week	0.539	-0.218	0.382	-0.022	0.404	0.499	-0.292	-0.044
Recognises homelands or traditional country	0.044	0.133	0.772	0.072	0.031	0.792	0.169	0.069
Identifies with clan, tribal or language group	0.183	0.189	0.774	-0.012	0.137	0.761	0.212	0.044
Importance of attending cultural events	0.359	0.140	0.628	0.259	0.332	0.652	0.062	0.236
How often attends cultural events	0.359	0.153	0.506	0.439	0.422	0.514	0.047	0.395
Speaks an Indigenous language at home	0.025	0.882	0.136	0.043	0.080	0.091	0.881	0.106
Speaks an Indigenous language	0.148	0.832	0.215	0.087	0.135	0.176	0.855	0.140
Participated in cult. activities: fish	0.047	-0.109	0.080	0.837	0.045	0.115	-0.063	0.835
Participated in cult. activities: hunt	0.109	0.445	0.129	0.649	0.162	0.091	0.400	0.691
Participated in cult. activities: gathering	0.428	0.352	0.041	0.446	0.399	0.069	0.324	0.567
Eigenvalue	5.20	1.76	1.24	1.16	4.98	2.01	1.27	1.06

Note: Derived using SAS Factor Procedure with the principal components and varimax rotation options. Questions on attendance at cultural events and participation in cultural activities relate to the past 12 months.

Table A3 Rotated factor patterns by age cohort

	Aged 15–30 years (n = 3084)				Aged 31–45 years (n = 2424)				Aged 46 years and over (n = 2315)			
	Participation	Language	Identity	Traditional activities	Participation	Language	Identity	Traditional activities	Participation	Language	Traditional activities	Identity
Events attended: festival	0.666	0.035	0.182	0.016	0.684	0.011	0.171	0.080	0.647	-0.273	0.015	-0.259
Participate: storytelling	0.651	0.159	0.074	0.097	0.673	0.150	0.104	0.091	0.636	-0.075	0.205	-0.103
Participate: performance	0.635	0.189	0.036	0.097	0.602	0.267	-0.019	0.163	0.543	-0.099	0.096	-0.394
Events attended – Aboriginal org.	0.608	-0.187	0.197	0.023	0.620	-0.167	0.290	-0.104	0.572	-0.488	-0.002	-0.151
Participate: art/craft	0.608	0.012	0.160	0.030	0.628	0.055	0.099	0.155	0.587	-0.101	0.187	-0.235
Events attended – ceremonies	0.501	0.360	0.132	0.165	0.526	0.373	0.141	0.065	0.637	0.019	-0.082	-0.355
Events attended – NAIDOC week	0.418	-0.260	0.477	-0.145	0.495	-0.315	0.397	-0.109	0.588	-0.442	-0.065	0.021
Recognises homelands or trad. country	0.040	0.155	0.758	0.096	0.011	0.113	0.814	0.085	0.499	-0.055	-0.420	0.434
Identifies with clan, tribe, language	0.144	0.225	0.754	0.019	0.172	0.160	0.772	0.005	0.567	-0.079	-0.422	0.360
Importance of attend cult. events	0.320	0.129	0.649	0.239	0.426	0.103	0.603	0.130	0.705	-0.155	-0.174	0.295
How often attends cult events	0.346	0.102	0.539	0.420	0.444	0.133	0.487	0.315	0.768	-0.081	0.025	0.203
Speaks Indigenous language at home	0.028	0.887	0.146	0.027	0.030	0.866	0.096	0.043	0.445	0.688	-0.347	-0.235
Speaks an Indigenous language	0.092	0.866	0.207	0.077	0.137	0.824	0.185	0.081	0.545	0.614	-0.327	-0.201
Part. in cult. activities: fish	0.009	-0.080	0.104	0.847	0.094	-0.060	0.074	0.876	0.401	0.241	0.495	0.430
Part. in cult. activities: hunt	0.101	0.441	0.151	0.636	0.131	0.467	0.116	0.646	0.549	0.477	0.381	0.175
Part. in cult. activities: gathering	0.407	0.443	0.025	0.446	0.448	0.399	0.067	0.406	0.613	0.177	0.436	0.076
Eigenvalue	4.77	1.97	1.26	1.13	4.95	2.00	1.29	1.05	5.53	1.74	1.29	1.20

Note: Derived using SAS Factor Procedure with the principal components and varimax rotation options. Questions on attendance at cultural events and participation in cultural activities relate to the past 12 months.

Table A4 Highest level of education attained: probit results by gender and remoteness

Parameter	Females						Males					
	Coeff.	Non-remote <i>P></i> <i>Chi.Sq</i>	<i>Sign.</i>	Coeff.	Remote <i>P></i> <i>Chi.Sq</i>	<i>Sign.</i>	Coeff.	Non-remote <i>P></i> <i>Chi.Sq</i>	<i>Sign.</i>	Coeff.	Remote <i>P></i> <i>Chi.Sq</i>	<i>Sign.</i>
<i>Cultural participation</i>												
Strong	0.81	0.00	***	0.68	0.00	***	0.66	0.00	***	0.62	0.00	***
Moderate	0.48	0.00	***	0.33	0.00	***	0.48	0.00	***	0.41	0.00	***
Weak	0.18	0.01	***	0.00	0.97		0.09	0.23		0.07	0.51	
Minimal	–			–			–			–		
<i>Cultural Identity</i>												
Strong	0.31	0.00	***	-0.10	0.49		-0.07	0.48		0.05	0.79	
Moderate	0.10	0.15		-0.23	0.09	*	-0.01	0.93		0.07	0.74	
Weak	-0.11	0.14		-0.22	0.15		-0.05	0.57		0.08	0.71	
Minimal	–			–			–			–		
<i>Indigenous language</i>												
Speaks at home	-0.50	0.01	***	-0.55	0.00	***	-0.80	0.01	***	-0.40	0.00	***
Speaks	-0.09	0.30		-0.19	0.05	*	0.09	0.34		-0.07	0.57	
Traditional activities	0.05	0.36		0.26	0.00	***	0.04	0.46		0.01	0.94	
Observations	2196			1090			1555			866		
Log likelihood	-3507	0.00	***	-1478	0.00	***	-2463	0.00	***	-1041	0.00	***

Notes: ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.
Only results for cultural variables reported; see table 5 for other variables included.

Table A5 Binary logit models for field of study and type of vocational training: odds ratios for cultural variables

	Cultural participation			Cultural identity			Indigenous language		Traditional activities
	Strong	Mod.	Weak	Strong	Mod.	Weak	At home	Speaks	
Field of highest educational qualification^a									
Natural and physical sciences (n = 29)									
Information technology (n = 55)						2.10*		0.17*	
Engineering and related technologies (n = 339)	0.42***	0.47***						0.63*	1.45***
Architecture and building (n = 163)									
Agric., environ. & related studies (n = 136)				1.90*			0.38**		1.67**
Health (n = 284)					1.46*		1.92***	1.69***	
Education (n = 188)		1.52*	1.80**				3.11***		
Management and commerce (n = 553)		1.50***		0.62***	0.61***	0.68**	0.68*		
Society and culture (n = 509)	1.68***								0.66***
Creative arts (n = 112)									0.67*
Food, hospitality and personal services (n = 212)			0.65*	0.65*	0.68*	0.62**		0.38***	
Mixed field programmes/not determined (n = 109)						2.05*			
Type of vocational training^b									
Trade or labouring training (n = 474)	0.58**	0.62***		1.49*	1.34*			0.59**	
Transport, plant & machinery operation (n = 331)	0.49**				1.57**		0.46*		1.62***
Management/supervision training (n = 493)	3.06***	1.84***	1.56***						
Technical training (n = 311)									
Computer or office training (n = 571)	2.97***	2.12***	1.51***						
Sales and personal service training (n = 250)				0.85**	0.81***				
Literacy training (n = 172)	4.44***	3.21***	1.79*	2.18**		2.17**			
Numeracy training (n = 135)	3.73***	2.34***	1.93**	6.39***	5.25***	7.32***			
Music, art or craft training (n = 89)	5.76***	2.05*					3.13**		
Health and safety training (n = 1076)					1.31**		0.52***		

Notes: ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.

Results reported only for cultural variables and only when significant at the 10% level or higher.

(a) Models are estimated on 2689 individuals, n refers to the number of individuals reporting highest qualification in that field.

(b) Models are estimated on 2312 individuals who completed training in the past 12 months, n refers to the number of individuals reporting that type of training.

Table A6 Probability of having participated in a vocational training in past 12 months: logit model estimates by gender and remoteness (odds ratios)

Parameter	Females						Males					
	Non-remote			Remote			Non-remote			Remote		
	Odds ratio	P> Chi.Sq	Sign.	Odds ratio	P> Chi.Sq	Sign.	Odds ratio	P> Chi.Sq	Sign.	Odds ratio	P> Chi.Sq	Sign.
<i>Cultural participation</i>												
Strong	1.98	0.00	***	2.59	0.01	***	1.73	0.03	**	0.83	0.63	
Moderate	1.79	0.00	***	1.35	0.19		1.49	0.01	**	0.98	0.94	
Weak	1.56	0.00	***	1.17	0.52		0.94	0.66		1.06	0.80	
Minimal	–			–			–			–		
<i>Cultural identity</i>												
Strong	1.62	0.01	***	1.06	0.86		1.29	0.19		0.62	0.18	
Moderate	1.28	0.10	*	1.23	0.53		1.46	0.01	**	1.01	0.98	
Weak	1.09	0.60		1.02	0.96		0.97	0.85		0.72	0.39	
Minimal	–			–			–			–		
<i>Indigenous language</i>												
Speaks at home	0.32	0.07	*	0.60	0.03	**	0.40	0.34		0.55	0.01	***
Speaks	0.90	0.64		0.77	0.30		0.65	0.04	**	0.91	0.69	
Traditional activities	1.22	0.07	*	0.83	0.32		1.29	0.02	**	0.77	0.23	
Observations	2563			1288			1908			1005		
Likelihood ratio	965	0.00	***	399	0.00	***	423	0.00	***	252	0.00	***

Notes: ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.
Only results for cultural variables reported; see table 6 for other variables included.

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