

Culture Counts: A choice modelling approach to quantifying cultural values for First Nations people

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Declaration

I, Michaela Woods, declare that this thesis contains only my original work except where reference is made to the work of others and acknowledgement has been made in the text.

This thesis does not exceed 100,000 words in length, exclusive of footnotes, tables figures and appendices.

Michaela Woods

December 2020

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I decided to research this question of the values in culture after travelling with a Nyikina elder some years ago. This man spoke of the struggles in establishing livelihood in the western way while also maintaining strong culture, particularly among younger people. He reinforced my understanding that cultural activity was essential for maintaining cultural connection, identity and well-being. But he also acknowledged the importance of work for incomes and livelihoods.

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Abstract

In response to the research question ‘What methods are feasible, reliable and appropriate for quantifying cultural values for First Nations people?’, this thesis demonstrates how choice modelling can elucidate and measure the value that Indigenous people place on aspects of their culture by privileging their viewpoints. Measuring and incorporating these intangible values in policy and legal frameworks is essential to effectively and substantially give voice to First Nations peoples.

The idea behind this research developed while travelling with a Nyikina elder who spoke of the tension between income from employment establishing a livelihood in the western way and the cultural activity essential for maintaining cultural connection, identity and wellbeing. Using those tensions and trade-offs in choice modelling enables measurement of intangible values of culture.

Choice modelling, which includes discrete choice experiments and best-worst scaling, has strong theoretical bases in economics and psychology, supported with rigorous mathematical architecture. It has been shown to accurately predict actual behaviour, with fewer behavioural biases than contingent valuation. Limited application of choice modelling with First Nations people has occurred in cultural heritage, environmental and resource management contexts.

Multiphase fieldwork in several west Kimberley locations, with Nyikina and Mangala people, started with qualitative research to build trust and inform the selection of attributes and levels for the choice model. In order to yield maximum information about preferences, with minimum cognitive load, a Best-Worst Scaling Profile Case model with a supplementary question about profile acceptability, a discrete choice experiment, was developed and incorporated into a survey.

The relative preferences identified in responses yield dollar valuations for the cultural attributes. Overall, access to traditional Country had the strongest responses to lowest and highest levels yielding marginal values of up to \$0.44 million per person per annum.

As well as informing methodological development, this research has significant implications and potential applications in policy and legal contexts. The need for Indigenous viewpoints to be central in policy development is generally accepted, and

choice modelling could support valuation in this context. Failures to protect cultural heritage have highlighted the need to quantify and incorporate cultural values in decision making, rather than dismissing them as immeasurable. Application of choice modelling in native title compensation cases could overcome the current limitation of determinations being reliant on judicial intuition and market proxies.

Glossary

Terminology

Generally, the term First Nations or First Nations people has been adopted when referring to Indigenous or First peoples in this thesis, except where referring to the terminology adopted by others, or in relation to the people in my fieldwork who prefer to be known as Aboriginal or their specific language group identity – such as Nyikina.

I have used the term Traditional Owner(s) (TOs) when referring to the First Nations people of particular country, as this is the terminology adopted in native title law and generally in land related policy. I acknowledge that some people prefer the use of the term Traditional Custodians in recognition that their relationship to country is more complex and quite different to ownership in a western sense.

The spellings of Aboriginal words, including Country and language group names, vary widely, including across references. I have adopted the spelling of language groups from the Gambay First Languages Australia online database and map (<https://gambay.com.au/languages/>), the Birr Nganka Nyikina CD-Rom and specified references for First Nations words spellings.

Acronyms

ABS	Australian Bureau of Statistics
ACLD	Australian Census Longitudinal Dataset
AGM	Annual General Meeting
ANU	Australian National University
AGRTP	Australian Government Research Training Program
AIC	Akaike information criterion
ASCED	Australian Standard Classification of Education (ABS)
ATSIC	Aboriginal and Torres Strait Islander Commission
BIC	Bayesian information criterion
BWP	Best-Worst pair
BWS	Best-Worst Scaling
CAEPR	Centre for Aboriginal Economic Policy Research
CAIC	consistent Akaike information criteria
CDEP	Community Development Employment Projects
CDP	Community Development Program
CEO	Chief Executive Officer
CHINS	Community Housing and Infrastructure Needs Surveys
COVID-19	coronavirus disease of 2019
CPI	Consumer Price Index
CRN	Collaborative Research Network
DCE	discrete choice experiment
df	degrees of freedom
ECoC	European Capital of Culture
ERP	Estimated Resident Population
GDP	Gross Domestic Product

HEAP	Level of Highest Educational Attainment measure of overall educational attainment (ABS)
IIA	independence of irrelevant alternatives
ILOC	Indigenous Locations
ILOC (UR)	Indigenous Locations (Usual Residence)
ILUA	Indigenous Land Use Agreement
INCP	Total personal income (ABS)
IOP	Indigenous Opportunities Policy
IPA	Intellectual Property Australia
IPP	Indigenous Procurement Policy
IT	Information technology
KALACC	Kimberley Aboriginal Law and Culture Centre
KAPCO	Kimberley Agriculture and Pastoral Company
KLC	Kimberley Land Council
KLRC	Kimberley Language Resource Centre
LCA	Latent Class Analysis
LFSP	Labour Force Status (ABS)
maxdiff	Maximum difference model that assumes choices of Best and Worst are made as the two that maximise difference in utility
NATSISS	National Aboriginal and Torres Strait Islander Social Survey
NBY	Nyamba Buru Yawuru
NGO	non-government organisation
NHMRC	National Health and Medical Research Council
NLC	Northern Land Council
NNTT	National Native Title Tribunal
NOAA	National Oceanic and Atmospheric Administration
NSW	New South Wales
OMEP	Orthogonal Main Effects Plan

ORIC	Office of the Registrar of Indigenous Corporations
RJCP	Remote Jobs and Communities Program
RNTBC	Registered Native Title Body Corporate
SC	stated choice
SIDE	Schools for Isolated and Distance Education
SROI	Social Return on Investment
SS	Sum of Squares
TESP	Total Empirical Scale Parameter
TO	Traditional Owner
UK	United Kingdom
UNESCO	United Nations Educational, Scientific and Cultural Organization
USA	United States of America
WA	Western Australia
WAC	Walalakoo Aboriginal Corporation
WLS	weighted least squares
WTA	willingness-to-accept
WTP	willingness-to-pay
YKC	Yawuru Knowing our Community

Words in language other than English

Bardi	First Peoples of the Dampier Peninsula, north of Broome, West Kimberley
biyalbiyal	(Nyikina) Freshwater Sawfish (<i>Pristis microdon</i>)
jarramba	(Nyikina) Freshwater prawn, also known as cherabin
clogit	Stata command for conditional (fixed effects) logit regression
ex-ante	Latin – before the event, based on forecasts rather than actual results
ex-post	Latin – after the fact, based on actual results rather than forecast
Garawa	First Peoples of the Gulf of Carpentaria region, near Burketown
glamm	Stata command for generalised linear latent and mixed models used in latent class analysis
Gomeroi	First Peoples of western NSW including Gunnedah
in globo	Latin – as a unit rather than separately
Jabirr Jabirr	First Peoples of the Dampier Peninsula, north of Broome, West Kimberley
Karajarri	First Peoples of Western Desert region south of Roebuck Bay and Broome, West Kimberley
kartiya	non-Indigenous white person, also kardiya
Kujika	Waanyi, Garawa – songlines
Kuninjku (Gunwinggu)	First Peoples of West Arnhem Land, Northern Territory
lclogit	Stata command for latent class analysis
lclogitml	Stata command that predicts the probabilities of choice and class membership after lclogit
Mangala	First Peoples of Western desert, West Kimberley
Martuwarra	Fitzroy River, West Kimberley, also Mardoowarra
mob	Aboriginal English term for family, kinship or language group
Ngaliwurru	First Peoples of the area of Timber Creek, Northern Territory

Ngunnawal	First Peoples of the Canberra region
Nungali	First Peoples of the area of Timber Creek, Northern Territory
Nyamba Buru	the native title representative prescribed body corporate for Broome
Yawuru	Traditional Owners – the Yawuru
Nyikina	First Peoples of western Martuwarra (Fitzroy River), West Kimberley
Nyul-Nyul	First Peoples of the Dampier Peninsula, north of Broome, West Kimberley
Waanyi	First Peoples of the Gulf of Carpentaria region, near Burketown
Warloongarriy	traditional narrative song about Woonyoombo
Warrwa	First Peoples of the Derby area, West Kimberley
wiliji	Black-footed Rock-wallaby (<i>Petrogale lateralis</i>)
Woonyoombo	the major Creation Ancestor for the Nyikina people
Wororra	First Peoples of Prince Regent River region, West Kimberley
Wunan	Law connecting people from the East Kimberley through the West Kimberley and south
xtlogit	Stata command for random effects logit regression
Yawuru	First Peoples of the Broome area, West Kimberley

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Part I

Introduction, Motivation & Theoretical Framework

Chapter 1 Introduction

1.1 Research purpose and question

Starting with the premise that First Nations people value culture over and above any market value that may attach to it, this thesis sets out to answer the following question:

What methods are feasible, reliable and appropriate for quantifying cultural values for First Nations people?

Considering the elements of this question in turn, feasible methods are those that could be effectively deployed and yield results, reliable methods are sufficiently rigorous to produce consistent results supported by sufficient evidence to provide confidence in the results, and appropriate methods would privilege First Nations people's viewpoints and suit their contexts.

To answer this question, lessons from previous research were applied to develop a mixed methods choice modelling approach. Working with people in the West Kimberley with Nyikina and Mangala connection, I sought to identify, demonstrate and quantify cultural values using a mixed methods approach. Building on a grounded qualitative research, the methodology included a qualitative and quantitative survey that incorporates choice modelling. Importantly, the methodology sought to privilege First Nations perspectives, framing the modelling and survey in line with their worldviews.

The choice model, embedded in a survey, tested the tensions and trade-offs between aspects of Aboriginal culture and income, to generate relative and absolute values of cultural attributes in dollar terms. The results demonstrate the high value of those aspects of Aboriginal culture identified as important by participants. The thesis then explores how the methodology might be adapted and applied by governments, non-government organisations (NGOs) and private companies to broader economic assessments, policy and program development that impact on Aboriginal culture.

As an introduction to the thesis, this chapter discusses the motivation for the research, particularly the policy and legal gaps, as well as introducing the limits of existing research. It then sets out a framework of the thesis as a guide.

1.2 Motivation

Several years ago I travelled with a Nyikina elder and others on Martu Country. This elder expressed concern about the loss of culture and knowledge, particularly among younger people who struggle with the competing demands of employment and government policies and maintaining culture and connection to Country. This planted an idea about using the tensions and trade-offs to measure the cultural values to First Nations people.

First Nations cultures positively impact on many people, bringing benefits in terms of cultural arts, cultural tourism and land management. Many of these values can be measured as economic impacts or commodified into market values. The value in the Indigenous art sector, cultural tourism, and carbon economy impacts can be estimated by reference to market measures to the extent they are commodified. But the values that this thesis explores are those that are intrinsic – values in themselves, rather than instrumental – or use values. These are values recognised by First Nations people but not always by others. They are often intangible, even if they are associated with tangible goods, and generally lie outside markets.

Cultural burning practice as a key part of ecosystems services provided by Traditional Owners (TOs) can illustrate the different values associated with First Nations culture. Some of the instrumental value of cultural burning practice has been commodified in the West Arnhem Land Fire Abatement Program. This program was established as a commercial agreement between TOs of savannah country in West Arnhem Land and ConocoPhillips, a multinational gas exploration and production corporation, with carbon credits attributable to these burning practices that significantly reduce greenhouse gas emissions used to offset emissions from the Darwin Liquefied Natural Gas plant. This created carbon markets and income streams for traditional owners (Russell-Smith et al. 2013).

The model has since expanded across Arnhem Land (Arnhem Land Fire Abatement (NT) Limited 2019) and other savannah areas, often involving Aboriginal ranger groups,

with funding from the Emissions Reduction Fund.¹ The commercial value of these programs is related to the value of the carbon. The devastating bushfires in the eastern states of Australia over the 2019–20 summer raised awareness of the broader instrumental value of cultural burning practices in terms of land management, economic benefits that had not been widely recognised or estimated. Apart from these instrumental values of a cultural practice, there are intrinsic values to First Nations peoples conducting cultural burning as an integral part of their deep cultural connection to Country. The intrinsic values associated with these practices contribute to the sense of identity, wellbeing and even self-determination, values that are intangible and beyond markets.

A key driver for this research is the significant gaps in policy, legal and research frameworks relating to the recognition and measurement of intrinsic, intangible, non-market values in First Nations cultures. Western ways of thinking dominate the paradigms operating in policy and legal spheres. While culture is often acknowledged as important, no mechanism to valorise and incorporate its value beyond the market value or market-equivalent valuation has been established and adopted. The following sub-sections consider some of the limitations in policy, legal, and research domains, and the implications of this research for these domains will be discussed in the concluding chapter.

This research explores one way to redress the limited quantitative techniques and data evidence for the value of culture in identity, social and cultural wellbeing and the impact of cultural values on behaviour in the market economy.

1.2.1 Policy

Culture is rarely central to policy framing, either in Indigenous or non-Indigenous domains. In the Indigenous policy domain overlays of imagery and design in glossy policy documents imply cultural input and sensitivity in a form of ‘virtue signalling’. Focusing on key economic and cultural policy domains, this section considers how

¹ Savannah burning projects supported by the Australian Government Emissions Reduction Fund can be seen by applying a filter for the savannah burning method to the map at <http://www.cleanenergyregulator.gov.au/maps/Pages/erf-projects/index.html>

policy has been and is currently framed and the extent to which it accommodates cultural values.

Australian governments acknowledge that culture is fundamental to First Nations peoples' strength and identity (Council of Australian Governments 2017, 2018). However, this has rarely been translated to incorporating cultural values into key policy frameworks.

Two key factors limiting this translation are: (i) the degree of First Nations involvement in policy and program design and (ii) the dearth of quantitative evidence of the value of culture. These are discussed further below. Without these inputs to policy and program design there is a risk that 'culture' remains a veneer evident in marketing and promotion of programs rather than a starting point in design, delivery and evaluation of policies and programs.

In relation to the first factor, Australia lags behind other colonial settler states in terms of fundamental legal recognition of First Nations peoples and the importance of their culture, being one of the last signatories to the United Nations Declaration on the Rights of Indigenous Peoples and, to date, rejecting constitutional recognition of its first peoples (The Hon. Malcolm Turnbull MP Prime Minister et al. 2017; United Nations 2019). Inevitably this means government policies continue to reflect the norms of the dominant society. This extends to neoliberal approaches to policy and program design premised on assumptions that market-based delivery mechanisms and the use of financial incentives and penalties are effective tools to modify behaviours. Current policy debates in Australia about constitutional reform and 'The Voice' have the potential to address both legal recognition of First Nations people and their involvement in policy and program design.

The first Closing the Gap targets were set in response to concern about inequality between First Nations and other Australians in health and life expectancy, education and employment evident in existing datasets. Since these targets were agreed by the Council of Australian Governments in 2008, high level policy and subsidiary program design and evaluation has focused on the specific measures (Council of Australian Governments 2012). Subsequent amendments to the original framework expanded the range of targets and measures, but continued failure to see substantive improvement in

or meet the majority of targets (see e.g. Australian Government Department of the Prime Minister and Cabinet 2016) led governments to agree that a new approach was needed.

In response to pressure for constitutional change enshrining a First Nations voice and the Uluru Statement from the Heart, governments acknowledged the importance of a First Nations voice as well as a strengths-based approach in the Closing the Gap Refresh process (Council of Australian Governments 2018; First Nations National Constitutional Convention 2017).

The refresh of the Closing the Gap eventually resulted in a new National Agreement in 2020 (Australian Government Department of the Prime Minister and Cabinet 2020), with a renewed emphasis on a partnership approach to policy making in areas that impact on Aboriginal and Torres Strait Islander peoples. It prioritises Aboriginal and Torres Strait Islander cultures as fundamental to improved life outcomes, and includes new targets and indicators related to cultural wellbeing.

The second factor limiting the incorporation of cultural values into policy is the dearth of quantitative evidence of the value of culture. This is demonstrated by the limited new targets and indicators related to cultural wellbeing in the new Closing the Gap National Agreement. While cultural safety, culturally appropriate services and the cultural competency of people providing services are mentioned in most of the 16 outcomes in the national agreement, cultural value is addressed more directly in only three outcomes. These outcomes deal with young people and social and emotional wellbeing (Outcome 14), relationship with land and waters (Outcome 15) and cultures and languages (Outcome 16).

Despite these policy changes, there is manifestly limited quantitative evidence demonstrating the value of culture in policy frameworks. Turning to four relevant policy areas in the following subsections – economic development, policies affecting the cost of living, regional development and cultural policy – we can see how the limitations in the quantitative evidence of the value of culture can result in policy framing that is inappropriate to the circumstances of First Nations peoples and lead to failure in stated objectives.

Economic development and employment policies

The key objective in employment and social welfare policies for First Nations peoples is employment parity with other Australians, reflecting the dominant market-oriented economic paradigm (Australian Government 1987; Council of Australian Governments 2012). This is despite questions about whether parity is appropriate or achievable (Altman 1991). An equity objective neither recognises the diversity of circumstances for First Nations peoples, nor reflects the value of culture and time involved in maintaining cultural practice as an integral part of Aboriginal society.

There has been little change in national Indigenous employment levels over the past decade, suggesting the training and work-for-the-dole schemes have had little success in alleviating unemployment (Commonwealth of Australia 2020; Venn & Biddle 2018). A shift in Commonwealth Indigenous employment policy emphasis, towards supporting Indigenous business, was partly driven by First Nations businesses lobbying for a preferential procurement policy modelled on the policy applying to minority suppliers in the United States of America (USA). Evidence of higher employment of Indigenous people by Indigenous business (Hunter 2015) supports the premise that increasing Indigenous business should result in increased Indigenous employment. It is likely that the creation of culturally safe environments, where the intrinsic value of culture is recognised and respected, contributes to this increased employment.

The 2010 Indigenous Opportunities Policy (IOP) required suppliers to demonstrate their commitment to First Nations employment, including through the use of First Nations suppliers. The IOP had minimal effect on employment and was replaced by the Indigenous Procurement Policy (IPP) in 2015. The IPP commenced with percentage and value targets for government portfolios that have been incrementally increased through to the final targets to be implemented in July 2020. The Commonwealth Government launched the Indigenous Business Sector Strategy in 2018 (Australian Government Department of the Prime Minister and Cabinet 2018b) to provide additional support for Indigenous business through business hubs in major cities, transitional finance, expanding microfinance and support to engage with major projects.

While there is evidence of growth in the number of First Nations Australians in business, the majority of these businesses are on the east coast of the country

(Shirodkar & Hunter 2019, p. 9). There is limited data to support comparison of remote with non-remote performance of the IPP. A major contributor to employment and business targets in these areas is the delivery of government services and programs by First Nations non-government organisations (NGOs) and businesses. Delivering government programs with performance targets associated with strict rules and regulations applying to First Nations clients reduces some of the benefits of self-determination that can otherwise be associated with Indigenous business.

At the time of this research the Community Development Program (CDP), a work for the dole scheme that replaced the previous Remote Jobs and Communities Program (RJCP), was operating in remote areas with predominantly First Nations participants. Each CDP participant was required to work for five hours each and every week-day, a total of 25 hours a week. This requirement precluded the normal conduct of cultural activity, including fishing, hunting and gathering that has traditionally provided a food security buffer against the high costs of living in remote areas. The inflexible working arrangements also limited the window of opportunity for families in remote communities to make the requisite half or full day trips to town to purchase food and other essentials. The penalties associated with the CDP further exacerbated the financial stress on households and families already struggling with the costs of living.

Regional development

Regional development policies have generally focused on the development of market economies, especially jobs and growth, often at the expense of environmental protection and cultural activity. On the other hand, there is growing appreciation of the potential value from marketing First Nations culture through curated First Nations art and tourism experiences, but limited understanding of the need to strengthen and maintain the underlying cultural fabric that supports these cultural economies.

Taking northern development as a broad regional development strategy, the 2015 White Paper on northern development 'Our North Our Future' (Australian Government 2015) focused on land reforms to increase access for commercial development, infrastructure and delivery of a range of feasibility, options and other studies targeted at supporting economic development in northern Australia. Of the 51 measures in the White Paper, those related to Indigenous people are focused on land reform and employment in

infrastructure projects and local businesses. Without understating the importance of Indigenous economic development in the form of employment and business in regions, the broader concept of the value of First Nations cultures is not taken into account in the framing of development policies and associated value propositions aimed at attracting commercial investment.

Authentic cultural attributes can provide competitive advantage and a point of difference in markets for First Nations tourism, art, and ecological contributions to the carbon economy (Jackson et al. 2017; Missens et al. 2010; Seiver & Matthews 2016). Increasingly, First Nations groups are seeking to differentiate localised tribal or clan cultures from homogeneous identity presented by national governments (Amoamo 2007).

This distinction of products, services and experiences, including First Nations language and culture, can enhance regional development. Welcome signage, including those on road entries to Canberra and Broome² (see Fig. 1 and Fig.2) recognising the Ngunnawal by name and Yawuru by including a welcome in language, enhances awareness of local First Nations cultures and languages.

Fig. 1-1 Welcome sign to Canberra Ngunnawal Country



² Canberra Ngunnawal sign from <https://www.abc.net.au/news/specials/curious-canberra/2016-04-04/curious-canberra-what-is-the-aboriginal-history-of-canberra/7286124>, Broome Yawuru sign from <http://www.danthonia.com.au/broome-entry-sign-23647.html>

Fig. 1-2 Welcome to Broome sign with Yawuru welcome



Cultural policy

While First Nations and mainstream Australian cultural policies have included recognition and support of some aspects of First Nations culture, such as language, cultural tourism and performance and other art forms, the fundamentals of culture and its value in building cultural identity and supporting social and cultural wellbeing have had less attention and support. No general First Nations cultural policy has been in place since the Aboriginal and Torres Strait Islander Commission (ATSIC) Cultural Policy Framework of 1995, which lapsed when the elected arm of ATSIC was abolished in 2004. The Australian Government's national cultural policy 'Creative Australia' (Australian Government 2013) had a focus on First Nations languages, but lacked new funding (Altman 2013).

There are only a few government programs that broadly support cultural activity. Government support for culture is generally targeted to specific functions, such as the Western Australia (WA) Department of Justice funding small cultural projects for youth

diversion³, and Commonwealth and state governments funding for First Nations arts centres⁴. Native title holders may not have access to resources to support cultural programs including language programs, as funding is generally negotiated in Indigenous Land Use Agreements (ILUAs) and dependent on the value of the land and resources involved.

Media attention on suicide rates highlighting particular suicides of very young people has given voice to calls for greater support of cultural programs that divert youth at risk and build cultural wellbeing (Australian Government Australian Human Rights Commission 2014; People Culture Environment & Media 2014). However, these programs are often targeted at particular activities for young people, rather than providing broader based support for cultural activity in communities.

Presenting quantitative evidence of the value of cultural policy and programs that support the maintenance of culture and cultural practice, including on Country activity, is difficult because of the absence of markets capturing this broader value. It is difficult to disentangle the impacts of cultural programs from other factors affecting health and wellbeing, so a fresh approach considering the value from the perspective of First Nations people is warranted.

Policies affecting cost of living

Many policy settings and programs administered by, and on behalf of, all levels of government affect the cost of living. The high cost of living in remote areas of the Kimberley adds significant financial pressure to residents, particularly those dependent on income support. Relative prices for food, housing, transport and other basics are reflected in the Regional Western Australia Price Index published regularly by the WA Government (see for example WA Department of Regional Development 2017). In 2015 the price index for the broader Kimberley region was 115.4 and for Derby 117.7 relative to Perth 100.0.⁵

³ <https://www.wa.gov.au/government/announcements/5-million-available-fund-community-safety-and-anti-drug-measures>

⁴ <https://www.arts.gov.au/documents/indigenous-art-centre-plan>

⁵ Data sets available from <https://catalogue.data.wa.gov.au/dataset/regional-price-index-western-australia>. Note that data is collected from regional centres not remote communities.

Changes in government policies have exacerbated cost of living pressures on First Nations peoples in remote regions in recent years. ‘Normalisation’ policies in housing, electricity and municipal services, aiming to bring pricing in regional and remote communities in line with ‘normal’ (unsubsidised) prices, apply to most remote First Nations communities.⁶ In WA the full implementation of changes to the housing ‘rent to income policy’ which introduced higher ‘normalised’ rents in remote communities in line with the Commonwealth State Housing Agreement, increased rents typically payable by adults from \$25 to around \$100 a week.⁷ Another key cost pressure that took effect in 2015 was the introduction of prepaid electricity meters and reduction in cross subsidisation for remote Aboriginal communities, with residents reporting increased costs, adding to financial pressures. These cost increases are reflected in the price index element ‘Household equipment and operation’ jumping from 110.5 in 2013 to 128.8 in 2015 for Derby (Perth base = 100.0).

The combination of the inflexible work arrangements and penalties associated with the CDP and the higher cost of living resulting from changes to policy exacerbated the financial stress of low-income families, while reducing the time they can allocate to cultural activities that build and sustain cultural identity and wellbeing. Without the means of quantifying the value of these cultural activities they are not taken into account in the consideration of market-based approaches to policy making.

1.2.2 Heritage protection

Heritage protection regimes administered by federal and state jurisdictions apply to protection of First Nations cultural heritage. Recent failures of these regime to protect cultural heritage include the destruction of Juukan Gorge in WA and the Commonwealth Minister’s decision to allow destruction of Gomeroi heritage by the building of the Watermark coal mine near Gunnedah in New South Wales (NSW),

⁶ There are a small number of independent communities where housing, power and water and other municipal services is not provided by governments.

⁷ Rental increases were in line with Commonwealth State Housing Agreement. See WA Government Rental Policy applying in remote Aboriginal communities https://web.archive.org/web/20130506084223/http://www.housing.wa.gov.au/HousingDocuments/Rental_Policy_Manual.pdf and Tenancy Agreement https://web.archive.org/web/20150403182353/http://housing.wa.gov.au/HousingDocuments/AH_Sample_Tenancy_Agreement.pdf applicable at the time.

despite reported acknowledgement by the Minister of the ‘immeasurable’ cultural value (Hunt 2020).

In both these cases, acknowledgement of the existence of cultural value was insufficient to support protection in the face of powerful commercial interests that can demonstrate high and readily estimable commercial and social value. Stronger legislative protection regimes need to provide agreed mechanisms for valorisation of heritage from the perspective of First Nations people, and a regime of penalties and compensation to First Nations people in line with that cultural value. Moving from acknowledgement of value to its measurement is critical to both these elements of a stronger protection regime.

1.2.3 Native title

The need for valorisation of cultural values, and their stark difference to market values, was highlighted in the recent Timber Creek native title compensation case. This case deals with the hurt caused to TOs that resulted from the illegal acquisition of the native title rights to specific areas of land in Timber Creek in the Northern Territory.

Justice Mansfield’s judgement in the Federal Court (*Griffiths v Northern Territory of Australia* (No 3) 2016) acknowledged that the value of the native title rights in question to the claim group and the Northern Territory Government are starkly different. While the value to the Government would approximate freehold value, he noted ‘If the appropriate test were as to the price at which the claim group would have been prepared to surrender their non-exclusive native title rights, the answer would be not at all.’^[232]

In deciding an appropriate compensation in dollars for the impairment of native title, Justice Mansfield separately considered three elements: economic value, interest and solatium – compensation for emotional harm. The last element, the solatium, was reframed by the High Court in the appeal judgement (*Northern Territory/Commonwealth of Australia v Mr A. Griffiths (deceased) and Lorraine Jones on behalf of the Ngaliwurru and Nungali Peoples and Anor* 2019) as cultural loss, but similarly distinguishes it from the first two elements which are readily calculated based on market valuations and economic indicators. While Mansfield related solatium to the loss of diminution of connection or traditional attachment to the land, he rejected market-based approaches, stating instead ‘The process required is a complex, but

essentially an intuitive, one^[302] and ‘The selection of an appropriate level of compensation is not a matter of science or of mathematical calculation.’^[383]

This reliance on intuition by the Federal Court judge was discussed by the High Court, which determined that the settlement should be consistent with acceptable community standards.

This case, and the judgements by both the Federal and High Courts, highlights the need for an approach to valorisation of the cultural value of the connection to Country.

1.2.4 Research gap

Non-market valuation is well established in various fields of economics including environmental and transport economics. Economic anthropology has largely focused on market and market-equivalent measures in the intersection of the customary economy and the market and state sectors of the economy. Non-market valuation in cultural economics has focused on cultural heritage and cultural events. The extent and limitation of research relating to non-market values, and how the lessons can be applied to the question of non-market values in First Nations cultures, is explored further in Chapter 2.

1.3 Chapter outline

This thesis is arranged in four parts covering nine chapters. Part I introduces the thesis and sets out the theoretical framework and motivation for this research, including an exploration of methodologies for quantification of cultural values. Part II explores the context and basic qualitative and quantitative findings from Phase 1 and Phase 2 of the research. Part III deals with the design, application and analysis of the choice modelling undertaken as part of Phase 2 of the research. The final Part IV draws together the research conclusions and considers the policy implications that can be drawn from them. The following outlines each of the chapters that comprise these parts and the conclusion in more detail.

1.3.1 Part I: Setting the scene

Part I contains this introductory Chapter 1, which sets out the research question, motivation and thesis structure, and two further chapters.

A framework for considering the concepts of values and value, culture, cultural and other forms of capital, including as they pertain to First Nations cultures, is set out in Chapter 2. It explores consideration of these concepts in the literature across disciplines including psychology and behavioural sciences, economics, cultural economics, economic anthropology, health and wellbeing literature. It then broadens the contextual consideration of non-market values in goods and services in the economic literature, and the theoretical basis for each approach. After comparing economic impact and welfare theory approaches that account for wellbeing or utility, Chapter 2 concludes that a welfare-based approach is most appropriate to cultural valuation in a First Nations context. This points us in the general direction of how the research question about methods to quantify cultural values will be addressed.

Chapter 3 builds on this theoretical framework and introduces a philosophical approach that frames a practical and appropriate methodology to answer the question of how to quantify First Nations cultural values. After a brief discussion of positionality, it identifies the importance of building relationships and reflexivity and how prior experience and relationships can help or hinder the research. It then considers pragmatic approaches to overcome the challenges of undertaking and analysing quantitative research with dispersed and small populations in the chosen area for fieldwork. It introduces the substantive issue of how to measure the cultural values, considering the approaches to non-market valuation in the literature including contingent valuation and choice modelling. The application of choice modelling in a mixed methods approach moves the discussion from theoretical to practical application in the field, addressing some of the potential challenges and considerations in the design and application of a survey and embedded choice model. Procedural requirements, including gaining support from a relevant Aboriginal representative body and ethics clearance, were interdependent with contextual issues like seasonality in finalising the methodology. Much of the methodological consideration in Chapter 3 addresses the question of feasibility and appropriateness of the methods in the First Nations context.

1.3.2 Part II: The people and the place

This part of the thesis investigates the context of the research, particularly where the research was undertaken, who the research was conducted with and their views on what matters to them. The contextual and participant information in these two chapters provide insights into the characteristics of the participants in the research and their communities, which is important when considering the question about feasible, reliable and appropriate methods for quantifying cultural values for First Nations people.

The fieldwork context and the economic and cultural aspects of peoples' lives is discussed in Chapter 4, along with initial qualitative findings from Phase 1 that involved discussions with individuals across several field sites about work, culture and what matters most to them. A number of barriers and enablers to economic and cultural participation were identified by participants, adding to the contextual understanding. These economic and cultural factors frame participants' views of any tensions and trade-offs between work and culture that lie at the heart of the valuation exercise. This enabled identification of key themes and aspects of culture subsequently included in the choice modelling. These findings also enabled refinement of a survey instrument including what would be asked, and in what order, and how it would be conducted is also discussed in this chapter. The grounding work of the qualitative phases reported in this chapter are critical to the reliability and appropriateness of the valuation methods deployed in the quantitative survey in Phase 2, thereby addressing key elements of the research question.

Chapter 5 outlines the approach to conducting surveys in Phase 2, stressing the importance of trust in gaining traction in the process of surveying remote populations with different world views to the researcher. The success measures normally used in assessing surveys, namely participation and completion rates, are discussed as well as other factors affecting or indicating trust that were relevant in the fieldwork. These measures indicate the reliability and appropriateness of the valuation methods posed by the research question. Cultural data collected in the Phase 2 survey demonstrates the diversity of identity and the impacts of colonisation and mobility. Key sociodemographic data is analysed and compared with census data where relevant and available, providing an indication of how the survey sample compares with the regional Aboriginal population. Analysing participants' views of work and culture, and

comparing reported income and employment data with available census data, Chapter 5 also examines relationships between work, self-reported cultural activity, proxies for cultural standing and income to see if there are corresponding relationships that might indicate returns to human capital and or cultural capital. The relationship between access to Country and employment for research participants is also briefly discussed.

1.3.3 Part III: Applying the choice modelling approach

Part III focuses on the design and application of choice modelling in this research.

The theoretical and practical considerations linked with the qualitative evidence from earlier phases of the research informing the design of a feasible, reliable and appropriate choice model in response to the research question is discussed in Chapter 6. It introduces the early theoretical and experimental studies using non-market valuation techniques with First Nations people that contributed to consideration of the design, mode and delivery of the choice model given the objective of ensuring a manageable cognitive load. Together with the theoretical basis of choice modelling and the different forms of choice modelling, this evidence provides the rationale for choosing Best-Worst Scaling (BWS) Case 2 – also known as the profile case – as the core form of choice modelling. The choice model design is linked back to the qualitative findings from Phase 1 with the key themes reflected in attributes used in the choice model. A supplementary question of acceptability, essentially a simple discrete choice experiment (DCE), was added to each scenario in the choice model for comparison with the relative values from the BWS model. Potential limitations in the methodology are canvassed in order to frame application of any results and inform future designs. Chapter 6 concludes with an outline of the process of analysis that is presented in subsequent chapters.

Chapter 7 takes a stepwise approach through analysis of the data from the core BWS Case 2 choice model to provide information about the relative preferences expressed by participants. Starting with simple count analysis of Best and Worst choices separately, then Best-minus-Worst choices and Best-Worst pairs before moving onto regression analysis of the same combinations of Best and Worst choices that provide relative estimates of utility. Two coding schemas – dummy coding and effects coding – were also tested in regression modelling for comparison purposes, given the latter coding system's ability to separately estimate attribute impacts and level effects. The relative

preference results are compared to assess the consistency of rankings and relative preferences of attribute levels in the choice model. These results are the fundamental basis for assessing the reliability of the choice modelling approach to respond to the research question.

Moving beyond the question of relative utility of the attributes and levels in the choice model, Chapter 8 considers whether the results of the BWS model can identify latent classes or groups of individuals with similar preferences, and any observed characteristics they may share. This analysis can support assessment of characteristics of respondents that may distinguish classes or groups with similar preferences. The results of the binary supplementary question of acceptability of each profile, a DCE, are then analysed using similar count and regression techniques as were applied to the BWS results, and the results from both compared. This comparison informs assessment of the reliability of the choice modelling methods deployed in response to the research question. Moving beyond the relative utility to estimate the monetary values is the final stage of analysis, and the ultimate test of the feasibility of the valuation methods. The results from both the BWS and DCE choice models are compared, and their differences analysed. Chapter 8 concludes by suggesting further potential analysis, including combining the preference information from the BWS and DCE choice tasks.

1.3.4 Part IV: Conclusions and policy implications

Chapter 9 concludes the thesis, having addressed the research question by demonstrating the feasibility, reliability and appropriateness of the methods for quantifying cultural values for First Nations peoples. This chapter then considers the potential applications and policy implications of the research methodology and findings. In particular it considers the application to significant policy and legal issues such as native title compensation, heritage protection and Indigenous knowledge protection and valuation. It also discusses the limitations of the research and how future research could be framed to address these.

Chapter 2 Values in culture

2.1 Introduction

This chapter introduces the key theories and literature that frame this research and address the concepts underlying the research question ‘What methods are feasible, reliable and appropriate for quantifying cultural values for First Nations peoples?’

It starts by exploring the central concepts of culture, cultural capital, values and value through different disciplinary lenses and with regard to their application to First Nations peoples. Given the potentially broad disciplinary readership, this multidisciplinary review will at times introduce concepts from first principles to clarify the intent of the language adopted in this thesis. Approaches to valuation of culture, particularly Australian First Nations culture, are then reviewed in conclusion to provide a grounding for the following chapter that deals with valuation methods in more detail.

2.2 Culture

It is critical to unpack what culture means in the context of this research. Culture can be defined in a variety of ways that generally ascribe common behaviours and identity to groups of people.

The Oxford Dictionary reflects its essentially colonial perspective in differentiating between forms of culture with two definitions of culture as it relates to people.⁸ This reference’s first definitions and cited examples that essentially reflect white intellectual, popular, or ‘high’ British culture: ‘The arts and other manifestations of human intellectual achievement regarded collectively: “20th century popular culture”’; and ‘A refined understanding or appreciation of culture: “men of culture”’. The second set of definitions and examples portray ‘other’ cultures: ‘The ideas, customs, and social behaviour of a particular people or society: “Afro-Caribbean culture”’; and ‘The attitudes and behaviour characteristic of a particular social group: “the emerging drug culture”’.

⁸ <http://www.oxforddictionaries.com/definition/english/culture> accessed 26/8/16

The cultural economist David Throsby similarly groups definitions of culture into two senses. The first is the ‘anthropological or sociological framework to describe a set of attitudes, beliefs, mores, customs, values and practices’ of a group that may reflect their ethnic, religious, political or geographical background. The second sense of culture Throsby defines has a functional orientation relating to activities and resultant products that may have creative, symbolic or other intellectual meaning (Throsby 2001, pp. 105–106).

Keesing’s critical review of anthropological theories of culture (Keesing 1974) groups them into two categories – cultures as adaptive systems and ideational theories of cultures – before discussing the complexities of contextualising culture in its social environmental and biological systems. He concludes that conceiving culture as an ideational subsystem in a complex biological social and symbolic system should allow for continuing development of our understanding of culture. Of particular relevance to the context of this research is his analysis of the different levels of individual competence or knowledge of details of the culture even if there is a shared understanding, albeit unconscious, of the theory of the cultural code.

Revisiting them 16 years later Keesing (1990) examines how anthropological conceptions of culture are sometimes essentialised, reified and personified in everyday popular discourse. Looking ahead, he points to developments in understanding of biological and cognitive constraints on human thought, emotion and learning as likely to lead to a need to revisit theories. He suggests that critical examination needs to consider the political economy, recognise potentially multiple cultural traditions as well as the hegemonic force of the dominant tradition, and the need not to see culture as a bounded unit (Keesing 1990).

Reflecting on changing attitudes and ambivalent views of anthropologists including Keesing, Brumann, Radcliffe-Brown and others, Sahlins (1999) seek to chart a course through the concept of culture. Sahlins defends anthropological ‘old-timers’ from criticism that they portrayed culture and tradition as fixed and distinctive – creating cultural separation, and notes the impact of hegemonic power on the portrayal of culture, consistent with Keesing’s (1990) views. Noting that culture involves classifying people into groups by way of some connection, Dockery highlights the impact of disciplinary context on the interpretation of the term culture in the literature

(Dockery 2010). As well as discussing Throsby's two senses of culture, he draws out the work of Hofstede, an organisational anthropologist, whose operating definition of culture is 'The collective programming of the mind that distinguishes one group or category of people from another.' (Hofstede & McCrae 2004). This definition stresses the collective rather than individualistic nature of culture, its behavioural basis and the fact that it is shared amongst some people but not all. Notably Hofstede's concept and model of culture is based on entire national societies, rather than what he refers to as subcultures (Hofstede 1980).

Dockery also introduces the narrower definition adopted by Guiso et al. (2006) who seek to identify any causal link from culture to economic outcomes. Guiso et al. also (2006, p. 11) point to the challenges for economists to consider culture as a deterministic variable given the breadth of the notion of culture and the challenge of designing testable hypotheses. In order to narrow the definition of culture to a workable concept and causal channel, they identify customary beliefs and values as key concepts for potential causality, differentiated from dimensions that are voluntarily accumulated, like popular culture. While Aboriginal cultures are not immutable, traditional culture is essentially a system of customary beliefs and customs.

2.3 Cultural and other capital

The concept of cultural capital also varies within and across disciplines, including in how it relates to other forms of capital including social and human capital. In this section I start with a brief discussion of the forms of capital before reviewing the genesis of the concept of cultural capital in sociology, conceptions of Indigenous cultural capital and how cultural capital relates to other forms of capital. Returning to economics I then consider how cultural capital has been framed in cultural economics. I will then propose how cultural capital can be considered in the context of Australian First Nations society as it relates to the fundamental concepts of culture, values and value in this thesis.

2.3.1 Forms of capital

Before delving into cultural capital, it is worthwhile reviewing the other forms and definitions of capital used in economics and sociology and how they relate to each other.

In the discipline of economics, the most recognised forms of capital are financial capital and physical capital, generally the stock of assets like plant and equipment that contribute to the production of other goods. The next most broadly accepted form is human capital, which is the stock of skills and expertise in people, developed through education or work experience, that similarly contribute to the production of other goods or services in the economy (Becker 1964; Goldin 2016). The concept of natural capital has evolved from the recognition that nature provides a stock of renewable and non-renewable resources, like clean water, fresh air, soil and biodiversity that provide ecosystem services (Costanza & Daly 1992).

The use of social capital across disciplines including economics and sociology reflects a level of overlap (Woolcock 2001). While social capital could be defined as the trust, cooperative norms and associations within groups or social networks, the number of different conceptions and definitions of social capital can create confusion (Hunter 2004b; Woolcock 2000). Woolcock (2000) identifies three dimensions of social capital, namely bonding, bridging and linking social capital. He proposes that bonding social capital, being the most familiar, occurs in groups of similar people, enabling reciprocal support; bridging social capital enables links between people who are not alike and would not normally mix; and linking social capital enables links to people in power or positions of authority.

Earlier exploration of economic impacts of social capital created from social networks and relationships looked to its macroeconomic effects on national economies (Knack & Keefer 1997; Putnam 1993). At a microeconomic level, social capital has been shown to affect financial returns or the creation of human capital (Coleman 1988; Fryer 2003; Glaeser et al. 2002).

2.3.2 Cultural capital

The term ‘cultural capital’ was coined by sociologist Pierre Bourdieu, who framed the concept to explain the knowledge behaviours and skills that someone can use to demonstrate their cultural status and competence (Bourdieu 1973; Bourdieu & Passeron 1964). After observing differential academic achievements relating to the social class of children in the highly stratified French society, Bourdieu further developed the theory to consider how cultural capital related to other forms of capital including social

capital and economic capital, and how the forms of capital might be transformed into other forms (Bourdieu 1984, 1986).

Bourdieu identified three forms of cultural capital, namely embodied, objectified and institutionalised. Embodied cultural capital or habitus is the knowledge gained by people – for example language dialect or accent. The objectified form might include something that symbolises status, such as a luxury yacht or a collection of art works. The institutionalised form might be the qualifications, or job title, held by a person.

Michèle Lamont and Annette Lareau, through analysis of Bourdieu and others that deal with cultural capital, seek to clarify the concept of cultural capital and its role in the maintenance of social stratification systems (Lamont & Lareau 1988). They propose a definition of cultural capital that focuses on cultural and social exclusion, as well as suggesting ways to decouple the concept from its French origins to make it more relevant to the American context – applying it to a more individualistic and capitalistic society.

While the worlds of stratified French society with its status and power relationships – and even contemporary – American society may be seen to be somewhat at odds with Australian First Nations cultures, I turn to consider how Bourdieu's theories may be applied in this context. Starting with the three forms of cultural capital identified by Bourdieu: the embodied form might include language and First Nations or traditional knowledge; the objectified form might include cultural artefacts and paintings with strong symbolism; and institutionalised forms might include elder status or a senior position in a cultural or representative organisation.

Bamblett et al. (2019) frame Indigenous cultural capital in Bourdieusian theory, against the six cultural fields (heritage, visual arts, literature, television, sports and music) studied in the 'Australian Cultural Fields' project (2019, pp. 1–37). Within these cultural fields they consider the difference that identity as Indigenous or non-Indigenous makes, suggesting that Indigenous cultural capital emerges to the extent that the distinct Indigenous character of a good is valued by society. They cite two examples of Indigenous cultural capital, framed in Bourdieusian theory, that reflect concepts of power arising from cultural capital and how it can be controlled and reproduced (Bamblett et al. 2019, pp. 2–3). The first is by anthropologists Faye Ginsburg and Fred

Myers (2006) who discuss the objectification of Indigenous culture in acrylic painting, noting the political power associated with recognition of this art form by the state. The second example cited is drawn from Xu Daozhi's work which deals with the representation of Aboriginal people in children's literature, confirming Aboriginal agency through the deployment of cultural capital (Daozhi 2018).

I suggest two reasons why Bourdieu's cultural capital is not necessarily a good fit in the cultural context for First Nations peoples. Firstly, it is premised on a narrower conception of culture than is relevant to many First Nations peoples where culture is not limited to 'high culture' but is more akin to Throsby's first definition of the sociological framework that includes attitudes, beliefs, values and practices. Secondly, the association of Bourdieu's concept of cultural capital with the reproduction of class differentiation does not fit well with First Nations culture. Rowse (2019) suggests that this latter reason is why anthropologists have tended not to use 'cultural capital', when ethnographic research hasn't presented 'classical Aboriginal society' as a class structure.

In her research into the negative effects of social capital in the context of Indigenous education, Moodie (2014) argues that a Bourdieusian approach to the interconnected nature of the forms of capital (cultural, economic and social) enables critical analysis of the impact of intergenerational economic and political marginalisation on Indigenous participation in higher education. While Moodie's focus is on social capital, the analysis demonstrates the interconnectedness of financial social and cultural resources to support academic success.

Given the limited relevance of the Bourdieusian cultural capital framework to my research I turn to consider an economic framing of Indigenous cultural capital. This marks a shift away from political and social power to economics, particularly returns to capital. The transformation of cultural capital to economic capital can be seen when First Nations knowledge and skills are used in the creation of artworks or cultural tourism (Throsby & Petetskaya 2019). Another example of this transformation is the financial return to traditional knowledge used in cultural heritage clearances.

2.3.3 Economics and cultural capital

Returning to look at cultural capital through an economic lens, the idea of building cultural capital through cultural practice can be likened to the concept of building

human capital in the western economy, where a person who is educated and has work experience holds greater human capital and can therefore seek a greater return for their efforts than someone with less education and experience.

Altman does not explicitly reference cultural capital in his hybrid economy model, although he does consider theories and factors determining the distribution of game that he witnessed, from more junior to senior men (Altman 1987). The distribution of catch to senior men is attributed to status relationships and paternal authority rather than considered as distributive returns to embodied cultural capital. An interesting example of the distribution of most of the game hunted by young unmarried Kuninjku (Gunwinggu) hunters, who may not eat at certain stages of induction to adult life, to senior men as ‘payment for the religious instruction they have received’ (Altman & Peterson 1988, p. 93). This later transactional explanation indicates a return to senior men’s embodied cultural capital utilised in religious instruction.

In Aboriginal communities where elements of the customary economy and cultural activity persist, especially those more remote communities with less structural interaction with non-Indigenous Australians, individuals who choose or are chosen to take on more of the cultural learning and work often emerge as cultural leaders, in effect developing cultural capital in an embodied form. This capital may be developed in a familial setting, with fathers or mothers passing knowledge and teaching cultural leadership attributes to their children or younger relatives.

The value of this knowledge and cultural capital can wane if the cultural practice is not visible and clear to others in a community. If culture is not practiced and shared in a way that builds and maintains cultural capital it will not continue to thrive. But western notions of linear continuity in capital growth are considered to be less relevant in an Aboriginal context, where engagement in work and learning may be sporadic, often in line with seasonal cycles of life, food, and cultural activity as well as external influences and demands (Altman 1987; Yunkaporta 2019b). Similarly, the transmission of cultural knowledge is not linear or automatic. In a podcast, Yunkaporta (2019a) talks about levels of ritual knowledge that were traditionally passed on to an individual in stages every 15 years of life. He maintains that despite the disruption to this traditional pattern of knowledge transfer, knowledge is not being lost because elders are making sure that

‘knowledge is distributed among a lot of people who have to exchange that and pass it on’.

The links and overlaps between human, social and cultural capital suggest a degree of commonality, particularly as many studies explore the development or use of these forms of capital in an education context, a starting point for economists considering human capital. The social context of First Nations cultures means that there are strong linkages between cultural and social capital as both are developed through cultural activities undertaken in a social context. This suggests a distinction between cultural capital that might be held by a group – perhaps a language group or clan – and embodied cultural capital, which is like a cultural form of human capital.

Walter explores a fourth dimension she calls ‘race capital’ added into to Bourdieu’s framework of economic, cultural and social capital, stressing the intertwined interactions between the four forms of capital (Walter 2010). Walter’s concept differentiates race as having a fixed nature, contextualised as a basis for population hierarchy that can explain why some social categories can differ in life chance to others. This form of capital is not one I will explore further in this thesis, other than to note that while racial identity might be a starting point for binary identification of First Nations Australians, the depth and diversity of First Nations cultures give rise to different forms of cultural capital.

Cultural capital standing is often a reflection of someone’s family status, history of cultural practice and education. Like human capital, the key determinants of cultural capital include family history and capital, investment in education, and history of employment, noting that in the cultural or customary economy the determinants are not financial capital but sociocultural capital. This is not western schooling style education but learning about Country and cultural ways, and the history of employment may include paid employment in cultural activities (e.g. through Aboriginal NGOs) as well as unpaid cultural activities. Traditional ownership in Aboriginal society is traced back to apical ancestors, reflecting the role of family standing and the contribution of familial knowledge transfer to cultural knowledge. Elders who benefit significantly from the sharing of a catch of fish for example, are generally those who have accrued significant cultural capital through the determinants of family, cultural work and education. These elders may also be ceremonial leaders reflecting their status and the cultural capital they have built.

The Bourdieusian concepts of cultural and social capital can be seen as related, particularly because Bourdieu defines social capital as being linked to possession of a durable network or membership of a group, which in the case of First Nations peoples can be their cultural group. The bonding dimension of social capital that arises in the closer familial context, which for traditional First Nations people would include extended family and kin, has strong parallels with bonding dimension of cultural capital as kin is where the norms are developed.

It is worth noting that these concepts of cultural and social capital are related rather than conflated, as the community or group context of social and cultural capital (as described by Bourdieu) enables leverage of the stronger form of capital to offset the weaker in order to garner resources. Coleman (1988) demonstrate how a rational actor model builds social capital on social relations that exist because of links through family, community and/or religious affiliation, reinforcing this overlap with cultural capital. Similarly, in a study of Harvard students exploring the influence of social and cultural capital in education – where cultural capital is taken as the forms of knowledge and skills, and social capital is seen as the benefits of knowing people – Zweigenhaft (1993) attributes the higher academic results for public school students relative to private school students – who put greater effort into social networking – to individual responses to perceptions of where the greatest personal gains are to be made. These sociological studies of cultural and social capital in the context of education demonstrate the strong linkages with economic concepts of human capital (Throsby 1999).

Unlike Bourdieu, whose focus is on the role of cultural capital in social status and power relations, Throsby looks to an economic framework of stocks and flows to explain cultural capital, which he defines as an asset embodying cultural value (Throsby 1995, 1999). Throsby (1995) first introduces his concept of cultural capital alongside intergenerational equity in a sustainability framework proposing two forms – physical cultural capital and intellectual cultural capital. The physical form includes tangible assets endowed with cultural significance such as structures or items used in cultural ceremony while the intellectual form includes the intangible body of ideas practices, beliefs, traditions and values together with the stock of artworks in the public domain. Throsby (1995, p. 203) makes the point that both forms represent stocks that need resource flows to maintain or increase them, and he continues to explore how the

concept fits into economic analysis (see e.g. Morphy & Throsby 2015; Throsby 2003; Throsby & Petetskaya 2016, 2019).

It is this cultural economics framing of cultural capital, particularly the intangible or intellectual form, which informed my earliest thinking on the value of cultural activity. The maintenance of cultural capital in an Australian First Nations context requires ongoing resources, primarily through cultural education learning and activities. While this framing of cultural capital is so distant from the French class and power system described by Bourdieu, it is conceptually similar as a form of capital.

2.4 Values and value

This section seeks to define terminology and theory related to value and values, as can be related to culture, before moving to consider valuation of culture.

The terms ‘values’ and ‘value’ have multiple meanings, dependent on the context and sometimes the disciplinary perspective. For this research, three noun form definitions of ‘value’ are particularly relevant. First, as the importance or worth or utility or regard in which something is held; second, the fair return in goods services or money for something exchanged and finally as a numerical quantity assigned or calculated. The verb form to ‘value’ something is generally taken as meaning to consider it important or having worth, and in some circumstances to attribute a monetary or numerical value to it. Values are taken as being the beliefs or principles that guide and motivate behaviour.

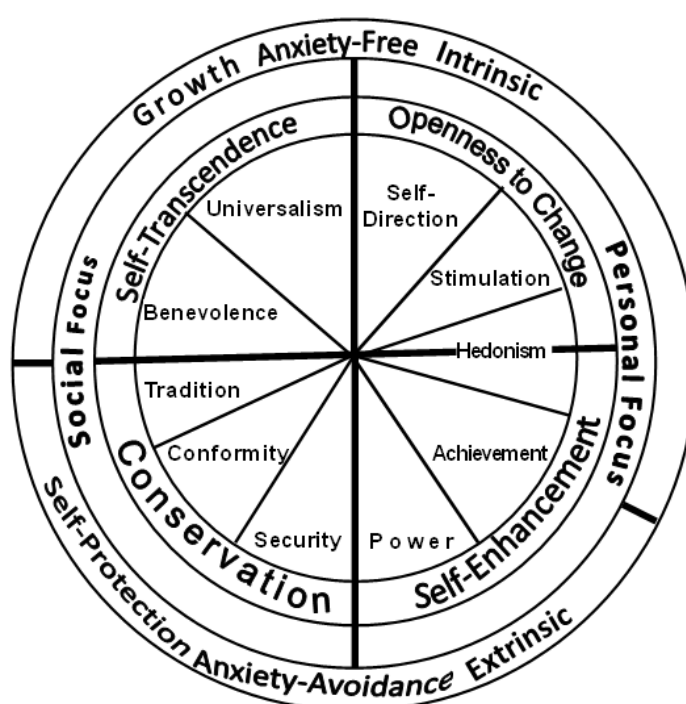
I assume the definitions to be human-centric, reflecting human estimation of worth on one hand and principles guiding human behaviour on the other. Based on their own values individuals will value things, people, acts or events differently, meaning the value is subjective.

2.4.1 Values theory

The Schwartz theory of basic values describes the nature and common features of values and sets out 10 universal basic personal values in a circular structure to reflect a continuum of adjacent compatible values with conflicting values with antagonistic motivations more distant (Schwartz 1992, 2012, 2015; Schwartz & Bardi 2001). This theory describes six main features of values: (i) values as beliefs; (ii) values refer to

desirable goals; (iii) values transcend specific actions and situations; (iv) values serve as standards or criteria; (v) values are ordered by relative importance; and (vi) the relative importance of multiple values guides action. A recent depiction of this theory in Fig. 2-1 shows the 10 values divided into four broader values (self-enhancement, openness to change, self-transcendence, conservation), bifurcated into two sets of interests (personal or social/collective) served by that value attainment. Schwartz stresses the near universality of this theory based on studies in over 80 countries including Australia.

Fig. 2-1 The circular motivational continuum of 10 values in the Schwartz theory (Schwartz, 2015)



2.4.2 Values and culture

While Schwartz stresses the universal pan-cultural nature of the typology of values in his theory, he notes that the relative importance that groups and individuals attribute to the values are often points of differentiation between cultures. For example comparison of the importance of collective versus individualistic values across cultures can reveal substantial differences in priorities (Schwartz & Bilsky 1990).

The link between values and culture is explicit in the work of the social psychologist Gerard Hofstede, who defines culture as the collective programming of the mind

applying to entire societies (Hofstede 1980). His work explores values and beliefs underlying national cultures, initially using IBM international employee survey data that included questions about values and beliefs. He categorises values into four dimensions including the collectivist/individualist dimension that features in Schwartz's theory. Hofstede's work parallels that of another psychologist Milton Rokeach who developed the Rokeach Value Survey, which includes terminal values (desirable end states) and instrumental values (preferable modes of behaviour) (Rokeach 1973).

In comparing the IBM survey results with those from the Chinese Value Survey, Hofstede and Bond find an extra dimension of values which they call 'Confucian Dynamism', which ranks most highly in four Asian countries that had the highest economic growth rates at the time (Hofstede & Bond 1988). At around the same time as this study, Bond compared results from his Chinese Value Survey with a nine-culture study of the Rokeach Value Survey and found one dimension of value in the Chinese Value Survey not found in the Rokeach Value Survey.

More recently a meta-analysis study comparing Rokeach Value Survey data and Schwartz value structure suggested a new value type the authors labelled self-fulfilled connectedness (Vauclair et al. 2011).

What is evident from this literature is that many psychologists see culture as founded in values and beliefs and seek to explain cultural differentiation through examination of differences in values. These psychology studies are a small sample of the intercultural comparisons in search of a pan-cultural typology for values. Despite this large body of literature, there is limited research using the Schwartz theory or other models with First Nations peoples specifically.

Two studies use the Schwartz Values Survey with Australian Aboriginal and non-Aboriginal university students found that Aboriginal students tend to be more collectively minded, scoring more highly in the collectivist scales of Conformity, Tradition and Security than the non-Aboriginal student cohorts (Fogarty & White 1994; White & Fogarty 2000). A comparative study of values by acculturation clusters of Canadian Aboriginal people found the group with higher endorsement of both traditional and mainstream cultures had a value profile most consistent with the Native worldviews predominant in the literature (Stonefish & Kwantes 2017).

2.4.3 First Nations cultures and values

The deep history of Australia's First Nations people extends back well over 60,000 years, with evidence of human habitation in the form of the world's earliest edge ground axe-heads in Arnhem Land, Northern Territory, dated to about 65,000 years (Smith et al. 2019). Colonial encounters, the pattern of pastoralism, the gazettal of Aboriginal reserves and more recently land rights and native title determinations have shaped the geographical distribution and impact on culture of the First Nations peoples (Norman 2015; Walter & Peacock 2019). Even in the sparsely settled areas north of Rowley's line – that in 1970 demarcated the closely settled regions from the northern regions where people still lived according to pre-colonial customs – only small scattered pockets of the Kimberley, defined by where pastoralists had not established herds, had become gazetted reserves whereas Arnhem Land was largely reserve (Markham et al. 2019; Rowse & Ryan 2019).

The precolonial diversity of peoples, cultures and languages that survived to be represented in Norman Tindale's 1974 map of tribal boundaries, reflects the 250 to 750 First Nations languages that were spoken around Australia in 1788 (Arthur & Morphy 2019; Australian National Placenames Survey 2004; Simpson 2019a, 2019b). While the number of language groups has reduced as a result of colonisation and assimilation policies that prevented people from continuing to use their language, significant efforts are being made to maintain and revive traditional languages (Simpson 2019a). Language is critical to orally transmitted cultures as well as being central to identity. The diversity of languages and cultures is reflected in the cultural practices, stories and art forms that exist today (Arthur & Morphy 2019).

First Nations cultures have a strong connection to their traditional land, or 'Country' as it is often termed in Australia, which is fundamental to their collective physical and cultural survival. The social context and collective nature of the culture and focus on sustainability are features common to First Nations cultures around the world (United Nations 2008, n.d.). In Australian First Nations cultures time is a circular rather than linear concept. That is reflected in kinship relationships and beliefs, part of an eternal cycle of renewal (Yunkaporta 2019b). This points to the sustainability focus of First Nations cultures as well as the difference of worldviews, beliefs and values from

those of the dominant society in which they live, a fact that underlies the need for this research.

2.4.4 Some concepts of value

Value is another concept that is framed in different terms, with different forms, across disciplines. The history of consideration of political, economic and philosophical approaches to value is deeper and broader than is essential to this thesis, so this sub-section focuses on key value perspectives in order to better understand how we might conceptualise the value of culture to First Nations people.

Intrinsic vs instrumental value

The philosophical distinction between instrumental and intrinsic value is important in the context of this research. Instrumental value is taken to mean the value something has in helping us get or achieve some other thing, whereas intrinsic value is the value in itself. This draws on two ideas about intrinsic value – firstly that it is ‘an end’ and therefore not valuable for any other objects it will produce and secondly that it is non-relational (in itself). A good example of an instrumental value is money which provides the ability to purchase desired goods in the market, rather than money as an end in itself. Intrinsic value could include things like friendship. This distinction, while seemingly absolute, is challenged by some philosophers (Kagan 1998; Rabinowicz & Rønnow-Rasmussen 2000).

Some aspects of Aboriginal culture may have both intrinsic and instrumental value. For example, when a ceremony with intrinsic value is conducted with paying tourists there is a market for this aspect of culture, meaning it has an instrumental value because it facilitates the realisation of other value (money). This example provides market and instrumental value, while an intrinsic value of such a ceremony may exist outside the market, maintaining and strengthening identity and sense of wellbeing as well as the ties between people and ancestors.

Intrinsic values are also recognised and considered in some forms of economics, particularly environmental economics and cultural economics (Bakhshi et al. 2009). In both fields, arguments to recognise intrinsic values, being outside the market, hinge on

the inability of neoclassical economics to deal appropriately with these values. The next subsections deal with the theory and classifications of value in economics.

Economic theory of value

Economic theories of value reflect the history of economic thought, generally aiming to explain the price or exchange value of goods and services. This section briefly explores some of the key conceptual shifts in the economic theory of value that inform current day approaches to valuation.

Early classical political economy labour theory of value built on the work of Sir William Petty whose theory identified the labour input to cost of production as a key determinate of value (Aspromourgos 1986). Adam Smith (1776) expanded labour theory of value to incorporate other factors of production such as rents as well as labour costs as determinants of value. David Ricardo and Karl Marx also developed theories based on labour and capital inputs (Marshall 1890, 2004). Ricardo proposed that the value of an output depends on the quantity of labour input rather than its price. Marx's extensive body of work included analysis of the 'form of value' and exchange value where the first form of value is the social form of the product of labour that is not 'concretised' and still abstract whereas the exchange value is essentially the market value. Marx's theories extended to the recognition of surplus value (profits) being returned to holders of capital inputs rather than labour. In formulating the exchange theory of value, Rubin (1927, 1928) further considered the distinctions between the 'form of value' and exchange value and between abstract and embodied labour. The distinction between 'form of value' and exchange value, while contextualised in socialist political economies, can be compared to the distinction between market and non-market values in this research.

Neoclassical economics shifts the focus on value theory away from a labour or cost of production theory to a theory of price resulting from supply and demand articulated by Marshall (1890, 2004). The theory that a good's value depends on consumer needs and desires, where marginal utility determines price, builds on the work of economists including Jevons, Walras and Menger, and introduces concepts of marginal utility, marginal rate of substitution and opportunity costs (Marshall 1890, 2004). While empirical approaches to value suggest positivity, irrespective of the discipline, value

inherently depends on normative judgements to some degree, and an individual's preferences will affect how they value something. This utilitarian approach to value underpins the methodology adopted in this thesis.

Economic classifications of value

Western policy frameworks are dominated by neoclassical and neoliberal approaches to economics. Neoliberal economics is dominated by laissez-faire approaches which assume government intervention and regulation are unnecessary distortions of efficient market economies. The distinction between this and the human-centred nature of neoclassical economics is important and makes the distinction between market and non-market value a useful starting point in considering value. The utilitarian approach of neoclassical economics to value underpins non-market valuation approaches.

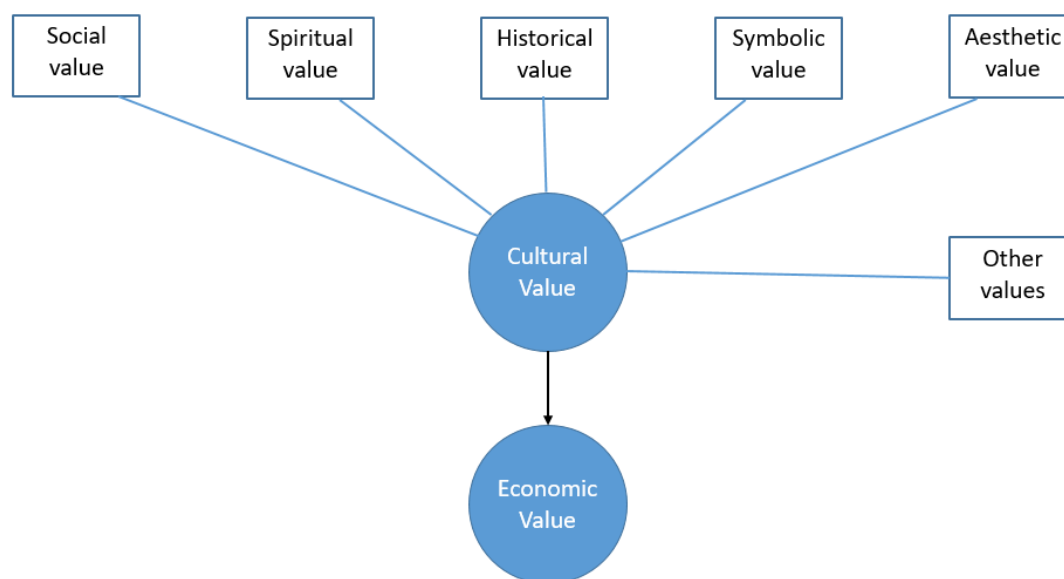
In the economics of markets, the simplest way to consider the value of a good or service is through supply and demand, valorised as the price that the producer is willing to accept and the consumer is willing to pay. Even within this market, the willingness-to-accept (WTA) or willingness-to-pay (WTP) is influenced by personal preferences that may shift the price away from market expectations or prior observations. For example, if a manufacturer of a widget sees more value in it because it represents a milestone in the production process, they may seek a higher price. If a consumer considers that the widget is scarce or has potential uses over and above those currently known in the market, they may be willing to pay a higher price. These influences on price are sometimes described as indirect use values that may see an agreed market price elevated beyond the previously established 'price' of the widget.

Non-market values are essentially values that exist outside a market. The terminology and distinction between market and non-market values is commonly associated with environmental economics. Examples of non-market values in the environment include the existence of an endangered species of plant or animal (existence or intrinsic value), preservation of an area of land or waters for future generations (bequest value), or enjoying a bush area for hiking or camping (non-rivalrous and non-consumptive use value). While the categorisation of and terminology for values in environmental economics is not uniform (Perman et al. 2011, p. 412), there are strong parallels to cultural economics, given the intangible and non-use natures of some of the values.

These similarities mean approaches to valuation in environmental economics are instructive when considering cultural values.

Cultural economics evolved in response to emerging interest in the economics of art markets, cultural public goods and the role of government and philanthropic support. The distinction between instrumental and intrinsic values is often important in cultural economics. The need to extend the conceptualisation of value in culture beyond purely market economic or instrumental value has been recognised in this field since around the turn of the century (Dekker 2015; Holden 2004; Hutter & Throsby 2008; Klammer 1996, 2002). While there has been significant development in the field of cultural economics, Throsby's proposition 'that cultural value is complex, multifaceted, unstable and lacks an agreed unit of account' (Throsby 2010, p. 18) still holds. Constituent elements of cultural value and its distinction from economic value were identified by Throsby (2001, pp. 28–29) and depicted by Angelini and Castellani (2018), as shown below in Fig. 2-2. Throsby and others argue that while cultural value may be considered as separate from economic value it does have an effect on it. Few would disagree with this, if and when economic value is taken as the exchange value in the market. The distinction between economic value and cultural value is often referenced, with few challenging the distinction. Nevertheless, the field of cultural economics uses the classical welfare theory of public choice and consumer preferences to explore the value in culture, rather than the alternative measurement of economic impact of culture (Bakhshi et al. 2009; Frey 2008; Sable & Kling 2001). An example in Aboriginal art of the potential for influence each way between market and cultural or aesthetic values is demonstrated by De Marchi (2008), who notes that the market in Aboriginal paintings has benefited from being viewed with a Modernistic aesthetic, foreign to the Aboriginal culture that it has helped sustain.

Fig. 2-2 Throsby's conception of constituent values in cultural goods' value and their relationships (from Angelini & Castellani, 2018)



Throsby's conceptualisation with social value a component of cultural value is reflected in Fig. 2-2. Others, like Klammer (2004), seek to separate cultural from social and economic value, categorising culture as transcending social relational or economic values. Cultural value in a First Nations context is more akin to what Klammer describes as an 'anthropological sense' (2004, p. 150) as it also pertains to the relations between and among people. The definition of cultural value in this thesis more closely aligns to that of Throsby, in as much as social value is an integral part of cultural value.

In relation to value in Aboriginal culture, the research undertaken for this thesis did not seek to deconstruct the nature of the value to the participants, instead recognising the relative importance participants placed on cultural attributes. It is evident that much of the value in culture to First Nations people is intrinsic and not fully captured in markets, but is likely to affect human preferences and behaviours, through which we may further explore the value.

2.5 Approaches to valuation of culture

Many approaches have been taken to valuation of aspects of culture and cultural practice. Across and within disciplines there are different approaches to deal with non-market and market values represented by intangible or intrinsic as well as instrumental values. Early research into the economics of culture amongst First Nations

people in Australia focused on the nutritional value of customary hunting, fishing and gathering. Most studies have sought to value culture through measuring its impact or benefits. This section explores a range of valuation approaches and the underlying theoretical frameworks of studies across different disciplines.

2.5.1 Valuation approaches

While there are several methodologies reflecting different perspectives, there are two general approaches to economic analysis of the values in culture (Frey 2008; Noonan & Rizzo 2017; Snowball 2008). The first is to account for the economic impact in terms of direct and indirect market impacts and multiplier effects, and the second is a welfare theory approach using valuations of the effect on wellbeing or utility. To illustrate these different approaches the following outlines how they could be used to value a cultural event.

Impact evaluations seek to capture the instrumental values that are reflected in market or market equivalent impacts. Applying this to a cultural event might involve estimation of the direct costs and benefits of staging the event and then look at the indirect impacts of visitation to that event, capturing things like jobs created and increased demand for food, beverage and accommodation services, possibly applying a multiplier effect to capture other flow-on benefits to the local economy.

Secondary impacts, while hard to attribute directly, can be considered in impact evaluations. Culture has been found to be positively associated with physical health, social and emotional wellbeing (Bourke et al. 2018; Cairney et al. 2017; Dockery 2010). Savings in primary health care costs of treatment of three common chronic conditions have been associated with greater participation in land management on Aboriginal land (Campbell et al. 2010). Despite this growing evidence of the link between culture and health and wellbeing, the challenges of quantifying these secondary impacts meant they are rarely explicit in cultural impact evaluations.

Governments often rely on impact evaluations because the effects are perceived to be concrete and measurable. Another approach to verification of the economic effects of a cultural event is to use *ex-post* econometric methods (Srakar & Vecco 2017). These techniques rely on the availability of large data sets that may not be available to assess

impacts of First Nations cultural events in Australia, some of which – ceremony – have restricted and secret participation.

A welfare theory approach assesses utility that captures instrumental as well as intrinsic value, including non-market values. This might involve testing people's preferences using contingent valuation or choice modelling to ascertain their WTP for a change. Such an approach can capture intrinsic and broader public values, including existence and option benefits for those that do not attend the event but see some benefit in the event being staged at that time.

These two approaches, impact and utility, form the basis of many approaches to valuation of culture as we will see in the following exploration of the approaches to cultural valuation that have been taken in different disciplines.

When considering First Nations cultural tourism, a market economic study would explore the market impacts and multipliers. Utility-based studies exploring the demand for cultural tourism might compare tourism with and without cultural components to reveal the value of the cultural attribute to potential consumers of the cultural overlay. In this research, the focus is on the value of culture to Aboriginal people as they consider the benefits of production in the individual or intersected sectors. A welfare theory approach that captures the wellbeing or utility associated with culture is appropriate in this situation.

Welfare theory and utility aggregation

Welfare theory approaches to valuation require aggregation of individual utilities to provide social valuations. Different approaches and decision rules around aggregation have been developed with fundamentally different philosophies addressing efficiency and justice considerations. While this research explores the value of culture through individual utility maximisation, application to matters of broader social utility would need to consider these aggregation issues. This section discusses key aspects of these approaches that are relevant to the consideration of social utility and First Nations peoples.

A classical utilitarianism approach, following Bentham, is to maximise the total social utility, this being the sum of individual utility, irrespective of its distribution

(Charlot et al. 2006; Harsanyi 1985; Sen 1974). Bentham's theory was act utilitarianism⁹, where the only moral decision is whether an action will produce the highest level of social utility in accordance with the Pareto principle, hence failing to adequately deal with the moral issues of distributive justice. Classical utilitarianism allows for application of the Kaldor-Hicks Criteria, also known as the Potential Pareto Criteria, where it is possible for those made better off to compensate those made worse off through a voluntary redistribution (Baldwin 1953; Hicks 1939; Kaldor 1939).

Rule utilitarianism on the other hand takes account of the correct moral rule that would apply to the situation, so that the social benefits of a moral code that protects individual rights may outweigh the social costs in consideration of social utility (Harsanyi 1985). To illustrate the difference, an act that harms an individual but brings pleasure to several individuals might increase total utility under classical utilitarianism, but may fail to meet a moral code that protects the individual from that harm and thereby not be seen as increasing social utility. Harsanyi (1985, p. 117) notes that rule utilitarian approaches can result in a higher level of social utility than the act utilitarian approach.

Different moral philosophies underpin different forms of rule utilitarianism (Harsanyi 1985; Sen 1974; Yaari 1981). Rawls (1985) points out the failure of classical utilitarianism to deal with human diversity, a relevant factor when considering First Nations people. The Maximin Rule developed by Rawls complies with the Pareto Principle but introduces the (least) Difference Principle where a change that makes even a majority better off but makes a small proportion worse off should be rejected. Other approaches include Leximin where an ordering of impact on those made worse off is considered, as well as Prioritarianism where decisions are based on individual advantage rather than relational impacts on utility (Holtug 2015).

Consideration of First Nations people's perspectives in aggregation would be important in social utility calculations, with the rule utilitarian code more likely to accommodate values that extend beyond individualistic ideals to produce a higher level of social utility. The ability of rule utilitarian theory to both recognise and accommodate values such as

⁹ Act utilitarianism considers only the consequences of the single act while rule utilitarianism considers the consequences of following a rule of conduct (see e.g. Harsanyi 1985).

altruism, while protecting individual rights, suggests it would be the preferred approach to assessing social value that incorporates First Nations peoples' preferences.

Total or marginal valuation

Valuation methods utilising the welfare theory approach outlined above estimate the WTP/WTB for a marginal or incremental change. The resultant marginal valuations are relevant to consideration of the effect of a change to a good, service or attribute, to determine what are often termed 'shadow prices' of goods and services outside the market (Starrett 2000). Where there is an objective of estimating a total value, marginal values from a range of approaches are standardised as average prices per area, or other relevant unit, to calculate the total value in a common currency (see e.g. de Groot et al. 2012, p. 54). Examples of this approach include the study by Costanza et al. (1997) estimating the global value of ecosystem service, which synthesised previous studies to value 17 ecosystem services, by 16 biome types applying to specific areas, to estimate the total value of global ecosystem services to human beings averaging \$33 trillion per annum.

In the context of First Nations cultural values, I am not aware of any studies seeking to measure total value. A limited number of environmental evaluation studies seek to either value specific cultural values or incorporate these values implicitly by including First Nations people in valuation exercises. Given the heterogeneity of First Nations cultures in Australia, let alone globally, it would be challenging to establish a methodological framework that supported sufficient consistency to enable aggregation of values.

The objective in this research is far more modest, focused on identifying feasible, reliable and appropriate methods for quantifying cultural values for First Nations peoples. The methodology in this research outlined in Chapter 3 and Chapter 6, is focused on a method to determine marginal values, the first step of the process outlined by de Groote et al. (2012). The scope of this research is limited to Aboriginal people with connection to two of many language groups in Australia.

2.5.2 Economic anthropology

The consideration of the economics of First Nations culture and customary practice is not a recent phenomenon. Building on essentially qualitative ethnographic methods,

investigation of economies and value in First Nations societies, often described as economic anthropology or anthropological economics, utilises quantitative methods to measure and value customary or cultural activity.

Early quantitative studies of the nutritional value of customary hunting and gathering practices were undertaken in Arnhem Land as part of a large expedition after World War II (McArthur et al. 1948, 2000). These were essentially time and motion studies of food production through hunting, fishing and collecting, with some assessment of the resultant nutritional values. Limited attention was paid to the investment of time in preparing and cooking the food and the distribution and exchange of food.

In a similar vein, the methodology of time allocations to assess competing production possibilities in hunter-gatherer societies was further developed by the anthropologist Marshall Sahlins (1972), whose ‘subsistence affluence’ thesis critiqued dominant economic paradigms based on scarcity in assessing hunter gatherer societies. His subsequent work (Sahlins 1976) explored the resistance to materialism by tribal society and the role of culture in providing a symbolic schema to life. His overall thesis is that utility is not only gained from possessions but also from culture.

While the additional economic value of subsistence production occurring on outstations resulted in comparable total economic value of income to that on government settlements and missions, in a nod to the utility of culture, Altman identifies that ‘quality of life’ factors made life on outstations ‘more appealing to many Aborigines particularly those more tradition-oriented’ (Altman 1980, p. 98).

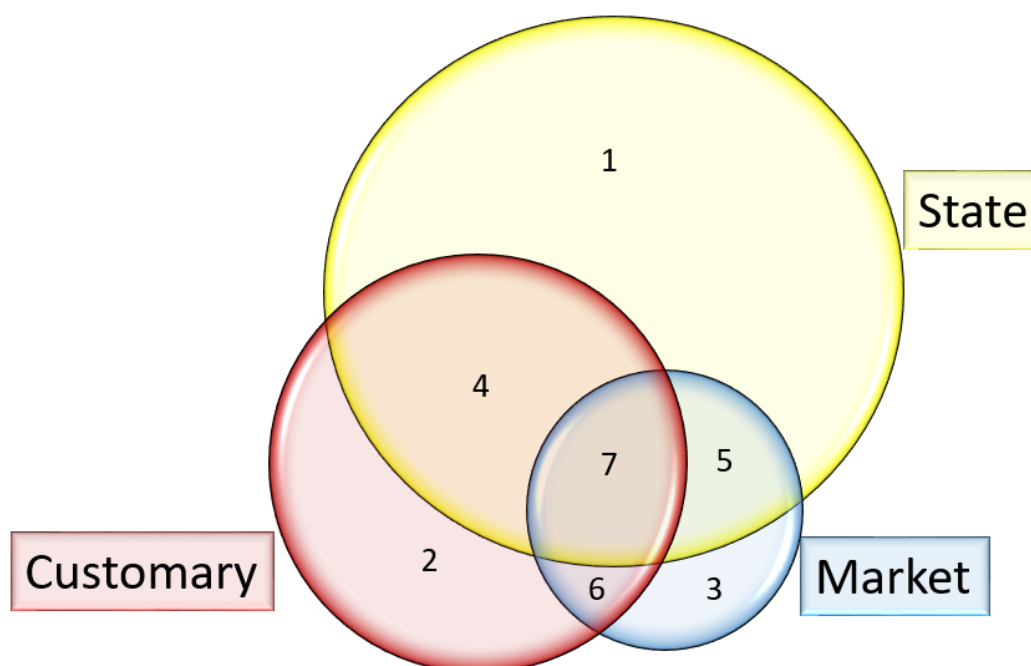
Hybrid to cultural economy

Altman’s concept of the hybrid economy was a key development in economic anthropology (Altman 2003, 2005; Altman & Allen 1992). His hybrid economy model identifies three key sectors – the market sector, the customary sector and the state sector – and their interaction. The customary sector in this model centred on the production, consumption and exchange of food harvesting (fishing, hunting and gathering). Art production was identified as a market sector activity, reflecting a classical instrumental view of the economy.

Social interaction is central to Aboriginal society and most cultural activity is generally conducted in a social context. Relationships are defined and predetermined by the rules of the kinship system, which provides a network of people with caring responsibilities. In the market sector of the economy such social interaction would be likened to leisure as it is not seen to be ‘productive’ or creating a market economy return. And yet such activity is central to demand-sharing and reciprocity practices in Aboriginal society, and may in fact be building sociocultural capital that provides a return in the future when the need is highest.

My conception of the cultural or customary sector extends beyond food harvesting, incorporating cultural activity that is integral to the sustainable economic lifeways of First Nations peoples. This broader view of the cultural economy seeks to recognise cultural activity beyond customary production to include facets of cultural education, health and wellbeing that lie outside market and state sectors but build critical capabilities for sustainable economies. The intrinsic values for First Nations peoples are also incorporated in this broader view of the cultural economy. Altman notes the divergence in relation to ceremonial production between ‘mainstream formal viewpoints’ that ceremony is non-productive and Gunwinggu viewpoints that ceremony is central to economic order. While noting the existence of ceremonial exchange of both observable goods with market value and esoteric or ‘social invisibles’, in his analysis he separates the economy from ceremony – viewing the latter as a religious system with political and social functions (Altman 1987, pp. 217–233).

Fig. 2-3 The hybrid economy in remote northern Australia (adapted from Altman 2005)



My adaptation of Altman's Venn diagram of the hybrid economy model, in Fig. 2-3, while not empirically based, reflects the relative scale of my expectation of importance of the three sectors in some remote areas where the government sector (services, social support) dominates, cultural or customary activity remains strong and there is only a small market sector. The areas of overlap in the Venn diagram represent the concurrence of the different sectors. Private, unsubsidised cultural tourism activity might fall into area 6 where the market economy overlaps with the customary sector. Government-subsidised arts programs might fall into area 7 of the diagram, given the interaction of state, market and customary or cultural sectors. Caring for Country programs with no market-based emissions trading might fall into area 4, whereas a government supported Caring for Country program with private sector trading might fall into area 7.

The customary sector in Altman's model builds on the concept of informal or subsistence economies incorporating cultural and traditional activities, such as hunting and gathering. With this focus and the first of five stated aims of hybrid economy research being 'to render the non-market and non-monetised customary sector visible' (Buchanan 2013, p. 3), attempts to quantify the value of the customary sector of the hybrid economy have been limited to harvesting, measuring on the calorific, food and

market substitute values of fishing, hunting and gathering activities (Altman et al. 2006; Buchanan 2013; Gray & Altman 2006; Kahn & O’Faircheallaigh 2010).

Other cultural or customary activities not explicitly canvassed in hybrid economy literature include cultural education and health services, such as teaching language and other aspects of culture and using traditional healing methods. These intangible services are integral to cultural and physical wellbeing, and contribute to the development and maintenance of First Nations knowledge and capability, which can be likened to a form of human capital. In labour economics, education and training are key factors in development of human capital that provide anticipated returns through increased income. Despite these parallels, cultural learning in sustainable First Nations economies is generally excluded from reckoning of economic activity as it is outside the market. In the field work study Altman founded his work on, while he discusses the transfer of knowledge he witnessed, his consideration of the customary economy is limited to the value of harvesting and its distribution (Altman 1987, 2009).

The positive association of culture with physical health, social and emotional wellbeing has been shown in studies across First Nations in Canada, Australia, New Zealand and the United States (Bourke et al. 2018). Social and emotional wellbeing are factors in the capacity of First Nations peoples to participate and contribute to economic productivity, in either mainstream or customary economies. Yet for activities that occur where the market economy converges with cultural or customary activity, such as the production of cultural tourism and arts, the value is most commonly a measure of market value, although this is not necessarily a true indication of the value to the Aboriginal person producing the market good.

The value to traditional owner groups of working on Country is expressed well by Jack Green and Jimmy Morrison, two Aboriginal rangers who wrote about the impact of moving back onto Country to undertake environmental services with the Northern Land Council (NLC)’s Caring for Country Unit in the Robinson River region. As well as employment, they discuss the cultural benefits which are largely intrinsic:

It gets them back out on the country and they often bring their kids with them. It’s like old times, families back out on country. The young ones get to see the

country through the old people's eyes. They are full of questions, learning on the country about being Waanyi and Garawa.

With the old ones, sometimes when we are on country, suddenly everything just comes back to them and they will tell us stories as we drive through the country. The stories are from the Dreaming. They tell us what ancestral beings travelled through the country, what they created or where they rest in the country. Some of the old ones sing to the country, the *kujika* (songlines), they know it. It's powerful; it hits you and makes your mind open up. This can't happen in town. These old people are leaving us so it's important that they come with us when they can. (Green et al. 2012, p. 158).

Their documentation of the history of people being moved off Country and then reconnecting, and the cultural significance now that they have established livelihoods in land management is indicative of improved wellbeing in the community. The Aboriginal view of the Caring for Country program was focused on the cultural activities and responsibilities as much as the employment aspects (Kerins 2012).

In her critique of Altman's hybrid economy model and its role in economic development, Katherine Curchin (2013) points to the tension between elements of the hybrid economy, specifically in relation to how Aboriginal people spend their productive time, how education priorities are determined and land use. The first of these tensions is addressed in my research. How do Aboriginal people choose to engage with employment and cultural practice, and what do their choices reveal about the value of the customary economy and cultural production? By exploring these potentially rival uses of Aboriginal labour from an Aboriginal perspective we can better understand the motivating forces at play in Aboriginal participation in economic development in remote Australia.

2.5.3 Cultural economics

The relatively new field of cultural economics also employs a range of approaches to valuation. Frey (2008) points to the two main approaches to valuing arts and culture – impact assessment and utilitarian – pointing to the different aspects of value captured and purposes they serve. Impact studies seek to capture the instrumental values resulting in costs and benefits in the market, whereas utilitarian approaches allow you to

capture the value of intrinsic values by exploring the willingness of agents to trade-off against market and non-market goods and services. Frey suggests that arts administrators and entrepreneurs prefer the impact studies whereas ‘art economists’ prefer the utilitarian approach that capture non-market and intrinsic values. This section explores some examples of these approaches and contemplates their relevance to considering value in First Nations cultures.

In the cultural sphere, impact assessments are generally preferred by governments and other funders. The Australian Government takes a conservative approach to measuring (*ex-post*) the economic value of creative and cultural industries in Australia, generally limited to robust comparable measures such as employment and value-add, avoiding ‘more complete’ measures primarily due to cost (Meeting of Cultural Ministers Statistics Working Group 2018, p. 8). This acknowledgement of the cost and challenges of collecting measures of indirect value and wider economic value, including use/non-use values and market/non-market values, is used to justify use of established consistent data over surveys and modelling, despite the resultant underestimation of value.

In a report targeting United Kingdom (UK) cultural policy makers Holden (2004) makes a case for augmenting market economic values to encompass a broader range of cultural, non-monetised values. Holden stops short of considering intrinsic value suggesting that it is subjective and a ‘reversion to patrician and patronising attitudes’, reflecting his criticism of top-down cultural policy making in the UK at the time. However, a key benefit of a utilitarian approach is that it can privilege consumers, users and non-users in a bottom up approach.

Many impact studies, used to bolster a case for cultural events and programs, are *ex-ante* predictions of the impact of direct expenditure, employment and using multipliers to estimate the flow-on effects. A criticism of these is that the *ex-ante* projections are often over optimistic and unreliable, and *ex-post* evaluations are sometimes used to assess the validity or otherwise of predicted economic impacts (Skinner 2006; Srakar & Vecco 2017). Srakar and Vecco (2017) demonstrate *ex-post* verification of the 2012 European Capital of Culture (ECoC) Maribor using econometric techniques, including difference in differences panel data analysis to test the effect of the ECoC program on participating cities and municipalities.

An economic impact study of a First Nations cultural tourism event would essentially seek to quantify the market impacts including employment and multipliers. Surveys of consumers could generate evidence on travel costs, length of stay, estimated spend, and other economic impacts. Moving beyond impact, a cultural valuation of a First Nations cultural tourism event might utilise surveys of participants to assess the value they gain through performing or contributing to staging of the event or attending the event. Most research exploring First Nations cultural festivals in Australia has focused on broader socio-cultural impacts including cultural engagement, empowerment, social inclusion, and education, rather than quantifying flow-on economic impacts (Phipps & Slater 2010).

Utilitarian approaches to valuation in cultural economics have focused on value of cultural heritage and consumption value of performances and festivals (Choi et al. 2010; Rolfe & Windle 2003; Snowball & Willis 2006; Willis 2014). Research on cultural production has centred on artists and the intrinsic value of creative production (Throsby 2006; Throsby & Petetskaya 2019).

Cultural assets

The value of cultural assets is an important consideration in valuing First Nations cultures. Cultural assets can be tangible like heritage artefacts and artworks, or intangible, like language, stories and customs. Despite First Nations cultures often being depicted as not accumulating or creating significant assets, there is evidence of tangible assets being part of customary societies. Fish traps in the Torres Strait and Brewarrina (Maclean et al. 2012; Rowland & Ulm 2011) are examples of tangible cultural heritage assets.

Where tangible cultural assets are privately owned and tradeable, they can be valued through the market. However, many cultural assets will be public goods or mixed goods, which limits the usefulness of market valuation measures and highlights the need for alternate valuation approaches.

Beyond tangible cultural assets, many aspects of culture, including cultural assets, are intangible. Ancestor stories are a key means of transferring knowledge between generations, knowledge which is critical to survival. If this knowledge was in a written

form, the books or scrolls would be tangible assets. Both forms of knowledge may have intrinsic value related to the sense of identity and belonging they create.

Valuations of tangible assets, cultural performances, and value to artists are aspects of culture revealed in cultural economics literature. Tangible cultural heritage assets, as a distinct form of capital that is generally public in nature, have been valued using contingent valuation to identify WTP estimates (Rizzo & Throsby 2006; Snowball 2008; Throsby 1999). Developments in this area of valuation have aimed to support preservation, restoration and conservation investment decisions through the application of economic techniques.

Another key application of economic valuation in the area of culture and the arts is in determining the WTP for cultural performances and their public good aspects (Snowball 2008; Throsby & Withers 1985). Contingent valuation has been the most commonly adopted approach to valuing cultural performances, although choice modelling – which has been broadly applied in environmental and transport economics to value mixed goods (private and public) – has been used in some cases to assess the non-market values of culture (Louviere & Hensher 1983; Mazzanti 2003; Santos 2007; Snowball 2008; Snowball & Willis 2006).

Turning to consideration of cultural value from a producer's perspective, a recent empirical study (Steiner 2013) corroborates other literature suggesting that artists are more satisfied with their work than non-artists. Furthermore, it identifies that this higher job satisfaction can be partially attributed to the higher self-employment rate, and also possibly to the variety and on-the-job learning characteristics of artistic jobs, which make them less mundane. Building on his earlier work proposing a production function for performing arts, Throsby (1994, 2006) developed a more general artistic production function, where the output quantity and quality are dependent on inputs of labour, capital, education, specific arts training, experience and creative talent, with the last factor being the characteristic unique to creative artistic work. This, and the premise that the primary incentive for artistic production is non-financial, differentiates this production function from more traditional production functions.

Much of the value in culture is intrinsic rather than instrumental. Many cultural assets, goods, production and practices generally do not exhibit characteristics, like private

ownership or excludability, which make market valuations appropriate. A key contribution of cultural economics has been moving beyond positive economics to recognise that determining the intrinsic values in culture requires normative approaches involving measures of utility.

The social context of cultural activity and production in First Nations society adds to the complexity of its valuation. Utilitarian approaches revolve around individuals maximising their individual utility expressed through preferences. The challenge with cultural production and activity is that the social construction of value may change over time and be influenced by increased awareness or appreciation by others. Klammer (2003) describes the development, enhancement and strengthening of certain values, giving examples where valuation increases because of growing familiarisation or immersion in new cultural contexts (foreign music and museums) or outsiders suggesting United Nations Educational, Scientific and Cultural Organization (UNESCO) listing of First Nations sites. Another factor that may be important in cultural valuation in a social context is the degree of consensus. In considering the possibility of separating individual judgement from the broader social or political context, Throsby (2001, p. 28) suggests ‘it may be possible, with sufficient regularity across individual responses, to find consensual agreements’, noting that irrespective of what influences that consensus, the fact of agreement on cultural value is of interest.

The feasibility of measuring cultural value has been debated for many years, and this research seeks to take the lessons from the range of disciplinary approaches and apply them to values in First Nations culture.

2.5.4 Work and culture

The relationship between work and culture can reveal a lot about the relative value of culture. While policy generally aims to maximise employment, the pull factors for many First Nations peoples associated with Country and kin, especially in remote areas, are understood to reduce the effectiveness of employment programs. This tension between culture and employment gave rise to the original thinking behind this research.

This section sets out some of the basic labour market economics underpinning Indigenous employment policies and then looks at some of the anthropological

evidence around attitudes to work, before looking at how the tensions and trade-offs might be expressed.

Key labour market concepts

Labour economics is a significant field of economics that centres on the productive capacity or human capital value of individuals, their available productive time and how that contributes to the economy. Factors affecting labour market participation include capability factors (education, experience) as well as wealth, income, personal preferences and budget constraints.

An individual's existing wealth and the income that wealth generates has a significant impact on their attitudes to employment. These wealth assets may be in a tangible form, for example bank savings, a share portfolio, a house or car. They may also hold intangible assets such as human capital, built or developed through education and work experience. Both forms of assets can generate capital growth or income, through for example interest on bank savings, dividends on shares, wage earnings or income generated from own businesses. First Nations people may derive income from non-labour sources, via royalties and welfare income.

There are different approaches to valuing leisure, own-account or domestic production that can also be considered in relation to cultural activity and production. Samuel Becker (1965) developed the opportunity cost method, in which he showed that where people make a choice between paid employment and leisure, own-account or domestic production, the hourly wage rate could be used as a proxy to measure the alternative activities. A second approach to valuation of own-account or domestic production is the replacement cost, which is the cost of having the service provided by someone else (Schreyer & Diewert 2013).

A range of underlying assumptions are made in labour market modelling, including income and time constraints. Time is constrained by the number of hours in a day that can be made available for work and leisure. Wage income is constrained by wage rates and time that can be worked, and personal non-wage income derived from assets is usually constrained by the level of capital holdings and the rates of return on share portfolios and other investments. Royalty income, which is akin to a return on capital, is constrained by agreements that set out the share of return to be provided and is affected

by market prices and returns. Welfare support income is limited by government policy and, in Australia, legislation. The CDP ‘mutual obligation’ requirements of up to 25 hours per week that applied at the time to many participants constrained time for alternate activities.

Another key concept in considering attitudes and responses in the labour market is the diminishing marginal utility of income. Essentially this concept reflects the decreasing pleasure or satisfaction an individual gains from additional incomes above a level where all needs are met and then even less above a level where most material desires have been met. Another concept akin to this that is mentioned in the literature is ‘satisficing’ – the act of meeting essential needs so that they are satisfied. In a sense this is a key turning point in diminishing marginal returns.

The basic premise underlying much of the theory is that personal preferences will influence individuals’ behaviours and choices as they seek to maximise utility, subject to constraints in budget or time.

Employment factors

Traditional human capital models build on a number of determinants of employment, factors that affect the likelihood of being employed and returns from employment. These include education, employment history, geography (particularly metropolitan/urban/regional or remote location) and family social capital and inherited wealth. Other determinants of employment considered in many models include age, gender, education, the number and ages of dependents, wealth, non-wage income and family history of education and employment. On many, if not most, of these factors First Nations people in remote areas have a distinct disadvantage relative to other Australians. Other factors relevant to remote First Nations people that may affect employment capacity include the level of their English language proficiency, own account/domestic production capacity (hunting, foraging, etc.) and other income, home production or demand-sharing that supports sustenance. Social determinants like health status and their housing quality and crowding also affect productive capacity.

An extensive and growing literature explores the patterns and trends in the labour market participation of Aboriginal people and Torres Strait Islanders and the factors affecting this participation (Altman 2000; Biddle 2010; Biddle et al. 2008; Daly 2011;

Dinku & Hunt 2019; Gray & Hunter 1999; Hunter 1996, 2004a; Hunter & Gray 1998, 2001; Venn 2018; Venn & Biddle 2018). Despite the extent of literature about Aboriginal people's engagement with work, there remains a significant gap in the research evidence about the relationship between cultural practice and labour supply (Gray et al. 2012).

Non-market cultural data

In mainstream data collections like the Census in Australia, measures of employment don't extend to cultural and social production outside the formal market. Streams of economics address non-market production and the exclusion of productive labour efforts in informal markets from national measures of productivity such as the GDP (Gross Domestic Product). For example, efforts by feminist economists to gain recognition of women's work not recognised by established accounting measures or economic frameworks led to some change in national accounting (Macdonald 1995; Strober 1994; Waring 1999, 2003), but the changes have not captured the extent of non-market productivity or extended to establish international standards. While work on the hybrid economy led by Altman (Altman 1992; Altman et al. 2012) has informed the expansion of data collected under the National Aboriginal and Torres Strait Islander Social Survey (NATSISS) to include cultural production beyond that marketed commercially, data on the market value or non-market value of this production is not routinely collected. The most recent round of the NATSISS (Australian Government Australian Bureau of Statistics (ABS) 2016a) included data on the time children spent with elders, an important marker of cultural transmission, but not the recognition of the value of the cultural knowledge transmitted or the value of the time spent by elders in such activity.

Attitudes to work

An overview of the effectiveness of labour market programs for First Nations people points out that most of what we know about Indigenous attitudes to work and their relationship to cultural practice stems from ethnographic studies (Gray et al. 2012). There is an extensive body of ethnographic research exploring Aboriginal concepts of and attitudes to work. These reveal some common themes and influences on attitudes to paid employment and cultural activity and the relationship between them.

Historical experiences, educational qualifications and the nature of available work affect Aboriginal people's attitudes to and engagement with western concepts of work (Austin-Broos 2003, 2006; Gibson 2010a, 2010b; McRae-Williams & Gerritsen 2010; McRae-Williams 2011; Musharbash 2001a, 2001b, 2008).

The history and continuity of engagement in employment in the community or region they live in strongly influence Aboriginal people's attitudes to work (Austin-Broos 2006; McRae-Williams 2011). The reflections of many Aboriginal people who lived and worked on pastoral stations in the Kimberley articulate accepting and often positive attitudes to work (Marshall & Hattersley 2004; Marshall 2011). A generation or so later, the sons, daughters and grandchildren of these people may be employed in Aboriginal NGOs such as land councils, Aboriginal health bodies or service providers, or be unemployed. In the interim period, some communities had access to the Community Development Employment Projects (CDEP) scheme, where communities were provided with unemployment benefit equivalent funding, with optional top up and capital funding, to support community-based enterprise and service delivery employment. While sometimes criticised as 'sit down' or make work schemes, CDEP provided support for local enterprises and scope for local services and community development.

Tension between paid work and maintenance of cultural practices and family obligations affect the capacity and attitude to paid employment (Austin-Broos 2006; McRae-Williams 2011; McRae-Williams & Gerritsen 2010; Musharbash 2001), particularly in remote areas. Such anthropological research provides insights into behaviours and motivations and the potential conflict and trade-offs between maintaining cultural practices and paid employment and the value of control and self-determination. On the other hand, factors encouraging engagement in paid employment include use of income from paid work supporting financially sustainable households (Sercombe 2008). The value of employment, in terms of the financial capacity that may provide to individuals and extended families to participate in cultural activities, has also been noted by Scambray (2013, pp. 197–198), although he acknowledges the broader anecdotal qualification that vehicle purchase, for example, is often achieved through hire purchase, with subsequent repossession when paid employment ceases and repayments are not maintained. These ethnographic studies are,

by their nature, limited to specific groups of First Nations people in specific locations and are not translated to quantitative impacts on employment.

The conflict between cultural and family obligations and the market economy is often seen to be exacerbated by government policies. The regimented CDP mutual obligation requirement (at the time of this research) to work 5 hours a day for 5 days a week is inconsistent with many cultural practices that have seasonal bases.

2.6 Conclusion

This chapter addressed concepts underlying the research question ‘What methods are feasible, reliable and appropriate for quantifying cultural values for First Nations peoples?’ and introduced the literature and theories underpinning the research.

It started by exploring the central concepts of culture, cultural capital, values and value through different disciplinary lenses. This multidisciplinary review not only clarified the intent of the language adopted in this thesis, but also added to the literature by bringing together and bridging the understanding of these concepts. Considering two broad approaches to the valuation of culture in the literature and practice, namely the economic impact evaluation and welfare theory approaches that account for wellbeing or utility, it is apparent that the latter is more appropriate for this research which seeks to value culture from the perspective of Aboriginal participants. After considering previous approaches to cultural valuation in First Nations contexts and identifying the gaps in welfare-based valuation that privilege First Nations perspectives, the next chapter will consider methodological approaches and valuation methods that might be used to address the central question of non-market values in First Nations cultures.

Chapter 3 Methodology and valuation methods

3.1 Methodology – philosophy of approach

I approach the research question, namely ‘What methods are feasible, reliable and appropriate for quantifying cultural values for First Nations people?’, as a human centric social science question with broad policy implications. While the qualitative value of culture can readily be acknowledged, this research explores a method to quantify the value. Pragmatically it cannot be answered directly by quantitative analysis of existing datasets and requires the development of a mixed methods approach collecting data of qualitative and quantitative forms.

Valuing non-market, intangible things is key to environmental economics and research methods have been developed and refined over several decades dealing with these questions of intangible non-market environmental value. Environmental valuation usually measures willingness-to-pay (WTP) or willingness-to-accept (WTA) in financial terms. However, the purpose of valuation is not necessarily to commodify the environmental good by placing it into a market, but to allow comparison with other values to inform decision-making. Decision-making may involve a reallocation of resources to either maximise total utility in a classical utilitarian model, or to redistribute them in line with justice objectives. This welfare economic approach is premised both on individuals being rational and knowing what is good for them in seeking to maximise their own utility and that social welfare is the aggregation of individual utility in whichever aggregation model is appropriate to the policy objective and underlying philosophical approach.

In order to quantify the intangible values in Aboriginal culture in the region, I started with the tensions and trade-offs between paid work and culture that the elder from one of the communities had spoken of some years earlier. This gave an attribute with a quantitative value –income – that was likely to hold more meaning for the people I would work with.

Approaching a question of measuring or comparing intangible, non-market values for First Nations people living in a remote area of Australia called for a methodology that

incorporated the most informed and appropriate valuation method embedded in an approach that respected and maximised the comfort and trust of participants. As an outsider, first and foremost I needed to acknowledge and be guided by local cultural protocols. To gain the trust of participants I needed to demonstrate my own cultural competency. It was also important to contextualise people's attitudes and behaviours in the colonial historical and current political landscape in which they live – particularly where these factors have shaped, or seek to shape, attitudes to cultural maintenance and paid employment. The constraints of the research proposal limited my ability to develop a truly grounded approach; however, the detail of the choice model and survey were informed by my interactions with participants in the first phase of the field research. I also planned to engage Aboriginal research assistants interested in building research skills to increase the comfort of participants and thereby help build trust.

While I do not claim to have adopted an ethnographic methodology, there are aspects of the qualitative components of my research methodology that pay respect to ethnography and inductive research. My life experience and the literature had informed my understanding of the tensions for remote living First Nations people between more traditional cultural ways of being and engaging as workers in the market economy. I needed to observe and listen to people in the field sites in order to better understand whether, and to what degree, this tension affected their day to day lives. This qualitative research was essential to inform the quantitative research, particularly the design of the survey and choice model.

3.2 Methodologies, reflexivity and positionality

This research occurs in an intercultural space. As someone who does not identify as Indigenous, I would not present it as Indigenist or Indigenous research (Foley 2018; Martin 2003, 2006; Rigney 1999, 2001). My strategy was to adapt an essentially western methodology to better fit with, account for and voice First Nations viewpoints, consistent with the fundamental aim to demonstrate value from the perspective of the Aboriginal people with whom I worked. This reflection of participants' viewpoints is essential to ensure the method is 'appropriate', as required by the research question.

In this section I reflect on my identity, positionality and reflexivity and how these relate to the methodology used in the research. I start by introducing my background and

positionality, and how reflexivity enabled me to adapt my methodologies in a way that better reflects the objective of reflecting First Nations values. While the detail of the methods is discussed in later sections of this chapter, I touch on them in this section in order to explain their essential adaptation to the context and overall methodological approach.

3.2.1 Positionality

Growing up as an adoptee raised in a loving and relatively privileged middle-class white family, in different countries, with different cultures and languages, I often felt an absence of identity and a sense of difference, of not quite belonging. That sense of difference and not belonging may have drawn me to work with First Nations peoples, whose strong sense of identity and belonging contrasted with mine. Being the ‘other’ was not something new to me. Experiencing other cultures growing up enabled me to develop empathy and reflexivity.

Prior to this research my interactions with First Nations Australians living in remote areas of the country had been as a friend, a senior government official, company director and occasionally as a tourist. While I had commissioned and overseen some research, I had never undertaken any as a solo researcher. I had much to learn. I needed to learn about the biases and position and reactions I carried that affect how I interpret but also how people react to me. I needed to understand my role, reactions to me as the ‘other’ and the impact this had on my research.

Being known of and by some people in relation to my professional background meant that I frequently needed to clarify my role as a researcher, distinguishing it from those previous official roles. But at the same time, I needed to reciprocate the generosity that people offered me by providing assistance where my expertise allowed, taking care not to overreach in ways that might be confusing or misleading.

3.2.2 Reflexivity

The importance of reflexivity in qualitative research (Berger 2015) became clearer to me as I faced some cultural barriers to entry early in my fieldwork. It was apparent that I needed to be mindful of my own reactions to situations that were uncomfortable for me, in order to better understand the viewpoints of people involved in my research. My

strategies to improve my reflexivity and reduce the discomfort of being the ‘other’ included reading about reflexivity and others’ experiences in fieldwork, seeking the advice and support of willing advisers in community and experienced researchers, together with journaling reflections. This helped me retain perspective, remain compassionate and reduced the discomfort of being the ‘other’.

A key part of that reflexivity was to acknowledge and understand my own privilege and the power imbalance that plays out in research. In discussing power, Linda Tuhiwai Smith (2012, p. 178) wrote ‘When undertaking research, either across cultures or within a minority culture, it is critical that researchers recognize the power dynamic that is embedded in the relationship with their subjects.’ My privilege was evident because I came in a car, with a high level of western education, and a professional background. While I was conscious of my material privilege, initially I didn’t fully appreciate the power imbalance as the researcher relative to the research participants. On the other hand, I came to recognise the participants’ power of agency and their ability to exercise that agency by determining their level of engagement.

3.2.3 Western, Indigenous or transdisciplinary methodology?

The original research question about how cultural influences on behaviour could be recognised arose from my original academic training in economics in the 1980s, particularly microeconomics founded on neoliberal concepts of utilitarianism from market goods and services. The dominance of market economics in Indigenous economic development policy analysis, development, implementation and evaluation during the period of my public sector career (1980s to early 2010s) meant cultural factors outside the market were often overlooked.

The need to explore ways of accounting for culture in policy making, rather than it being a side issue or secondary consideration, was crystallised when I spent time travelling with a Nyikina elder. Listening to this elder talk about the challenges of cultural maintenance and its centrality in survival and wellbeing prompted me to consider how the value of culture might be measured and how such technically challenging research could be undertaken in a way that respected First Nations perspectives and realities. Bridging the gap in understanding between market-focused

economics that dominates public policy and the values and viewpoints of First Nations peoples was an essential objective of the research.

Methodology follows objective and this research seeks to reflect the viewpoints of, and measure the values of culture to, the Aboriginal people involved. Importantly this is not a binary exercise comparing and contrasting Indigenous and non-Indigenous values. But the different worldviews and values are why this research is important, to extend the standard economic approach which is lacking in its ability to reflect cultural values (Chan et al. 2012; Kenter et al. 2015; Stoeckl et al. 2018). The quantification methods would need to be embedded in a methodology that respected and privileged Aboriginal participants' viewpoints.

When discussing culturally sensitive approaches to research with Māori, Smith (2012, p. 179) identified alternate strategies for non-Indigenous researchers, including the strategy of avoidance (where the researcher avoids dealing with the issues or Māori), the strategy of personal development (such as learning language), the strategy of consultation and the strategy of making space within research organisations to include more Māori researchers. These approaches are increasingly being adopted to support the development of this capability amongst interested First Nations researchers in Australia. Of these four strategies, it was impossible to adopt an avoidance strategy, so I focused instead on consultation, with limited attempts at learning language and culture.

It would be reasonable to say that my methodology approaches the 'Cultural Interface' described by Nakata (2002) as the intersection of the Western and Indigenous domains, and might be characterised as transdisciplinary research because of its reliance on western and 'Indigenous methodologies (decisions around who needs to be consulted, what counts as evidence, how truth claims should be assessed, where to start, where to go on, where to finish and so on)' (Christie 2006, p. 81).

While most Indigenous research literature relates to qualitative research, Walter and Anderson (2013, p. 73) argue for Aboriginal investment in statistical forms, noting that 'properly conceived and executed evidence speaks back to the state in a manner that both incorporates Indigenous knowledges and is ontologically translatable to state actors'. Walter and Anderson (2013, p. 86) suggest three ways of generating statistics through an Indigenous lens, namely privileging Indigenous perspectives, not assuming

Euro-Australian value systems as norms and not presuming a deficit starting point. The first of these is central to this research and the methodology is consistent with the others.

It was a challenge to engage meaningfully on a project that was using an abstract method (choice modelling) while seeking to ensure it was grounded. Should a researcher shy away from research methods and techniques that may support a group of people achieve greater self-determination? While ethically I felt I was on strong ground there were times when I was uncomfortable. I was cognisant of calls from some First Nations academics here in Australia and overseas – ‘nothing about us without us’ – which is essentially a community partnership approach (Ball 2005; Ball & Janyst 2008; Wehipeihana 2008).

Building successful research depends on trust. For First Nations Australians trust of researchers is limited by a history of over-research ‘on’ them rather than ‘with’ them, generating mistrust, animosity and resistance (Martin 2003). It was important that I take the care and time to ensure that the research participants felt empowered and free to tell me their stories. Critically I sought to avoid my research becoming colonising in the way it defines without participants being able to shape it (Smith 2012).

Many of the people I spent time with during my fieldwork had previous experience with researchers, not all of it good. The collective memory of and pain caused by early research, including that of Eric Mjöberg, a Swedish researcher who stole and smuggled remains of Nyikina and Ngarinyin people to Sweden, was recounted to me when I was taken to cemeteries by different individuals (Treloyn & Charles 2014, p. 177).

The successful conduct of a survey was always going to rely heavily on building trust. Participation rates in survey-based research involving First Nations Australians is highly variable. Traditionally western research participation, particularly for surveys, focuses on selection of participants on a purely random basis and response rates that ensure the sample is broadly representative of the population being studied. Response rates are generally related to the method of communication (postal survey, online survey, face-to-face) rather than the strength of the relationship with the researcher. Neutrality and lack of relationship is generally seen as a positive aspect in survey conduct, as it removes the potential for bias arising from the relationship.

Many researchers have found themselves supporting the communities that they spend time in with research, advice, and submission writing, because of the particular skills they can offer. Bringing people together often involves researchers in catering with drinks and food. These are all the unrelated ways that researchers give back, over and above the core purpose of the primary research which, directly or indirectly, benefits the community.

Treloyn and Charles (2014) also reflect on the discomfort and trauma of the ‘Self and body’ researchers can experience in fieldwork. They surmise that the tensions and discomforts of intercultural collaboration should be recognised, with support to sustain researchers working in the intercultural space critical to a sustainable research effort. I was aware not only of my own discomfort, but that of some people in the communities I was spending time in, particularly in the early stages of my fieldwork.

This discomfort and limited trust and understanding in the early stages led people to exercise agency and control through guiding or limiting my access to people and by managing their own accessibility and availability to me through their reactions. Use of language was an important part of this, with much greater use of Kriol initially by gatherings of people when I was nearby, whereas the same people used English later in the research. A participant later explained that this strategy of not using English is used when outsiders came into community, something I witnessed with others entering into community.

The way I adapted and undertook this research could be seen as what Christie (2006) describes as transdisciplinary research that crosses boundaries. Christie (2006, p. 81) notes that this may involve Indigenous methodologies such as ‘decisions around who needs to be consulted, what counts as evidence, how truth claims should be assessed, where to start, where to go on, where to finish and so on’. Christie also points to the tensions that can arise when Aboriginal governance means non-Indigenous researchers need to ‘submit to an incomprehensible, time-consuming and often nerve-wracking regime of order, authority and accountability’ in transdisciplinary contexts.

3.3 Valuation method

While my methodology needed to be appropriate for the people, historical and geopolitical context and time of research, the most significant issue to be addressed was the choice of valuation method that could measure the value of culture to First Nations people.

Two key factors guide the choice of valuation method. Firstly, the need to privilege the perspective of the First Nations people and secondly the nature of values in culture relative to the market.

Of the two general approaches to valuation of culture, impact analysis and welfare theory or utility analysis, Section 2.5 in Chapter 2 shows that a utility approach that captures and privileges the First Nations perspective is more appropriate to this research. This requires primary research investigating the views of First Nations people, rather than exploration of secondary data sets that might provide some insights but are insufficiently focused on the question of value.

Limiting the focus to economic impacts, or even proxy measures, would not address the underlying question of value to the First Nations people themselves, which is the essence of this research. That is not to suggest that economic impact is not important to those First Nations people, but the core of this research is to go beyond this to explore the total value, including intangible value, to these people.

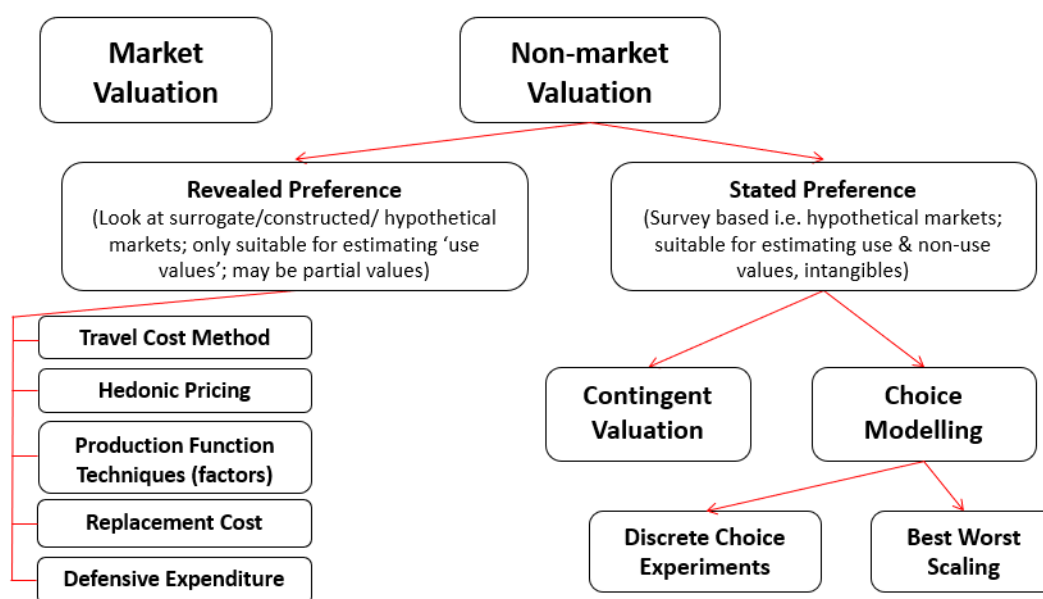
The second key factor is about the nature and value of culture relative to the market impacts and the fundamental difference between market and non-market values. How can we value the process of group hunting and gathering beyond the calorific and market price equivalent of the product? Can ceremony be valued only according to the tourist dollars it may generate? Does the market value of First Nations art reflect its value to artists or does the process of production bring other benefits? Is the market value of land an adequate measure of the value of that Country to traditional owners? These questions demonstrate the importance of recognising and quantifying value beyond markets in policy consideration of First Nations cultural and economic livelihoods.

The following sections briefly review methods for non-market valuation in order to demonstrate the appropriateness of choice modelling, specifically BWS, to this research. A more detailed discussion of the design and application of BWS in this research is covered in Chapter 6, of Part III.

3.4 Non-market valuation methods

While market valuation approaches are measured according to established market pricing mechanisms, there are several approaches and specific methods adopted in environmental economics, and other areas of public economics including health, transport and cultural economics, to value non-market goods. These are summarised in Fig 3-1 and include revealed and stated preference approaches.

Fig 3-1 Cultural valuation approaches, adapted from Choi et al. 2010



In summary, revealed preference approaches rely on observable behaviour changes that may be evident in the market, and include the travel cost method, hedonic pricing, and impacts on costs through production functions and replacement costs techniques. For example, hedonic pricing may be evident in the higher value of real estate that is proximate to parkland than real estate of comparable standards without the same parkland proximity, thus revealing the value of that parkland.

3.4.1 Stated preference techniques

Stated preference techniques including contingent valuation and choice modelling have dominated cultural economics. Choice modelling includes a range of techniques variously described as stated choice methods, DCEs, BWS and conjoint analysis. The terminology around different forms of choice modelling is highly variable and inconsistent, so I use ‘choice modelling’ as an encompassing term for all stated preference techniques involving choices and trade-offs between options, rather than a direct question of WTP/WTB valuation that is used in contingent valuation.

To better understand the context and application of these methods to value non-market, intangible or non-excludable goods, I begin by briefly outlining developments and applications in the various economic fields mentioned above.

Valuation of environmental amenity or its degradation, where no explicit market exists, has been a central area of non-market research. Partial equilibrium models from neoclassical welfare economics have been used to calculate shadow prices as estimates of the social prices of public goods or social costs of environmental damage or pollution (Parks & Gowdy 2013). The underlying valuations for non-market environmental goods are generally determined through revealed preference approaches such as the travel cost method or stated preference approaches such as contingent valuation or DCEs.

Led by Throsby, the recognition of non-market values has also been achieved in cultural economics. Research in this field has predominantly focused on the value of cultural goods consumed or cultural heritage assets as public goods using similar methods to those used in environmental economics (Snowball 2008; Throsby 1999, 2003; Throsby & Withers 1985). Throsby (2006) has also examined the creativity involved in the artistic productive process and its value in terms of innovation and contribution to the artist’s human capital. Less attention has been directed to cultural activity as a process of producing cultural goods and services, particularly in First Nations cultural contexts.

Given the inherent limits on measuring the economic effects of preferences for cultural activity with a revealed preference approach, a stated preference technique is appropriate for this research. Contingent valuation dominated non-market valuation in earlier developments in environmental and cultural economics. But the trend in more

recent years has been to move away from contingent valuation towards choice modelling and the following section sets out some of the reasoning behind this shift.

3.4.2 *Why not use contingent valuation?*

Contingent valuation is a survey-based technique that draws out an individual's stated view of their valuation of a non-market good, such as an environmental asset, to produce a social value for that good, generally through summation of affected individuals' valuations. It assesses an individual's valuation as their stated WTP/WTa for use and non-use of an environmental good/bad.

Contingent valuation has developed since it was first used in the 1960s but, unlike revealed preference methods, it is essentially a hypothetically-based valuation. According to Parks and Gowdy (2013, p. e3), another stated preference valuation method, choice experiments, has replaced contingent valuation as the preferred method of calculating shadow prices. Importantly the survey technique used for choice experiments is also an individual hypothetically-based preference, albeit framed with discrete choices and values.

Behavioural sciences have been instrumental in understanding the weaknesses of contingent valuation. A reasonably comprehensive summary of 12 types of bias and problems, including hypothetical bias and the WTP/WTa disparity, with contingent valuation is set out in Perman et al. (2011, pp. 424–426). Tversky and Kahneman identified behaviours that give rise to biases in the 1970s (Kahneman & Tversky 1979; Tversky & Kahneman 1974). Building on his earlier work with Tversky, in *Thinking, fast and slow* Kahneman (2011) describes two cognitive systems: 'System 1', which involves fast, intuitive, automatic responses and judgements based on familiar patterns; and 'System 2', which is a more intense, focused, deliberative and methodical way of thinking. Behavioural implications discussed further in following subsections include hypothetical bias, the WTP/WTa disparity, embedding and scope, hyperbolic discounting, confirmatory bias and identity bias.

Jerry Hausman, from the Massachusetts Institute of Technology, is a strong critic of contingent valuation, and likens contingent valuation to an opinion poll about the environment in general rather than a measure of preferences about a specific project (2012, p. 44). He identifies three persistent problems with contingent valuation:

1) hypothetical response bias that lead to overstatements of value; 2) large differences between WTP and WTA; and 3) the embedding problem, which encompasses scope problems. Hausman attributes much of the problem to the way survey respondents respond ‘essentially inventing their answers on the fly’ (2012, p. 43). Although not using the terminology of Kahneman, his description of rapid responses is the essence of System 1 thinking.

Hypothetical bias

Hypothetical response bias is relatively easy to understand. Where someone is asked how much they would be prepared to pay for something that is beneficial to themselves and society, their response in a hypothetical setting is likely to be much higher than if they are actually asked to pay. Two examples cited by the National Oceanic and Atmospheric Administration (NOAA) Panel in their report (Arrow et al. 1993, pp. 7–87) compared contingent valuation with experiments to test actual WTP for environmental protection and showed that expressed WTP was higher than actual WTP in both cases.

WTP and WTA

We gain insight into the disparities between WTP and WTA in contingent valuation from Kahneman’s exploration of the perceptions of uncertainty and how people apply weights, again often using System 1 thinking, in assessing the possibility and certainty effects (2011, pp. 310–319). In presenting results of experimental work that he and Tversky conducted subsequent to their prospect theory publication, Kahneman (2011, pp. 314–318) sets out the ‘Fourfold Pattern’ which shows how most people behave in choosing whether to take a chance or stick with certainty of the expected outcome when faced with the four combinations of a high probability (certainty effect) or low probability (possibility effect) of a large gain or loss. This shows that most people will be risk averse when there is a high probability of gain or a low probability of loss but will be risk seeking when there is a high probability of loss or a low probability of gain.

Hausman (2012, p. 47) points out that alternative means of rationalising the difference between WTP and WTA, such as discounting for altruism or sympathy, would

contravene the underlying neoclassical welfare economics assumption of additive properties of welfare, where social welfare is the sum of individual welfares.

Embedding and scope

In contingent valuation the assessed value of a good can vary greatly depending on whether it is considered by itself or as part of a broader group of things. Diamond and Hausman (1994, as referenced by Hausman 2012) demonstrate this and propose an embedding test, known as the Diamond-Hausman test, which compares the values of a single project, a larger encompassing project and the larger project less the single project of interest. Where the single project value and the larger project less the single project of interest do not add up to the value of the larger encompassing project, generally exceeding it, this reveals a bias in valuation of the components when they are not embedded. The cable television contingent valuation survey case study examined by Hausman (2012, pp. 49–53) shows that, by reference to the total package, the values of individual component options were overvalued and summed to more than the total package value, even though the design involved framing choices against certain price points.

Hyperbolic discounting

In standard economic approaches, rational decisions about the future are not affected by the current state and are discounted exponentially by a constant discount rate. Studies have shown hyperbolic discounting undermines this aspect of rationality (Read et al. 1999; Tversky & Kahneman 1974). Hyperbolic discounting suggests that people put disproportionate weight on current gains and losses relative to delayed ones (Read & van Leeuwen 1998).

Read and van Leeuwen (1998, pp. 194–195) illustrate the impact of what they term quasi-hyperbolic discount function on dynamic inconsistency with experimental choice between a virtue which will yield 25 units in period received and 200 units in the second, and a vice which will yield 100 units in each of the periods. They show that a delay of one period will result in greater discounting of vices than virtues.

A choice between current comfort and future environmental protection will be influenced by these factors, making it highly relevant to environmental valuation using contingent valuation with explicit or implied intertemporal effects.

Confirmatory bias

Other behavioural factors that affect valuations are the availability, representativeness and affect heuristics, or the tendency to make judgements about the frequency and likelihood of a risk depending on how easy it is to recall similar instances. If an event is rare, but well reported through electronic media, reactions are to place a higher weighting on the likelihood and impact than is rational. Kahneman refers to this as the confirmatory bias of memory (2011, p. 333). For example, a survey that is assessing someone's WTP to avoid or prevent a tsunami in Japan is likely to result in a biased response because their memories of images of the worst impact of the recent tsunami are so vivid, and they are likely to overestimate the probability of a tsunami.

Identity

Akerlof and Kranton (2010) write about how a person's identity, including their gender, religious or cultural background, the social codes they ascribe to and how they think of themselves, will guide their behaviours and choices. For most people their identity will influence their intuitive, rapid System 1 thinking. It would be reasonable to expect that an individual from a societal group that places a high value on nature and the environment may exhibit a higher WTP than an individual from a societal group that does not have the same attitude to the environment. While it may be feasible to identify and control for some of these identity traits, some of these tendencies may be unobservable, and may bias resultant social welfare valuations. Also, there may be cohort effects as awareness and comprehension of environmental impacts changes over time. In contingent valuation surveys, identity may also contribute to or exacerbate some of the other biases such as hypothetical bias, as the respondent considers how their answers reflect on their identity.

3.5 Choice modelling

Choice modelling evolved from the works of psychologists such as Thurstone and Luce and economists such as Hotelling and Lancaster, brought together by McFadden in the

early 1970s, when he applied multinomial logit model to random utility theory and then applied the model in a transportation study (McFadden 1974a, 1974b). Choice modelling includes techniques variously described as ‘discrete choice experiments’ (DCEs) and ‘stated choice’ (SC) experiments or techniques.

Choice modelling has developed significantly since that time, moving from multinomial logit with clear probabilities to numerical integration with simulation techniques. Its application is well established in transportation, health economics, marketing, environmental economics, political science, engineering, and to a lesser degree cultural economics. Relevant developments in choice modelling include the development of BWS as an effective means of obtaining high quality rankings in choice sets from small samples because of the lower cognitive load relative to ordered preference elicitation (Finn & Louviere 1992; Marley & Louviere 2005; Scarpa et al. 2011).

The comparison of contingent valuation and choice modelling in a range of circumstances has shown choice modelling to be superior (Adamowicz, Boxall, et al. 1998; Hanley et al. 1998; Hanley et al. 2001). Considering the nature of the production choice underlying this thesis, choice modelling is considered the most appropriate approach to exploring the motivation underlying the choices that First Nations people make, and the next section explores the most appropriate technique in the context of an overall research methodology.

3.5.1 What is a choice model?

A choice model is a mathematical expression, derived from random utility theory, which specifies the probability that a given alternative y is chosen from a set of alternatives C :

$$P(y|C) \tag{3-1}$$

This choice probability may be conditioned on attributes of the decision maker z (their socio-demographics), alternatives x (attributes or characteristics), and environment or context k :

$$P(y|z, x, k, C) \tag{3-2}$$

A choice model can be used to study and quantify human decision-making with respect to discrete goods, in market and non-market contexts.

3.5.2 Why use choice modelling?

Choice modelling has been shown to accurately predict actual behaviour (Hensher et al. 1998; McFadden 2000). The use of choice modelling for valuation of non-market attributes is now common in cultural economics and environmental economics, having been demonstrated to provide more reliable results than contingent valuation (Hoyos 2010; Mazzanti 2003; Snowball 2008).

3.5.3 Characteristics of choice models

There are a variety of forms of choice modelling, reflecting the range of choices available in real life. However, there are some characteristics of choice models that set them apart from other means of ranking attributes.

Generally choice experiments do not use rating scales, but instead identify and present choices that are analogous to real life. This ensures that the choice model approximates the experience of people when facing life choices.

The attributes that are considered may be presented at different levels in different choice sets. For example, if someone is making a choice between forms of transport, they might be presented with choice sets including bus, train or car transport at different speeds and costs.

Choice modelling can be used for non-market valuation where one attribute is financial cost/return. This enables trade-offs between financial returns or costs and the non-market attribute, such as environmental damage or benefit.

3.5.4 Types of choice models

The types of choice models can be categorised into three groups: binary DCEs, multiple DCEs and BWS.

Binary DCEs support modelling of choices between only two options, factors or attributes, such as bus and train as mode of transport, and require the selection of the best option in each choice set presented.

Multiple DCEs allow ordered results or rankings on choice sets of multiple attributes at different levels. An example of such complex decision-making is the selection of a mobile phone, where the attributes might include brand, screen size, camera quality, operating system, and memory size and where each attribute can have several options/levels.

A feature of BWS is that it presents multiple attributes, sometimes at different levels, seeking the selection of the best and the worst option. This is a more efficient choice task than traditional DCEs that identify most preferred only. In practice they may replicate how choices are made in real life – by ruling out worst and identifying best options in each choice set. The combination of the efficiency and parallels to normal decision-making when faced with several factors can reduce the cognitive load on the respondent, making it more suitable for elderly or very young people, who may have limited cognitive capacity.

An aspect of BWS that may make it more appropriate for some situations is that it can provide a reference case at a single attribute rather than entire scenario – enabling common scaling of an attribute’s levels to estimate attribute impact.

The three forms of BWS are known as BWS Case 1 or the object case, BWS Case 2 or the profile case and BWS Case 3 the multi-profile case.

The question of appropriate form, design and the mathematical representation of the choice model used in this research is covered in Chapter 6.

3.6 Mixed methods approach

My intent in undertaking this research was to ensure that it was well grounded and reflected First Nations perspectives. Any quantitative research seeking to represent First Nations perspectives should be grounded in strong qualitative understanding of the context and collection methods. While more straight forward consumer choice modelling is often undertaken without extensive qualitative preparatory research, the importance of qualitative research to underpin design of choice models seeking to capture non-market values has been stressed by many choice modelling practitioners (see e.g. Coast, Salisbury, et al. 2006; Ratcliffe et al. 2012).

The mixed methods approach I adopted involved identification of potential fieldwork area, desk-based research and analysis, preliminary scoping visits and two distinct phases of substantive fieldwork, as set out in Table 3-1. The process was not purely linear, as the processes of site(s) selection, agreement or not with representative organisations, and ethics clearance were somewhat interdependent and affected by seasonality and availability of people and information.

Table 3-1 Outline of methods and outcomes for mixed method approach

Phase	Method	Outcome
Scoping	Discussions with leaders of First Nations organisations & researchers in West Kimberley	Gauged interest in research Learnt about political, historical & cultural context
Phase 1	Informal interviews/discussions – mostly one on one or in pairs or small groups, often with families in periphery	Built trust Learnt about attitudes to and experiences of work and culture Identified what aspects of culture mattered most for a ‘good life’ Translated these to attributes and relevant levels Informed the survey design and deployment method
Phase 2	Quantitative & Qualitative Survey with embedded Choice Model – BWS Case 2 with supplementary DCE	Qualitative & quantitative data for analysis
Analysis	Survey qualitative and quantitative data summary and comparisons BWS count & regression modelling, DCE count & regression modelling Latent class analysis of BWS Valorising utility	Qualitative and comparative quantitative features of survey participants Relative preferences, utilities and valuations; identification of biases & inconsistencies Identification of classes of respondents with different preferences Marginal valuation of attributes

In essence though, once the general field area was determined and agreed through the scoping phase, the substantive research was conducted as a two-phase process. The initial Phase 1 fieldwork followed cultural protocols guided by elders. It involved qualitative research through individual and group discussion and observation. This informed the design and conduct of qualitative and quantitative data collection through structured individual interviews, incorporating a choice model, in Phase 2. As the key

quantitative method to answer the question, the choice model form was selected and designed as appropriate for the circumstances and in light of Phase 1.

3.6.1 Country for fieldwork

In 2011 I participated in a personal capacity in a study tour of Martu art and lands of the Canning Stock Route. This was arranged by the Institute for Professional Practice in Heritage and the Arts and Friends of the National Museum of Australia in conjunction with Kanyirninpa Jukurrpa and Martumili, two arts and cultural heritage organisations based at Newman. The tour followed the National Museum of Australia exhibition ‘Yiwarra Kuju: The Canning Stock Route’ and was designed as an opportunity for Martu and the tour participants to experience cross-cultural dialogue and sharing of knowledge. For Martu it was also an opportunity to gain an understanding of what was involved in taking groups of tourists on Country by working with experienced tour operators from Kimberley Dreamtime Aboriginal Tours who provided tour logistical support. For me, as one of the ‘tourists’ it provided an opportunity to consider how very remote communities might develop cultural and art tourism products as well as learning about Martu perspectives on Country.

During this tour I was lucky enough to spend some long travelling days in support vehicles with Uncle Harry Watson, a Nyikina and Mangala elder, and his grandson Canny Watson from the community of Jarlmadangah Burru (Jarlmadangah) where Kimberley Dreamtime Aboriginal Tours is based. Uncle Harry was inspiring in articulating the challenges of engaging youth in employment while maintaining connection to culture and Country in the face of disruptions including technology, changing government policies, alcohol and drugs. He told me about how he takes young men out on Country with his camels for days at a time so that they can get away from these disruptive influences and learn to read and feel Country and understand themselves. Uncle Harry also contrasted the lives and opportunities available to their younger people now as against his upbringing on pastoral stations, where pay was negligible, working hours long, conditions tough, and education non-existent.

Uncle Harry’s stories stayed with me and fuelled a desire to better understand the challenges of cultural maintenance and economic development and the tensions that can arise between them in remote areas. Cultural economies in tourism and art are often

portrayed as keys to economic development for First Nations people in remote areas where other markets are rare. While art plays a significant role in remote First Nation economies (Acker et al. 2013; Woodhead & Acker 2014), cultural tourism does not generate significant wealth for many communities (Tremblay 2009, 2010; Whitford & Ruhanen 2010; Zeng et al. 2010). The Jarlmadangah community's interest in establishing Kimberley Dreamtime Aboriginal Tours was born from a desire to create some employment while both strengthening cultural maintenance and engaging young people.

As my research was partly inspired by this experience with Uncle Harry, I was keen to work with him and his people on his Country in the West Kimberley. I also had experience working professionally on economic development opportunities with First Nations peoples in the Kimberley. This, along with personal travel, had given me some familiarity with the region and the people.

3.6.2 Desk-based research

My desk-based research included analysis of ethnographic studies that identified key factors influencing attitudes to work and choices that people made around engagement with the paid workforce. I also reviewed ethnographic and economic development studies with a focus on culture and economic development in the region I planned to work in.

Previous analysis of census and NATSISS data provided some insights into patterns of work and cultural activity and I analysed the recent Australian Census Longitudinal Dataset (ACLD) to determine what that could reveal about patterns of work and cultural activity.

A third component of desk-based research related to the demographics of the geographical area in which I would be conducting my fieldwork, using 2011 Census data. This basic analysis, together with analysis of the 2016 Census undertaken after the fieldwork, provides a basis for comparison with my survey sample.

3.6.3 *Scoping*

The scoping phase, undertaken from July 2014 to April 2015, enabled me to engage with Aboriginal groups to assess their interest in engaging in the research, build my contextual understanding of the region and issues affecting Aboriginal people as well as identifying potential local Aboriginal people who might be able to assist me in conducting the research.

While there was no formal interviewing or focus groups, this phase was critical to building my understanding of the current social and political context of remote and urban Aboriginal life in the West Kimberley. It was also important for me to understand how local research engagement had been conducted in the past and to assess how that might affect people's attitudes and my approach to fieldwork.

Originally, I sought to work with traditional owner groups across urban and remote settings, meeting with key people during the scoping phase to assess their interest in engaging with me and guiding my research. This, together with desk-based research on the organisations, the people they represent and their interest and involvement in cultural and economic matters was a critical step towards identifying possible fieldwork sites. I also needed advice and assistance with identifying local Aboriginal research assistants.

I spoke with several groups and individuals that might be interested in my research during the scoping phase. A seminar I presented in Broome for the Nulungu Research Centre at the Notre Dame University attracted strong representation from Aboriginal NGOs and academics. I attended the Kimberley Aboriginal Law and Culture Centre (KALACC) cultural festival held over three days in September 2014 at Jarlmadangah, which included the Annual General Meetings (AGMs) of the Kimberley Land Council (KLC), Kimberley Language Resource Centre (KLRC) and KALACC. I was able to reconnect with the senior Nyikina man and his grandson with whom I had travelled through western desert country some years before and to meet other key people in the community of Jarlmadangah.

I was also able to meet with several senior representatives, Aboriginal and non-Aboriginal, from key Indigenous NGOs as well as researchers with experience in the region. The levels of interest in the research were variable. Unfortunately, late in

2014, one NGO with a large predominantly urban-based membership that would have provided valuable insights into urban perspectives on cultural value, ultimately declined to participate. Other organisations that focus on particular interests rather than representing specific language groups of Aboriginal people were interested in the research but not in a position to engage beyond conceptual discussions.

I was pleased that the native title holding entity for Nyikina and Mangala people, Walalakoo Aboriginal Corporation Registered Native Title Body Corporate (RNTBC) (WAC), continued to engage with the ideas and practicalities of the research concept through the scoping phase and beyond. The scoping phase culminated in April 2015, when I successfully presented a proposal to the full board of WAC, gaining their agreement to work with me in the research.

I subsequently entered into an agreement with WAC dealing with ethical clearance, restricted cultural material, intellectual property and review processes that ensured my research was respectful of Nyikina and Mangala peoples' customary practices and rights, while confirming my copyright over the resulting intellectual property in my research. The agreement provided for copies of video and audio recordings to be held by WAC following the Australian National University (ANU) Human Research Ethics Committee's required period of retention by the researcher after publication of the results.

3.6.4 Ethics clearance

As with any research involving First Nations peoples, it was essential that the research accord with National Health and Medical Research Council (NHMRC) guidelines for human research. The research proposal, information sheets for participants, information scripts and consent forms, as well as the survey and data management and security proposal were cleared by the ANU Human Research Ethics Committee¹⁰ prior to fieldwork commencing.

Given the phased nature of the research, draft proposals for both phases were presented initially and updated as necessary amendments were identified in the field. I was able to demonstrate the requisite support of TOs with a letter of support from WAC. The final

¹⁰ ANU HRC Ethics Protocol: 2014/296.

Phase 2 survey, information sheets and consent forms were cleared by the Ethics Committee following revision in light of the Phase 1 findings. The final information sheets, consent forms and survey form approved by the Ethics Committee are at Appendices 1 to 7.

3.6.5 Potential fieldwork locations

The broad geographical area for the research was the lower Fitzroy Valley area of the West Kimberley, with the Nyikina and Mangala peoples. This area was broadly in line with the first Nyikina and Mangala native title determination which covers a large area (26,000 square kilometres) in the West Kimberley, in or around several small communities situated along the Fitzroy River. These communities include Looma, Pandanus Park/Yurmulun, Jarlmadangah and smaller communities such as Bidan/Bedanburru and Balginjirr.

As many Nyikina and Mangala families are resident in the West Kimberley towns of Broome and Derby near the native title determination, these towns were also considered within scope for the fieldwork. Nyikina and Mangala individuals and families also live in towns and communities across the Kimberley as well as places like Darwin and Sydney. The high mobility of the population in response to work opportunities, health care and relationships with other language groups, means that people often move between towns and communities, resulting in fluctuating populations.

The 2011 Census data guided consideration in site selection, given my objective was to survey between 100 and 200 adults. The 2016 Census was conducted the year following the majority of the fieldwork so is used for further comparisons throughout this thesis. Given the notable intercensal variations between the 2011 and 2016 Censuses for some communities, and the undercounts of Aboriginal and Torres Strait Islander people that result in significant adjustment of raw census counts, the table below compares the estimated resident adult populations in 2011 and 2016 for the Indigenous (Aboriginal, Torres Strait Islander or Aboriginal and Torres Strait Islander) and non-Indigenous populations for the towns and larger communities in the fieldwork scope.

Table 3-2 Estimated Resident Adult Populations 2011 and 2016 in potential fieldwork sites, by Indigenous status

Indigenous Status	Indigenous		Non-Indigenous		Total	
Census	2011	2016	2011	2016	2011	2016
Broome	2,374	2,594	7,630	9,372	10,004	11,965
Derby	599	877	1,267	1,314	1,866	2,191
Jarlmadangah Burru	34	60	4	4	39	64
Pandanus Park	96	87	3	6	100	92
Looma	290	387	–	3	290	390
Total	3,394	4,004	8,905	10,699	12,299	14,703

Data Sources: ABS Census of Population and Housing, 2011 TableBuilder; ABS Census of Population and Housing, 2016, TableBuilder; 3238.0.55.001 – Estimates of Aboriginal and Torres Strait Islander Australians, June 2011; and 3238.0.55.001 – Estimates of Aboriginal and Torres Strait Islander Australians, June 2016.

Notes: Counts of people by usual residence, adjusted by the smallest level SA2 ERP:Count ratio. Broome is total of four Indigenous locations (ILOCs) within the general urban area of Broome. Cells in this table have been randomly adjusted to avoid the release of confidential data. No reliance should be placed on small cells.

These estimates are calculated by applying the Estimated Resident Population (ERP) to count ratios at the most granular relevant geographical level SA2 published by the ABS to the raw census counts for adults (age 18 and over) usually resident in the community and town Indigenous Locations (ILOCs). These ERP adjustments intended to address undercounts are significant, with the ratios ranging from 1.10341 for the 2016 non-Indigenous population in the Derby-West Kimberley SA2, to 1.398933 for the 2016 Indigenous population in the Broome SA2. The latter ratio means that the ABS, in estimating the Aboriginal and Torres Strait Islander population in the Broome SA2, increases the raw census counts by around 40%. Based on my experience in this research I would expect the population in the discrete remote communities to be closer to the census enumeration given housing limitations.

Issues with multi-site research

The relatively small population size of the discrete communities points to the need for multi-site fieldwork in order to achieve the desired survey sample size. I had established connection with some people in Jarlmadangah, but it was too small to achieve my objective of interviewing 100 to 200 adults. It was evident that I needed to extend my fieldwork sites to another remote community as well as Broome and Derby, where the number of people with Nyikina and/or Mangala connections was unknown. On one hand, research involving people across different communities and towns involved some

logistical and engagement challenges, but on the other hand the geographical spread of Nyikina and Mangala families and individuals presented an opportunity to engage with people living in a range of circumstances.

The most significant benefit of drawing on different living circumstances is that it enables some comparison of remote communities and towns with varying social and economic bases, employment opportunities and possibly differences in cultural practices. Covering such diverse living circumstances also provided better representation of the language groups involved in the research.

The major drawback in the site selection was the additional travel time involved and the limited continuity in any single community. More time spent travelling between different sites meant less time getting to know, and be known, by people. While it was not clear how this would impact on building relationships, it was a different style of engagement from a deeply embedded approach, which is the norm in ethnographic research. However, the original plan for my quantitative work in Phase 2 was to engage with the relatively large community of Looma, located not far from the small community of Jarlmadangah, together with some town-based people. This would have provided a reasonable sample size with limited travel between sites.

3.6.6 Participants in research

Who could participate?

The research was targeting working-age adult Aboriginal people, generally between 18 and 65 years of age.

It is impractical to predetermine a sampling frame in remote First Nations contexts, as can be undertaken in mainstream research. My aim instead was to reduce bias within the sample by interviewing as many working-age people in each remote community or selecting people in larger community or town as randomly as possible.

In all sites it was anticipated that, consistent with cultural protocols, there would be a degree of referrals and introductions from key informants, who were generally cultural leaders or elders, through language group networks, in what could be described as

‘snowball’ sampling. In fact, support through social networks is critical to the success or otherwise of gaining high participation rates.

Ideally the resultant sample would include a range of age, gender and education and work experiences. While census data has its limitations, comparison with town and community profiles could be used to assess whether there were significant variations in the sample from the First Nations population in each location.

Benefits to participants

In order to gain traction with WAC and the communities I was to research it was essential to be able to articulate the benefits of participating in the research. This was also an important consideration for the ANU Human Research Ethics Committee.

The primary benefit of participation would be in telling the story about the value of culture to Aboriginal people. As with any research, providing feedback to the people involved is critical. The most appropriate means of doing this would be a plain English version of the story that my thesis tells that would be owned by participants, and potentially could support them in any bids for support of cultural activities, hybrid activities such as Caring for Country or tourism ventures.

Support for social ventures rely on the estimation of a Social Return on Investment (SROI), so this work could assist with the calculation of the cultural values created or supported by social ventures. It could also be used to inform employers of the importance of culture and point to an adapted methodology that can be used to determine employment policies to maximise attraction and retention of First Nations employees. Being physically present in communities would also enable me to provide support and advice in relation to government relations, enterprise development, strategic planning, and governance issues, drawing on the skills I developed through my career.

3.7 Challenges and considerations

In designing my methodology, I anticipated several challenges and limitations. Some of these identified prior to fieldwork commencement are set out below. These are revisited in discussion of the survey process and participation results in Chapter 5. Lessons

relating to the methodology and the implications for future research are discussed in Chapter 9.

3.7.1 Philosophical objections

Philosophical objections are most likely to arise because of the need to adapt quantitative techniques in an area previously largely researched qualitatively. The oft-quoted phrase ‘Not everything that counts can be counted, and not everything that can be counted counts’ may be misattributed to Albert Einstein (O’Toole 2010). The sociologist William Bruce Cameron (1963, p. 1313) who, in emphasising that not all data needed by sociologists could be enumerated, wrote: ‘...not everything that can be counted counts, and not everything that counts can be counted’. This maxim, or parts thereof, often reflects an underlying message about the limits of, or objection to, the use of measurement, metrics and monetised valuation that are often associated with neoliberal focus on markets and new managerialism (see e.g. Broder et al. 2004; Foord et al. 2004; Grimson 2014; Toye 2015).

It is important to stress that the quantification of value I am aiming to show does not equate to commoditisation, one of the first criticisms I anticipated from those less familiar with rather abstract valuation concepts used in economics. I anticipated that appraisal of the methods used, and how I adapted and applied them, was likely to be as important as the results of the research.

A key question I needed to deal with early in the development of my ideas was the reality that cultural activity per se is not a reflection of the totality of culture, which more broadly encompasses ways of being and doing. My focus on cultural activity was premised on the assumption that it can be considered as an investment in building cultural capital. If people do not spend time practising or engaging in culture, including transmitting it to the younger generation, then the level of cultural capital and the culture itself is put at peril. Colonial policies aimed at extinguishing First Nations culture sought to prevent people connecting and identifying with their culture through language, ceremony, dance, and by denying access to country.

3.7.2 Survey design and delivery

Survey design and length

The direct relationship of response and completion rates with the length and complexity of surveys undertaken with First Nations participants in remote regions has been considered by a number of researchers and practitioners.

In a project analysing the Indigenous Enumeration Strategy in the 2001 Census, Martin et al. (2004) note the challenges in engaging and retaining the interest of Aboriginal participants in Census surveys through to completion. Sanders notes (2004) that separate household and individual forms was the biggest challenge to participants. He also observed interviewers having trouble retaining the interest and presence of household members where the process extended over a couple of hours or a morning, and notes the impact of this rate of survey on overall census completion and likely significant undercount from avoidance. This was contrasted with the homeless enumeration that entailed a much shorter and simpler questionnaire that took only a couple of minutes, resulting in the enumeration of 115 homeless people in the Alice Springs area in a single night.

Morphy's experience in survey design for use in remote areas is well established, and her advice to people seeking to survey Aboriginal people always stresses the need for simplicity, clarity and brevity in survey questionnaires. Morphy's work in designing a population survey for North East Arnhem Land (2012, p. 29) mentions how tired respondents felt after completing the first of two forms. In relation to the 2006 ABS Census (Morphy 2007, p. 156), she refers to the impact of survey length and complexity of questions on the energy and engagement of interviewer and interviewees, as well as the length and design encouraging formulaic responses.

Other comments were made on the impact of length and complexity of the surveys in the 2006 Census study (Morphy 2007). Sanders, who observed both the 2001 and 2006 Census processes in the Alice Springs town camps contrasted the improved process in 2006 with the cumbersome and tiring two-form collection in the 2001 Census (Sanders 2004, pp. 81–84; 2007, p. 24). The reported 40–60-minute process in Alice Springs town camps in 2006 is in stark contrast to that in Wadeye reported by Taylor (2007), who

commented that the arduousness and limited training of interviewers meant that household interviews were often lengthy and took up to half a day. This contrast suggests that more than form design was at play, and Taylor attributes this to both the length of the survey and the limited training of interviewers (Taylor 2007, p. 64).

More recently, in a project on the Indigenous cultural economy led by Professor David Throsby, researchers found that they needed to shorten the first pilot survey in order to increase the engagement of Yolgnu participants. The first pilot took about 1.5–2 hours to complete, with a 40% completion rate (K. Petetskaya, personal communication, June 24, 2016; D. Throsby, personal communication, June 25, 2016), and after simplifying and shortening the survey and clarifying survey concepts the second pilot took 40 minutes on average to complete and achieved 100% completion (Throsby & Petetskaya 2015).

Survey delivery

One of the objectives in my research design and budget was a provision to engage and work with interested local Aboriginal people, who might have aspired to future involvement in research, as research assistants. The benefits to me would be the addition of local knowledge and insights, provision of interpretation assistance to overcome language and cultural barriers, and assistance with introductions to individuals. For the local research assistants, it would mean an opportunity to work with me and to gain an insight into the research process as well as some of the underlying theory and knowledge that I brought to the project. It was difficult identifying and engaging research assistance in the available timeframe and budget, given the number of locations and my unfamiliarity with appropriate and available individuals, prior to commencing fieldwork.

3.7.3 Constrained timeframe for fieldwork

Unlike ethnographic research, the nature of the second phase of my research, the survey design and delivery, required interactive interrogation of many individuals over a constrained period of time. The first phase of my research was essential to not only observe, listen and learn, but also to build sufficient trust that I could actually conduct the voluntary surveys in Phase 2. Both phases needed to be conducted over a single dry season and delays in commencement further limited this window. Both the quality and

quantity of the data I would collect would be highly dependent on the trust I was able to engender, even with the aid of local Aboriginal research assistants.

3.7.4 Implications of heterogeneity and sample size

First Nations populations across this country are far from homogeneous. While my results might be ground-breaking in terms of determining empirical values, the relatively small sample of the population that I would be including in my research could not be considered as representative in any way of the broader regional or national population. The value may lie in using the methodology and results in tailored estimates of value for this or other First Nations groups or as a basis for comparative studies that may reveal regional or national variations.

Statistical significance will be difficult to achieve, although a study of values in high mountain country (Scarpa et al. 2011) has shown it is feasible with a high quality design using BWS and a sample of 107 completed questionnaires. Similarly, a pilot study of 19 respondents using the profile case of BWS to explore the preferences of older people yielded similar results to the subsequent study involving 315 respondents (Coast et al. 2008). The consistency of findings across the two studies is encouraging for the application of this technique in a smaller population.

3.7.5 Temporal considerations

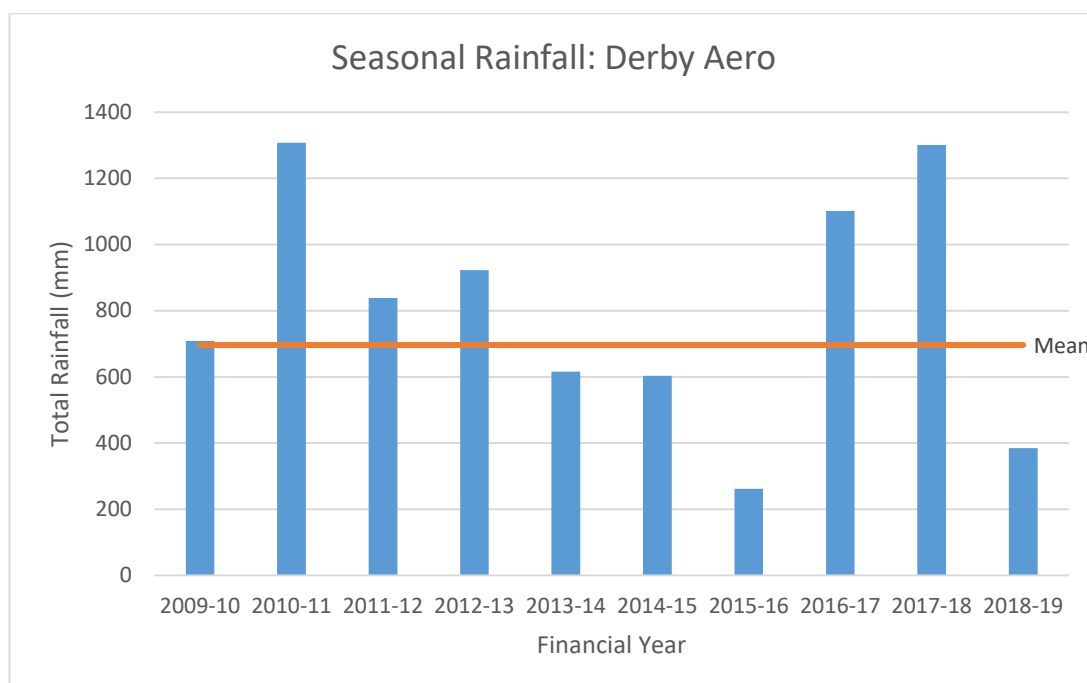
Another significant limitation of any survey relative to ethnographic research is that it occurs at a point in time, where issues of most concern and interest to participants may not represent their views at a different point in time or over a longer period. Seasonality of cultural activities such as ceremony, hunting, fishing, collecting bush tucker, and the impact of modernity in terms of school holidays, working patterns including for fly-in-fly-out workers, are all likely to influence people's availability and even their responses.

Direct observation of cultural activities over an extended period of say 12 months would provide more accurate data on actual time spent on cultural activities than a survey methodology. This was the approach taken by Altman in his early doctoral fieldwork at Momeka outstation where he lived for 13 months (Altman 1987). However, even a single year sample period may not accurately reflect a typical or average year,

depending on events or activities undertaken during that period. For example, if someone does or does not attend ceremony that year because of their relationships with initiates, the time spent in that year may not accurately reflect a typical or average year. Work, employment and family caring commitments may also be variable, affecting participation in cultural activities.

Climate and seasonal variability also affects many cultural activities. Over the few years I have been involved with people in the West Kimberley I have been struck by the variability of the length and strength of wet seasons. This variability is shown in Fig. 3-2 below that plots total financial year rainfall against the mean annual rainfall over a 10-year period recorded at Derby (WA) airport. The financial year captures the total wet season that typically runs from October/November to March/April. Seasonal variability, particularly of wet seasons, impacts on people's movements and cultural activities that are integrally tied to rivers and broader ecosystems. This impact is felt by Aboriginal communities across northern Australia (Leonard et al. 2013), and scientific evidence points to this happening for tens of thousands of years (Denniston et al. 2013; Field et al. 2017).

Fig. 3-2 Seasonal rainfall variation at Derby Aero, 2009–10 to 2018–19



Data source: Bureau of Meteorology, Climate Data Online, Derby Aero Station Number 003032; accessed from http://www.bom.gov.au/jsp/ncc/cdio/wData/wdata?p_nccObsCode=139&p_display_type=dataFile&p_stn_num=003032

In their research on the economic value of fisheries to a New South Wales (NSW) Indigenous community, Gray et al. (2005) were seeking to assess the average catch and collection and the number of people harvesting each species over a 12-month period. Given the seasonality of the resources, they adopted a cost-effective survey methodology that asked the respondents to estimate their harvest or catch over a 12-month period, in preference to direct observation or asking respondents to maintain a detailed diary of the resources harvested over that period. As with Altman's previous work (Altman 1987; Altman & Allen 1992) they noted the trade-off between the accuracy of immediate observation and measurement and the completeness and efficiency of asking respondents to recall a full 12 months, noting the essential role of the local Aboriginal community member who assisted the lead researcher, being present for each survey interview.

In considering the question of the timeframe for questions about people's cultural and other activity, two possible approaches could be taken, or a combination of each as they relate to specific activities. Timeframe questions could be couched in terms of very specific time-frames such as last week or last month, which are likely to elicit more accurate responses, but they might be biased by events such as 'sorry' business¹¹. The alternative, more generic, approach adopted in this research was to ask about the activity over a full year to capture all seasons. The importance of seasonality in participants' lives outweighs the potential loss of recall and reduced accuracy. Where some activities or events occur less frequently, such as annual events like festivals and certain ceremonies, it may be more appropriate to ask how frequently people are involved in these activities.

3.8 Conclusion

This chapter has outlined the philosophy of my methodological approach as a researcher who does not identify as Indigenous, my positionality and reflexivity. This, along with considerations around the non-market valuation methods that best suit both the research context and the research question, were critical to framing an overall methodology that would successfully incorporate technically abstract quantitative methods in a grounded approach. Building on the finding in Chapter 2, that a welfare-based utility approach privileging the perspectives of First Nations people is

¹¹ Sorry business is a period of cultural practices following the death of a family or community member.

appropriate for measuring non-market values of their culture, this chapter explored in more detail the possible valuation methods, and identified that choice modelling was more robust than contingent valuation.

Having determined a general mixed method approach involving a qualitative phase in the field that would then inform the design and delivery of a survey incorporating a choice model in the following phase of fieldwork, this chapter has then discussed the process of engagement, identification of potential sites, agreement and ethics clearance required prior to fieldwork commencing. It has concluded with a discussion of challenges and potential limitations considered in the development of the methodologies.

The next two chapters in Part II discuss the findings from the qualitative Phase 1 and the Phase 2 participation which relate back to these considerations of design and methodology. Chapter 6 of Part III builds on consideration of valuation methods in this chapter together with the findings discussed in Chapter 4 to discuss the design and application of the selected BWS choice model.

Part II

The People and the Place

Chapter 4 Early fieldwork lessons: Phase 1

4.1 Introduction

Building on the preparatory work of engaging with Aboriginal groups, scoping and agreement making, outlined in Chapter 3, this chapter starts by briefly discussing the fieldwork engagement before exploring some of the key issues and lessons from the scoping phase and the Phase 1 qualitative research that inform the selection and design of the choice model employed as part of the survey conducted in Phase 2. The three phases of fieldwork between 2014 and 2016 are described as the scoping phase, Phase 1, and Phase 2.

I start by setting out some of my insights from regional Aboriginal organisations I dealt with in the scoping and first phase, including the interests of the native title holding entity for the Nyikina and Mangala people and relevant Kimberley-wide interests of other Aboriginal organisations. I then describe the places and the processes of engaging with people in the field, covering the physical, governmental, and social contexts evidenced in both the scoping and first phases.

Much of this groundwork is qualitative in nature, reflecting the viewpoints that people shared in discussions in Phase 1. Such grounding is essential to ensure that the methods subsequently deployed to quantify cultural values are feasible and appropriate in response to the research question. I have included relevant and available demographic data and contextual information about the field sites that were ultimately included in the research and, where possible, I have sourced independent research about claims and issues discussed.

The final section of this chapter discusses key lessons emerging from the qualitative scoping and first phase thematically that were used to inform the survey and choice model design.

4.2 Insights from Aboriginal organisations

Throughout the scoping phase I was in communication with several Aboriginal organisations. This section outlines the interests of key organisations that intersect with this research, starting with WAC, the primary organisation supporting the research.

4.2.1 *Walalakoo Aboriginal Corporation*

The WAC holds native title on behalf of Nyikina and Mangala people, following their first determination of native title in May 2014. Over the course of the scoping phase and beyond, many of the WAC board members generously provided me with their time and insights into the political, economic, and cultural context of the Nyikina and Mangala people. These Nyikina and Mangala leaders enabled me to better understand the challenges and opportunities in the post-native title determination phase and how my research interests intersected with these. This meant I could identify the potential value of my research to the Nyikina and Mangala people.

Leveraging native title in commercial activities is a high priority for many directors of the WAC Board. Their land has coal and gas resources as well as growth potential in agriculture and tourism, the leadership of the WAC represents the range of views across the prescribed body corporate about the relative importance of potentially conflicting priorities of resource development and environmental protection.

The importance of maintaining culture for wellbeing and identity appears to be a common aim of all the WAC Board directors. By focusing on cultural activity, I was able to navigate a course with my research that acknowledged the tensions around resource development while taking a more grounded approach to inquiry about individual attitudes to culture and work.

Another question of interest to the WAC Board was how my research into the value of culture related to native title value, and potential compensation. While compensable value is not at the core of my question, there is a clear relationship between the intangible values in culture and the value of native title. This means that my research might inform a way of approaching the broader question of how to value native title for compensation.

At the April 2015 WAC Board meeting, directors expressed interest in the concept and potential application of my methodology to the issues of native title compensation and ‘solastalgia’. Solastalgia was explained to me to be the sadness or pain that results from environmental impact on Country, particularly Martuwarra (the Fitzroy River), even if accessing that Country is not part of their everyday lives. The term ‘solastalgia’ first appeared in the literature in 2005 (Albrecht 2005), and has been applied to Indigenous and non-Indigenous peoples and environmental losses arising from both human impact and natural disasters.

Following the WAC Board’s agreement to my research, individual directors of WAC as cultural leaders were able to guide me in cultural protocols and facilitate appropriate introductions to communities and town-based Nyikina and Mangala individuals with whom I would engage. These directors were very generous with their time, particularly in the early phases of the research, providing a clear picture of the dynamics and politics of community and town life for Nyikina and Mangala people.

4.2.2 Kimberley Aboriginal Law and Culture Centre

The KALACC is the peak law and cultural organisation for the Kimberley region supporting 30 Aboriginal language groups. Established by the KLC in 1984 it has worked in partnership with the KLC and the KLRC as well as a range of other Aboriginal NGOs in the region. The Mission of KALACC is ‘To assist and promote the ceremonies, songs and dance of Kimberley Aboriginal people, to encourage and strengthen their social, cultural and legal values and ensure their traditions a place in Australian society.’ This mission statement reflects its focus on traditional culture, and its expressions in song, dance, and language.

The KALACC supports a range of cultural programs aimed at instilling resilience, investing in cultural capability, and supporting measures to address youth suicide, social disadvantage, and cultural loss. Major projects include the Kimberley Aboriginal Caring for Culture Project, Yiriman Project and Culture Camp Project, with the latter incorporating the Julurru Project – a significant project seeking to establish the links between cultures across the Kimberley in a traditional linked dance and song that had fallen out of practice.

In order to develop an evidence base supporting Culture and Law, including evaluations of its programs (see e.g. Davey et al. 2020; Golson & Thorburn 2020), KALACC has established research partnerships with Nulungu Research Institute of Notre Dame University, Murdoch University, University of Wollongong, and is strengthening its relationship with the Centre for Aboriginal Economic Policy Research (CAEPR) at ANU. KALACC also works to build relationships with government, industry, and philanthropic partners to garner support and influence policy and practice. Advocating for cultural groups in the Kimberley, it has been particularly involved in research, practice and lobbying for support for its program that specifically address youth suicide.

While KALACC clearly has a strong interest in matters related to my research, its research and evaluation focus is on impact evaluations of cultural projects. KALACC's Kimberley-wide focus supporting cultural groups meant that it was not in a position to offer practical support with access to a particular language group or individuals. While KALACC has not been an active partner in this research, it has an interest in the methodology and findings.

4.2.3 Kimberley Land Council

My dealings with the KLC were limited during this research. However, as a senior public servant working on native title in the 1990s, I had dealings with it and was aware of its work striving for self-determination and balancing economic development and cultural maintenance.

The KLC was formed in 1978, meeting at Noonkanbah and then protesting against oil drilling near Noonkanbah over the next two years (Hawke & Gallagher 1989). It continued to fight for land rights in WA, representing and advocating for Kimberley TOs through the outstation movement, the 1983–1984 Seaman Inquiry into Western Australia Land Rights and then federal land rights.

Under the *Native Title Act 1993*, the KLC has been a recognised Native Title Representative Body acting on behalf of TOs across the Kimberley seeking recognition of their native title. The KLC, having developed significant political capability in the fighting for land rights in WA prior to the Mabo decision, was a leading organisation amongst WA native title representative bodies in the formative native title days, when they were dealing with a hostile state government that had introduced its own

legislation, the *Land (Titles and Traditional Usage) Act 1993*, that extinguished native title to replace it with a statutory provision for ‘traditional usage’, and challenged the validity of the Commonwealth’s *Native Title Act 1993* in the High Court. The KLC, representing the Wororra and Yawuru peoples, together with representatives of Martu peoples, successfully challenged the validity of the WA legislation in a 1995 High Court decision that also upheld the *Native Title Act 1993*.

Of relevance to this research is KLC’s roles and interest in balancing the economic development imperatives and cultural interests of TOs. The KLC’s landmark conference in 1991 at Crocodile Hole (Crough & Christopherson 1993; Kimberley Land Council & Waringarri Resource Centre 1991) made recommendations aimed at changing the relationship between Aboriginal and non-Aboriginal people and increasing self-determination for Aboriginal people. These recommendations covered culture and land; Aboriginal community control and organisation, negotiation processes; education and training; health; mining; pastoral industry; local government; water resources; national parks; tourism and funding. Many of these recommendations reflect the history of marginalisation of Aboriginal people in decisions affecting them, their culture and their land, factors that continue to affect Aboriginal people today.

4.3 Fieldwork – when, where & who

4.3.1 When

The three phases of engagement with participants in the field that occurred between 2014 and 2016 are described as the scoping phase, Phase 1 and Phase 2. The engagement and approval processes involved in the scoping phase between July 2014 and April 2015 are described in Section 3.6 of Chapter 3. The substantive fieldwork occurred between June and November 2015, with Phase 1 from June to September 2015 and the bulk of Phase 2 between September and November 2015.

Building on the methodological philosophy and approach in this intercultural space, as discussed in Chapter 3, successful engagement of the local Aboriginal population in this research was dependent on building trust. As with fieldwork in any location where the researcher is an outsider, developing relationships between researcher and participants

and building trust takes time. The pace of fieldwork was dictated by research participants, and the level of trust they felt with me and my research.

Having worked in fast-paced national policy environments, I struggled with the slower pace of research in the field, particularly early in the substantive fieldwork when I was ready to live and learn in the field and knowing that I needed to complete both phases of the fieldwork well before the onset of the wet season. There was, however, a remarkable change in pace around the time of the transition to Phase 2 coinciding with other responses reflecting improved trust, such as greater use of English rather than Kriol in my presence. Reflecting on the slower pace early in Phase 1, I recognise behaviours such as use of Kriol and limiting accessibility that reflected community members' need to exercise agency and control.

4.3.2 Where

Most Nyikina and Mangala people live in two West Kimberley towns and several communities along the western end of the Martuwarra (Fitzroy River). My aim was to survey working-age people living in these very remote areas or communities of Jarlmadangah and nearby Looma as well as those resident in a larger town such as Derby or Broome, in order to capture samples across areas with diverse economic opportunities.

In June 2015 I drove from Canberra to Broome, via Uluru, Alice Springs, Balgo, Halls Creek and Fitzroy Crossing. I had planned to pick up two of the WAC directors to travel with to Looma, which, with an ERP¹² of 450 based on the 2011 Census count (644 in 2016) is one of the largest discrete Aboriginal communities in the West Kimberley.

While crossing the Tanami, I received advice that, because my research dealt with attitudes to culture, I would not be welcome in Looma. It was suggested that my research could exacerbate tensions in the community between those aligned with

¹² The estimated resident populations are calculated by applying the ERP to count ratios at the most granular relevant geographical level SA2 published by the Australian Bureau of Statistics to the raw census counts for adults (age 18 and over) usually resident in the community and town ILOCs. It should be noted that the application of this adjustment equally to populations in towns and communities within SA2 areas irrespective of gender or age profile or housing constraints, may make smaller community adjusted estimates less reliable than larger towns.

churches that were explicitly opposed to traditional cultural practice and those seeking to maintain culture. The loss of this field site with its estimated adult Aboriginal and Torres Strait Islander resident population of 290 in 2011 (387 in 2016) significantly decreased the potential sample size for my Phase 2 survey and resultant analysis. So I worked with leaders from WAC to identify strategies that would still enable me to survey 100–200 working-age adults. This involved the addition of new sites that I had no prior contact with, including one of the larger communities Pandanus Park (also known as Yurmulun) and one or two smaller family outstations in the region.

A final contingency suggested to me was the addition of Bidyadanga, a large community south of Broome on Karajarri country, where a number of people have Nyikina and/or Mangala connections, including a number of the listed members of the native title holding body WAC. I decided that the additional travel time as well as the time that it would take to build relationships in this new place outweighed the marginal benefit of increasing the sample size. The time constraint was real, dictated by seasonal travel opportunities, and spending time in another location would potentially put at risk building deeper trust and relationships in the other sites. Instead, I focused on the narrower geography of communities in the Nyikina and Mangala determination area plus the towns where many Nyikina and Mangala people reside.

My approach to engaging people in the field was to move between the two larger discrete communities of Jarlmadangah and Pandanus Park, Derby and Broome, working flexibly around the needs of key informants and broader communities. Key leaders in Jarlmadangah were involved in ‘sorry’ business at the time I was ready to commence, so I started in Derby under the guidance of one of the WAC directors.

Derby

Derby is a commercial and service hub for the West Kimberley. It supports the seasonal tourist industry as well as the town and surrounding remote areas with an airport, a hospital, aged care, schools, shops, government agencies, churches and NGOs. Many of the businesses and services employ local Aboriginal people, with some travelling from communities to work in the town.

Based on the 2016 ERP, Aboriginal and Torres Strait Islander people accounted for approximately 47% of the town’s population. It is hard to estimate the number of

residents in Derby with Nyikina and/or Mangala connections, particularly given the proximity of Derby to Country for many other language groups including Ngarinyin, Wandjina, Warrwa, and Nyul Nyul. In terms of the broader Aboriginal and Torres Strait Islander population in Derby, Table 3-2 in Chapter 3 shows an adult Aboriginal and Torres Strait Islander ERP of 599 in 2011, increasing to 877 in 2016.

I started my Phase 1 fieldwork in Derby with guidance and support from a cultural leader and their family. This leader and their partner were extremely generous with their time, providing valuable insights into perceptions and practices of town life and how this contrasted with life out bush. I was able to meet and mix with a range of people in different contexts, including at NAIDOC events. Most importantly it gave me an opportunity to observe the interactions of people in town, and to gain some insights to how they maintained strong cultural connections and awareness.

Many of the people I met in Derby had connections to one or more communities or outstations and regularly left the pressures of town to ‘go bush’. It was evident that the cultural leaders who lived in town for work or education were central to a complex social fabric of the town which wove cultural and kinship connections with knowledge of government systems affecting everyday life in the realms of housing, employment, family support and social security. I observed leaders being called on at any time of day or night for advice and emotional, physical, cultural and financial support. Many people acknowledged that drug and alcohol use in town significantly disrupts cultural and social norms that might be observed in remote communities where substances are prohibited or tightly controlled. Getting away from these issues was often cited as a key benefit of getting back on Country.

Broome

Broome is the largest town in the West Kimberley. It is located on Yawuru country, with an ERP of 16,371 in 2016, 26% of whom identify as Aboriginal and Torres Strait Islander. It is a town of contrasts, with the glamour and wealth associated with the pearling and tourism industries sitting alongside the dark history of enslaved pearl divers, dispossession of local Aboriginal people and racism against both Aboriginal and Japanese. Economic productivity in Broome accounts for about half of the entire Kimberley’s Gross Regional Product (Kimberley Development Commission 2020).

My Nyikina and Mangala contacts in Broome during Phase 1 were primarily directors of WAC and other senior people who worked in Broome, many of whom I had interacted with during my scoping visits. As with Derby, many of these people were living in Broome for work and regularly, some weekly, returned 'home' to communities where family still resided. I also spoke with other people who worked with or undertook research with Nyikina and Mangala people, who could offer perspectives that helped me understand the historic and current social and political context for Nyikina and Mangala people.

The discussions with Broome-based participants revolved around regional political, social and cultural issues. They provided insights and perspectives on issues of concern to Aboriginal people of the West Kimberley, often highlighting different perspectives on tensions between economic development and culture, as well as disparities between people's access to resources, real and perceived, often arising from native title determinations and settlements. While native title determinations and settlements represent recognition, which, in itself, has real meaning and value for TOs, there can be significant disparity in other benefits flowing from them.

This disparity surfaced in many discussions in Broome, where the Yawuru secured a significant package of benefits in its native title settlement. The Yawuru native title determination and agreements finalised in 2010 provided a \$196 million package comprising land and money, including \$50.5 million compensation over five years, in exchange for extinguishment of native title in some areas and suppression in others to enable development (Agreements Treaties and Negotiated Settlements Project 2011). Importantly the agreements establish a framework for Yawuru recognition and involvement in decision making that reinforces that recognition and underlies the Yawuru Cultural Management Plan (Yawuru RNTBC 2011). This Plan explicitly states that Yawuru welcome others into their Country but they set two requirements for visitors, namely show respect for elders and always ask permission (Yawuru RNTBC 2011, p. 124). This acknowledges, and to some extent provides for, the many Aboriginal people who live or visit Broome that do not have Yawuru connections. However, some participants revealed a perception that there are two classes of Aboriginal people in Broome – Yawuru and others. Others claim that an increasing number of people who had not previously identified as Yawuru were now doing so to access the benefits that flowed from the agreement. As part of a broader

strategy to build knowledge around their Country, community and stories, and to provide an evidence base for setting priorities for use of the native title settlement funds, Yawuru undertook the Yawuru Knowing our Community (YKC) household survey demographic survey in 2011 (Taylor et al. 2014). A repeat survey, which has not yet been undertaken, could provide evidence of any increased identification as Yawuru.

The first Nyikina Mangala consent determination is not associated with a compensation package comparable to the Yawuru ILUA. However, as with Yawuru, the Nyikina Mangala native title determination supports a degree of self-determination that can be exercised through negotiations about access to, or use of, land. For example, in 2015, WAC entered into agreement with Buru Energy Ltd and Diamond Resources (Fitzroy) Pty Ltd in granting easements within their native title determination area. While the commercial terms of the Ungani Co-Existence Agreement are not public, the necessary native title provisions coinciding with that agreement are contained in the publicly registered ILUA.¹³ This agreement provides access to leasehold land for resource projects, and given the resource potential in the region, there may be more such negotiations in the pipeline. Most importantly, the holding of native title goes some way to providing the TOs with the capacity to determine the nature and extent of development that could affect their Country.

Pandanus Park

As I had not previously met key leaders at Pandanus Park, my introduction was through a chain of contacts to an appropriate TO. The fact that I had not previously established relationships with people in community may have attributed to their slower initial engagement.

Pandanus Park is an Aboriginal community adjacent to the Fitzroy River near Willare Crossing Roadhouse on the Great Northern Highway, about 60 kilometres south of Derby. ‘Pandanus Park’ was the name of the fruit and vegetable farm that operated in that location, and the community grew from those living and working there, with the community negotiating a Land Management Order with the Aboriginal Land Trust at the end of 1999.

¹³ <https://www.atns.net.au/agreement.asp?SubcategoryID=121&EntityID=6883>

Pandanus Park is the largest discrete Aboriginal community in my research, with an ERP of around 162 in 2016. It has a relatively young population comprising many children and young people and fewer older people. In the 2016 Census, 42% of the enumerated Indigenous population in Pandanus Park was under 15 years of age, as compared with 30.9% in Derby, 33.6% in Broome and 32.0% across all remote and very remote areas of WA.

A factor influencing the age structure of the community, in particular the small number of aged persons resident, is the limited health care and absence of aged care, other than family carers, in the community. Several participants commented on the lack of services and the impact that has on cultural continuity, with elders often living in town to access health and aged care services. Several people residing in community were cared for by family members who may otherwise have been employed, and potentially resident elsewhere. More than one respondent reported that they had either stopped working, or taken extended leave of absence to care for older family members, and that this often provided respite from institutional care by enabling the older person to reconnect to Country and kin. This movement of older people, and their carers, in and out of community adds the mobility of the population which is problematic for estimation of populations and planning for services.

A major program of housing upgrades, including refurbishments and some new housing, was well underway in Pandanus Park during my fieldwork, with many families either relocated/co-located into existing housing or demountable accommodation within the community. These housing upgrades were subsequent to the community entering into a housing management agreement in October 2012 (WA Department of Housing 2012). Under this agreement with the WA Government the community relinquished control over housing, rental and management services to the government for 40 years, as part of the new legal framework for remote Aboriginal housing in WA (WA Department of Housing 2015).

Ongoing paid employment opportunities within the community were limited to around four positions related to municipal services and employment services. Other work opportunities were sporadic, and depended on outside funding for an activity. During the period of fieldwork, a small number of locals were employed in the housing refurbishment works, effectively doubling the number of paid jobs within the

community. Many people in the community work in and around Derby, largely in NGOs providing services to Indigenous peoples.

Pandanus Park has had a history of seeking to establish community enterprises, with a *cherabin* (fresh water prawn) aquaculture project¹⁴, an ice-making venture and a sand mine being notable examples of ventures that have been attempted without sustained success. Renewed efforts to develop the sand mine in conjunction with a non-Aboriginal developer commenced during the period of fieldwork. Its proximity to the Willare Crossing Roadhouse provides some advantages for businesses targeting tourists and other travellers.

Jarlmadangah Burru

The second largest discrete Aboriginal community in my research, Jarlmadangah Burru (Jarlmadangah), is a community with an estimated resident population of 103 people in 2016. It is located about 115 kilometres by road south east of Derby, in the Grant Ranges near the Fitzroy River and the towns of Camballin and Looma.

It was established in 1987 on land excised from Mount Anderson Station (which is also known by its traditional name Jarlmadanka) by TOs seeking to establish an independent community where activity would not compromise culture and heritage sites. Notably, one of the key elders of the community was the Chair of the KLC from 1981–1986, just prior to the establishment of the community, and again in 1991–1993. The emphasis on self-determination that arose in the early days of the KLC and was evidenced in the Crocodile Hole report is reflected in the way Jarlmadangah was established. The strength of the community arose from this community control and planning, complemented by the skills and capability of community members in identifying and attracting resourcing and support. Education on Country and in language is a priority and despite its limited population size it has its own school, meaning children do not need to travel to Looma or Derby for primary level education. The Nyikina Mangala Community School, operated by the Association of Independent Schools of Western Australia¹⁵, was staffed with a principal and another teacher supported by local teaching assistants and cultural educators at the time of my fieldwork. There is a language

¹⁴ <https://www.isx.org.au/pandanus-park-freshwater-prawn-farm>

¹⁵ <https://www.ais.wa.edu.au/>

program at the school and during one of my earlier visits I saw a cultural multimedia program being delivered by a media organisation and local elders.

A range of enterprises have operated previously in the community, including a shop, gardens and an aquaculture venture. Continuing enterprises at the time of the research included a cultural centre and a long running cultural tourism venture. A new nursery and greenhouse infrastructure was being built during 2015 as a ‘Green Army’ project, to support a new venture to raise native plants for use in medicines and foods.

The Nyikina Mangala Rangers are based at Jarlmadangah, and are involved in a wide range of activities including land management, fire management, feral plant and animal control, crocodile management, as well as a range of research activities in partnership with universities, research organisations and conservation organisations. This research extends to surveys of threatened species including biyalbiyal (Freshwater Sawfish (*Pristis microdon*)) and wiliji (Black-footed Rock-wallaby West Kimberley race (*Petrogale lateralis*)).¹⁶ The diversity of work undertaken by rangers demonstrates how Traditional Ecological Knowledge used in conjunction with science and new technologies can add value to the cultural lives of rangers as well as the biodiversity values of the nation.

Bidan

Bidan, formerly known as Bedanburru, is a small settlement of around 20 people from three family groups. Situated on the Highway between Broome and Derby, it is about equidistant (about 110 kilometres) between Broome and Derby, and about 55 kilometres south west of Pandanus Park. Bidan seeks to be self-sustaining with solar power, water treatment and a small school that was operating sporadically during my fieldwork as a remote school with a teaching assistant.

¹⁶ While both examples are listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999*, species profile and threats database (<https://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl> accessed 2020) managed by the Australian Government Department of the Environment and Energy, the Freshwater Sawfish is listed as Critically Endangered (Global Status: IUCN Red List of Threatened Species: 2018.1 list) and the Black-footed Rock-wallaby West Kimberley race is listed as Endangered (*Biodiversity Conservation Act 2016* (Western Australia): September 2018 list).

Balginjirr

Balginjirr is another small settlement that is home to a small number of families and a caretaker, with the population estimated to be 21 people by the WA Department of Planning Lands and Heritage. Balginjirr is situated about 12 kilometres off the highway, north of Willare Crossing. At the time of my research most of the residents were working or studying in Broome, Derby and Pandanus Park, where I spoke with them.

A wilderness centre used as a training and education facility had been developed in this community. Residents of Balginjirr are working on plans to develop global geoparks and there is potential for the wilderness centre to be developed further as a base for tourism.

Willare Crossing Roadhouse

Willare Crossing Roadhouse and accommodation is on the highway between Broome and Derby, directly across from the community of Pandanus Park. As with most roadhouses in remote areas, it is frequented by community members seeking a lift to town, buying fuel, take-away or other food and drinks. As with many other roadhouses in remote areas, it is a place where people often congregate and meet, or seek lifts with, family or others who are passing on the highway. Teams including Nyikina and Mangala TOs working on heritage surveys or other site clearance work were often accommodated at Willare.

The relationship between the roadhouse managers and staff and Pandanus Park community members was variable, dependent largely on the management and individual workers' attitudes. Some community members complained about discrimination and lack of employment opportunities afforded to them, as well as the use of foreign backpacker staff. I witnessed discriminatory practices by staff, including one who ignored the Aboriginal person at the front of a queue to serve a non-Aboriginal person behind them, and another who followed an Aboriginal person around the aisles evidently suspecting theft. Over the periods of time I was in the area I saw and spoke with only one Aboriginal employee at the roadhouse, who was from another part of WA.

4.3.3 Participants

Phase 1 fieldwork

In Phase 1, I adopted an inductive approach, using discussion and observational techniques to get a sense of the people, what was most important to them and their wellbeing, and to identify what cultural activity and paid employment were undertaken.

My interactions were very informal in the initial stages, mostly spending time in and around the communities and talking with family groups and individuals. My initial introduction to communities involved meeting with key community leaders including the Chairs and Chief Executive Officers (CEOs) and discussing my research, what I hoped to achieve and how the community might benefit. Consistent with cultural protocols, the pattern of engagement then involved meeting with senior TOs who held knowledge about cultural practices and the history of the region, community and how Aboriginal people engaged in the economy. I also met with and interviewed a range of people in the community, including men, women, younger people and family groups. While my intention had been to hold larger group meetings it became evident that as part of the process of building trust and relationships, people were more comfortable to meet as individuals or pairs. During these informal interviews I inquired about the nature of cultural activity undertaken and how that related to paid employment and the activity required to meet social security requirements. I met and talked with around 45 people during this phase of research, some of them on multiple occasions. These discussions were not audio recorded.

I was able to observe family, social and cultural dynamics in the towns of Derby and Broome and compare these to the dynamics of the remote communities. Many people living in these towns have lived, or do live from time to time, in the remote communities along the Fitzroy River. Many of these people live in town temporarily or permanently – for employment, health or education reasons – and maintain a close interest in and connection to communities through their family connections.

Building an understanding of people's attitudes to research and researchers was an important outcome of my Phase 1 fieldwork. Some communities had established long-lasting relationships with researchers and had experience collaborating with them. Some

individuals had collaborated directly with researchers and were able to clearly articulate their opinions about the impost and benefits of research. Others had a limited exposure and were understandably cautious in their initial dealings with me.

The qualitative data from this initial phase was critical in informing the design of the semi-structured survey and the attributes and levels used in the embedded choice model to ensure that they were as realistic as possible, thereby minimising the risk of presenting hypothetical scenarios that are not readily understood by participants.

KALACC, KLC and KLRC Annual General Meetings

As well as my visits to communities and towns in Phase 1, I was able to meet Nyikina and Mangala people at the 2014 and 2015 combined AGMs of the KLC, the KALACC and the KLRC. In September 2014, these combined AGMs were held at Jarlmadangah and coincided with the KALACC Festival which is held every two or three years. This event involved people from language groups across the Kimberley as well as philanthropic, research and other organisations.

In mid-September 2015, I attended the three-day bush AGMs of the three Kimberley organisations at Pandanus Park. Here I was able to reconnect with people I had previously met and meet key leaders, as well as talk to people about my research and how it could benefit Nyikina and Mangala people. While I did not undertake any interviews at this AGM event it was another opportunity for me to meet and spend time with a range of Aboriginal people from across the Kimberley including Nyikina and Mangala people. It also afforded an opportunity to observe and develop a better appreciation of the political aspects of Kimberley organisations and their interactions with individuals from across the Kimberley who attended the meetings.

4.4 Thematic findings

This section presents the key findings from the scoping phase and Phase 1 which were used to inform the design of the choice model and the survey it would be embedded in. It shows that while cultural activity is important, other aspects of culture including access to traditional Country and being with family and kin are very important.

Discussions in the scoping phase were broad ranging and largely participant-led. Although I would outline my research interest, the purpose was to provide context and gauge interest in my research. I spoke with many of the same people as in Phase 1, so much of their framing introductions about themselves, their interests and lives they canvassed in the scoping were not explicitly repeated but referenced as assumed understanding.

Before speaking to participants in Phase 1 of the research, I explained my research, offering the information sheet or explaining it verbally, and sought consent in line with the ethics protocol. This gave participants an understanding of what I wanted to hear about and those who were confident and comfortable needed little prompting, leading to longer, more unstructured ‘yarns’ (conversations) than with those who needed a little more prompting. And while much of the information was gleaned from yarning with participants, I also observed how people interacted and lived, and followed up on other references mentioned that might develop my understanding. This thematic analysis brings this information from across all sites and participants together in a way that informed the design of the choice model. Notes from discussions were analysed using NVivo 11.

4.4.1 What matters most to participants

While I introduced my research framed in terms of work and culture, a starting point for many of the discussions was to talk about what was important to participants in living a good life. Most participants related a good life to knowing who you are and where you belong, being on Country or being able to get to Country, being with family, having enough food and a house, and having enough money or a good job that earns money.

One elder, in discussing balancing work and culture, reflected on the values espoused in their family – being able to work to support the family and maintain culture. Two other participants spoke explicitly of the values that guide how they live. In a discussion that led to a comparison of Aboriginal and western culture, one elder said:

Values of generosity and caring are central to Aboriginal culture. Taking the time to talk, to listen and to be with people, family and on Country. Just being, feeling.

Many participants reflected on how they live, their community, being on Country, as well as work and culture. Most elders spoke of the history that had brought them and their communities to where they are now, reflecting on what has been achieved and what has been lost.

One elder spoke of the essence of sharing and reciprocity in culture being impinged by the need to plan in western culture. They contrasted sustainable pre-colonisation activity and living in smaller groups with life in larger artificial communities that couldn't be supported with nomadic hunting and gathering. They also compared the current need to plan on how to make the money last till next pay when food is needed, with traditional society where whatever resources were available at any time were shared in the knowledge that others would also share at another time.

The following summarises the issues most frequently raised in discussion of the key themes of culture, work and enterprises, and accessing or being on Country. I will then briefly touch on a number of issues that were raised that were seen as barriers to or enablers of cultural aspects of life and employment. Finally, I will discuss how these were seen to play out in relation to the commonly referenced contexts of community, family and youth.

4.4.2 Culture

Culture and cultural activity was the most frequently discussed theme, and presented some of the most important lessons from my scoping and Phase 1 interactions. My introduction of this research included reference to cultural activity, which led many participants to talk initially about traditional culture and cultural activity. Most participants spoke about traditional culture and the activities that they and others undertook to maintain it. The continuation of ceremony and lore was the most frequently cited aspect of traditional culture. I was reminded by a couple of elders that cultural identity, particularly language group affiliation, is critical when talking about culture.

Views expressed about the importance of cultural identity and connection ranged from it being critical to survival to some who spoke about losing or not caring so much about culture. Positive perspectives on cultural identity were most common, outweighing the negative or indifferent views. An example was one elder who said that if they didn't

know their culture they couldn't survive. Those apparently less engaged with cultural identity included one person who indicated that they are sometimes called a 'black fella *kartiya*'¹⁷ because they didn't grow up with their culture but were learning their culture from family now. Another person said that they grew up two ways – Aboriginal and white.

Aboriginal culture involves ways of knowing, being and doing. The sense of cultural identity and belonging – the being – was expressed more strongly by some participants, while others spoke in terms of traditional culture and cultural practices – the doing.

Traditional culture

The most frequently raised aspect of culture was what might be termed traditional culture– ceremony; stories; songs; dance; arts and crafts; and bush healing. Several people referred to the shared Wunan law that extends from the east through the West Kimberley and south. Most participants articulated views about the importance of maintaining those traditions, although a few participants lamented the loss of culture for a range of reasons. Some participants talked about specific traditional practices and the rules and protocols that guided behaviour at certain times.

Elders chose to talk to me about aspects of culture that were linked to the past, and how they pass on these traditions through ceremony and immersion with younger people. The importance of involving children and young people in cultural activities, including ceremony and learning the dances, songs and stories, was mentioned by several people including some parents. It was evident that much of this occurred on camping or day trips on Country that involved fishing, hunting and gathering.

Youth programs to teach aspect of culture and law were mentioned by several participants as increasingly important in terms of cultural continuity and diverting youth from crime and assisting suicide prevention. These included special school holiday programs and the Yiriman program that take youth on Country to immerse them in culture and Country. The absence of elders in community was raised as a reason for the limited opportunities to learn traditional dancing and stories. Several participants referred to one elder who taught kids from several places, sometimes visiting

¹⁷ *Kartiya* is the term used to refer to non-Aboriginal (white) people.

communities to teach there, apparently infrequently, and also was involved in youth programs, cultural clearances and cultural tourism. Others said that teaching for traditional law might cease because the two elders who led this might not do it anymore.

Fishing, hunting and bush foods

The next most frequently mentioned cultural activities were fishing, hunting and bush tucker gathering. Fishing was mentioned more than hunting, reflecting the importance of Martuwarra (the river) in cultural lives of communities. It was evident that hunting and fishing was seasonal but that in any trip on Country, both might be undertaken. While some participants showed me catch-and-kill food in freezers, food security was mentioned by a minority of those who spoke about hunting and fishing, and some of those spoke about providing for elders and young people. Specific cultural rules that restricted foods that could be consumed at particular times were also mentioned, with some of the food distribution being undertaken to support this.

Language

English is the most commonly spoken language in the West Kimberley. Of the related languages identified in the field, Nyikina was the most commonly referenced traditional language in my discussions, and most of the younger people speak Kriol. Several participants lamented their own inability to speak in their traditional language(s) but many indicated that they understood most speakers. Many participants indicated that their traditional language was picked up from extended family when it was spoken in the home, including languages other than Nyikina or Mangala.

The teaching of language to young people through schools and from elders was identified as an important aspect of cultural activity. Efforts at building Nyikina language capability and use have been made through school programs, a visiting linguist and other centres. Several participants lamented the limited teaching of language in schools – both in the past when they were growing up and now. Participants referred to the teaching of Yawuru in Broome schools, but no mention was made of language programs in Derby schools and the only Nyikina program referred to was at the independent school in Jarlmadangah.

There appeared to be an underlying contradiction with language being asserted as being central to identity, while its use is apparently limited. Several participants indicated that they understood language when it was spoken by older relatives at home but did not speak language (or speak fluently). This may reflect their confidence in their language skill and be masking the actual usage of language. As so many participants referred to the importance of young people learning language, and lamented the absence of formal language programs in schools, this indicates the importance of language.

4.4.3 Access to Country

The majority of participants I spoke with referenced the importance of being on or accessing Country for their culture. Traditional cultural practices and activities are conducted on and connected to Country and land and the river are integral to culture. Lucy Marshall, then Chair of the Pandanus Park community expressed this well in her submission to the Seaman Land Rights Inquiry (Marshall 1983):

The Nyigina people's relationship with the land is all connected with their way of life; 'THE LAND IS PART OF US AND WE ARE PART OF THE LAND'. That is the whole basis of our culture.

One of the reasons given for a preference for living in community, as opposed to in town, was being on or near Country. Participants commented on the ability to live off the land and the sense of connection they felt. Camping trips, and the immersion in culture they enabled, was seen as essential for building cultural continuity through the generations. Learning on Country with the old people was frequently identified as a goal. Even where it seemed that these trips were not frequent, the ability to get out onto Country, knowing Country was there and getting to it was achievable, seemed important.

Several participants spoke of the difference between living in town and living in community or out bush. While they felt compelled to live in town for education or work purposes, everyone who had experienced both living in town and living in community or out bush expressed a preference to be out bush where they were on Country. One elder living in a community said that they prefer the bush and spending time where they were born.

4.4.4 Work and enterprise

Many participants I spoke to expressed very strong opinions about the importance of work, and several spoke about enterprises. This section touches briefly on some of the history and issues raised by participants in the scoping and Phase 1.

Work

The history of regional employment of Aboriginal people was often raised by elders. The pastoral industry has evolved from its early days of non-Aboriginal owned and managed sheep and cattle stations to larger amalgamated cattle stations owned by large Australian and/or international entities and Aboriginal corporations like the Kimberley Agriculture and Pastoral Company (KAPCO). The area under Kimberley pastoral leases owned by Aboriginal corporations has increased from around 19% in 1992 to around 33% in 2017 (Crough & Christopherson 1993; WA Department of Primary Industries and Regional Development 2018). While the sovereign risk associated with live cattle exports affects the industry, and profitability fluctuations associated with seasonal changes are more marked in the Kimberley, the region is more profitable on average than other WA rangelands (WA Department of Primary Industries and Regional Development 2018). Kimberley Aboriginal corporations involved in the industry are seeking to establish economic and social returns from their increasing re-engagement in the pastoral industry as owners and managers. This momentum and enthusiasm for the industry was evident in discussion with several people in the field area.

Employment conditions have changed significantly from the days of harsh conditions and minimal pay reflected by elders who spoke with me and those captured in *Raparapa: Stories from the Fitzroy River drovers* (Marshall 2011). Despite the harsh conditions, many involved reflected positively on the values and work ethic that were developed in those days when larger numbers of Aboriginal people were employed on stations.

There are limited paid employment opportunities in community – as rangers, in tourism and administrative jobs – so most of the people who worked travelled to town for work. A couple of participants mentioned having travelled to work in the mines in the past. Most people in community were undertaking work-for-the-dole activities under the CDP.

Earning money was the most frequently mentioned motivation for participants who talked about work. Some participants spoke of the increasing costs of housing, electricity, food and fuel. A couple of participants lamented the time pressures associated with working but felt that reducing hours or quitting was not possible because of the need to earn money and provide for family.

A couple of participants highlighted a cultural perspective on what work was, contrasting it with the dominant *kartiya* way of working. For example, one person spoke of the need to redefine labour and to recognise that work is what people want to do in a way that meets all their needs. Another said that, for Aboriginal people, resigning is an option because there isn't the same sense that it had to be done or attachment to work as an identity as there was for *kartiya*.

Several participants indicated that they had held several jobs, sporadically, citing family time and other needs being more important at the time. Other work was sporadic in nature, including construction work and heritage clearances.

Enterprises

Several community-based enterprises were mentioned during these early phases of research. Some, like the tourism venture Kimberley Dreamtime Aboriginal Tours operating from Jarlmadangah, had operated for some years, albeit seasonally and sporadically. That business operates both commercial tours and cultural immersion as well as diversionary programs for youth.

Several participants talked about ideas and plans for enterprises both in towns and communities, and apparently successful ventures operating elsewhere. These enterprises and ideas are referenced in the discussion of locations in Sub-section 4.3.2. Most participants referred positively to the potential for enterprises. Evidence of failed businesses was visible, and a common attribute was that the driving forces behind these businesses were outsiders, or people who had moved on.

4.4.5 Barriers and enablers

Participants raised several issues and concerns in discussion, with many identified as barriers or enablers of culture and/or work. These included: alcohol and drugs, housing, fencing and gates, religion and church, *kartiya*, transport, cultural recognition and

technology. This section touches briefly on these issues and their impact on culture and work.

Alcohol and drugs

In my discussions, the use and impact of alcohol and drugs was the concern most frequently cited by participants in terms of disruption to work and culture. Common themes were their prevalence in town, adding to the reason for some people preferring to live in the communities which are both designated as dry communities. One of the communities has a designated drinking area outside its boundary although the majority of comments made about the disruptive effect of alcohol were in relation to this community.

Youth justice diversionary programs and the Yiriman youth project were developed aiming to take people on Country, away from the influence of alcohol, drugs and other distractions, to immerse people in their culture. Alcohol and drugs, along with other factors, are seen as key drivers behind the increased levels of self-harm and suicide that has increased across many First Nations communities in this country (People Culture Environment & Media 2014).

A few participants identified as ex-drinkers, and some people were identified by others, including family, as drinkers. Self-identified ex-drinkers talked about how good they feel, how they are able to work, and have been able to get driving licenses and gun licenses. The ex-drinkers appeared to be, to the extent possible, more notably actively engaged with their culture and employment than drinkers.

People identified as drinkers were observed to be relatively unengaged with community life during the day, and were often not living on their own Country or engaged with their culture. One comment made about the disruptive effect of alcohol in a community was that there wasn't much culture because people just focus on alcohol and that there is more culture in other communities. One elder commented that they would like to move out of the community because there is too much alcohol and drugs.

Housing

Access to affordable and appropriate housing is fundamental to most people. Housing and living in a nice house were mentioned by some participants when they talked about

a good life. Housing is also an important enabler for people to allow them to live on or near Country and to live in ways that support their culture and are culturally safe. Some participants identified access to their, or their partner's, Country as a reason to live where they do.

Both public and private rental housing is available in Derby and Broome, although private rentals are expensive and wait times for public housing are long. One person said that there is a 6–7 year waitlist for public housing in Derby through Homeswest, one of the factors that led them to seek housing in a discrete community. The same person reflected on the insecurity of private rental in Derby which was an important consideration for their family.

Everyone in the larger community and most of the participants in towns that I spoke with lived in public housing. The standard of housing was variable, ranging from those that were overdue for renovation or demolition, to those that were new or newly renovated. A major program of new builds and renovations in one community was nearing completion while I was in the field, and during that period people were often living in crowded conditions sharing homes and in 'dongas'¹⁸ that were serving as temporary housing for families displaced by renovations. By the time I had left the field the majority of the renovations were complete and the crowding issue had been alleviated. A major change in policy and a housing agreement that involved changes in land tenure and rental agreements meant that people living in public housing on communities were subject to higher rentals, capped to a proportion of income rather than a flat rate that had previously applied.

In the community where the building program was nearing completion, several participants cited the availability of housing as a reason for living in the community rather than in town or elsewhere. While some participants had identified the affordability of housing relative to town as another reason for previously moving to community, the increased rentals associated with the policy change concerned several participants. The impact of the increased public housing rental charges policy extended beyond communities directly affected to communities without housing agreements, with

¹⁸ Dongas are basic shelters frequently used as temporary housing or in mining and construction camps to house workers

some participants noting the need to help people in affected communities that had rental arrears and no job to enable them to clear the debt.

Only three participants spoke of a desire for home ownership. One of these was in a community and said so in the context of their traditional ownership and involvement in the maintenance and improvement of their home, unaware of the implications of the 40-year lease under the new housing agreement.

Fences and gates

Relationships with pastoralists were raised in scoping discussions and continued to be aired throughout the research. One of the biggest concerns was the historic and current blockage of access to Country with fences and locked gates. Along with restrictions on travel from pastoral stations historically, locked gates in current times, even where underlying native title had been proven, were seen as a barrier to attending lore grounds, and traditional hunting, fishing and gathering areas.

On the other hand, fencing is seen as an asset by some, particularly in and around communities. Fencing is essential to prevent cattle from damaging property including water bores, taps, and gardens. I observed cattle wandering through a community in the evenings and mornings, wandering into gardens with open gates or inadequate fencing. While these are unlikely to be directly affecting cultural practice, they are important to the safety, health and wellbeing of community members and their ability to live on or near their Country. Rangers were also involved in fencing work around water flows into wetlands that had been badly affected by cattle and erosion so that ecosystems could be restored.

Church and religion

The tensions between some churches and religions that I had been alerted to before my Phase 1 fieldwork began were raised by several participants. Of particular relevance is the impact on cultural practices.

While historically the Catholic Church established churches and missions in Broome, Derby and the Dampier Peninsula and a leprosarium in Derby, the two larger communities in this research were not established as missions and did not have dedicated church buildings. However, several churches operating in the Kimberley have

a presence, to differing degrees, in the area of the fieldwork including Derby and Broome. I was told that there were five churches operating in Looma, although I have not been able to confirm that. Six churches including the Catholic Church, are listed for Derby and nearby Mowanjum.¹⁹

The major source of concern for participants who did speak about the tension was its impact on culture. The tensions that were discussed, with some reluctance given the close relationships between people across the region, are reflected in a media report (ABC News 2019). Essentially some churches are opposed to cultural practices and are encouraging followers to destroy traditional artefacts (see e.g. Forward in Faith Ministries International 2011). This puts pressure on individuals wishing to continue with those practices and in some cases divides families.

Kartiya

The impacts of colonisation and the presence of *kartiya* (non-Aboriginal people) were echoed in comments from several participants during this early phase of the research. Some of these comments related to historical treatment of Aboriginal people and *kartiya* disrespect for Aboriginal cultures and ways of being. The following comments from a couple of elders reflect on the challenge of maintaining culture when Aboriginal people worked for pastoralists:

Culture was very important to me but we were driven by *kartiya* not to worry about culture.

The *kartiya* bosses never listened about what was important – lore.

Another echoed this sentiment saying

...white man changed everything and he can see culture dying.

Difference in approaches to work and cultural obligations was also mentioned. These differences gave rise to tensions about the time needed to arrange agreement for heritage clearances, the delivery and content of health care and education, and leave arrangements for funerals.

¹⁹ See <https://www.westkimberleydirectory.com.au/religious-organisations>, accessed 18/06/2020.

Transport

Limited transport options, particularly accessible and reliable vehicles, was the most frequently cited problem for accessing Country. Public transport options are limited in the region, with some people using school and private bus company options where they are available, particularly for communities on the highway, to occasionally access shopping and services in town.

I observed and heard about several exercises in retrieving broken-down vehicles and occupants. As in most remote areas, working vehicles are a prized possession, enabling people to access traditional Country for hunting, fishing and gathering of bush foods and medicines. They also enable family members to connect or visit other kin. In communities without stores. Vehicles also enable trips to ‘town’ or nearby communities with shops for groceries. A couple of participants indicated that they were required to use their own vehicles for their work.

Technology

The impact of technology on lifestyles and cultural transmission was evident. One elder mentioned how message sticks were used in the past to transmit information to family across pastoral stations, but now they have access to telephones. Another said that technology – television, air conditioning and iPads – kept people at home in community rather than out bush and they ‘lose culture’. Another said that people just watch television and DVDs and don’t go camping on weekends.

My experience was of limited and patchy mobile reception. One of the communities close to the highway has patchy reception, but the other main community has no mobile reception. Office and education centres had land line telephones and ADSL Wi-Fi. Satellite dishes adorn most houses, providing television reception. Most of the homes have air-conditioning. The high cost of available technologies and power concerned many participants.

Cultural recognition

The advent of native title law has created tensions and contestation between groups in relation to recognition of traditional ownership and the questions of who has the right to ‘talk for Country’. The Kimberley is not the only region with resources where this

contestation becomes public, and significant energy and resources are devoted to asserting rights and seeking recognition. Several participants spoke of the cultural and political tensions that arise because of this contestation.

These tensions were seen to divert attention away from other changes in government policy requiring the attention of TO groups and representative bodies. Several significant policy and legislative reform processes were being discussed or underway at the time of the fieldwork. These included automatic renewal of all WA's pastoral leases with potential native title impacts, proposed amendments to WA's heritage protection laws, and proposed closure of up to 192 'unsustainable' remote Aboriginal communities. In contrast with a couple of people who raised these significant policy issues, several participants raised concern over appropriate identification of TOs in recent native title determinations. It is interesting to note that the membership of WAC, the registered native title body corporate for Nyikina and Mangala, has more than doubled since its establishment as these issues are addressed and resolved.

4.4.6 Community and family context

Discussion with participants were not constrained to culture and work topics, with many participants talking about community life and their families. The history of people and communities, community governance, and concerns for family and youth were primarily contextual, but often served to illustrate the degree or otherwise of autonomy and self-determination that people have in their lives. This section examines some of the issues raised and how each of them frame and reflect the degree of autonomy and self-determination they perceive.

Community

As in many parts of the country, the concept of a 'community' in the Kimberley is often rooted in a colonial past or as a reaction to it, rather than being a natural product of traditional lifestyles. Community is a term used in relation to discrete settlements where most residents are Aboriginal, and in an urban context in relation to connected Aboriginal residents. Many discrete Indigenous communities in the Kimberley are former missions, although interestingly the two larger communities I worked with had different origins – one as a settlement following the relinquishment of a farm lease, the

other a relatively recent community-led establishment. Smaller settlements were generally centred on smaller family groupings and were largely independent.

People's attitudes to community generally reflected the degree of self-determination and autonomy they felt. In one community there was a strong sense of pride in the independence and self-determination that created the community amongst those with familial links to the founders. In another there was less of a sense of independence, and more exposure to the whim of government. In the smaller family-based communities where the sense of autonomy was greater, there appeared to be cohesion and clear vision for the future. A strong shared vision, often the product of grounded community planning, was evident in both a larger and smaller community, in contrast with another community where a strategic plan had been written with minimal community involvement. The involvement of young people in effective community planning avoided the youth disengagement that was raised elsewhere.

The importance of providing a safe and stimulating environments for children in community was raised by a few participants. Sports including basketball football and bike riding are extremely popular, and community infrastructure such as basketball courts, football grounds and BMX tracks were identified by some participants as important. Where functional, basketball hoops were evidently well-used, and a regional basketball competition was thriving.

Participants also reflected on the impact of policy and political issues on their daily lives in community. Increases in government administration of and charges for housing, power and municipal services were immediate concerns to many participants. These, combined with frequent changes to the policy and administration of work for the dole schemes (CDP/RJCP), present an enormous cognitive and financial burden on people.

The degree of government involvement in the day to day lives of community members affected their ability to determine their own direction. Where government agencies, or their contractors, determine the provision of housing, education, and welfare support there is little scope for grounded community development planning. Communities that have greater self-sufficiency or non-government support for education and housing are better able to plot the path for their own community within other constraints.

Town/community differences

Many families spoke of the need to stay in town for access to local schools and jobs, but expressed their strong preference to live on Country, and those with sufficient means sought to get back to Country when they could. Limited health and social services in remote communities, particularly aged care and hospitals, also kept some families in town. Participants in remote communities expressed disappointment that the lack of aged care support meant that their elders could not stay in community without dedicated family carers, noting that this impacted on the transfer of cultural knowledge to younger generations.

Economic disadvantage was more evident in some communities, with issues including food security, high levels of debt, inadequate means of transport, and increases in the cost of living including rent and electricity raised with me and, in some situations, observed. Hunting and fishing were important cultural activities, but they also provided some food security. Without food stores in remote communities, and limited funding for travel to town to shop, I observed inter-household transfers of foodstuffs and other essentials. My observation of this was less frequent in town, possibly because I spent less time in households in town.

Some of those who spoke of a strong desire to be out bush, on Country, talked about getting away from the pressure, drugs, alcohol and the noise in town.

One of the notable things about being in town, particularly in the public housing areas, was the noise level which I noted was much louder than the non-public housing areas of town. I observed variable noise levels in the remote communities I stayed in, with higher noise levels associated with particular nights of the week. Participants spoke about the disruptive impact of noise on families and children, and the level of daytime activities following noisy nights.

Drug and alcohol use were referenced by many participants. While technically the communities I worked in were 'dry', the level of control of alcohol varied. In town people spoke of the 'ice problem' (amphetamines) that was destroying so many young lives, although this seemed to be less of an issue for people in remote communities. There were regular reports of drug seizures on the highway between Derby and Broome, and car accidents that were attributed to drug use.

Family and youth

Cultural transmission through families is not always from parents to their own children. A few participants talked about being raised by grandparents or other family for various reasons. Some indicated that their grandparents had been the ones who taught them their culture. Several participants indicated that they were raising or responsible for kids other than their own, generally relatives, with their responsibilities extending to cultural education.

Family care was another facet of family life, with several participants indicating that they cared for older relatives and others with disabilities where they were not in residential care.

Many participants talked about young people, and their concerns for cultural learning and involvement, education, involvement in the community, sport and other activities. As mentioned previously, cultural immersion programs are seen as vital in stemming the high suicide rates in the Kimberley.

Education is another area of concern for families. While there is a secondary school in Derby, and a primary school in Jarlmadangah, there is no school in Pandanus Park and children are bussed to Derby to attend primary school. Many young people spoke of having gone to boarding school for part of their secondary schooling.

4.4.7 Interaction of work and culture

Different views were put forward reflecting how culture and work interact in people's lives. Some spoke of the way that work accommodated cultural obligations and vice versa, in order to minimise the tensions to the extent possible. Others described how they worked on Country or with people, in order to combine work and culture. And finally, there were cases where real tensions between cultural obligations and work arose, causing problems for people. This section briefly describes these views.

It is worth noting that when the interaction of work and culture was discussed, several participants referenced their work for the dole, not just paid employment.

Accommodating work and cultural obligations

Several participants spoke of the way work can accommodate cultural obligations and vice-versa. Some of these participants expressed a view that both work and culture were important.

Particular reference was made to the conduct of cultural ceremony or lore over four weeks around Christmas when people were on holiday from work or school. Some referred to this as scheduling work around cultural obligations, while others described it the other way around. References to this scheduling of cultural ceremony as a historical practice suggests that it has been well established for decades.

One leader said that it was important not to lose jobs and indicated that there was significant planning of cultural activities up to a year in advance to enable women to collect and store bush tucker, process some seeds for flour, while the men use the lead times to make artefacts for gifts. He indicated that this planning of ceremony and preparation of cultural goods was to accommodate people's need to work.

Interestingly some spoke about how culture was adapted in the past to work around the demands of *kartiya* business and bosses. Another person who worked in a leadership position in an Aboriginal NGO said that they still schedule work around cultural obligations.

One of my key informants contrasted the situation of workers with the mines in the Pilbara, who are on relatively high wages, with those who were living locally, on lower incomes or social welfare. He said that while the mine workers had not always been able to return for funerals if it clashed with their work schedules, generally they were able to return for the major annual ceremonies, and when they did they could afford to bring purchased gifts. This was contrasted to the situation for local people, many of who were not employed and relied on income support, who could only attend if they had the means to travel, and made gifts by hand, provided foods they had caught or gathered, or sourced gifts from within their family.

Working on Country

Many participants described their work on Country, ranger work in particular, as utilising and building cultural knowledge of Country. Other work such as heritage

clearances, while sporadic in nature, use cultural knowledge. Tourism work was also cited as an example where people were working with their culture on Country.

Working with people

Some participants indicated that they felt their work with Aboriginal people as clients or co-workers drew on their cultural knowledge and insights. Most expressed comfort in working in these situations.

Clash of work and culture

Taking time off work to attend funerals was the most frequently cited clash between work and culture. Participants referred to the number of funerals they felt obligated to attend, with many funerals requiring several days travel.

Some participants suggested that employers and government didn't understand these obligations and how inadequate 10 days leave a year was for this. While this may in part reflect the different expectations and priorities of Aboriginal people and *kartiya* mentioned previously, many of the government programs are now delivered by Aboriginal NGOs but the conditions of employment often reflect the government standard.

One person referenced a specific cultural practice that constrained movement and meant that holding down a job was not possible. Reflecting on this in the coronavirus disease of 2019 (COVID-19) era, it would be reasonable to expect that many jobs could be undertaken with these physical constraints, however, the reality of telecommunications infrastructure means that working from home would not be feasible in many remote communities, even if housing was adequate and not overcrowded.

4.5 Key lessons for survey and choice model

This section summarises the key lessons from these early phases of fieldwork that were reflected in the final survey design and attributes for the choice model.

4.5.1 Survey design

The lessons from Phase 1 resulted in significant amendment of the preliminary survey design, which included fairly standard sociodemographic questions about age, gender, basic family composition, education and employment details as well as the draft choice model.

Survey adjustments made to address advice from elders and issues raised during Phase 1 that were likely to be relevant to experiences of cultural aspects of life included:

- the inclusion of an early question about language group affiliation, as explicitly advised by one elder who said that I should ask what language group people are from, not where they are from
- more nuanced questions about the family situations that people grew up in and lived with
- asking questions about whether people live on or access their traditional lands, and native title recognition of traditional lands
- detailed questions about cultural activities recognising the diversity of experiences reflected in Phase 1
- questions about the interaction of work and cultural obligations, including questions about heritage surveys and other cultural business that reflect on cultural status, using cultural knowledge or working on Country
- asking about going away from home for schooling
- explicit reference to work-for-the-dole schemes
- more detail about employment, including challenges getting work, working hours, permanent or temporary status.

I also included a couple of open-ended questions about what work and culture meant to the respondents. The final survey is at Appendix 7.

4.5.2 Attributes for choice model

The key themes that emerged from the early phases of fieldwork about what was important to people in relation to work and culture were then reflected in the choice model design. These include spending time on cultural activities, spending time with family and other Aboriginal people, access to traditional Country and income earned from working. These attributes, at levels that reflected the range of experiences I observed in fieldwork and through desktop research, were included in the choice model. Other design and delivery considerations for the choice model reflecting my experience in these early phases of fieldwork are discussed in detail in Chapter 6.

4.6 Transitioning to Phase 2

This chapter discusses the early qualitative stages of the fieldwork, the scoping phase and Phase 1, the organisations I spoke with, the places that I visited and the people I spoke with. Many of the early discussions, consistent with cultural protocols, were with elders, although I also interacted with some younger people. What emerged from this early fieldwork were the key themes around culture and work particularly the importance of accessing traditional Country, the nature of cultural activity, and experiences of work. I also canvassed a range of barriers and enablers for cultural and employment participation that were raised during these early phases. This is critical grounding of people and place to ensure that the valuation methods deployed in subsequent phase were appropriate.

The key themes around culture and work were then translated for inclusion in the choice model design, which is described in more detail in Chapter 6. Other lessons from the qualitative grounding research informed the design of the survey deployed in Phase 2, in which the choice model would be incorporated. Chapter 5 will conclude Part II, building on the qualitative findings of Phase 1 covered in this chapter to discuss qualitative and quantitative findings from Phase 2, excluding the choice modelling which is covered in Part III Chapters 6–8.

Together with the survey results to be discussed in Chapter 5, the contextual and participant information in these two chapters provide insights into the characteristics of the participants in the research and their communities, which is important when

assembling the data required to address the research question about feasible, reliable and appropriate methods for quantifying cultural values for First Nations people. This contextual information is significant given the heterogeneity of First Nations cultures and experiences, both within Australia and globally.

Chapter 5 The participants and context: Phase 2

5.1 Introduction

The focus of this chapter is on the descriptive statistics and associated qualitative information resulting from Phase 2 – the final of three phases of engagement with participants in the field that occurred between 2014 and 2016 (described as the scoping phase, Phase 1 and Phase 2). While Phase 1 was primarily qualitative, Phase 2 involved collecting qualitative and quantitative data through a survey with an embedded choice model.

This chapter briefly describes the survey process and presents the key quantitative sociodemographic and cultural characteristics of participants surveyed in Phase 2 of the research and then, specifically, the interaction of work and culture shown by the data. While there was significant richness in the qualitative data from the survey, these are only used occasionally to illustrate some of the key findings rather than being the subject of further detailed analysis. Census 2016 data is used for comparison where available.

The cultural and economic circumstances of participants, and the interaction of work and culture they experience, is important to understanding their attitudes, as expressed in the choice modelling analysed in subsequent chapters.

Together with the qualitative information presented in Chapter 4, this chapter includes important contextual and participant information. In particular it provides insights into the sociodemographic and cultural characteristics of the participants in the research and their communities, and how well these represent local Aboriginal people. This is important given the heterogeneity of First Nations peoples. This data about the participants relative to context supports assessments of the feasibility and appropriateness of the choice modelling methods utilised to quantify the cultural values

5.2 Phase 2 survey conduct

Over the course of Phase 2, a total of 98 participants were surveyed in Broome, Derby, Jarlmadangah, Pandanus Park, Bidan and at the Willare Crossing Roadhouse. Apart from one participant, who was keen to participate but absent during the survey period

and interviewed on a subsequent visit in April 2016, interviews were conducted between September and November 2015.

Surveys were conducted as semi-structured face-to-face interviews, using the questionnaire at Appendix 7 that includes qualitative and quantitative questions as well as the choice model. Thirty-nine participants, having been involved in discussions during previous phases, had already considered the central survey themes of their culture and work activities. In contrast with the reserved manner of a few, the strong sense of agency and confidence exhibited by many participants may be the result of prior experience in research (Treloyn & Charles 2014, p. 184), engagement in speaking publicly, or working with people outside family and community.

5.2.1 Testing and piloting

Two approaches were taken to testing the survey instrument and choice model.

Initially, the survey instrument was tested with three key informants, seeking their feedback on the process as well as ensuring that the explanatory script was adequate and well-rehearsed. In light of that feedback, the written choice model was illustrated with simple diagrams representing each attribute level for incorporation into the choice model. An example of these representations is in the sample profile shown in Fig. 6-1 in Chapter 6.

The second approach was to pilot the survey instrument in one community first, to ensure that it was understood and achievable with a wider range of participants. A benchmark of around 30 individuals in a pilot was informed by previous research (Flynn et al. 2007) that demonstrated the scalability of results in a pilot of that scale using Best-Worst Scaling Case 2. A pilot of this size would test the methodology and provide indicative results if the aim of between 100 and 200 participants was not achieved.

5.2.2 Building research capability

Attempts to employ local Aboriginal co-researcher(s) or research assistant(s) to partner with me in the field were unsuccessful. Local Aboriginal and research organisations

offered advice about the best approach to identifying and engaging local Aboriginal research assistants who were interested in building research skills.

The limited nature of the research work offered, and uncertainty about timing and location, made it potentially difficult for one person to undertake if they had family or other commitments. Each time someone expressed interest they soon became unavailable because of employment opportunities or family demands. This highlighted that, for those who did not have regular ongoing roles in government or NGOs, employment was often precarious and intermittent. In these circumstances people often felt compelled to seize job opportunities as they arose.

Other factors that may have inhibited engagement of a co-researcher include the conceptual nature of the research; research fatigue on the part of the Aboriginal people most likely to engage; or the strategy of avoidance noted by Smith (2012, p. 179) as one of the responses to Māori concerns about research about them.

5.2.3 Identifying potential participants Phase 2

The experience of engaging potential survey participants was different in each location. In discrete communities I relied mainly on referrals to and suggestions of potential participants, consistent with cultural protocols or the advice of community leaders. In the towns I also used referrals, supplemented by other information sources such as the WAC membership list.

The Office of the Registrar of Indigenous Corporations (ORIC)²⁰ listing of registered adult members of the WAC, recognised Nyikina and Mangala TOs, included names and postal addresses that indicated the community or town of residence. This list, originally compiled for the Nyikina and Mangala native title determination in April 2014, was reviewed with some directors of the WAC to identify deceased people and potential participants I might contact directly or through referrals where appropriate. This was particularly useful in identifying Nyikina and Mangala residents in Broome or Derby, where I would otherwise be unable to distinguish people with Nyikina and or Mangala connections.

²⁰ <http://register.oric.gov.au/document.aspx?concernID=4253152>, accessed 14 January 2015.

In each fieldwork location, I worked with key informants suggested by the WAC to identify potential participants. Participants and key informants would also suggest others that might also be willing to participate, in a snowball sampling approach for hard-to-reach populations (Goodman 2011; Handcock & Gile 2011; Heckathorn 2011). The trust established during the time I spent in the two larger discrete communities during Phase 1, particularly with elders and cultural leaders, supported referrals to, and engagement with, a wider range of individuals in Phase 2. In one discrete community I was given the names of every adult staying in the community at that time by house, enabling me to approach most adult residents.

While a few people preferred to arrange times to be surveyed, many interviews were opportunistic, arising from informal conversations with people in gathering areas, or someone overhearing an interview and then expressing interest. Above all, the sampling technique depended largely on building trust, word of mouth, and referrals.

5.2.4 Population distribution and fluctuations

Population fluctuations arising from the movement of people in, out, between and within communities, were evident over the course of the fieldwork, highlighting the limitations of using point-in-time census counts. Irrespective of these fluctuations, the 2016 Census data, collected the year following my fieldwork, provides the best publicly available comparator to the survey sample.

Factors contributing to the high mobility of resident populations in remote communities include education and employment opportunities; health care, aged care and housing availability; corrective services; sorry business; cultural festivals, and transport availability.

The availability of aged care services is a key factor affecting population distributions and transmission of cultural knowledge. Comparing the proportions of Indigenous people over 55 years of age revealed that Broome with 13.7% and Derby with 16% have significantly higher proportions of Indigenous people aged over 55 than Pandanus Park (2.3%) and Jarlmadangah (0.0%).²¹ There were several people aged over 55 years of age

²¹ The Jarlmadangah data may reflect adjustments adopted by the ABS when reporting small numbers to avoid the release of confidential data through TableBuilder. Using 5-year age brackets TableBuilder reports Indigenous people in Jarlmadangah by 5-year age categories summing to significantly less (17.3%)

in Jarlmadangah at the time of the field research, but the proportion was smaller in Broome and Derby, where there are in-home and out-of-home aged care services available. This age profile has been consistent in past census and Community Housing and Infrastructure Needs Surveys (CHINS) used by the WA Government to estimate populations in Aboriginal settlements (WA Department of Planning Lands and Heritage 2019).

5.2.5 Estimating participation and completion rates

Participation rates are an indicator of the appropriateness, feasibility, and reliability of survey methods generally. In this case, where the valuation tool – the choice model – was incorporated into the survey, response and completion rates are important in considering how effectively the methodology addressed the research question ‘What methods are feasible, reliable and appropriate for quantifying cultural values for First Nations people?’

Estimating response rates, generally expressed as a proportion of surveys delivered/provided that are attempted, is not appropriate here given the snowball sampling approach. The participation rate, expressed as the percentage of potential participants that agreed to and commenced the survey, is estimated where the potential participants can be estimated.

When people chose not to participate, this was mostly effected by avoidance rather than a direct refusal to participate. Some people sought to defer participation but were not subsequently available. A very small number of potential participants indicated that they did not want to participate, generally attributing this refusal to being too busy or not having Nyikina or Mangala connection.

The lack of data about the population with Nyikina or Mangala connections, fluctuations in populations, and the different sampling approaches in communities and towns, makes it hard to estimate the overall participation rate in Phase 2. An approach to roughly estimate participation rates in the larger discrete communities of Jarlmadangah and Pandanus Park is set out below.

than the total reported. Running the same tables by 10-year age brackets shows a minor difference in totals and 5.1% of the population in the 70–79 years bracket.

Jarlmadangah Burru

Jarlmadangah has a small but relatively stable population due primarily to the fixed level of housing owned and managed by the community corporation. During Phase 2 in Jarlmadangah, the Community Chair was able to identify the 45 normal adult residents by house, 18 of whom were away from the community for work, study, health or other reasons. This provided a base population of 27 adults to survey, just under my pilot threshold.

The participation rate for Jarlmadangah was high, with 81% of adult residents present at the time of the surveys agreeing to participate. I also met and interviewed three visitors in Jarlmadangah. All but one participant completed the survey.

Pandanus Park

Pandanus Park has a larger population than Jarlmadangah and appeared to be in a state of flux at the time of the research. The displacement of several families by building works when I first arrived in the community made identification of adult residents by house impracticable. Key informants in the community assisted in identifying potential participants. The CDP participants involved in the civil construction training that was underway in Pandanus Park at the time were working extraordinarily long hours, making them less available to survey.

While the resident adult population at the time could not be confirmed, based on the Census 2016 adult population estimate of 71 adult Indigenous residents, the participation rate was about 62%. The survey completion rate here was 100%.

5.2.6 Research with First Nations people

Many First Nations people feel overburdened by previous research efforts, exacerbated by the historic lack of feedback and ownership of data, plus the non-accessibility of the data they generated (Jamieson et al. 2012; Manathunga 2009; Smith 2012, p. ix; Yu 2011).

When I first met Rona Charles, a participant with a strong background of working with researchers, she asked ‘How do you feel about squeezing oranges?’ In response to my puzzlement, Rona explained this as a metaphor for extracting important knowledge

from community and leaving less than you take in the research process (Treloyn & Charles 2014). The sense of mistrust and research fatigue frequently expressed by First Nations peoples was evident when I met some participants.

Researching in the intercultural space requires a high degree of reflexivity on the part of the researcher. This is to ensure that they do not jump to conclusions about difference based on their own viewpoints. I am grateful for the patience exhibited by many participants as my reflexivity and understanding of their worldviews developed.

5.2.7 Trust

Establishing trust is critical to successful research with First Nations people. This section discusses key indicators of trust and contributing factors collected in this research that are cross tabulated in Table 5-1.

Trust indicators

The key indicators of trust in this research include the participation rates, the recording rates and the choice of names for quotes. The options of recording and choosing how to be quoted were exercised in the information and consent processes prior to interviews.

Agreement to having the Phase 2 survey interview recorded depended on the trust in the researcher as well as trust in the WAC, which would ultimately hold the recordings after completion of the research. Three interviews with well-known participants were undertaken to test the survey instrument and were not recorded. For the remaining 95 participants, as part of the informed consent protocol cleared by the ANU ethics committee, I explained what would happen with the recordings and sought agreement to record the interview. The majority (80%) of these participants agreed to the interview being recorded.

The choice of identity for how any quotes might be attributed (full name, pseudonym or no attribution) could also indicate the degree of trust in the researcher and how the research would be used, as well as the self-confidence of participants. Where participants asked to use a pseudonym, they could opt to specify a pseudonym, often a nickname or a language name, or not. Over half (64 %) of participants opted to have

their identity revealed by their full name, whereas around one-in-five opted not to have attribution.

Trust factors

As well as trust in me as a researcher, factors that are likely to have contributed to, or affected, trust in this research include: participants' English literacy; their prior involvement in the research; gender; trust in holders and users of the research; and broader community acceptance.

The indicators of trust in holders and users of the research, being agreement to recording and identity for quotes, are compared to measures that related to factors that may affect trust in Table 5-1. These factors include:

- prior involvement in earlier phases of this research
- broader community acceptance of the research (indicated by town or remote interview)
- gender, and
- English literacy (indicated by form of consent to participate).

Each of these factors and their relationship to the indicators of trust in holders and users of the research require some discussion.

Participant involvement in earlier phases of the research provided a deeper understanding of the research and a relationship with me as the researcher. This factor was associated with slightly higher proportions than the overall proportion for agreeing to recording (39.5%) and for opting for full names for quotes (44.4%).

Broader community acceptance may play more of a role in developing trust in discrete Aboriginal communities, where the presence of a fair skinned *kartiya* (non-Aboriginal) researcher is more conspicuous than in towns. It would be reasonable to assume that if a researcher was not familiar and broadly accepted in a discrete community, participation would be low. The higher proportion of participants in remote locations agreeing to record (73.7%) and opting to use full names for quotes (74.6%) suggests that

there was stronger trust in discrete communities, possibly attributable to broader community acceptance.

As a sole female researcher, I had anticipated that there may have been a bias towards females participating in and agreeing to recording of survey interviews. While participation and the rate of agreement to record was balanced across genders, males more frequently opted for their full name or a known pseudonym as identity for quotes than did women. It is possible that cultural norms and underlying lower self-confidence may have reduced these indicators for females.

English literacy was not directly tested, but the form of consent (written or oral) could indicate English literacy and an ability to independently read and assess the information sheet about the research. The majority (91%) of participants completed the written consent form, suggesting high levels of literacy. The overall rates of written consent were comparable for those agreeing to interview recording and using full names for quotes, suggesting that this was not an important trust factor.

While ultimate use of the research outputs remains an open question, potential participants were informed that I would give all interview recordings to the WAC on behalf of Nyikina and Mangala TOs, as set out under the terms of our research agreement. While no reasons for declining to be recorded were sought, a small number of participants that declined explicitly attributed their decision to this provision.

Table 5-1 Trust indicators of survey recording agreement and quote identity compared with involvement in scoping or Phase 1, gender, form of consent and remoteness of interview location

	Agreed to Interview Recording			Identify for any Quotes					Total Number
	No	Yes	Total	Full Name	Pseudonym known	Pseudonym unspecified	No Attribution	Total	
	Col. %	Col. %	Col. %	Col. %	Col. %	Col. %	Col. %	Col. %	
Involved in Scoping/Phase 1 and Phase 2									
No	68.4	60.5	62.1	55.6	66.7	28.6	81.8	60.2	59
Yes	31.6	39.5	37.9	44.4	33.3	71.4	18.2	39.8	39
Gender									
Female	52.6	52.6	52.6	46.0	16.7	100.0	68.2	53.1	52
Male	47.4	47.4	47.4	54.0	83.3	–	31.8	46.9	46
Interviewed in town or more remote									
Town	36.8	26.3	28.4	25.4	33.3	42.9	40.9	30.6	30
Remote	63.2	73.7	71.6	74.6	66.7	57.1	59.1	69.4	68
Form of consent to participate									
Written	89.5	90.8	90.5	90.5	66.7	100.0	95.5	90.8	89
Oral	10.5	9.2	9.5	9.5	33.3	–	4.5	9.2	9
Total Number	19	76	95	63	6	7	22	98	

Source: Phase 2 survey data collected and compiled by author, recording agreement data excludes participants not asked.

Note: Col. = Column.

5.2.8 Representativeness of the survey sample

As well as the small survey sample, two other factors limited the ability to estimate its representativeness of the population with Nyikina or Mangala connection in the West Kimberley. The first is that the high mobility made estimation of the population difficult. The second is the focus on people with Nyikina or Mangala connections, which are not separately identified in census data. It is particularly difficult to accurately estimate the population with Nyikina and Mangala connection normally resident in Broome or Derby at any point in time.

Census data had limited comparative value in this research, given the small target populations, population mobility, the timing of collections relative to survey, as well as the absence of cultural information, including the language group connections of individuals. The ABS has introduced measures to try and overcome the acknowledged limitations of census data (Australian Government Australian Bureau of Statistics (ABS) 2007; Morphy 2007; Taylor et al. 2012; Yu 2011) in relation to Aboriginal and Torres Strait Islanders in remote contexts.

An alternative approach to collecting data about their people has been taken by Nyamba Buru Yawuru (NBY), the native title representative prescribed body corporate for the Yawuru TOs of Broome. Prompted by the need to have a clear picture of the Yawuru population of Broome following the native title settlement, NBY undertook specific population studies in the Broome area with the Kimberley Institute and CAEPR (Taylor et al. 2012). This study provided more accurate population estimates including cultural information as the baseline for planning by NBY. No comparable studies for Nyikina and Mangala populations have been undertaken.

Despite its limitations, the census remains the only publicly available and current comparative data for the towns and the two larger discrete communities involved in this research. A comparison of adults surveyed by location and normal residence with available Census 2016 enumeration of Indigenous adults in Table 5-2 shows that the majority of the survey sample drawn from Pandanus Park and Jarlmadangah represent a significant portion of the enumerated adult population in these discrete communities, whereas the minority surveyed from the towns represent a tiny fraction of the

Indigenous adults counted in the Census. Overall, 64% of the sample surveyed were normally resident in Pandanus Park, Jarlmadangah, Balginjirr or Bidan.

Table 5-2 Survey sample location and primary residence compared with Census 2016 adult Indigenous enumeration in available fieldwork locations

ILOC (UR)	Survey respondents						Census 2016 enumeration	
	Location surveyed			Primary residence			Indigenous	
	No.	Col. %	Row %	No.	Col. %	Row %	No.	Col. %
Broome	11	11.6	0.6	9	10.1	0.5	1,854	68.6
Derby	19	20.0	2.6	20	22.5	2.8	719	26.6
Jarlmadangah	21	22.1	42.9	17	19.1	34.7	49	1.8
Pandanus Park	44	46.3	62.0	43	48.3	60.6	71	2.6
Total	95	100.0	3.5	89	100.0	3.3	2,702	100.0

Data Source: ABS Census of Population and Housing, 2016, TableBuilder; Survey data collected and compiled by author.

Notes: Counts of people aged over 17 years. Broome total of four Indigenous Locations (ILOCs) within the general urban area of Broome. Cells in this table have been randomly adjusted to avoid the release of confidential data. No reliance should be placed on small cells. Col. = Column. UR = Usual residence.

Around one-in-eight survey participants (12.2%) were interviewed in locations that were not their normal place of residence, reflecting the high mobility of populations. Over the period of my fieldwork around 40% of the normal adult resident population of Jarlmadangah were away from community, mainly because of work, study or family commitments elsewhere. This is in line with the experience of surveys in the Fitzroy Valley Population Project, which showed high population mobility (Morphy 2010, pp. 19–20).

Overall, comparing the survey participants with the 2016 Census records by residence is of little value in determining representativeness, particularly in the towns, although comparisons are worthwhile in the two larger discrete communities. Comparative analysis with available Census 2016 record data included in the next section suggests no particular biases in the sample.

5.3 Survey sample characteristics

The survey identifies cultural and sociodemographic characteristics of participants and frames the choice model by asking participants to reflect on their cultural and economic participation and how they balance these aspects of their lives.

5.3.1 Cultural characteristics

The cultural characteristics reviewed in this sub-section include language group affiliation, recognition of traditional ownership, family settings and language use – which are critical to cultural identity. These characteristics are discussed below under the subjects of diversity of identity, connection to Nyikina and/or Mangala, traditional ownership of residence, recognition of TOs, and family language and culture.

Diversity of identity

Identifying and belonging to a language group is central to Aboriginal cultural identity. Even where the use of a traditional language has diminished or been lost, either individually or by the language group, the retention of that language identity continues to be critical.

During the earlier phases of this research more than one senior cultural leader stressed the importance of language group affiliation in establishing identity at the beginning of any conversation or interview. In line with that advice, once formal consent was provided, I asked the following question after asking their name ‘What language group(s) do you belong to or identify with?’

The responses elicited a wide range of language groups and varying numbers of affiliations, as shown in Table 5-3 below. While the majority of participants named one or two language group affiliations, one specified six language groups with which they identified.

Table 5-3 Language group affiliations identified

	No.	Col. %	Cum. %
<i>Number of language groups identified with</i>			
1	44	44.9	44.9
2	30	30.6	75.5
3	16	16.3	91.8
4 or more	8	8.1	100.0
Total	98	100.0	
<i>First named language group</i>			
Nyikina	65	66.3	66.3
Mangala	8	8.2	74.5
Yawuru	5	5.1	79.6
Jaru	5	5.1	84.7
<i>Second named language group</i>			
None	44	44.9	44.9
Mangala	23	23.5	68.4
Ngarinyin	8	8.2	76.5
Nyikina	4	4.1	80.6

Source: Phase 2 survey data collected and compiled by author.

Note: Col. = column. Cum. = cumulative.

The diversity of identity is reflected by the 26 different language groups with which participants identified. Nearly half (44.9%) identified with only one language group. The most frequently identified primary language groups, namely those named first and second, are set out in the second and third panels of Table 5-3.

Connection to Nyikina and/or Mangala

Nyikina people were traditionally based along the western end of the Fitzroy River, while Mangala people were originally from the Western Desert region south of the river. Both language groups were impacted by colonisation and now live in communities and towns throughout the West Kimberley and across Australia, with many people retaining strong links to their traditional Country. The major native title claims of Nyikina and Mangala language groups were combined and settled in an ILUA (consent determination WCD2014/003) in 2014, with a supplementary consent determination in 2015 (WCD2015/004).²² The native title rights are held on behalf of TOs by the WAC, the registered native title body corporate.

²² Detailed at

http://www.nntt.gov.au/searchRegApps/NativeTitleRegisters/Pages/NNTR_details.aspx?NNTT_Filen

The remote sites of my fieldwork are on land traditionally owned by Nyikina and covered by these native title determinations. More recent additional Nyikina claims extend to the outskirts of Derby. For the purposes of the analysis in this research of traditional ownership, locations of interviews and participants' normal residence, only Broome – on Yawuru Country, is considered to be other than Nyikina or Mangala Country.

Given the location and expressed objective of working with people with Nyikina and/or Mangala connection, it is not surprising that Table 5-3 shows around three-quarters of participants identified Nyikina (66.3%) or Mangala (8.2%) as their first language group, with Mangala the most frequent second mentioned language group (23.5%). Nearly four-in-five (79.6%) participants identified Nyikina and/or Mangala as their first or second language affiliation. Following explanation of my research relating to Nyikina and Mangala people, a very small number (less than 5) of people declined to participate on the basis that they did not belong to one or both of these language groups.

Traditional ownership of residence

The level of traditional ownership of the normal residence was assessed two ways. The first was a direct question 'Is the place you normally live your traditional lands?' The second was using the first and second language groups identified with as an indicator of traditional ownership, matched to the location of normal residence. While neither of these mechanisms would meet legislative evidentiary requirements (s190B of the *Native Title Act 1993*), they are a useful proxy for traditional ownership in this analysis. Of the 70 participants where first or second language group matched traditional ownership of residence, 65 responded positively to the direct question. All five participants who didn't self-identify as TOs for their normal residence are Nyikina and/or Mangala living in a location recognised or claimed as Nyikina and/or Mangala Country, and their responses indicate that this reflects their perception of boundaries and extent of their traditional Country.

[o=WCD2014/003](http://www.nntf.gov.au/searchRegApps/NativeTitleRegisters/Pages/NNTR_details.aspx?NNTT_FileNo=WCD2014/003) and
http://www.nntf.gov.au/searchRegApps/NativeTitleRegisters/Pages/NNTR_details.aspx?NNTT_FileNo=WCD2015/004

Participants who didn't live on their traditional Country offered a wide range of reasons for this. The most frequent reason given was that they lived on their partner's Country, and the second most frequent reason was for work or study purposes.

Recognition of Traditional Owners

Having traditional ownership recognised through native title or land rights is significant in terms of cultural standing.

Participants were asked whether their traditional lands were covered by a native title determination or agreement, with around 90% responding positively, 9% unsure and only 1% saying native title wasn't recognised. Table 5-4 shows that nearly all participants (98.6%) normally living on their traditional lands said that their native title was recognised, whereas nearly one-third who indicated they were not residing on their traditional Country thought their native title wasn't recognised or they were unsure. This suggests to a strong correlation of awareness and recognition of native title with living on traditional Country.

Table 5-4 Traditional ownership of normal residence and level of access to Country compared with native title recognition

Native title recognition							
Recognised			Not recognised		Unsure		Total
	Col. %	Row %	Col. %	Row %	Col. %	Row %	Col. %
<i>TOs of normal residence</i>							
No	21.6	67.9	100.0	3.6	88.9	28.6	28.6
Yes	78.4	98.6	—	—	11.1	1.4	71.4
<i>Level of access to traditional Country</i>							
Full access	64.8	96.6	100.0	1.7	11.1	1.7	60.2
Some access	31.8	96.6	—	—	11.1	3.4	29.6
No access	—	—	—	—	11.1	100.0	1.0
Unsure	3.4	33.3	—	—	66.7	66.7	9.2
Total number	88		1		9		98

Source: Phase 2 survey data collected and compiled by author.

Note: Col. = column.

It would be expected that recognition of native title would ensure that traditional Country could be accessed, as even non-exclusive possession generally provides for the right to access and move freely through and within the areas. Most of the largest Nyikina Mangala native title determination comprises exclusive and non-exclusive native title, with only small pockets within the determination area where native title was not

determined to exist (National Native Title Tribunal 2014). Despite this, Table 5-4 shows that nearly one-third of participants with a native title determination indicated that they had only some access rather than full access to their lands. This misconception of rights to access Country corresponds with the high level of concern about barriers to accessing traditional Country expressed by participants in the earlier phases of the research.

Many participants spoke of protocols in terms of contacting the manager or leaseholder to explain that they were seeking access to Country. Some see their own rights as superior and this is only done out of courtesy; others felt that seeking permission was an obligation and their rights were subsidiary to the leaseholders.

The impact of exclusion from traditional Country can mean loss of knowledge of significant sites because the elders or custodians of the knowledge have died without being able to transmit their knowledge about the sites, their meanings and customary caring/maintenance regimes. Even if the land was returned to the TOs, this break in continuity of custodianship has resulted in a loss of cultural capital. An example of this was brought to my attention in an earlier phase of my research by a TO leading a small group to a site with faded rock art. The TO indicated that the art is not refreshed, as in other areas, because knowledge of that story had been lost as a result of historical exclusion from the site. In comparable sites impacted by such historical loss, efforts have been made to reclaim access and transmit the traditional knowledge (Mowljarlai & Peck 1987; Palmer 1975).

Family language and culture

Assimilation policies historically adopted in both Australia and other colonial settlements, such as Canada, frequently involved removal of children from their family to be raised in institutional settings or by non-Indigenous families (Armitage 1995). The objective of these assimilation practices was to remove the child from the influence of their First Nations culture, including language use, so that they would be raised with the cultures, values and beliefs of the dominant society.

Family circumstances and child protection policies involving the removal of children by governments, as well as kinship caring, mean that many First Nations children are raised by people other than their biological parents. This may have an impact on language and cultural transmission. Nearly all survey participants (99%) were raised by parents or

other family. However, during this research, the spectre of removal of particular children by government agencies was being discussed by people seeking to protect these children and ensure that they were not removed from family and kin.

Language is often a key indicator of a living culture. Significant efforts have been made by First Nations people, supported by linguists and others in recent decades, to reverse the loss of languages.

Table 5-5 shows many participants (41.8%) said they didn't have or use a language other than English. My observation throughout the research was that while only a few regularly conversed in traditional languages, many individuals used occasional words or phrases in Kriol (also known as Aboriginal English) or traditional languages.

It became apparent that when outsiders came into communities, the level of usage of Kriol or traditional language increased, as a strategy to exercise some agency in dealing with outsiders. I noticed a decrease over time of the use of language other than English in my presence, as my relationships with people strengthened, and I was more trusted.

The presence of multiple generations in households is also likely to strengthen connection to culture and language. Responses to a question about who was cared for in the family home provide a snapshot of current caring practices. Of those surveyed nearly half (45.9%) cared for children in their home, a smaller minority (14.3%) cared for others but not children, and even fewer (12.2%) cared for children and others, an indication of multigenerational family living. Several people lamented the loss of elders from community because they needed to move to town for aged care support, despite a stated desire to support those older people in community. These comments were often made in the context of decreasing use of language and cultural activity, and often by people who were older, but did not claim status as elders.

The calculated estimate of annual cultural activity, based on responses to the questions about time-use, is shown in second panel of Table 5-5. These estimates were based on individuals' recollections over varying periods, up to a 12-month period for seasonal activities, converted to annual estimates. As noted in Sub-section 3.7.5 of Chapter 3, there are challenges in estimating time-use given seasonality of activity, recall and non-linear approaches to time.

Table 5-5 Main language, frequency of usage, cultural activity and household caring roles

	Language mainly spoken							
	Don't speak language		Traditional		Kriol		Total	
	Col. %	Row %	Col. %	Row %	Col. %	Row %	No.	Col. %
<i>Frequency of Language Usage</i>								
Don't speak language	100.0	100.0	–	–	–	–	41	41.8
Rarely	–	–	2.2	100.0	–	–	1	1.0
Yearly	–	–	21.7	100.0	–	–	10	10.2
Monthly	–	–	10.9	83.3	9.1	16.7	6	6.1
Weekly	–	–	23.9	100.0	–	–	11	11.2
Daily	–	–	41.3	65.5	90.9	34.5	29	29.6
<i>Annual cultural activities time</i>								
0–500 hrs	41.5	73.9	8.7	17.4	18.2	8.7	23	23.5
501–1,000 hrs	22.0	56.3	10.9	31.3	18.2	12.5	16	16.3
1001–2,000 hrs	31.7	46.4	26.1	42.9	27.3	10.7	28	28.6
2001–5,000 hrs	4.9	8.0	41.3	76.0	36.4	16.0	25	25.5
5001–10,000 hrs	–	–	13.0	100.0	–	–	6	6.1
<i>Caring for children and/or others in home</i>								
Not caring for children or others	26.8	40.7	28.3	48.1	27.3	11.1	27	27.6
Caring for children but not others	58.5	53.3	37.0	37.8	36.4	8.9	45	45.9
Caring for others but not children	9.8	28.6	19.6	64.3	9.1	7.1	14	14.3
Caring for children and others	4.9	16.7	15.2	58.3	27.3	25.0	12	12.2
Total	100.0	41.8	100.0	46.9	100.0	11.2	98	100.0
Total number	41		46		11		98	

Source: Phase 2 survey data collected and compiled by author.

Note: Col. = Column.

Language, as a key cultural indicator, is compared in Table 5-5 with its frequency of use, time spent on cultural activity and family caring arrangements. In the first panel we see that most Kriol speakers (90.9%) use this as an everyday language, whereas less than half (41.3%) of traditional language speakers indicate they use it every day. Many speakers of traditional language will also use Kriol but responded to language use questions about language use in relation to traditional languages. I observed that Kriol was quite commonly used. The pattern of self-reported time spent on cultural activities is slightly skewed towards traditional language speakers reporting higher times than those who only use Kriol. The only notable differences in caring relationships is that a higher proportion of traditional language speakers care for older relatives rather than children, whereas a higher proportion of Kriol speakers indicated that they cared for children and others in multigenerational homes.

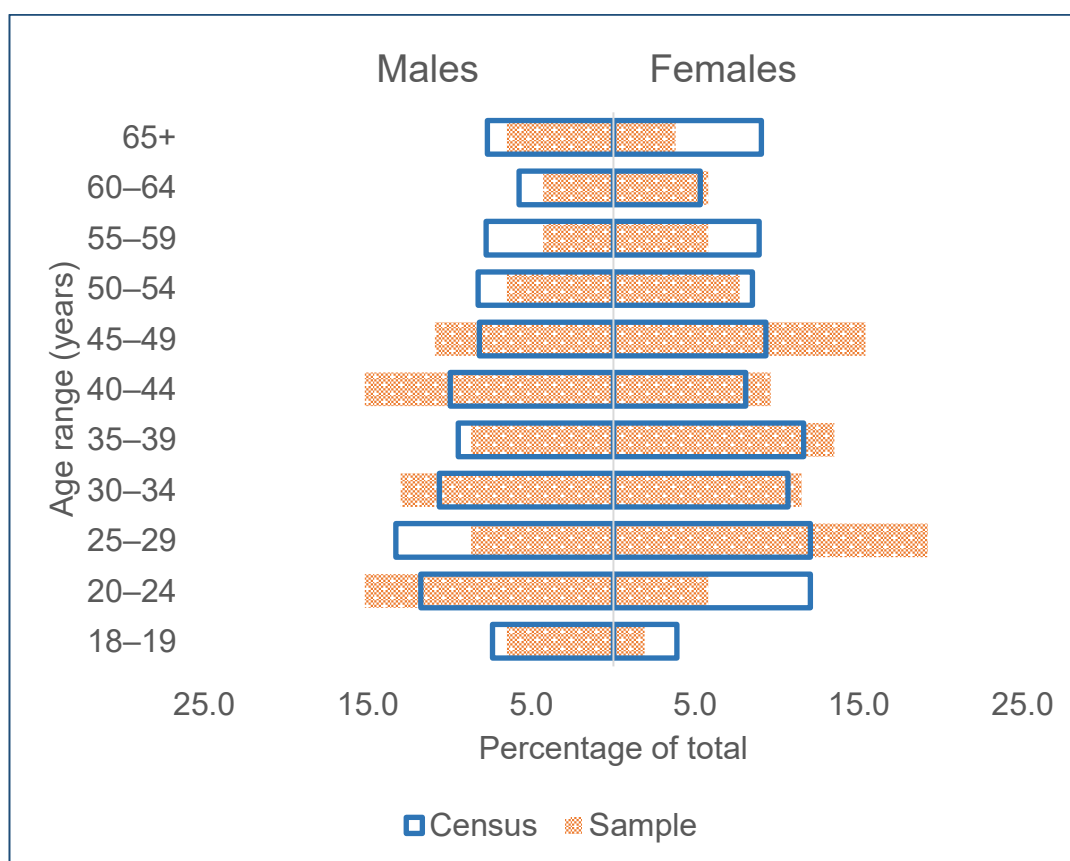
5.3.2 Sociodemographic characteristics

This section compares key sociodemographic characteristics of the survey sample with relevant Census data. As discussed in Sub-section 3.6.5 of Chapter 3, I believe the application of the SA2 level ERP adjustments is likely to overestimate the populations of discrete communities in this research, so for comparison of characteristics of the survey sample with census data in this chapter I use publicly available raw Census 2016 counts. As most of the comparisons are proportional, it makes no difference whether raw counts or ERP adjusted estimates are used.

Age and gender

The survey participants were broadly representative in terms of age and gender of the Aboriginal population in the region. An age and gender pyramid comparing the sample with census data available for fieldwork locations is shown in Fig. 5-1. This shows slightly greater variations in the age distribution of females surveyed relative to census counts, but no discernible bias by gender or age.

Fig. 5-1 Proportional distribution of adult survey sample and field location Census 2016 enumeration by gender and five-year age range



Data Sources: ABS Census of Population and Housing, 2016, TableBuilder; Phase 2 survey data collected and compiled by author.

Note: Broome Census Population total of four ILOCs within the general urban area.

Education

Survey participants were asked separately about school and post-school educational attainment. The education attainment of participants ranged from no formal schooling to higher degree qualifications. This sub-section compares the education levels of the survey participants with Census 2016 data and explores how educational achievement relates to gender, age and living away from home for education. For consistency with available Census 2016 data, the Level of Highest Educational Attainment (HEAP) Level 1 categorisation of overall educational achievement has been used in this analysis.²³

²³ Level of Highest Educational Attainment (HEAP) categorisation combines non-school qualifications and highest year of school completed to produce a single measure of a person's overall educational attainment. For the 2016 Census, HEAP categorisation excludes specific mention of Primary or Pre-primary level education (Australian Standard Classification of Education (ASCED) Broad Levels 7 and 8)

Comparing the survey with Census 2016 data in Table 5-6 shows proportionally higher proportions of participants had post-school Certificate level qualifications (3.1% and 36.7% of adults surveyed as compared with the 0.3% and 19.7% reported in the Census), while lower proportions have secondary school and tertiary level qualifications.

The gender breakdown shows that two-thirds of female participants completed to high school or equivalent whereas more than half of the males had Certificate III or IV or higher qualifications. This may be the result of differential access and take-up of education by women with family responsibilities while men pursue post-school trade training.

Historically access to education has varied. Several of the elders I met with in the first phase of the research, who were not included in the subsequent survey, had no formal schooling or very limited primary schooling, reflecting the availability of schooling for Aboriginal people at the time, particularly for those who lived and worked with their families on pastoral stations. Some people had access to schooling on missions, in some cases necessitating staying at the missions while families worked elsewhere.

The highest educational qualification by broad age categories in Table 5-6 reflects changing opportunities and requirements to attend education over time. Larger proportions of the youngest group had completed senior secondary schooling and had completed Certificate III or IV level qualifications. While the middle-aged group had similar proportions with these level qualifications, some had gone on beyond to higher level post school qualifications. The older group had the largest spread with the highest proportion having Year 9 or less schooling and a number with postgraduate qualifications.

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and groups Year 10 with the broad ASCED coding for senior secondary levels (Year 11 and 12 and bridging courses at level).

Table 5-6 Highest education attainment level of research participants compared with adult Indigenous people enumerated in fieldwork locations in Census 2016, by gender and broad age categories

Highest education coding based on Census HEAP – 1 digit level	Research participants												Census 2016	
	Gender				Broad age categories						Total			
	Female		Male		18–29		30–49		50 plus					
	Col. %	Row %	Col. %	Row %	Col. %	Row %	Col. %	Row %	Col. %	Row %	No.	%	No.	%
Supplementary codes ¹	–	–	2.2	100.0	–	–	–	–	4.5	100.0	1	1.0	115	5.3
Secondary education – Years 9 and below ²	11.5	60.0	8.7	40.0	7.1	20.0	8.3	40.0	18.2	40.0	10	10.2	253	11.7
Certificate I & II level	3.8	66.7	2.2	33.3	3.6	33.3	–	–	9.1	66.7	3	3.1	8	0.4
Secondary education – Years 10 and above	50.0	63.4	32.6	36.6	46.4	31.7	43.8	51.2	31.8	17.1	41	41.8	1,085	50.2
Certificate III & IV level	25.0	36.1	50.0	63.9	42.9	33.3	41.7	55.6	18.2	11.1	36	36.7	425	19.6
Advanced Diploma and Diploma level	5.8	75.0	2.2	25.0	–	–	4.2	50.0	9.1	50.0	4	4.1	135	6.2
Bachelor Degree level	–	–	2.2	100.0	–	–	2.1	100.0	–	–	1	1.0	104	4.8
Postgraduate ³	3.8	100.0	–	–	–	–	–	–	9.1	100.0	2	2.0	45	2.1
Total number	52		46		28		48		22		98	100.0	2,163	100.0
Total %		53.1		46.9		28.6		49.0		22.4				

Data Sources: ABS Census of Population and Housing 2016, TableBuilder; survey data collected & compiled by author.

Notes: Census counts of Aboriginal and/or Torres Strait Islander people aged over 17 years based in Indigenous geography for available fieldwork locations. Cells in this table have been randomly adjusted to avoid the release of confidential data. No reliance should be placed on small cells. Census records with education level not stated or not applicable excluded itemwise.

Col. = Column.

1. Supplementary codes include no education and inadequate description.

2. Secondary education - Years 9 and below includes primary education.

3. Postgraduate includes Graduate Diploma and Certificate level and postgraduate degree level.

Access to education

Access to education, even at the primary level, is still limited in the region. Only one of the discrete communities involved in this research, Jarlmadangah, had an active primary school which was attended by around 20 children. The largest discrete Aboriginal community in this research, Pandanus Park, had a relatively large population of young children, with school-aged children travelling by bus to Derby, leaving the community around 6.45am and returning around 3pm. One of the smallest communities had been using Kimberley School of the Air and the Schools for Isolated and Distance Education (SIDE) to enable their small number of school-aged children (up to 5) to be educated on community. However, at the time of the Phase 2 fieldwork there was no support teacher, and children were travelling to Broome or Derby for schooling. Another very small community had a similar arrangement until the parents felt it better to take up residence in town to provide access to school, sporting and social activities for their primary school-aged children.

More than half (58%) of participants indicated that they had lived away from home to undertake education. While it is currently feasible to complete an education to Year 12 level in Broome or Derby, the increasing availability of scholarships has supported more students to travel or live away from home to complete their education. Of the 77 participants who had Year 10 or above education, the majority (62%) had lived away from home for schooling in Perth, Brisbane or as far away as Melbourne. Many of these young people had not completed to the end of Year 12, speaking of the challenges of being away from family and Country. This struggle to stay at boarding school to complete Year 12 is reflected in Table 5-7, where the Year 11 completion rate for those who did live away for education is higher than the comparative rate for Year 12.

Table 5-7 Highest educational qualification compared with living away for education

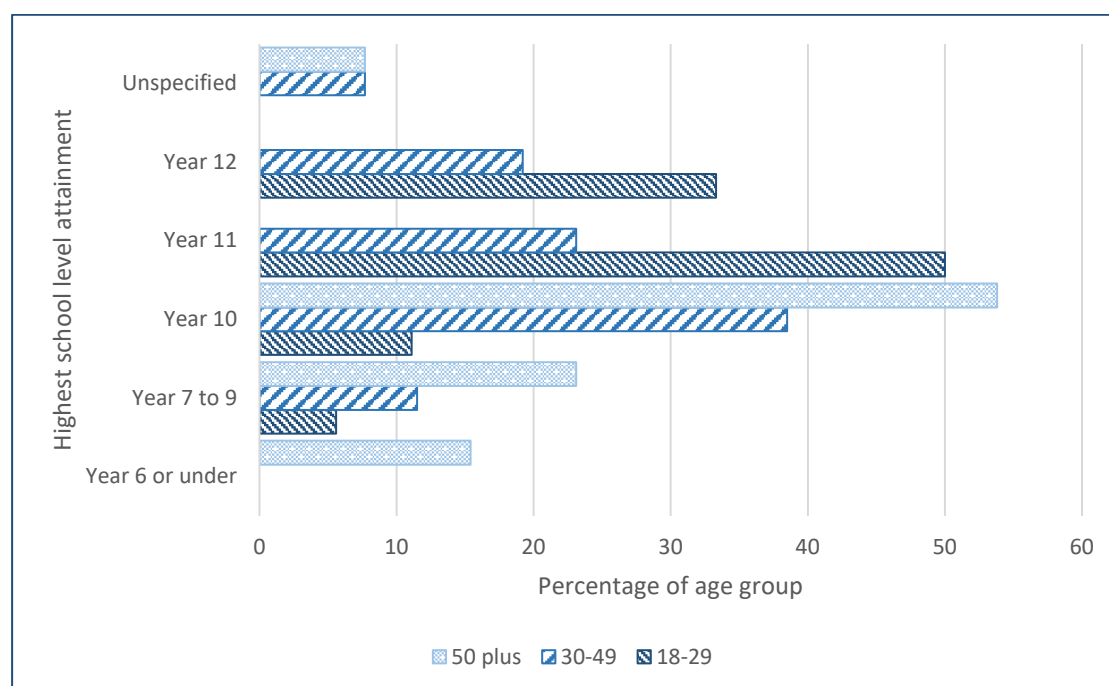
	Lived away from home for education		
	No	Yes	Total
	Col. %	Col. %	Col. %
Highest school level completed			
Never	2.4	–	1.0
Year 6 or under	2.4	3.5	3.1
Year 7 to 9	24.4	12.3	17.3
Year 10	41.5	33.3	36.7
Year 11	12.2	26.3	20.4
Year 12	17.1	19.3	18.4
Unspecified	–	5.3	3.1
Highest education level completed (HEAP Level 1)			
None	2.4	–	1.0
Junior secondary Year 9 or less	14.6	7.0	10.2
Certificate II or less	2.4	3.5	3.1
Senior secondary Years 10 to 12	34.1	47.4	41.8
Certificate III or IV level	43.9	31.6	36.7
Advanced Diploma or Diploma level	–	7.0	4.1
Bachelor degree level	–	1.8	1.0
Postgraduate degree level	2.4	1.8	2.0
Total number	41	57	98

Source: Phase 2 survey data collected and compiled by author.

Note: Col. = Column.

The increased opportunities for higher level residential education over time is reflected in the pattern of school level attainment by age group of participants that lived away from home for education, shown in Fig. 5-2, with more in the youngest group (under 30 years of age) having completed Years 11 or 12.

Fig. 5-2 Distribution of school level educational attainment by age group for those that lived away from home for education



Source: Phase 2 survey data collected and compiled by author.

Post-school education

The majority (69%) of participants had post-school qualifications, ranging from short course and Certificate I or Certificate II (25.5%) qualifications to Advanced Diploma or Diploma, Bachelor or Postgraduate (7.1%). Most of these (62.2%) were Certificate level qualifications, with more than half of those being at the Certificate III or higher level, including those that completed Certificate III in Civil Construction during the fieldwork period. These qualifications don't necessarily lead to employment using the skills, with none of the Civil Construction trainees employed in subsequent roadworks on the highway that runs past the community and another participant not utilising qualifications evidenced by a folder full of certificates.

Employment and activity

In this sub-section, the data on participants' involvement in paid employment and other work-like activity including CDP activities is compared, where appropriate, to census data. The impact of government employment policies including CDP policy and program delivery as it affects participants is considered. It was apparent in discussions that participants had various ideas about 'employment' and 'work', and their responses were self-determined and not constrained. However to facilitate categorisation I sought

to clarify if work was paid employment, work-for-the-dole activity or other activity, such as domestic chores, that have been excluded from this analysis of paid work and work-like activity.

Comparing activity categories by gender and broad age categories in Table 5-8 enables some assessment of any patterns of engagement in work or CDP relative to other income support of all survey participants. This shows that proportionally more women than men were unemployed or on some form of income support, most likely attributable to caring roles. The spread of CDP and paid employment across these genders and broad age categories also reflects the expected capacity for employment beyond education and caring roles, plus aged or disability levels.

Table 5-8 Income activity by gender and broad age group

Activity	Gender		Broad age categories			Total	
	Female	Male	18–29	30–49	50 plus	no.	Col. %
	Col. %	Col. %	Col. %	Col. %	Col. %		
Unemployed/Income support	32.7	17.4	21.4	18.8	45.5	25	25.5
CDP	26.9	30.4	35.7	33.3	9.1	28	28.6
Paid employment	40.4	52.2	42.9	47.9	45.5	45	45.9
Total number	52	46	28	48	22	98	

Source: Phase 2 survey data collected and compiled by author.

Note: Col. = Column.

Income levels were self-reported as low (up to \$400 per week, the equivalent of Newstart at the time) medium (between \$400 and \$1,000 per week) or high (over \$1,000 per week). The majority (56.1%) of all participants reported low incomes, significantly higher than the 36.7% recorded in the Census for available fieldwork locations shown in Table 5-13. This was likely to be the result of high levels of participation in CDP and other income support arrangements.

Paid employment

The employment rate for survey participants was slightly higher than Census 2016 data for available fieldwork locations, as shown in Table 5-9. This could be partly attributable to a referral or self-selection bias, offset by the limiting factor that those working full-time were more difficult to interview because of their time constraints. Notably, this differential for males was greater, but the employment rate was lower for female participants than the Census.

Table 5-9 Labour force status by gender, comparing survey participants with Census 2016 enumeration of adult (18+) Indigenous Australians for available fieldwork locations

LFSP Labour force status	Gender				Total	
	Male		Female			
	Census %	Survey %	Census %	Survey %	Census %	Survey %
Employed	45.6	52.2	43.6	40.4	44.3	45.9
Unemployed or Not in the labour force ¹	54.4	47.8	56.4	59.6	55.7	54.1
Total	100.0	100.0	100.0	100.0	100.0	100.0

Data Source: Census of Population and Housing, 2016, TableBuilder; Survey data collected and compiled by author.

Notes: 1. In the 2016 Census participants in CDP are not considered to be employed, whereas in the 2011 Census, participants in the previous CDEP were classified as employed.

With less than half of the survey participants in paid employment some of the employment characteristics by gender and age grouping are compared in Table 5-10 to identify any notable differences.

Table 5-10 Paid employment characteristics by gender and broad age group

	Gender		Broad age categories			Total	
	Female	Male	18–29	30–49	50 plus	No.	Col. %
	Col. %	Col. %	Col. %	Col. %	Col. %	No.	Col. %
<i>Years working experience</i>							
5 years or less	14.3	25.0	58.3	8.7	–	9	20.0
5–10 years	23.8	16.7	33.3	21.7	–	9	20.0
Over 10 years	61.9	58.3	8.3	69.6	100.0	27	60.0
<i>Permanent or temporary paid employment</i>							
Permanent	85.7	79.2	66.7	87.0	90.0	37	82.2
Temporary	14.3	20.8	33.3	13.0	10.0	8	17.8
<i>Sector of paid employment</i>							
Government	–	4.2	–	4.3	–	1	2.2
Private sector	–	16.7	16.7	4.3	10.0	4	8.9
NGO	100.0	79.2	83.3	91.3	90.0	40	88.9
<i>Industry of employment or activity</i>							
Agriculture forestry & fishing	–	8.3	8.3	4.3	–	2	4.4
Mining	–	4.2	8.3	–	–	1	2.2
Municipal services	–	4.2	–	4.3	–	1	2.2
Construction	–	12.5	8.3	4.3	10.0	3	6.7
Other - Advisory/legal services	–	4.2	–	4.3	–	1	2.2
Employment & support	19.0	8.3	–	21.7	10.0	6	13.3
Public administration	–	8.3	–	4.3	10.0	2	4.4
Education	23.8	8.3	16.7	21.7	–	7	15.6
Health care & social assistance	38.1	8.3	8.3	17.4	50.0	10	22.2
Arts & tourism	9.5	4.2	8.3	4.3	10.0	3	6.7
Natural resource & land management	9.5	29.2	41.7	13.0	10.0	9	20.0
<i>Weekly work hours</i>							
Under 20 hours	4.8	4.2	–	4.3	10.0	2	4.4
20–29 hours	4.8	8.3	16.7	–	10.0	3	6.7
30–39 hours	71.4	54.2	58.3	65.2	60.0	28	62.2
40 hours or over	19.0	33.3	25.0	30.4	20.0	12	26.7
<i>Income level</i>							
Low	9.5	–	8.3	4.3	–	2	4.4
Medium	76.2	91.7	91.7	78.3	90.0	38	84.4
High	14.3	8.3	–	17.4	10.0	5	11.1
Total number	21	24	12	23	10	45	

Source: Phase 2 survey data collected and compiled by author; paid employment categorisation excludes CDP participants.

Note: Col. = Column.

The gender comparison of paid employment characteristics in Table 5-10 shows:

- labour force participation was lower for women, reflecting high levels of caring responsibilities, and a much higher proportion of women who had never held paid employment. This was also reflected in greater income disparities, with nearly two thirds of women saying they had low incomes, while less than half of the men reported low incomes
- proportionally more women than men had more than 5 years' experience of paid employment
- a higher proportion of women reported their employment as permanent, suggesting less precarious employment than the male participants
- no women were employed in the government or private sector, compared to around 20% of employed men, and
- around 10% of women reported low income levels from paid employment, whereas all men reported medium or high incomes.

The age profile comparison of paid employment characteristics in Table 5-10 most likely reflects the effect of historical changes in policy and practice, the expected relative working life of participants, as well as the experience and exposure to employment opportunities in these remote areas.

Consistent with expectations relating age to working life, the pattern of paid work experience by age group shows the highest proportion of the oldest group having had over 10 years' experience, and the highest proportion of the youngest group having had 5 years or less experience.

The younger age category appears to have experienced more precarious paid employment, making up half of those who indicated they were in temporary employment and one-fifth of those who indicated they were in permanent employment, whereas they comprised more than a quarter of the paid workforce in the sample.

Community Development Program

The limited labour market operating in remote regions of Australia is a significant consideration in the design of Indigenous employment policies and programs (Altman & Gray 2005; Australian Government Department of the Prime Minister and Cabinet 2018a; Dockery & Lovell 2016; Dockery & Milsom 2007; Fowkes & Li 2018; Hunter & Gray 1998). The CDP and its predecessor schemes have been central planks of these programs for decades.

The CDP is an Australian Government compulsory work-for-the-dole program that has been operating in remote regions of Australia since July 2015, when it replaced the RJCP that had been operating since 2013 (Australian Government Department of the Prime Minister and Cabinet 2018a). Prior to that the CDEP scheme had been in operation since the mid-1970s (Sanders 1993). While notionally a mainstream program, the CDP has very high levels of Aboriginal and Torres Strait Islander participation, with around 85% of participants nationally at the time of this research (Fowkes & Sanders 2016).

These policies and program delivery mechanisms contextualise the contemporary experience of participants. The CDP and its predecessor programs appeared not to be well understood by participants in discrete communities. Provider representatives in the communities were focused on reporting obligations and ensuring that people reported for CDP activities. The ability for communities to have a role in deciding appropriate activities that might align with community priorities appeared limited, and the CDP provider representatives within and visiting communities were unable to provide clear responses to questions about the possibilities of communities having a say in what activities could be undertaken. During the period of field surveys, the CDP had been newly implemented, and the rules, penalties and even the name of the program was not clear to participants. Many referred to CDEP, and were unaware of the names of or differences between CDP or its immediate predecessor the RJCP, an interesting reflection on the limited engagement of participants in the design of policy and program delivery arrangements.

The rate of participation in CDP amongst survey participants, at 28.6%, was nearly two-thirds the level of paid employment. Census 2016 data on CDP participation data was

only collected from the Interviewer Household Form used in discrete Aboriginal and Torres Strait Islander communities and reported a total of 18 (14%) CDP participants in the two relevant discrete communities. The difference between the survey and the Census data may be attributable to the limited understanding of government programs like CDP, issues associated with a single person in the household completing information on households, and some increased CDP participation levels due to the training that was underway at the time of the survey.

Changes in census treatment –the 2016 Census treated CDP participation as unemployed or not in the labour force, whereas up until the 2011 Census CDEP participation was treated as employment (Australian Government Australian Bureau of Statistics (ABS) 2016b, pp. 11, 179, 208) – together with ongoing changes in policy and program settings, have made evaluations and comparison over time challenging.

The CDP ‘was designed to improve employment outcomes in remote communities by increasing participation in work-like activities, improving employability and increasing sustainable work transitions among program participants’ (Australian Government Department of the Prime Minister and Cabinet 2018a). This involved extension of less flexible mutual obligation requirements, to 25 hours a week across a 5-day week, and a stricter compliance framework than was present in the RJCP (Australian Government Department of the Prime Minister and Cabinet 2018a). Evidence of the increasing and disproportionate level of penalties applied to Indigenous participants under CDP relative to RJCP and other mainstream programs, plus associated higher levels of disengagement (Fowkes 2019), was apparent in some locations at the time of my fieldwork, which coincided with the first six months of CDP, and even more so on my subsequent visits. CDP activities running in the remote communities at the time of this research included horticultural, land and natural resource management, tourism, road construction and public administration.

A Certificate III Civil Construction training program, organised by the CDP provider Winun Ngari and involving around 20 people, was conducted in Pandanus Park during the period of fieldwork. The timing of this training appeared to be opportunistic, linked to the availability of a training organisation which was then moving through the Kimberley. At the initial meeting between the training organisation, the CDP provider and the community, both the trainer and the Winun Ngari representatives from Derby

stressed the value of the training for job opportunities, including local road construction, as well as the importance of getting a minimum number of participants that would stick with the training and turn up each day. While all participants, other than one who died during the course, successfully achieved certification, none of the graduates were employed in road construction in the following year, despite an extensive post-wet season rebuild and repair of the major highway that passes the community. This training was on a full-time basis, around 37.5 hours a week, well over the CDP requirement of 25 hours per week.

At the same community, the CEO of Pandanus Park undertakes this role as a CDP activity earning the equivalent of Newstart (SBS The Feed 2019). I observed this participant's long working hours, at least equivalent to full-time 37.5 hours per week. This meant an effective hourly rate of \$7.49, based on a basic Newstart rate for a single person with children applicable at the time (Australian Government Department of Human Services 2015). The demands of this role are not insignificant, including managing community issues associated with a major housing upgrade program, exploring new enterprise opportunities, and dealing with a serious water quality issue in the community. While the water issues were highlighted in a government report in May 2015 (Office of the Auditor General Western Australia 2015), it took around 10 months of lobbying before bottled water was made available for the young babies in the community and a charity stepped in to assist with a water filtration system (ABC Kimberley 2017; ABC News 2016; NITV 2016).

Attitudes towards work, and views of what constitutes work, varied across and within the field sites. When responding to the question about what work meant to them, many talked about paid employment and some talked about their CDP activity. A small number of participants mentioned housework or yard work, although these participants were not employed and most had no experience of paid employment. While these activities might be seen by most Australians as domestic chores rather than employment, from the perspective of many in community, these types of work may be associated with what *kartiya* tell them they should do to maintain their occupation of public housing, and are not necessarily distinguished from other imposed CDP activities.

Returns to human capital

In a labour market economic model returns to human capital, developed primarily through education and experience, are in the form of increased likelihood of employment and earnings capacity. These employment and (western) education factors remain the focus of policy frameworks, despite the evidence that cultural knowledge and skills are highly valued or even critical for some Aboriginal employees.

With limited data from this research I have not used regression modelling to explore the concepts of returns to human capital. Table 5-11 cross tabulates the current activity of participants with their highest education attainment and work experience. A larger share of those in paid employment at the time of the research had higher levels of education and work experience than the unemployed or those participating in CDP.

Table 5-11 Experience and qualifications by employment category

	Broad activity category this month			Total
	Unemployed/ Income support	CDP	Paid employment	
	Col. %	Col. %	Col. %	
<i>Highest education level completed (HEAP Level 1)</i>				
None	4.0	–	–	1.0
Junior secondary Year 9 or less	24.0	7.1	4.4	10.2
Certificate II or less	4.0	–	4.4	3.1
Senior secondary Years 10 to 12	44.0	53.6	33.3	41.8
Certificate III or IV level	20.0	39.3	44.4	36.7
Advanced Diploma or Diploma level	4.0	–	6.7	4.1
Bachelor degree level	–	–	2.2	1.0
Postgraduate degree level	–	–	4.4	2.0
<i>Years working experience</i>				
None	36.0	39.3	–	20.4
5 years or less	24.0	50.0	20.0	29.6
5–10 years	4.0	10.7	20.0	13.3
over 10 years	36.0	–	60.0	36.7
Total number	25	28	45	98

Source: Phase 2 survey data collected and compiled by author.

Note: Col. = Column.

Extending this analysis to broad categorisation of income levels (given the small number of respondents reporting high incomes) in Table 5-12 shows:

-
- work experience correlates to higher incomes, with the majority (61.5%) of those with 5–10 years' experience and a higher proportion (72.2%) of those with over 10 years' experience earning medium to high incomes
 - the returns to education are less consistent with expectations from a traditional human capital model, with high proportions of people with senior secondary qualifications (65.9%) being on low incomes, and only about half of those with Certificate level III or IV qualifications being on medium to high incomes (52.8%)
 - the returns to effort, indicated by self-reported working hours by income level, are more consistent with expectations, showing that the clear majority (73.7%) of those working 30–39 hours and all (100%) of those working 40 hours or more per week earn a medium to high income. However, the majority of those earning medium to high incomes work less than 40 hours per week.

Table 5-12 Experience, qualifications and weekly working hours by income level

	Income Level L/MH				Total
	Low		Medium-High		
	Col. %	Row %	Col. %	Row %	Col. %
<i>Highest education level completed (HEAP Level 1)</i>					
None	1.8	100.0	–	–	1.0
Junior secondary Year 9 or less	14.5	80.0	4.7	20.0	10.2
Certificate II or less	1.8	33.3	4.7	66.7	3.1
Senior secondary Years 10 to 12	49.1	65.9	32.6	34.1	41.8
Certificate III or IV level	30.9	47.2	44.2	52.8	36.7
Advanced Diploma or Diploma level	1.8	25.0	7.0	75.0	4.1
Bachelor degree level	–	–	2.3	100.0	1.0
Postgraduate degree level	–	–	4.7	100.0	2.0
<i>Years working experience</i>					
None	36.4	100.0	–	–	20.4
5 years or less	36.4	69.0	20.9	31.0	29.6
5–10 years	9.1	38.5	18.6	61.5	13.3
Over 10 years	18.2	27.8	60.5	72.2	36.7
<i>Weekly work hours</i>					
None	45.5	100.0	–	–	25.5
Under 20 hours	3.6	66.7	2.3	33.3	3.1
20–29 hours	32.7	90.0	4.7	10.0	20.4
30–39 hours	18.2	26.3	65.1	73.7	38.8
40 hours or over	–	–	27.9	100.0	12.2
Total number	55		43		98

Source: Phase 2 survey data collected and compiled by author.

Note: Col. = Column.

Census data don't reveal the levels of lifetime experience, but can be used to compare with the education levels of survey participants. Table 5-13 compares the education to income relationship of the survey participants with Census 2016 enumeration data for Indigenous adults in available fieldwork locations. The most significant differences in the returns to education between the survey and the Census arise in those whose highest level of education was Certificate III and IV level, where a much higher proportion of the Census (76.4%) than the survey (52.8%) reported medium to high incomes.

Similarly, the proportion of those whose highest level of education was Year 10 or above secondary school reporting medium to high incomes was much lower in the survey (34.2%) compared to the Census (59.4%), reversing the expected increased returns to education demonstrated in the Census. Much of this difference may be attributable to the inclusion of the towns of Derby and Broome and the resultant larger employment pool in the census data.

Table 5-13 Comparing highest education level by income reported by survey participants with Census 2016 enumeration of adult Indigenous residents of fieldwork locations

INCP total personal income (weekly)	Low income				Medium–high income				Total	
	Census		Survey		Census		Survey		Census	Survey
	Col. %	Row %	Col. %	Row %	Col. %	Row %	Col. %	Row %	Col. %	Col. %
<i>Highest education coding based on Census HEAP Level 1</i>										
Supplementary codes	6.8	44.4	1.8	100.0	4.2	47.9	0.0	0.0	5.6	1.0
Secondary education – Years 9 and below	19.5	59.5	14.6	80.0	6.6	34.9	4.7	20.0	12.0	10.2
Certificate I & II level	0.4	100.0	1.8	33.3	0.0	0.0	4.7	66.7	0.1	3.1
Secondary education – Years 10 and above	55.5	41.6	49.1	65.9	45.9	59.4	32.6	34.2	49.0	41.8
Certificate III & IV level	12.9	24.1	30.9	47.2	23.7	76.4	44.2	52.8	19.6	36.7
Advanced Diploma and Diploma level	2.7	15.9	1.8	25.0	8.3	83.3	7.0	75.0	6.3	4.1
Bachelor degree level	1.8	12.7	0.0	0.0	6.5	78.2	2.3	100.0	5.3	1.0
Graduate Diploma and Graduate Certificate level	0.0	0.0	–	–	1.5	100.0	–	–	1.0	–
Postgraduate degree level	0.0	0.0	0.0	0.0	1.2	94.1	4.7	100.0	0.8	2.0
<i>Grouped HEAP codes</i>										
Year 10 and higher	73.0	32.7	81.8	53.6	87.1	67.3	90.7	46.4	91.7	81.9
Tertiary	1.8	9.5	1.8	14.3	9.2	83.0	14.0	85.7	15.8	7.0
Total number	769		55		1,326		43		2,095	98
Total %		36.7		56.1		63.3		43.9		

Data Sources: Census of Population and Housing, 2016, TableBuilder; Phase 2 survey data collected and compiled by author.

Notes: Census Counts of Aboriginal and/or Torres Strait Islander people aged over 17 years based in Indigenous Geography for available fieldwork locations. Cells in this table have been randomly adjusted to avoid the release of confidential data. No reliance should be placed on small cells. Col. = Column.

1. Low income is less than \$400 per week, medium–high income is \$400 or over. Excludes data where 'Income not stated'.
2. Supplementary codes include no education and inadequate description.
3. Secondary education – Years 9 and below includes primary education.
4. Postgraduate includes Graduate Diploma and Certificate level and postgraduate degree level.
5. Census records with education level not stated or not applicable excluded itemwise.

5.4 Relationship between work and culture

One of the key propositions framing this thesis is that cultural knowledge and cultural status gained from time spent on cultural activities can be considered as embodied cultural capital, comparable to human capital. A strong parallel can be seen to exist with human capital inasmuch as cultural education and experience are a necessary, if not sufficient, means of building the skills essential to a (culturally) enriched life. Access to cultural knowledge can depend on factors including gender, age, cultural identity, the level of cultural knowledge actively used and taught by a person's clan and language group, and even socioeconomic and sociopolitical factors.

Examining the relationship between cultural activity and status with work and income can provide some insight into the value of the cultural capital of people involved in this research. The cultural activity and status indicators collected in the survey include reported levels of cultural activity, use of cultural knowledge in work and being asked to undertake cultural work like heritage surveys. Given the focus of this research on cultural activities, there may be some bias in the results towards higher levels of each, as a result of self-selection, or referral, of survey participants.

5.4.1 Use of culture in work

In this research, people were asked to self-assess the time that they spent on cultural activities, whether they had ever been asked to undertake cultural work like heritage surveys, or whether they worked on Country. These indicators of investment in culture and overlap with work were relevant to CDP participants as well as those in paid employment.

A majority of participants (72.6%) said that they used cultural knowledge in their work (paid employment or CDP). For some, this was about ways they worked with other Aboriginal colleagues and clients in a cultural context, including work in the health, education or social services sectors. For others, it was using particular specialised knowledge of Country or people in a representative role.

Being asked to undertake cultural work, like heritage surveys, can indicate a recognised level of cultural knowledge and authority or cultural capital held by individuals in an

embodied form comparable to human capital. The majority (83.0%) of those that had ever been asked to be involved in cultural surveys or other cultural business were in paid employment or CDP at the time they were surveyed.

Extending this use of cultural knowledge in work or working on Country, in Table 5-14, we see proportionally more of those with recognised cultural knowledge through using cultural knowledge in paid work (73.6%) or being asked to be involved in cultural surveys or other cultural business (76.9%) were in paid employment. Both measures demonstrate the way that people combined employment and culture in their day to day lives. Nearly everyone worked on Country, reflecting the location of interviews.

Table 5-14 Work involving culture or on Country for CDP and paid employment categories

	Broad activity category this month				Total
	CDP		Paid employment		
	Col. %	Row %	Col. %	Row %	
<i>Using cultural knowledge in work</i>					
Yes	50.0	26.4	86.7	73.6	72.6
<i>Asked to be involved in cultural surveys or other cultural business</i>					
Yes	32.1	23.1	66.7	76.9	53.4
<i>Working on Country</i>					
Yes	100.0	40.6	91.1	59.4	94.5
Total number	28		45		73

Source: Phase 2 survey data collected and compiled by author.

Note: Col. = Column.

Estimating the overlap between the time participants stated they spent on cultural activity and paid work provides an indication of the cultural input into paid employment. The distribution we see in Table 5-15 shows that the overlap was significant at three-quarters or more of the time for only 20% of employed participants, with most (68.9%) having had an overlap of one-quarter or less of the time.

Table 5-15 Overlap of paid work and culture

Percentage overlap	Number	%
None	12	26.7
Up to 25%	19	42.2
25–50%	3	6.7
50–75%	2	4.4
75–100%	9	20.0
Total number	45	

Source: Phase 2 survey data collected and compiled by author.

5.4.2 Clash of culture and work

Two survey questions were asked to determine the extent of the tension between work and culture. Given the framing of each of the questions in terms of what had been asked previously, as well as the way they were asked, it was unsurprising that the responses were not totally consistent. The first question about work clashing with or being a barrier to cultural activity, asked after the questions about cultural activity, was ‘Do you ever find yourself in a situation where you are not able to meet the demands of culture and work?’ The second question, which was asked after questions about employment and use of culture in work, was ‘Because you work, is it possible to meet all your cultural responsibilities?’ A clash between CDP work and culture was indicated by 39.3% of CDP participants, with 71.4% saying that they were able to meet their cultural responsibilities with work.

The comparison of responses from participants in paid employment to these questions, in Table 5-16, shows that only one-third indicated that there is no clash and they were able to meet their cultural responsibilities. Nearly one-third said that there was a clash between work and culture that made them unable to meet their cultural responsibilities. Finally, one-third said that there was a clash, but they were able to meet their cultural responsibilities. Examples of this situation that were given included where someone was unable to attend a funeral because of work, but instead ensured that a contribution was sent with another family member who was able to attend the funeral.

Table 5-16 Comparing responses on clash of work and culture and meeting cultural responsibilities

Culture and work clash? Y/N	Able to meet cultural responsibilities with work? Y/N		
	No	Yes	Total
No	2	15	17
Yes	13	15	28
Total	15	30	45

Source: Phase 2 survey data collected and compiled by author.

Note: Includes those in paid employment only.

Looking to characteristics of people in paid employment where a clash between paid work and culture was identified, in Table 5-17, all but one were working full-time (30 hours per week or more), and most were working in the non-government sector.

Table 5-17 Characteristics of paid work where it clashes with culture

	Number	%
<i>Sector of paid employment</i>		
Private sector	2	15.4
NGO	11	84.6
<i>Industry of employment or activity</i>		
Municipal services	1	7.7
Construction	2	15.4
Employment & support	2	15.4
Education	2	15.4
Health care & social assistance	3	23.1
Arts & tourism	2	15.4
Natural resource & land management	1	7.7
<i>Weekly work hours</i>		
Under 20 hours	1	7.7
30 to 39 hours	8	61.5
40 hours or over	4	30.8
<i>Gender</i>		
Female	7	53.8
Male	6	46.2
Total number	13	

Source: Phase 2 survey data collected and compiled by author.

The qualitative responses in the survey confirm that earning money is a key motivator for most participants seeking paid employment. In response to the question about what work means to them, nearly half the participants (43.9%) explicitly spoke of working to earn money, an income, survive, pay bills or provide for family. This was exemplified by the following comments:

Work means to me, is income. Like, if I really need an income to survive, income to live a better life and to get a better place or create a home. Just to have a better life.

Work means being able to earn an income, have an income. It gets you things – like roof over your head and food. Mainly it's being able to support yourself.

This explicit linking of work with money was even made by participants who had never worked. The handful of people on high incomes reflected on the purpose of the work related to their roles, rather than the income they earned.

5.4.3 Returns to cultural capital

I now turn to consider how time spent on cultural activity and use of cultural knowledge in paid work, as proxies for development and use of cultural capital, relate to a broad income level as an indication of return to that capital. While the numbers are small, Table 5-18 shows the use of cultural knowledge in work and having ever been asked to be involved in cultural work correlates to higher income profiles than the overall sample, with 8.9% and 6.4% in the higher income bracket compared to 5.1% for the overall sample, and 58.9% and 53.2% in the medium income bracket as compared to 38.8% for the overall sample.

Table 5-18 Cultural Involvement through working with culture or on Country by income level

	Income level		
	Low	Medium	High
	%	%	%
<i>Using cultural knowledge in work</i>			
Yes	32.1	58.9	8.9
<i>Asked to be involved in cultural surveys or other cultural business</i>			
Yes	40.4	53.2	6.4
<i>Annual cultural activities time</i>			
0–500 hours	69.6	26.1	4.3
501–1000 hours	68.8	31.3	–
1001–2000 hours	50.0	39.3	10.7
2001–5000 hours	48.0	48.0	4.0
5001–10000 hours	33.3	66.7	–
Total number	55	38	5
Row Percentage	56.1%	38.8%	5.1%

Source: Phase 2 survey data collected and compiled by author.

It should be noted that other sociopolitical factors, some with cultural elements, are likely to influence access to both cultural knowledge and employment opportunities. However, the data here is consistent with a general hypothesis that cultural knowledge embodied as cultural capital in First Nations contexts is comparable to human capital.

5.4.4 Access to traditional Country and employment

The limited job market in remote areas is seen as a key factor in the low levels of employment, including for people who live in remote areas to stay connected to Country.

Comparing living on traditional Country and access to traditional Country with the broad activity categories, in Table 5-19, shows that slightly higher proportions of those who lived on their traditional Country (47.1%) or could access it (47.7%) were in paid employment than the overall sample (45.9%). There may have been a higher awareness of the rights to access Country amongst participants in paid employment, given how many were employed in the NGO sector servicing the local Aboriginal people. Access to traditional Country can be facilitated through, or dependent upon, access to vehicles, funding and other resources flowing from employment. In this way, the desire to access Country can be an incentive to seek paid employment that offers the flexibility to meet cultural obligations and the returns to facilitate this.

Table 5-19 Employment categories for TOs of primary residence and access to Country

	Broad activity category this month						
	Unemployed/Income Support		CDP		Paid Employment		Total
	Col. %	Row %	Col. %	Row %	Col. %	Row %	Col. %
<i>TOs of normal residence</i>							
Yes	68.0	24.3	71.4	28.6	73.3	47.1	71.4
<i>Can access traditional lands</i>							
Yes	92.0	26.1	82.1	26.1	93.3	47.7	89.8
<i>Level of Access to Traditional Country</i>							
Full access	72.0	30.5	50.0	23.7	60.0	45.8	60.2
Some access	20.0	17.2	32.1	31.0	33.3	51.7	29.6
No access	–	–	–	–	2.2	100.0	1.0
Unsure	8.0	22.2	17.9	55.6	4.4	22.2	9.2
Total (number and %)	25	26%	28	29%	45	46%	98

Source: Phase 2 survey data collected and compiled by author.

Note: Col. = Column.

5.5 Conclusion

In reviewing the quantitative data collected during Phase 2, this chapter, together with Chapter 4, provided important context for the choice model analysis that follows. It also provided an overview of the sociodemographic and cultural characteristics of the participants. This is important given the heterogeneity of First Nations cultures and lived experiences.

In exploring the cultural characteristics of participants, it is clear that traditional languages were not dominant, and native title recognition was high but not matched by

access to Country, confirming concerns expressed in earlier research phases about barriers to accessing Country.

Of the western sociodemographic indicators collected, few are remarkable, with education and employment reflecting historical policies and practices. The most marked divergence from the Census comparator for my fieldwork locations is in relation to income, with a much higher proportion of the sample on low incomes. With such high costs of living in the fieldwork area it was unsurprising, therefore, that work meant income or money to so many participants. The CDP played an increasingly important role in participants' day-to-day lives, as the mutual obligation requirements had risen to 5 hours a day, 5 hours a week, with many participants working full-time hours in a training program during the fieldwork. This impinged on their ability to undertake cultural and other family activities.

The evidence in relation to indicators of cultural standing and returns through employment and income is consistent with the proposition that cultural knowledge and standing can be seen as embodied forms of cultural capital in this First Nations context.

The tension between work and culture was more keenly felt by those in paid employment with a majority indicating work clashed with culture. The relationship between employment and living on or access to Country suggested that access or living on Country was not incompatible with employment for a range of possible reasons, not least of which is the resources it can provide to enable that access. Finding the balance between work and culture is not a straightforward proposition with a single pathway.

By comparing participant characteristics with the available census data relating to the broader Aboriginal population, this chapter demonstrates that the survey process yielded good participation rates in the discrete communities and near perfect completion rates, with no particular biases. This indicates that the grounded methods, including the survey process, was feasible and appropriate for the participant groups, going some way to a positive answer to the research question 'What methods are feasible, reliable and appropriate for quantifying cultural values for First Nations people?'

The next chapter discusses the detailed choice modelling design before then moving to analysis of the choice model in Chapters 7 and 8.

Part III

Applying the Choice Modelling Approach

Chapter 6 Choice model design and application

6.1 Introduction

Part III comprises three chapters – Chapters 6, 7 and 8 – and presents key elements of the detailed design and analysis of the choice modelling undertaken in this research. This first chapter of Part III discusses the appropriate form and detailed design of a choice model to assess First Nations cultural values. The form and design is informed by choice modelling literature, together with the findings from the Preliminary Phase and Phase 1 fieldwork discussed in Chapter 4. The form and design are critical considerations to respond to the research question ‘What methods are feasible, reliable and appropriate for quantifying cultural values for First Nations people?’

After reviewing lessons from previous theoretical and experimental choice model studies with First Nations people, the theoretical basis of choice modelling is revisited before discussing the most appropriate form of choice model and then stepping through the design process. The model is specified before the process of analysis is described, the results of which are presented in following chapters.

Given the limited examples of choice modelling with First Nations peoples in the literature, this study is a significant contribution in applications of choice modelling in this context. Its novelty extends to the objective of the choice modelling – quantifying cultural values.

6.2 Valuation with First Nations peoples

Given the small population in the field locations for this research, maximising participation was critical to ensure that there was an adequate sample for quantitative analysis. Lessons from earlier theoretical and experimental studies using different forms of non-market valuation with First Nations people informed the design and conduct of this research.

6.2.1 Early theoretical studies

The first theoretical study exploring issues likely to arise in the application of non-market valuation of natural resources to First Nations people identifies key issues and potential means of addressing them (Adamowicz, Beckley, et al. 1998). These include issues of eliciting individual valuation responses in relation to non-substitutable goods including those that are sacred; communal resources and property rights; and satiation arising from limits to individual accumulation within First Nations cultures. Issues associated with aggregation of individual responses from First Nations people given group political and decision-making structures and aggregation of Indigenous and non-Indigenous responses given differences in political structures, currency and incomes were also identified.

A second theoretical study expanded the list of challenges identified by Adamowicz et al. (1998), to include seven additional factors affecting Indigenous responses and the aggregation of these responses (Venn & Quiggin 2007). These include: unfamiliarity with the purchasing power of money; poor English and numeracy skills; low level of knowledge and understanding about non-Indigenous forms of natural resource management; problems of interviewer and compliance bias; the tendency to share wealth among larger groupings; cultural diversity; and need to distinguish between TOs and others in Indigenous communities. In my experience, these generalisations do not apply across all First Nations peoples but may be relevant in some contexts.

6.2.2 Early experimental studies

Lessons from two key experimental studies using choice modelling with Aboriginal and non-Aboriginal participants informed the design, mode and delivery mechanism adopted in this research to maximise participation and completion of surveys. These Australian studies considered the value of cultural heritage sites and river ecosystems.

The first study of Indigenous and non-Indigenous people's preferences for the protection of Aboriginal cultural heritage sites in Queensland (Rolfe & Windle 2003) used a DCE that presented eight groups of multiple profiles (drawn from 64 different choice sets) to participants. Surveys were deployed as drop-off and collect, with an Aboriginal collector employed to sample the Indigenous community and to undertake optional face-to-face interviews. This study reported significantly lower survey response

rates in the targeted Indigenous cohort (56%) than the two general community samples (83% and 70%). The authors' focus on literacy was also reflected in the choice set design in survey forms, with the addition of pictures or icons to describe the attributes, while maintaining numerical, dollar and percentage values for attribute levels, a factor which may have challenged people without good numeracy skills.

A possible non-response bias, noted in the Rolfe and Windle study and based on higher than expected reported income of the Indigenous respondents, may have been attributable to the non-responders and proportion of respondents who did not disclose their income being from lower income groups (Rolfe & Windle 2003). The authors note the lower education levels in the Indigenous target population, but stop short at claiming this was a factor in the low response rate. While the proportion of choice sets skipped in completed surveys from the targeted Indigenous population was significantly lower (3.1%) than the two general populations (8.0% and 19.0%), if some Aboriginal respondents found the choice model particularly challenging then they may have elected not to complete and return the survey, which would also accord with the authors' note of potential educational bias in the Aboriginal sample.

The second study undertaken by Straton and Zander of river ecosystems (Straton & Zander 2009; Zander & Straton 2010) adopted a similar approach of blocking the 24 possible choice sets into groups of eight for the survey. The mode of delivery, using Aboriginal co-researchers who selected the participants and conducted the surveys face-to-face, no doubt played a significant part in the strong response rate from the first survey targeting Aboriginal people in discrete communities, with only two refusals noted (Straton & Zander 2009, p. 29). The second survey targeting non-Aboriginal sample through a mail-out survey had a response rate of 29% (Zander & Straton 2010, p. 2419). No specific data on choice set completion rates is provided in these reports.

6.2.3 Best-Worst Scaling with First Nations peoples

The use of DCEs is more prevalent than BWS involving First Nations peoples, particularly in the natural resource management context. A recent study with Yawuru in Broome used BWS Case 1, the object case, to ascertain preferences for aspects of wellbeing (Yap 2017). The survey was conducted by the lead researcher, community

partner and local Aboriginal research assistants using tablet technology. The 30 choice sets across 25 attributes were split into 2 blocks of 15 choice sets. Around 80% (123 of 156) respondents completed the choice task in the final survey, with feedback suggesting that respondents felt the survey was too long, with too many choice sets and that it was repetitive. While that research project aimed to build local research capacity, completion rates may have been increased with consistent delivery by a single researcher rather than a range of researchers with resultant differences in explanation and assistance to respondents.

6.2.4 Cultural choice modelling for economic valuations

Extending economic valuation to include cultural values is challenging, but essential, to avoid undervaluation of welfare estimates and subsequent decision-making. As far as I am aware, this research is the first exploring cultural values for Australian First Nations peoples.

A choice modelling study incorporating a Māori cultural attribute in the context of freshwater resources resulted in significant WTP estimates, demonstrating the need to take account of Indigenous cultural values (Miller et al. 2015). Omitting cultural elements can impact on welfare estimates and decision-making, exacerbating historical exclusion of First Nations interests in decision-making.

6.3 Theoretical basis

6.3.1 Random utility theory

As touched on in Section 3.5 of Chapter 3, choice modelling, including BWS, has its theoretical basis in random utility theory, which essentially sets out that the utility U_{iq} an individual i derives from each of the q choices reflects their systematic (observed) preferences V_{iq} and random (unobserved) factors ε_{iq} (Thurstone 1927).

$$U_{iq} = V_{iq} + \varepsilon_{iq} \quad (6-1)$$

Thurstone's original pairwise comparison model was developed theoretically in mathematical psychology by Luce (1959) and Marley (1968). In transportation research, McFadden applied random utility theory in an econometric model, initially using data on

revealed preferences from previous transport studies to predict demand for a new transport system (McFadden 1974a, 1974b), before generalising the model to broader consumer products (McFadden 1980).

In essence, random utility theory models preferences as a function of the relative frequency of choice. This can be expressed as the probability of choosing h from a range of options q in choice set C_n

$$P(h|C_n) = \frac{V_h}{\sum_q (V_q)}, \forall q \in in C_n \quad (6-2)$$

Or in log form:

$$\ln[P(h|C_n)] = \ln [V_h / \sum_q (V_q)] \quad (6-3)$$

Substituting inferred choice frequency for probabilities

$$\ln (\text{choice frequency}_h) = \ln V_h - \ln (K_{C_n}) \quad (6-4)$$

Where K_{C_n} is a constant associated with each choice.

The specific model adopted in this research is set out later in Section 6.5 of this chapter.

6.4 Which choice model form?

The choice of the appropriate form of choice model depends on the objective, context and population being sampled. Careful consideration of cognitive load was central in ensuring that the method was feasible and appropriate for the participants, in order to address the research question.

An overarching criterion in designing the choice model for this research was minimising cognitive load so that enough participants would attempt and complete the choice task. This was particularly important given the relatively small populations of people with Nyikina and Mangala connection in the fieldwork locations. A complex choice model would likely result in only a small sample completing the task, making it difficult to draw conclusions, and there would likely be an educational bias in the sample. The results

from the model adopted revealed no overall bias towards higher levels of education in the sample population relative to the Census in Table 5-6 of Chapter 5.

Participants were expected to have a wide range of literacy and education experience, and the choice model needed to be comprehensible and relevant to everyone. To avoid cognitive burden and fatigue, the number of profiles to be presented to each participant was minimised, and involved realistic attributes and levels informed by earlier phases of this research.

6.4.1 Forms of choice models

As outlined in Section 3.5 of Chapter 3, there are several forms of choice model, including binary DCEs, multiple DCEs and the three forms of BWS. In environmental economics, multiple DCEs are the most common form for valuation of non-market environmental attributes.

By asking respondents to select best and worst, BWS can efficiently yield more information than DCEs that only ask for the best choice. When people are faced with several choices, ruling out the worst and selecting the best in each choice set or profile can be nearly as easy as picking the best. In this way, BWS can yield more information about relative preferences with minimal additional cognitive load. This power to cognitive load is the most attractive feature of BWS.

The three forms of BWS introduced in Chapter 3 are Case 1 the object case, Case 2 the profile case and Case 3 the multi-profile case. Case 1 is used to identify preferences from a larger list of individual things. Case 2 and Case 3 are used when seeking to identify preferences of different attributes at different levels, with Case 2 presenting a single profile at a time while Case 3 presents a number of profiles at a time (Louviere et al. 2015).

Selection of the form of BWS depends on the objective and relevant attributes that are appropriate to the question. Case 1, the object case, is used when trying to reveal preferences from a larger list of objects or things, by presenting subsets of the larger set and asking respondents to select the best and worst from each set. Case 2, the profile case, is used when seeking to rank preferences of different attributes at different levels by presenting profiles or choice sets that combine each attribute at different levels and

asking the respondent to identify the best and worst in each profile. Case 3, the multi-profile case, is often used to rank preferences where one attribute has a monetary value to value the other attributes, and presents a sequence of choice sets where each choice set is made up of several profiles or scenarios, and asking the respondent to identify the best and worst profiles in each set. Examples of these BWS cases are illustrated below.

Fig. 6-1 Example of the three forms of BWS – Case 1, Case 2 and Case 3

Case 1 (Object Case)		
Select which of the following is best and which is worst for you		
Best	Attribute	Worst
	Earning income	
	Spending time hunting, fishing, and gathering	
	Having access to traditional Country	

Case 2 (Profile Case)		
Select which aspect of the following situation is best and which is worst for you		
Best	Attribute level	Worst
	Earning a medium income of \$1,200 per fortnight before tax	
	Spending less than 2 hours hunting, fishing, or gathering food	
	Some access to traditional Country	

Case 3 (Multi-profile Case)			
Select of the following situations is best and which is worst for you			
	Situation 1	Situation 2	Situation 3
	Earning a low income	Earning a high income	Earning a medium income
	Spending 2–5 hours a week hunting, fishing, or gathering food	Spending no time hunting, fishing, or gathering food	Spending more than 5 hours a week hunting, fishing, or gathering food
	Some access to traditional Country	Full access to traditional Country	No access to traditional Country
Best			
Worst			

6.4.2 Why use BWS Case 2 – the profile case?

The primary objective of this research is to compare the relative importance or value of cultural activity and other aspects of culture outside the market with a monetary or financial value to enable quantification of those cultural values. Case 1 does not support valuation as it does not support multiple levels of attributes and simply ranks different attributes, making it more relevant to the construction of indices or rankings of objects. Both Case 2 and Case 3 could enable comparison of cultural activity at different levels with financial values at different levels.

The key advantage of Case 2 over Case 3 is the lower cognitive load of considering a single profile of attributes at different levels rather than multiple profiles of attributes at different levels at a time (Yoo & Doiron 2013). Louviere et al (2015, p. 141) identify three conditions for the estimates from Case 2 to be the same as Case 3, namely that the respondents must not become deterministic; there must be no interactions; and the context must be consistent across choice tasks.

However, because only one profile is considered at a time in Case 2, asking which attribute in the profile is best and worst doesn't indicate how the respondent rates the overall profile or situation relative to the status quo or whether it is an acceptable situation. This can be addressed in part by asking the respondent whether the overall profile or situation is acceptable or not, supplementing the attribute level choice information.

6.5 Designing the choice model

The design process involves developing attributes and levels, deciding how many profiles and the appropriate design to achieve this, testing and recoding, if necessary, to ensure profiles are realistic, and blocking the design if it has more choice sets than an individual can evaluate.

A preliminary design involving four attributes (employment and associated income; time spent hunting, fishing and gathering per week; number of relatives living with; time spent 'on Country') was developed prior to fieldwork. This enabled feasibility testing of a design which was not likely to overload participants. It also provided a model for

ethics clearance and presentation to key informants and leaders of the Aboriginal groups involved in this research. The preliminary design was amended in light of Phase 1 lessons to make the attributes and levels more relevant and realistic.

6.5.1 Which attributes and levels?

As described in Chapter 4, the key themes associated with a good life that people identified in Phase 1 were earning income from paid employment; spending time on cultural activities; spending time with Aboriginal people including family and kin; and being able to access traditional Country. These themes were translated to attributes that were important and relevant, comprehensible, and had some independence from each other, with levels of the attributes that were meaningful and relevant. The choice model was framed by survey questions that ensured participants had contemplated and understood the attributes.

A major design challenge was choosing attributes given the limit of independence of so many factors of First Nations lives and livelihoods. Complete independence of attributes is difficult to achieve in the context of contemporary remote First Nations society, where people are continuing to live in ways that combine traditional and western ways of life. For example, in my preliminary design I had an attribute ‘spending time on Country’ in recognition of the importance of Country in Indigenous identity and lives, but it became apparent during Phase 1 that this often coincided with spending time hunting and fishing or on other cultural activities and that having access to Country was important to participants.

A second design challenge was the introduction of a financial element that could be used as a trade-off for the valuation. A tax or payment mechanism is problematic in the remote Indigenous socioeconomic context. On the other hand, income, and an underlying assumption that it is a consequence of time spent working, can add a time constraint factor into the attribute. However, the nexus between income and time spent working was weakened by the mutual obligation requirements of the CDP where earning the lowest income involved significant time ‘working’. The CDP in operation during this research required most people to work 5 days a week for 5 hours a day for the Newstart allowance, with incentives to work longer hours reduced by the design of

penalties. This made the level of income from working a relevant measure for the choice model.

The rationale for these attributes is summarised in the following sub-sections.

Income from working

Varying attitudes to employment, income and cultural activity were evident from both interviews and observation during Phase 1. CDP participants were required to work 25 hours a week, but there was a notable income differential between CDP participants and those in paid work. This meant that the level of income earned through working, whether from CDP or paid employment, was important and relevant in the choice model. The qualitative data from Phase 2 identified income as a critical motivator to work in paid employment.

Cultural activities

Phase 1 identified key cultural activities that were important to most people. While most people referred explicitly to traditional culture such as ceremony, many spoke more broadly about the social context of culture and the cultural education of young people as important. Fishing and hunting were the most frequently referenced cultural activities. The food security benefits of fishing and hunting, while evident, were only noted by a minority of people.

Access to Country

Phase 1 revealed participants generally had a good understanding of the Country they belonged to, their language groups, and the native title status of their lands – findings confirmed in Phase 2. The native title representative body for Nyikina and Mangala people, WAC, also had a strong interest in improving the understanding of the value of native title. While solastalgia was raised by some WAC directors, the concept of damage and hurt caused by loss of environmental values was not raised by other participants during Phase 1.

Participants frequently referred to being on Country and in community near Country, which highlighted the importance of being able to access Country. However, concern with the barriers to accessing Country, such as fencing and locked gates, were even

more frequently mentioned. This introduced the concept of rights to access, as well as practicalities affecting frequency of access, into the attribute.

Being with Aboriginal people

My observation of people interacting, in both town and community environments, made it clear that interaction and spending time with family and other Aboriginal people were important. Introductions were generally framed around family relationships and often referred to cultural standing of individuals. In discussions it was clear that while some people were pleased with their ability to mix and converse with *kartiya*, the importance of sociocultural interactions with other Aboriginal people took primacy in day to day life. Tensions between being with family and other Aboriginal people and working were evident in several interviews, and many people opted to be away from family

6.5.2 How many profiles to present?

Determining how many profiles to present involved balancing optimal design principles and cognitive load. Utilising design principles for increased statistical efficiency and ability to estimate the main effects and interactions might lead to more complex design with many profiles while a smaller number of profiles was essential to ensure that the choice tasks were not so onerous and fatiguing for participants that they became a disincentive to participation.

Having identified four attributes, I selected the minimum of three relevant levels in each. A full factorial design would present every possible combination of attributes at their different levels. With 4 attributes at three levels, this would involve presenting $3^4=81$ profiles, which would overwhelm participants because of the cognitive load and time it would take to complete. An alternative approach involves fractional factorial designs that present a smaller number of profiles. This can be achieved with a blocked design and/or a balanced orthogonal design.

A blocked design is created by splitting a larger design such as a full factorial into blocks of profiles with random subsets of the sample, with different blocks presented to subsets of the sample of respondents. For example, the full factorial of 81 profiles could be split into three blocks of 27 profiles. To ensure balance, the design would ensure that

each attribute appears equally often and appears with levels of other attributes equally often. This blocked design is most appropriate where the survey population size is known and large enough to ensure that it is balanced. A mechanism to rotate the respondents through blocks can be used to ensure that the overall balance of profiles is maintained.

Balanced orthogonal designs can use existing published orthogonal arrays²⁴ to create a subset of the full factorial. A balanced design is one in which attribute levels appear equally often individually and in combination with the levels of other attributes (Louviere et al. 2015). For an application of one of these designs to be considered as a feasible alternative to blocking, it is critical to ensure that each resultant profile in the design makes sense. This can be achieved by describing the profile with its attributes at the levels included and ensuring that such a profile, situation or scenario is realistic.

Research based predominantly on web based opt-in research (Coast, Flynn, et al. 2006; Louviere et al. 2013) suggests that the statistical efficiency gains in using a larger subset or number of profiles does not necessarily result in significant reductions in response rates. However, in the context of this research, the need to minimise the cognitive and time load for the choice task overrode the benefit of increased statistical strength of a larger subset of profiles or a full factorial design. Where participation in research is completely opt-in, an arduous survey was likely to be a strong disincentive to participation.

6.5.3 Final design

The selection of an Orthogonal Main Effects Plan (OMEP) with three levels and strength-two: oa.9.4.3.2 yields nine profiles, each containing four attributes at one of the three levels of each. This design is less fatiguing for participants than an alternative approach of blocking the full factorial of 81 profiles into blocks of 27. The design was applied, and resultant profiles tested to ensure they represented realistic situations.

To provide some comparison of acceptability of the profiles, given that they are presented one at a time in a Case 2 design, a supplementary accept/reject question asking if the overall scenario presented in the profile is 'OK' or 'not OK' is asked after

²⁴ Published balanced orthogonal arrays include those published by Neil Sloane

each profile is considered. This question of acceptability of the profile is a binary DCE that assumes the respondent's status quo is the benchmark by which they assess the acceptability of the overall profile. While it is a different task than the selection of individual attribute levels within the profile as Best or Worst, as a DCE it represents the more frequently adopted valuation tool. Few examples of this approach of using BWS Case 2 with a supplementary acceptance questions are revealed in the literature (Marley et al. 2008; Soto et al. 2016; Yoo & Doiron 2013).

Each profile was simply illustrated with diagrams representing each level of each attribute. An example of a choice set is shown in Fig. 6-2.

Fig. 6-2 Example of illustrated profile (choice set) with supplementary question

 Best	Situation	 Worst
	Working or spending most of the time with Aboriginal people 	
	Some access to traditional country 	
	Rarely spending much time on cultural activities 	
	Earning a medium income of \$1200 per fortnight before tax 	
Is this situation OK for you?		Yes / No

6.5.4 Survey length

The profiles were embedded in a survey that included questions about cultural and language affiliations and connection to Country, age, education, employment, and attitudes to culture and employment.

As well as the complexity of the choice model the overall length of the survey was an important design consideration to avoid cognitive burden and fatigue for participants.

As discussed in Chapter 3, research with First Nations peoples in Australia has demonstrated the importance of keeping surveys as short and simple as possible to prevent fatigue and avoidance. As with the choice model design, there is a balance to be struck between the detail collected and engaging and retaining participants.

6.5.5 Survey and choice model delivery

The use of technology in survey and choice modelling delivery is efficient and effective for participants who are comfortable with the technology and platform used. Recent examples of survey delivery using tablet technology with Aboriginal people in remote areas demonstrate its feasibility, including some software that supports remote operation with subsequent uploading of results (Throsby & Petetskaya 2015; Yap 2017). In populations where use of technology is not widespread, accepted, or supported by telecommunications infrastructure, relying on it for surveys can present problems. It may even result in sample bias because it may be more enticing for younger and more information technology (IT) literate participants, while deterring people who are less confident with technology.

Use of technology solutions such as tablet technology supported by proprietary software to deliver choice modelling could:

- support strong visual imagery for a choice model
- support self-administration by participants
- automate the recording, storing, manipulation and transmission of data, and
- automate the blocking of choice sets if required.

On the other hand, a simple paper-based approach is:

- accessible to everyone, irrespective of location
- able to support a combination of pictures and words
- affordable

-
- not reliant on electrical power, battery recharging or telecommunications connectivity in the field, and
 - free of ethical issues associated with data being held by proprietary software, or cloud-based storage.

Given the use of an OMEP rather than a blocked design, the major limitation of a paper-based approach is the requirement for manual data recording, management and manipulation. Participants in Phase 1 were comfortable with the transparency of handwritten notes, reinforcing the appropriateness of a low-technology approach in this context. A manual flip chart with each of the nine profiles on a page was used, enabling participants to control the pace of movement through the choice model. Fig. 6-3 shows a participant using choice model flip chart during survey. Note taking was supplemented by transcribing recordings where participants agreed to this.

Fig. 6-3 Participant using choice model flip chart during survey



6.6 Limitations in methodology

Limitations in the methodology mean that caution is required in interpreting the results. The small sample size and non-random selection, together with temporal issues around recall, seasonality and varying conceptions of aspects of culture, may affect the representativeness of the findings.

6.6.1 Pragmatic sample

The original intention of engaging with a language group or groups as opposed to a single community or town, was twofold. Primarily, it was to ensure a sample size that could support the quantitative analysis. Secondly, it was to ensure that the range of living and working circumstances of a relatively mobile population, with some degree of common cultural practice, was reflected in the quantitative sample.

The exclusion of Looma, the second largest Aboriginal community in WA, limited the number of adults with Nyikina and/or Mangala connection in the fieldwork area that I could survey. Relying on snowball sampling rather than randomised selection within the population has the potential to introduce bias, although no bias was evident in the analysis presented in Chapter 5.

6.6.2 Time-use and seasonality

Issues related to the concepts of time and time-use play out in a choice model where time constraints are considered. As discussed in Sub-section 3.7.5 of Chapter 3, the methodology recognised the need to balance the limits of reliability of recall of time spent over an extended period relative to the burden of observing and or having participants record times actually spent (Gray et al. 2005, p. 15). Some participants found it hard to quantify time-use without prompting with a timeframe such as over a year, and many recalled concrete examples in framing their responses.

The seasonality of life in the remote tropical north of Australia is an important consideration in this research. First Nations cultural livelihoods are highly attuned to this seasonality. This can be a limitation for researchers who do not conduct fieldwork over a full annual cycle or more, particularly if they are reliant on observation or even recall of events that are not current. Seasonality was referenced by nearly all participants, particularly in relation to cultural activity. While the fieldwork was mostly undertaken in the dry season participants would often refer to fishing, hunting and gathering of bush foods as well as ceremonies that occurred in other seasons. Despite the potential limitation of recall, participants' ability to reference specific examples of their experiences in other seasons, generally in quite concrete terms, provided some reassurance that undertaking such research in a relatively short part of an annual cycle was reasonable.

6.6.3 *Intertemporal preferences*

Application of the values from choice modelling in a cost benefit analysis or resource planning context requires careful consideration of discount rates applicable to future streams of benefits or costs. These can be estimated by specifically testing intertemporal preferences in the methodology. This research does not specifically address intertemporal preferences, but other research with First Nations peoples provides some insights into discount rates that may be applicable to cultural values.

Limited choice modelling research with First Nations people specifically deals with discount rates. Research on the development and environmental trade-offs estimated an implied discount rate of zero (Spyce 2012). This aligned with my intuitive expectations of low or negligible discount rates where First Nations cultural identity is tied to the land, and cultural and community continuity is important. In the context of small scale fisheries where international studies have revealed very high discount rates (up to 200%) and current bias amongst fishers, a study amongst Indigenous fishers in Madagascar estimated a relatively lower implied discount rate of 62% (Oleson et al. 2015).

Differences in intertemporal preferences between Indigenous and non-Indigenous people are an important consideration where populations of both are affected by, or concerned with, any resultant decisions. Other issues, such as relative weighting of preferences in a strictly additive model, also need to be dealt with in these contexts.

6.6.4 *Cultural concepts*

As one participant commented ‘Culture is not just fishing, hunting and ceremony’. They spoke about Aboriginal ways of being and relating to each other, and a deep connection to Country. In that way, so many aspects of First Nations culture are not time dependent, and in some ways are timeless, but critical to continued cultural practice and identity.

Creation or beginning stories carry knowledge about Country throughout generations, and where once transmitted orally, are now retold in books, animations, and stage productions. This adaptation demonstrated an evolution of the ways cultural knowledge is transmitted and held by First Nations peoples. A relevant example is how the story of *Woonyoomboo*, the major Creation Ancestor for the Nyikina people, has been retold in the

traditional narrative song *Warloongarriy*, and is now also recorded and transmitted in the children's book '*Woonyoomboo* A Story from Jarlmadangah Community' (Thompson 2008), several multimedia YouTube videos, and is referenced in cultural plans and references (Barber & Woodward 2018; Poelina et al. 2019; Watson et al. 2011).

Woonyoomboo left law, ceremonies, dances, kin and skin relationships for the Nyikina people and his story conveys botanical, ecological, cartographic knowledge that continues to be important to livelihoods on Country.

Most cultural activity in Aboriginal society is undertaken in groups, reflecting the close association of cultural and social contexts. This may render the cultural activity indistinguishable from the social activity. For example, fishing and hunting is generally undertaken in groups, often a mix of generations, and might involve storytelling, and teaching about the ecology of the Country. The interrelatedness that is evident in so many aspects of First Nations lives challenges the independence of attributes generally assumed in choice modelling.

6.6.5 Attribute independence and aggregation

The primary objective of the choice modelling in this research is to measure the attribute levels against a common scale, in this case a dollar value. This is premised on an assumption that the design will be additive – each attribute contributes or adds to utility, and independence of irrelevant alternatives (IIA) – where the likelihood of choosing any particular attribute or attribute level is not dependent on another. Where additivity holds a simple OMEP may provide an adequate design.

This can only be tested in larger Case 2 designs that allow the independent estimation of main effects and two-way interactions. For the 4-attribute 3-level design used in this research, a balanced blocked design of 27 profiles per block would not satisfy the requirement to exceed the degrees of freedom ($df=32$), and would present a task that would seem onerous for most participants.

Given the potential dependence of attributes for the participants, caution needs to be exercised in interpreting the results.

6.6.6 Individual versus group preferences

While the focus on this research was on preferences for cultural activity, the methodology relied on individual responses in survey and choice modelling. Adamowicz (1998) flagged potential issues with valuation based on aggregation of individual First Nations preferences, given group political and decision-making structures. An alternative approach with First Nations peoples, involving testing the effect of communication prior to decision-making, demonstrated the effect of group preferences in choice modelling related to common property resources (Nikolakis et al. 2016). Moving away from resource allocation decisions to wellbeing, Yap (2017) flags a possible similar approach of taking the ranking of attributes back to male and female focus groups as a way of discussing and deciding as a group.

Arguably a method that captured group preferences, perhaps through communication of options within a group, may have yielded slightly different responses. Given the reticence of people to meet in groups during Phase 1, such a novel adaptation may not have been feasible or appropriate for the participants in this research, and may have introduced more bias in responses.

6.7 The model specified

6.7.1 Application to this research

The underlying economic model for the choice model in this research is the following reduced form utility function.

$$U = \sum_{m=1}^M \sum_{l=1}^L \beta_{ml} m_l \quad (6-5)$$

Where:

U = utility

β_{ml} = coefficient value from attribute m at level l

Expanding this to the specific attribute levels incorporated in the model results in a fully expanded utility function:

$$U = \alpha + \beta_{p1} p1 + \beta_{p2} p2 + \beta_{p3} p3 + \beta_{c1} c1 + \beta_{c2} c2 + \beta_{c3} c3 + \beta_{a1} a1 + \beta_{a2} a2 + \beta_{a3} a3 + \beta_{y1} y1 + \beta_{y2} y2 + \beta_{y3} y3 \quad (6-6)$$

Where the attribute levels are represented as:

$p1, p2, p3$ (levels of ‘spending time with Aboriginal people’ attribute)

$c1, c2, c3$ (levels of ‘access to traditional Country’ attribute)

$a1, a2, a3$ (levels of ‘time spent on cultural activities’ attribute)

$y1, y2, y3$ (levels of ‘earning income’ attribute), and

$\alpha = \text{constant}$

6.7.2 Behavioural implications for analysis

The mathematical basis for analysis of BWS depends on the approach to selection of best and worst that respondents are assumed to take. This also impacts on consideration of the means of how to aggregate the information from the choice model for analysis.

The two approaches are known as the sequential model and the maxdiff model. The sequential model assumes behavioural responses in which the best (or worst) is first selected from the full M range of attributes in the profile, and then the worst (best) from the remaining (M–1) attributes. The maxdiff model assumes respondents select as best and worst the pair that maximises the difference in utility between the available (M(M–1)) attributes.

Comparisons of these two approaches (Flynn et al. 2008; Louviere et al. 2015, p. 53) cover both the behavioural and analytical considerations, although a direct comparison of the methods by Flynn et al. (2008) demonstrates that the results of the two approaches are closely approximated at the aggregate sample level.

The sequential model is considered simpler to analyse and is assumed by specialised software (Latent GOLD Choice 4.5) that supports BWS (Louviere et al. 2015). The maxdiff model is more complex to analyse because it assumes that the respondent chooses a specific best and worst combination that maximised the difference in utility between the M(M–1) possible combinations.

The surveying process is crucial in determining the most appropriate analytical approach. How respondents are prompted, and how they consider best and worst choices, is relevant consideration in decisions about whether the sequential or maxdiff model is most appropriate. Online or face-to-face surveys incorporating BWS, where respondents are first asked to select the best thing and then the worst thing (or the worst then the best thing), are characteristically sequential models.

In the face-to-face surveys in this research respondents were free to respond with either best or worst choice first to the question ‘which is best for you and which is worst for you?’ The survey technique in this research sought to empower respondents by giving them physical control of the flip chart choice models, enhancing this freedom to choose best or worst first. A sequential approach may have been adopted by some respondents, particularly if they understood the order articulated in the question as an instruction. However, the freedom to choose best or worst first meant that some respondents selected the best first in some profiles and the worst first in others, particularly those profiles that were not attractive overall.

Given this relative freedom, it is not clear how respondents considered each profile, so count analysis was undertaken following both models. Using both analytical models in this research enables comparison and testing for consistency with the findings by Flynn et al. (2008) that the two approaches yield comparable results at the aggregate sample level. Given the novelty of the context of this research, comparative analysis of both approaches can also inform future research.

6.8 Process of analysis

A broad scan of recent literature comparing choice modelling methodologies and analysis and establishing standards for health state valuation has focused on DCEs (Mulhern et al. 2018; Soekhai et al. 2018; Xie et al. 2015). Also evident in the health economics literature are comparisons of different forms of BWS and DCEs (Cheung et al. 2016; Lancsar et al. 2013; Louviere & Islam 2008; Whitty & Gonçalves 2017; Whitty et al. 2014; Yoo & Doiron 2013).

Comparisons of analytical techniques using different tools are less evident in the literature (Flynn et al. 2007, 2008; Lancsar et al. 2007; Louviere et al. 2015). It has been

noted that, in relation to DCEs in health economics ‘inadequate reporting of methodological details inhibits quality assessment’ (Soekhai et al. 2018), and prior to publication of a substantive volume on BWS (Louviere et al. 2015), there was limited guidance in the literature to selection of appropriate BWS techniques and associated analytical methodologies (Flynn et al. 2007).

In this research the BWS results were analysed broadly following the process set out by Louviere et al. (2015, pp. 69–84), with score calculation, linear regressions to estimate utilities and multinomial regressions to allow conditional or grouped analysis with fixed or random effects. After multinomial (conditional logit) regression modelling using dummy coding of results, effects coding was undertaken to separately consider the mean impact of attributes and attribute levels. These analyses are presented and discussed in Chapter 7.

Chapter 8 extends these analyses to examine the heterogeneity of respondents using latent class analysis (LCA) and analysis of the binary supplementary question about acceptability of the profile using count and regression analysis. These results are compared with the cluster analysis of best and worst counts and the BWS results in Chapter 7.

A key result of analysing the choice model data where the reference attribute such as cost or income has a linear scale, is the identification of the relative value of the other attributes. The final step in analysis in Chapter 8 uses the results from both the BWS and the binary supplementary question to estimate the marginal values of each attribute level in dollar terms. This addresses the objective of this research of identifying the value of cultural activities.

While it would be feasible to skip some of the count and linear regression modelling that estimate relative values, these steps provided familiarity with the data and comparators for the results. They are presented in the following chapters to reflect the stepwise process and for comparison purposes.

While specialised proprietary software can be used to analyse the results from choice modelling, statistical analysis packages such as Stata, R and SAS can also be used. Following the preliminary analysis of counts using Excel, Stata 12 and Stata 15 were

used for all final quantitative analysis of the choice model and other quantitative results presented in this thesis.

6.9 Conclusion

This chapter discusses the rationale for and some of the detailed considerations in the design of the BWS Case 2 choice model with a supplementary acceptance question DCE, adopted in this research. Drawing on the lessons from early phases of the research it sets out the basis of selecting attributes and levels, the number of profiles to present and the way the choice model would be incorporated into the survey and undertaken by participants.

Given the innovative nature of this research into First Nations cultural values, the experimental design was limited to maximise participation in the small population. The resultant design and deployment was intended to answer the research question about feasible, reliable and appropriate methods for quantifying cultural values.

Potential limitations in the methodology are canvassed in order to frame the application of results and inform future designs. Finally, the process of analysis is outlined, the results of which are set out in the following Chapters 7 and 8.

Chapter 7 Ranking Best to Worst

7.1 Introduction

Building on discussion of the BWS methodology and design adopted in this research in Chapter 6, this chapter presents analysis estimating the relative utilities of the attributes and levels of the BWS Case 2 choice model. Given the novelty of the methodology in the context of this research, utilities were estimated by applying several methods to the results from both the BWS and the supplementary question DCE. This multipronged approach enables assessment of the reliability of the methods, addressing that part of the research question ‘What methods are feasible, reliable and appropriate for quantifying cultural values for First Nations peoples?’

To recap on the source of choice modelling data available for analysis, each survey participant that completed the choice modelling task – who will be referred to as respondents in the context of the choice model analysis – was presented with nine individual profiles in a BWS Case 2 design, each profile containing the four attributes at particular levels. For each profile, the main BWS task involved respondents identifying which attribute level was best for them (Best) and which was worst for them (Worst). Participants then responded to the supplementary question – a binary DCE – indicating if they accepted (‘OK’) or rejected (‘not OK’) the profile as a whole.

A stepwise approach to analysis and estimation of utilities indicated by these responses – Best, Worst, and accept/reject – was undertaken for several reasons. Firstly, there is limited detailed discussion of analytical methodologies for BWS in the literature, with most dedicated BWS modellers using analytical software that is not open source. Secondly, the analytical approaches applied to the different data address different objectives, including overall sample preferences, individual preferences, and assessments of particular biases. Thirdly, stepping through the analysis from simple counts to more complex regressions builds an increasingly detailed picture of the preferences of the sample population as a whole and characteristics of individual respondents. Fourthly, it enables comparison of results across techniques, thereby supporting assessment of consistency of the responses in elucidating preferences that would provide confidence in the reliability of the choice modelling methods. Finally, as discussed in Chapter 6, the

applications of choice modelling in the context of First Nations culture are limited, and adopt various approaches to analysis from counts (Yap 2017) to combinations of counts and multinomial regressions (Nikolakis et al. 2016; Oleson et al. 2015), warranting detailed discussion and comparison of results across the techniques adopted in this research.

An outline of elements in this stepwise analytical approach is presented in Table 7-1. This overview assists readers navigate this and the next chapter.

Table 7-1 Aspects, elements and objectives of analysis presented in Chapters 7 and 8

Aspects of analysis	Data source and elements	Objective/rationale
What is being analysed?	BWS profile: Best choices	Separate analysis of Best and Worst choices provides indicative results and assessment of consistency or bias in the sample
	BWS profile: Worst choices	
	BWS profile: Stacked Best and Worst (Best-minus-Worst) choices	Pooling Best and Worst data (with Worst scaled by –1 for Best-minus-Worst (B–W)) provides more preference information than separate consideration of Best and Worst Scores used for cluster analysis of individual choices
	BWS profile: Best-Worst pairs	Analysis of specific Best-Worst pairs provides most preference information including relative utilities and \$ values
Group of analysis	DCE: accept/reject choices	Assessment of profile responses provides comparable relative utilities and \$ values
	Aggregate sample	Average response for sample – useful for determining average values
Type of analysis	Individual respondents	Enables identification of outliers, potential groupings of respondents and associated significant covariates
	Count analysis – non-regression	Provides indicative relativities to benchmark subsequent analysis
	Linear regressions on weighted dependent variables (regress)	Approximates conditional logit, estimating utilities – aggregate sample only
	Multinomial regressions: conditional (fixed effects) logit regression (clogit); random effects logit regression (xtlogit)	More complex regressions allow conditional or grouped analysis. Estimates utility at aggregate sample or individual level
Coding scheme for regression analysis	Latent Class Analysis (lclogit)	Regression modelling identifies clusters or groups of respondents and any observable characteristics
	Dummy coding (binary 0, 1 indicating absence/presence)	Basic approach to coding for the type of regressions used in BWS
	Effects coding (–1, 0, 1 indicating reference level, absence, presence)	Effects coding enables separate consideration of the mean impact of attributes and attribute levels

Note: Stata command for respective analysis noted in brackets.

Most possible combinations of the types of analysis, coding and group of analysis were applied to the BWS and supplementary question data and analysed using Excel 2016 and Stata/IC 15.1. As mentioned previously in Chapter 5, all but one of the 98 participants who undertook the survey completed the choice model exercise, bringing the sample size for the analysis in this chapter to 97 respondents. A selection of the results from the analysis undertaken is presented in this and the following chapter, to illustrate and compare the key results.

The remainder of this section outlines the analysis presented in this chapter, starting with a review of the notation utilised in the theoretical utility model that underpins the choice model and its analysis in Section 7.2.

Analysis of the BWS data starts in Section 7.3 with count calculations, by attribute level, of Best, Worst, stacked Best-minus-Worst (B–W) scores, then Best-Worst pairs. These count analyses provide indicative utility rankings of attribute levels and support some cluster analysis. Sub-section 7.3.1 starts with simple analysis of the counts of Best and Worst choices separately, enabling comparison of, and visual testing of the consistency between, Best and Worst choices for the sample as a whole. Patterns of individual's stacked Best and Worst choices, by attribute and overall, were then analysed to test for clustering of preferences and identification of outliers and bias in Sub-section 7.3.2. Specific Best-Worst pairs are then analysed in Sub-section 7.3.3 using marginal count means to rank relative utilities of attribute levels and attribute means for the sample as a whole, and paired count analysis that provides visual and more granular information about individual preferences.

Analysis shifts from count analysis to regression modelling in Section 7.4. The same data – Best, Worst, stacked Best and Worst, and Best-Worst pair – was coded two ways (dummy and effects coding) and modelled to estimate utilities for the sample average using linear regression techniques. Subsequent multinomial regression modelling calculated utilities for the aggregate sample and individuals, and allowed for conditional or grouped analysis with fixed or random effects. The mean impact of attributes and attribute levels were also estimated in a multinomial regression model using effects coding. Key regression results are presented and compared in tabular and graphical form, by data type, in the sub-sections of Section 7.4. Models of Best and Worst data are compared in Sub-section 7.4.1. Stacked Best and Worst data analysis results,

including the ranking of all attribute levels, is presented in Sub-section 7.4.2. The results of the Best-Worst pair data modelling in Sub-section 7.4.3 includes rankings of attribute levels for comparison. The purpose of effects coding in determining attribute impacts in the modelling and relevance to this research is then discussed in Sub-section 7.4.4.

The count and regression techniques, by the element being analysed for the sample and individuals, are summarised in Table 7-2 below. Selected results are reported in this thesis to support the comparison of estimated utilities across techniques.

Table 7-2 Analysis conducted by group, element and type

Element	Average sample		Individual	
	Count	Regression	Count	Regression
Best	Number (no.)	Linear WLS (regress)		Multinomial conditional logit (clogit)
Worst	Frequency (%)			
	Probability (%)			
Best-minus- Worst, Stacked Best and Worst	Number (no.) Frequency (%) Ratios ($\sqrt{B\%/W\%}$), $\ln[\sqrt{B\%/W\%}]$	Linear WLS (regress)	Cluster Analysis (sum of squares (SS), total empirical scale parameter (TESP))	Multinomial conditional logit (clogit)
Best-Worst pairs	Marginal count means	Linear WLS (regress)	Paired counts	Multinomial conditional logit (clogit) LCA – Multinomial latent class (lclogit)
DCE (Accept/reject supplementary question)	Number (no.) Frequency (%) (accept minus reject) difference frequency (%)	Linear WLS (regress)		Multinomial random effects logit (xtlogit)
Combinations of DCE & BWS	Best with accept: No. & frequency (%) Worst with reject: No. & frequency (%) Share of Best with accept in BWP frequency (%) Share of Worst with reject in BWP frequency (%)			

Notes: Regressions were conducted on dummy coded and effects coded data unless otherwise indicated. WLS = weighted least squares (the dependent variable is weighted by a small fraction). Stata command for respective analysis noted in brackets in regression columns.

The next and final chapter of Part III extends the analysis further to examine: LCA of the BWS results, analysis of the DCE and how the results relates to those from the BWS model, and the derivation of WTP/WTAs valuations from the relative utilities.

7.2 Notation and terminology

The notation adopted in the analysis is as follows:

$n = 1, \dots, N$ denotes a respondent ($N = 97$)

$j = 1, \dots, J$ denotes a profile ($J = 9$)

$m = 1, \dots, M$ denotes an attribute ($M = 4$)

$l = 1, \dots, L$ denotes a level ($L = 3$)

$ml = m1, \dots, mL$ refers to a level of attribute m

Each profile is described by the M attributes set at specific levels, with x_{ml}^{nj} a 0–1 variable indicating availability which equals 1 if attribute m at level l in profile j is shown to respondent n . Similarly g_{ml}^{nj} is a 0–1 variable indicating if attribute m at level l in profile j is chosen as Best (or Worst) by respondent n .

$$x_{ml}^{nj} = 1 \text{ if attribute } m \text{ at level } l \text{ in profile } j \text{ is shown to respondent } n, \\ 0 \text{ otherwise} \quad (7-1)$$

$$g_{ml}^{nj} = 1 \text{ if attribute } m \text{ at level } l \text{ in profile } j \text{ is chosen as Best(Worst)} \\ \text{by respondent } n, 0 \text{ otherwise} \quad (7-2)$$

The availability of an attribute level for the total sample across all profiles is:

$$\sum_{n=1}^N X_{ml} = \sum_{n=1}^N \sum_{j=1}^J x_{ml}^{nj} \quad (7-3)$$

Where

$$X_{ml} = \text{the availability of attribute } m \text{ at level } l \text{ across all profiles} \\ \text{shown to respondent } n \quad (7-4)$$

In describing the choices made and the resultant counts, the following terminology is used:

-
- ‘Best’ is the attribute level chosen as best, and also refers to the counts of that attribute level being chosen as best
 - ‘Worst’ is the attribute level chosen as worst, and also refers to the counts of that attribute level being chosen as worst
 - ‘Best-minus-Worst’ (B–W) is the count of stacked Best and Worst – best choices minus the count of worst choices for an attribute level, and
 - ‘Best-Worst pair’ is the pair of attribute levels chosen as best and worst within a profile.

Generally, these counts are for a specified attribute level or pair of attribute levels.

Attribute level counts can be contextualised by individual profile (j) or for all the presented profiles (J) and by the individual (n) or by the total sample (N), depending on the purpose of the analysis.

For reference throughout this chapter and the next, the codes corresponding to the full descriptions for each attribute level *ml* are set out in Table 7-3 below. Similarly, the attributes are described in summary form as ‘people’, ‘Country’, ‘activities’ and ‘income’ through this part of the thesis.

Table 7-3 Attribute level codes and descriptions

Code	Full description
p1	Rarely working or spending time with Aboriginal people
p2	Working or spending some time with Aboriginal people
p3	Working or spending most of the time with Aboriginal people
c1	Little or no access to traditional Country
c2	Some access to traditional Country
c3	Full access to traditional Country
a1	Rarely spending much time on cultural activities
a2	Spending some time on cultural activities
a3	Spending a lot of time on cultural activities
y1	Earning a low income (e.g. Centrelink, \$600 per fortnight before tax)
y2	Earning a medium income of \$1,200 per fortnight before tax
y3	Earning a high income \$2,700 per fortnight before tax

7.3 Count analysis

Analysis of counts of the choices that respondents make in response to the BWS exercise provides an indication of the relative utilities of attributes and their levels. Stepping through the analysis and findings presented in this section, counts of Best and Worst are analysed, by attribute level, separately in Sub-section 7.3.1 to compare consistency. This testing is a prerequisite to combining or stacking Best and Worst as Best-minus-Worst in Sub-section 7.3.2. The counts of Best-Worst pairs are then analysed two ways in Sub-section 7.3.3 using the marginal and paired analysis methods. As the number of options increases with each combination of Best and Worst – from four Best or Worst options to eight stacked Best and Worst to 12 Best-Worst pairs per profile – the number of observations being analysed and detail of preference information increases.

A summary of the raw count results, by profile, for the BWS and DCE are presented in Appendix 8.

7.3.1 Best and Worst counts

Best and Worst counts, frequencies, probabilities and other indicators derived from counts, provide a preliminary overall picture of the strength of feeling of respondents to the attributes and levels presented. Consistency of choice should, in theory, be reflected in Best and Worst choices being inverse or mirror images. The analysis of Best and Worst counts presented in this section is for the aggregate sample.

Count and frequency measures

For each individual respondent, the raw Best (or Worst) count g_{ml} is the number of times they select level l of attribute m as best (or worst) across all J profiles, and the sum of these selections for all attribute levels equates to the number of profiles presented.

$$\sum_{m=1}^M \sum_{l=1}^{L_m} g_{ml} = J \quad (7-5)$$

Expanding this for the specific design in this research:

$$\begin{aligned} g_{p1} + g_{p2} + g_{p3} + g_{c1} + g_{c2} + g_{c3} + g_{a1} + g_{a2} + g_{a3} \\ + g_{y1} + g_{y2} + g_{y3} = 9 \end{aligned} \quad (7-6)$$

The first approximation of relative utilities relies on aggregate sample counts and frequencies of the Best and Worst separately, and the difference in these, for each attribute level. No adjustment or normalisation for availability bias is required, as all attribute levels were available three times ($X_{ml} = \sum_{j=1}^J x_{ml}^j = 3$) in the $J=9$ profiles in the balanced design presented to each respondent.

The results of this first approximation in Table 7-4 shows, for each attribute level, and in total, the aggregate sample Best and Worst counts (g_{ml}) in Columns (1) and (2). Column (3) results from subtracting Worst from Best to give an indication of the scale, and positive or negative direction, of the preference response to the attribute level. Column (4) squares these differences $(B - W)^2$ providing an absolute (without positive or negative direction) measure of the strength of response. For example, the largest $(B - W)^2$ value for an attribute level of 46,225 for the lowest level of the Country

attribute (c1) indicates a strong response, whereas the smallest value of 25 for the middle level of the income attribute (y2) indicates a weak response because there was little difference in how often this attribute level was chosen as Best or Worst.

The frequency scores (f_{ml}) for Best and Worst choices enable ranking of all levels of attributes by the sample as a whole. For each attribute level, the frequency score f_{ml} is essentially an average or mean value, calculated as the number of times it is chosen divided by the number of times it is available, expressed as a fraction or percentage.

$$f_{ml} = \frac{\sum_{n=1}^N \sum_{j=1}^J g_{ml}}{\sum_{n=1}^N X_{ml}} \quad (7-7)$$

As each attribute level is available three times to each of the N=97 respondents in the sample, its frequency is simply the total count divided by 291. The Best and Worst frequencies for each attribute level are shown in Columns (5) and (6) of Table 7-4.

While the relativities of frequencies (f_{ml}) are identical to the counts (g_{ml}) in this design, the scaling of frequencies between zero and one enables interpretation of consistency of the results for Best and Worst across attributes.

Table 7-4 First approximation – aggregate sample counts and frequencies of Best and Worst choices

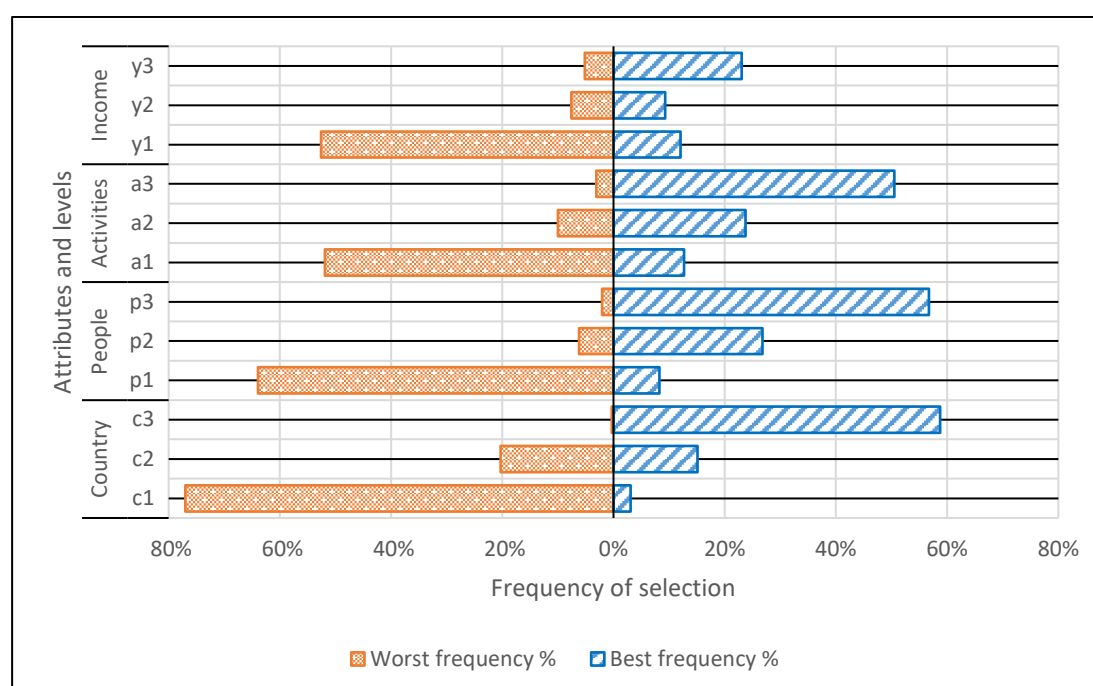
Attribute	Level	(1) Total Count Best	(2) Total Count Worst	(3) Best- minus- Worst	(4) (B-W) ²	(5) Frequency Best	(6) Frequency Worst
People	p1	24	186	-162	26,244	0.082	0.639
	p2	78	18	60	3,600	0.268	0.062
	p3	165	6	159	25,281	0.567	0.021
Country	c1	9	224	-215	46,225	0.031	0.770
	c2	44	59	-15	225	0.151	0.203
	c3	171	1	170	28,900	0.588	0.003
Activities	a1	37	151	-114	12,996	0.127	0.519
	a2	69	29	40	1,600	0.237	0.100
	a3	147	9	138	19,044	0.505	0.031
Income	y1	35	153	-118	13,924	0.120	0.526
	y2	27	22	5	25	0.093	0.076
	y3	67	15	52	2,704	0.230	0.052
Totals		873	873	–	180,768	3.000	3.000

Data Source: Phase 2 survey data collected and compiled by author.

The frequencies for attribute levels, expressed in percentage terms, are graphed in Fig. 7-1, with Worst frequencies shown as negative values in orange dotted bars and

Best frequencies as positive values in blue cross-hatch bars. These reflect the relative preference strengths of attribute levels, showing the stronger positive responses to highest levels and negative responses to the lowest levels of each attribute. The frequencies of Worst in the lowest levels are greater than those of Best in the highest levels of each attribute, which could be attributable to loss aversion and possibly nay-saying (Kahneman 2011; Tversky & Kahneman 1974), behavioural biases that can lead to some imbalance in Best and Worst choices.

Fig. 7-1 Overall frequency of Best and Worst counts by attribute level expressed in percentage terms



Data Source: Phase 2 survey data collected and compiled by author.

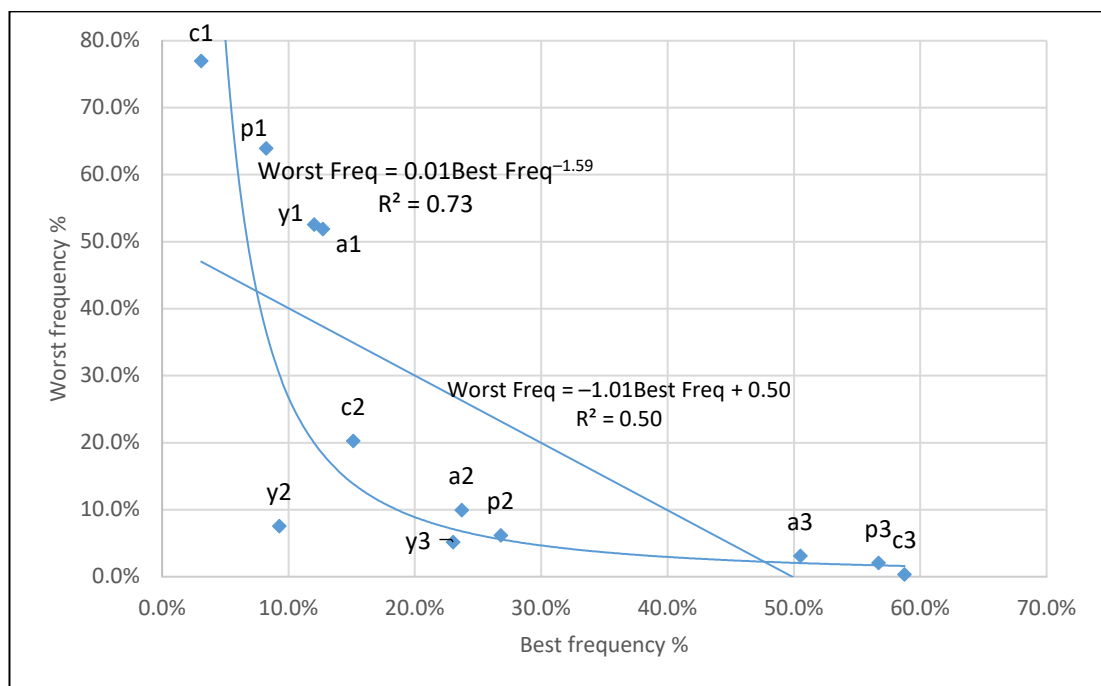
Note: Worst frequencies depicted in orange and Best frequencies in blue. Frequencies are shown in percentage terms.

The differences between the frequencies of levels of an attribute indicate value differentiation between the levels, while the relative frequencies across all attribute levels indicate overall value differentiation. Comparing the Country and income attributes for example, we see the former has the strongest overall results and differentiation, while the income attribute has the least differentiation and smallest frequencies at the highest and second smallest at the lowest level. The Worst frequencies for the income attribute, being more notably differentiated than the Best, highlights the negative response to low incomes.

Overall, the relativities of counts and frequencies of Best and Worst in Table 7-4 and Fig. 7-1 shows the symmetry of Best and Worst between attribute levels and consistency of scale within attributes. This indicates that Best and Worst data could be stacked for further analysis. Moving beyond simple count and frequency comparisons, several tests of the consistency of Best and Worst choices at the aggregate sample level determine the appropriateness of stacking Best and Worst data for further analysis. These frequency relationships and ratios, starting with the direct ratio between the frequencies then moving to more complex proportional measures between Best and Worst, are described below.

Plotting the frequency that each of the 12 attribute levels is chosen as Best against Worst in Fig. 7-2 reveals the expected inverse relationship between Best and Worst counts (Louviere et al. 2015, p. 230). The power relationship ($\text{Worst Freq} = 0.01 (\text{Best Freq})^{-1.59}$, $R^2 = 0.73$) shows a better fit than the straight linear relationship ($\text{Worst Freq} = -1.01 (\text{Best Freq}) + 0.50$, $R^2 = 0.50$). Three distinct groupings of attribute levels can be seen with the lowest levels on the top left-hand side above the line of best fit and the medium levels of each attribute below that line in the left-hand bottom and the highest levels low on the right-hand side. The only exception to this grouping is the highest income level (y3) which sits with the middle levels.

Fig. 7-2 Frequency of Best versus Worst counts for each attribute level (aggregate sample)



Data Source: Phase 2 survey data collected and compiled by author.

Further ratio and difference tests using the Best and Worst counts and frequencies for the aggregate sample can tell us about consistency and indicate the meaningfulness of the data. In line with approach taken by Louviere et al. (2015, pp. 198–200), three such measures: Best frequency minus Worst frequency; the square root of the ratio of frequencies (Best frequency divided by Worst frequency); and the natural log of this square root, are shown as the final three columns of Table 7-5.

The first measure of the difference between Best and Worst frequencies ($B\% - W\%$) in Column (3) indicates the relative preference of the attribute levels as rated by the respondents. Attribute level measures of this difference are centred at zero, but level differences are not as comparable as the differences of ratio measures.

The second measure in Column (4), the square root of the ratio of Best and Worst frequencies ($\text{SQRT}(B\%/W\%)$), also indicates how strongly preferred the attribute levels were. This ratio scale should be proportional to the Best frequency if there is reasonable consistency between Best and Worst choices. For example, this ratio measure for p3 is more than double that for p2, and the Best frequency for p3 is just over double that for p2, indicating that p3 is more than twice as preferred as p2 for the sample as a whole.

Table 7-5 Best and Worst count frequencies and ratios

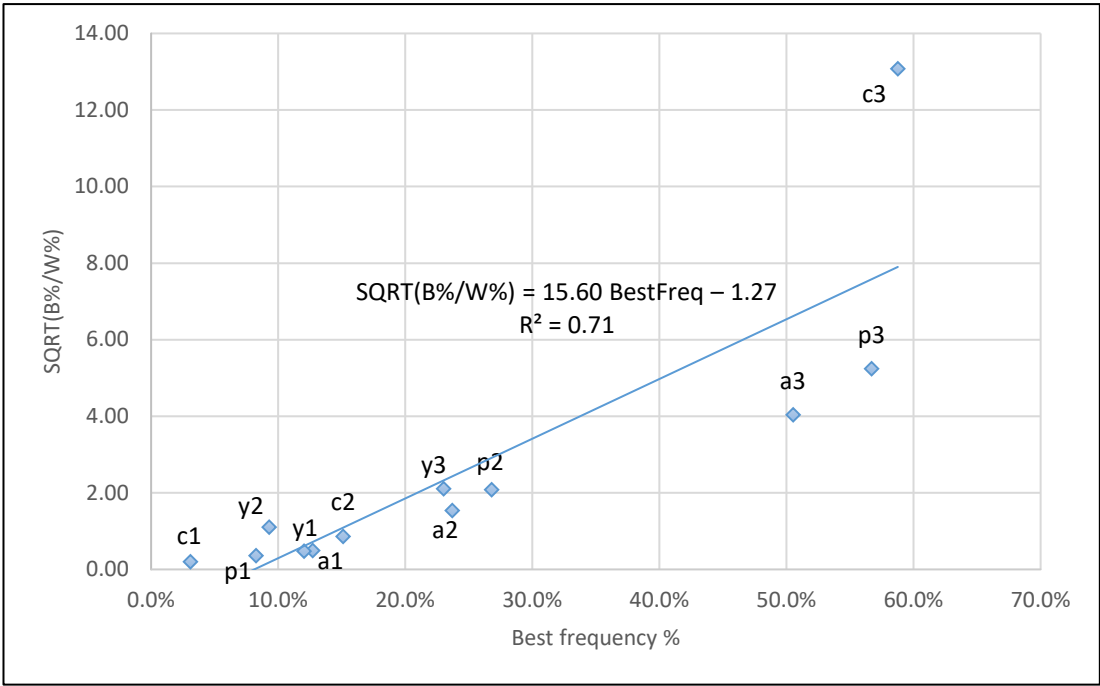
Attribute	Level	(1) Best Frequency (B)	(2) Worst Frequency (W)	(3) Best frequency minus Worst frequency (B–W)	(4) Square root of frequency ratio $\text{SQRT}(B/W)$	(5) Natural log of square root of frequency ratio $\text{Ln}[\text{SQRT}(B/W)]$
People	p1	0.082	0.639	–0.557	0.359	–1.024
	p2	0.268	0.062	0.206	2.082	0.733
	p3	0.567	0.021	0.546	5.244	1.657
Country	c1	0.031	0.770	–0.739	0.200	–1.607
	c2	0.151	0.203	–0.052	0.864	–0.147
	c3	0.588	0.003	0.584	13.077	2.571
Activities	a1	0.127	0.519	–0.392	0.495	–0.703
	a2	0.237	0.100	0.137	1.543	0.433
	a3	0.505	0.031	0.474	4.041	1.397
Income	y1	0.120	0.526	–0.405	0.478	–0.738
	y2	0.093	0.076	0.017	1.108	0.102
	y3	0.230	0.052	0.179	2.113	0.748
Totals		3.000	3.000	0.000		

Data Source: Phase 2 survey data collected and compiled by author.

The relationship between this square root ratio and Best frequency for each attribute level, graphed in Fig. 7-3, shows that the proportional relationship is a close fit for most attribute levels. The relationship is weaker for attribute levels with the highest frequencies of Best, namely c3, p3 and a3. We see that for attribute level c3 the ratio measure sits well above the linear relationship with the Best proportion, pointing to the influence of a low Worst proportion in the square root ratio, as shown in Table 7-5.

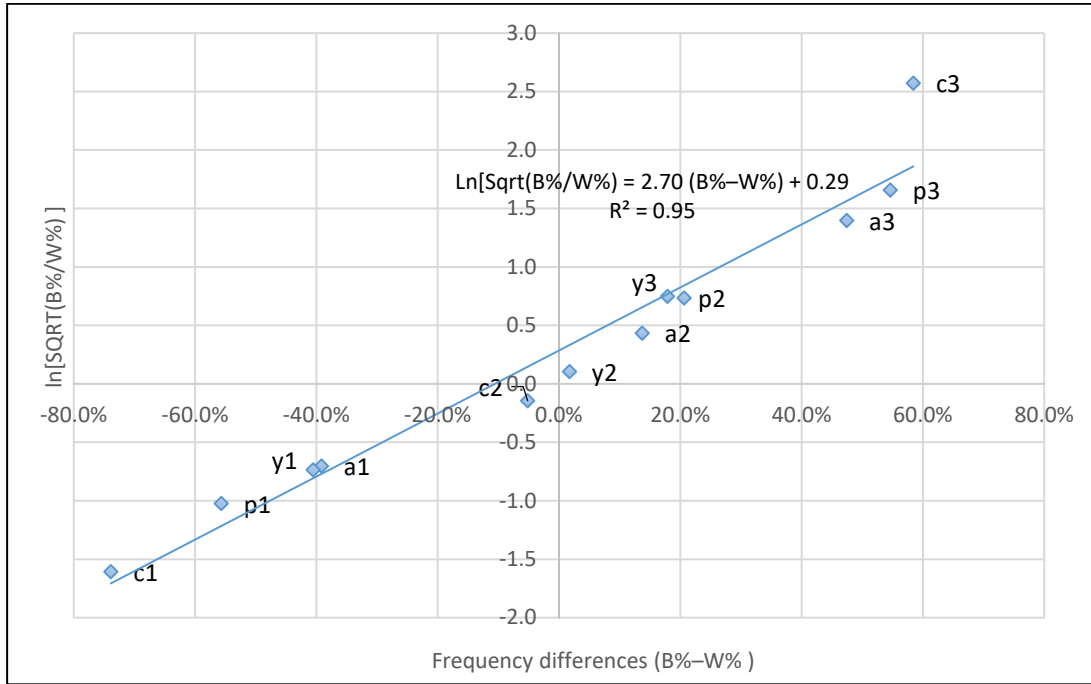
The final measure testing the consistency and meaningfulness of the count data is the natural log of the square root of the Best and Worst frequency ratio $\text{Ln}[\text{SQRT}(\text{B\%/W\%})]$, shown in Column (5) of Table 7-5. This difference measure is scaled around zero, as was the frequency difference measure $(\text{B\%}-\text{W\%})$, and if the choices are consistent these two should be proportional for each attribute level. The relationship between these two zero-centred difference measures shown in Fig. 7-4 plots demonstrates a strong linear relationship, with a high measure of fit ($R^2=0.95$).

Fig. 7-3 Best frequency versus square root of ratio of Best to Worst frequencies (SQRT[B%/W%]) (aggregate sample)



Data Source: Phase 2 survey data collected and compiled by author.

Fig. 7-4 Frequency differences of Best and Worst (B%–W%) relative to natural log of square root of Best to Worst ratios ($\ln[\text{SQRT}(B\%/W\%)]$) (aggregate sample)



Data Source: Phase 2 survey data collected and compiled by author.

Probabilities of selection

The probabilities of selection of individual attribute levels and whole attributes for the aggregate sample indicate the values and part values of attributes and attribute levels expressed in a way that may be more intuitive, with probabilities lying between zero and one, and summing to one.

The probability (P_{ml}) of selecting a particular level l of an attribute m as Best or Worst the number of times it was selected divided by the number of profiles presented for the sample as a whole.

$$P_{ml} = \frac{\sum_{n=1}^N \sum_{j=1}^J g_{mjl}}{N \cdot J} \quad (7-8)$$

The average selection frequency (f_{ml}) and the probability (P_{ml}) are proportional as follows:

$$f_{ml} = \frac{\sum_{n=1}^N \sum_{j=1}^J g_{mjl}}{\sum_{n=1}^N X_{mjl}} = \frac{\sum_{n=1}^N \sum_{j=1}^J g_{mjl}}{N \cdot 3} = \frac{3 \cdot \sum_{n=1}^N \sum_{j=1}^J g_{mjl}}{N \cdot 9} = 3 \times P_{ml} \quad (7-9)$$

These probabilities estimate the part worth, or scale position, of individual levels of each attribute, and can be expressed as fractions or in percentage terms.

To estimate the impact of an attribute, the probabilities for each attribute are summed across all levels.

$$P_m = \sum_{l=1}^L P_{ml} = \sum_{l=1}^L g_{ml}/J = \sum_{l=1}^L \frac{\sum_{n=1}^N \sum_{j=1}^J g_{mnl}}{N \cdot J} \quad (7-10)$$

It should be noted that, as an average of all levels of an attribute, the impact of an attribute should not be confused with the importance of an attribute.

The probabilities for attributes, attribute levels and the ranges between attribute levels, shown in Table 7-6, provide a preliminary indication of the ranking of attributes as Best or Worst across all respondents. Noting that attribute impact rankings, as averages of the attribute levels, is not a measure of importance, Columns (2) and (4) reflect different rankings of attribute impact for Best and Worst.

The range in attribute level probability differences in Columns (5) and (6) of Table 7-6 indicate scale sensitivity within attributes, with larger ranges indicate greater scale sensitivity. These ranges rank attributes consistently across Best and Worst (Country, people, income, activities).

Table 7-6 Probabilities that attributes and levels will be selected as Best or Worst

Attribute	Level	(1) Probability attribute level Best	(2) Probability attribute Best	(3) Probability attribute level Worst	(4) Probability attribute Worst	(5) Range probability Best	(6) Range probability Worst
People	p1	0.027		0.213			
	p2	0.089		0.021			
	p3	0.189	0.306	0.007	0.241	0.162	0.206
Country	c1	0.010		0.257			
	c2	0.050		0.068			
	c3	0.196	0.257	0.001	0.325	0.186	0.255
Activities	a1	0.042		0.173			
	a2	0.079		0.033			
	a3	0.168	0.290	0.010	0.216	0.126	0.163
Income	y1	0.040		0.175			
	y2	0.031		0.025			
	y3	0.077	0.148	0.017	0.218	0.046	0.158
Totals		1.000	1.000	1.000	1.000		

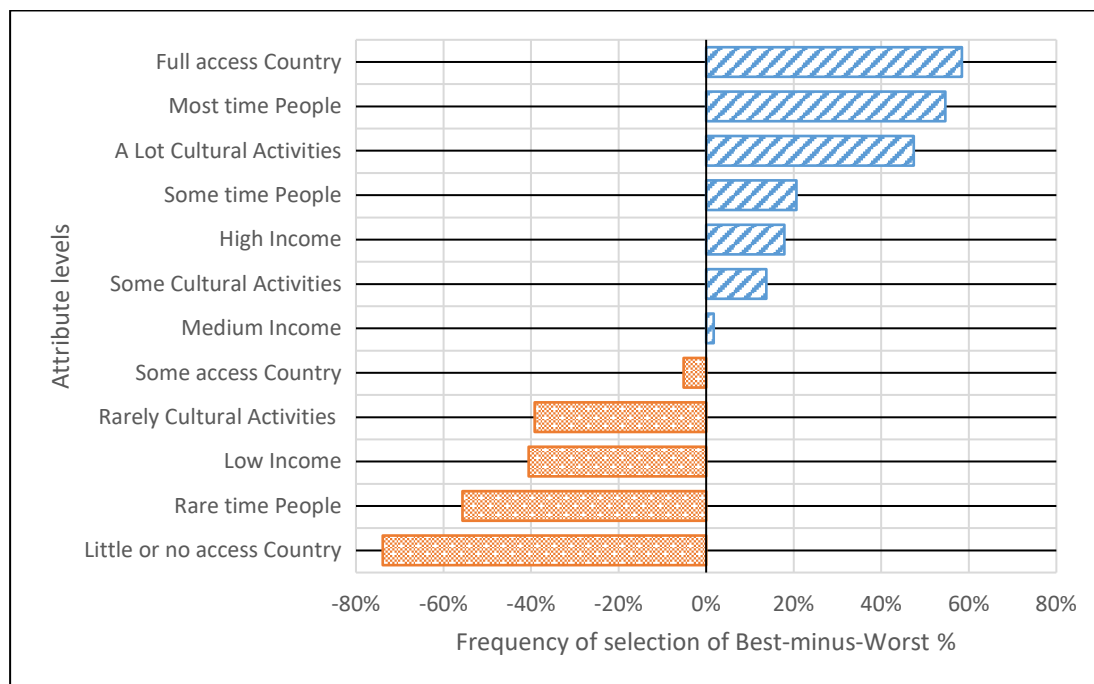
Data Source: Phase 2 survey data collected and compiled by author.

7.3.2 Stacked Best-minus-Worst scores

After satisfying the tests for consistency in the inverse relationship of Best versus Worst scores, for the overall sample, analysis was extended to stacking Best and Worst, by adding the positive Best counts to the negative Worst counts in Best-minus-Worst scores. The stacking of Best and Worst in this way effectively doubles the power of the analysis. Analysis was undertaken at the aggregate sample level to reveal overall preferences, as well as at the individual level to check for consistency and heterogeneity of responses.

At the aggregate sample level, the Best-minus-Worst tallies provide another perspective on the relativities of attribute level preferences. The relative preferences for attribute levels indicated by the frequency of Best choices minus Worst choices are shown graphically in Fig. 7-5, ranked from the least preferred at the bottom to the most preferred at the top. While shown in rank order rather than by attribute, these are comparable to the attribute level relativities portrayed in the separate Best and Worst sample level totals in Fig. 7-1, the 'Best-Worst' and '(B-W)²' columns in Table 7-4 and the attribute level probabilities in Table 7-6.

Fig. 7-5 Overall frequency of Best-minus-Worst counts by attribute level



Data Source: Phase 2 survey data collected and compiled by author.

Cluster analysis

At the individual level, stacked Best-minus-Worst scores can be analysed using a form of cluster analysis known as Sum of Squares (SS) and total empirical scale parameter (TESP) measures. By revealing clusters of responses and outliers, this analysis enables assessment of the degree of heterogeneity of the sample, and identification of respondents that potentially misunderstood the choice tasks or sought to ‘game’ their responses. Importantly, these aid in assessing whether the cognitive burden of this form of choice modelling was too onerous, as well as understanding individual differences. This testing is important in responding to those elements of the research question about the methods being feasible and appropriate. Decisions to retain or remove outliers from further analysis are supported by further investigation.

Calculating and graphing the distribution of individual attribute SS and TESP measures, compared with a normal distribution for the sample total, provides an indication of preference scale, consistency and variances (Flynn et al. 2015, pp. 261–262, Appendix A; Louviere et al. 2015, pp. 246–250).

For each attribute, an individual respondent’s SS is calculated by squaring and summing their normalised Best-minus-Worst scores for each levels of that attribute. Equation (7-11) shows how this is calculated in this research, noting that each attribute level is presented three times in the nine profiles considered by each individual.

$$SS_m = \sum_{l=1}^L (BWN_{ml})^2 = \sum_{l=1}^L \left(\frac{(B_{ml} - W_{ml})}{3} \right)^2 \quad (7-11)$$

Where:

SS_m = Sum of Squares for attribute m

BWN_{ml} = best worst normalised score for attribute m level l

B_{ml} = best count for attribute m level l (g_{ml} for Best)

W_{ml} = worst count for attribute m level l (g_{ml} for Worst)

The total of an individual respondent’s SS across all attributes, or TESP, is calculated using Equation (7-12.)

$$TESP = \sum_{m=1}^M SS_m \quad (7-12)$$

Where:

TESP = Total Empirical Scale Parameter

Graphing the SS scores for each individual provides a visual means of assessing the consistency and the strength of feeling or scale of preference responses for each attribute. The histogram of TESP measures provides a picture of the consistency or heterogeneity of respondents.

The distribution of individual respondents' SS measures for each attribute overlaid with a normal distribution curve of each SS, calculated on the mean and standard distribution of the SS measures for that attribute, are shown in Fig. 7-6. These histograms enable visual assessment of respondents' consistency and comprehension of choice task. For each attribute in this research, the minimum SS is 0.0, and the maximum is 3.0.

Individuals with SS measures at the maximum of 3.0 may have misunderstood the choice task, or may have sought to game the model, by always choosing that attribute as Best (or Worst) irrespective of level. These maxima are seen for two individuals in the people attribute and three individuals in the income attribute. This low number of respondents showing these maxima confirms the feasibility and appropriateness of the BWS choice task for the respondent population, in response to the research question. However, to ensure that the reasons behind these responses were understood, further non-identifying investigations were undertaken.

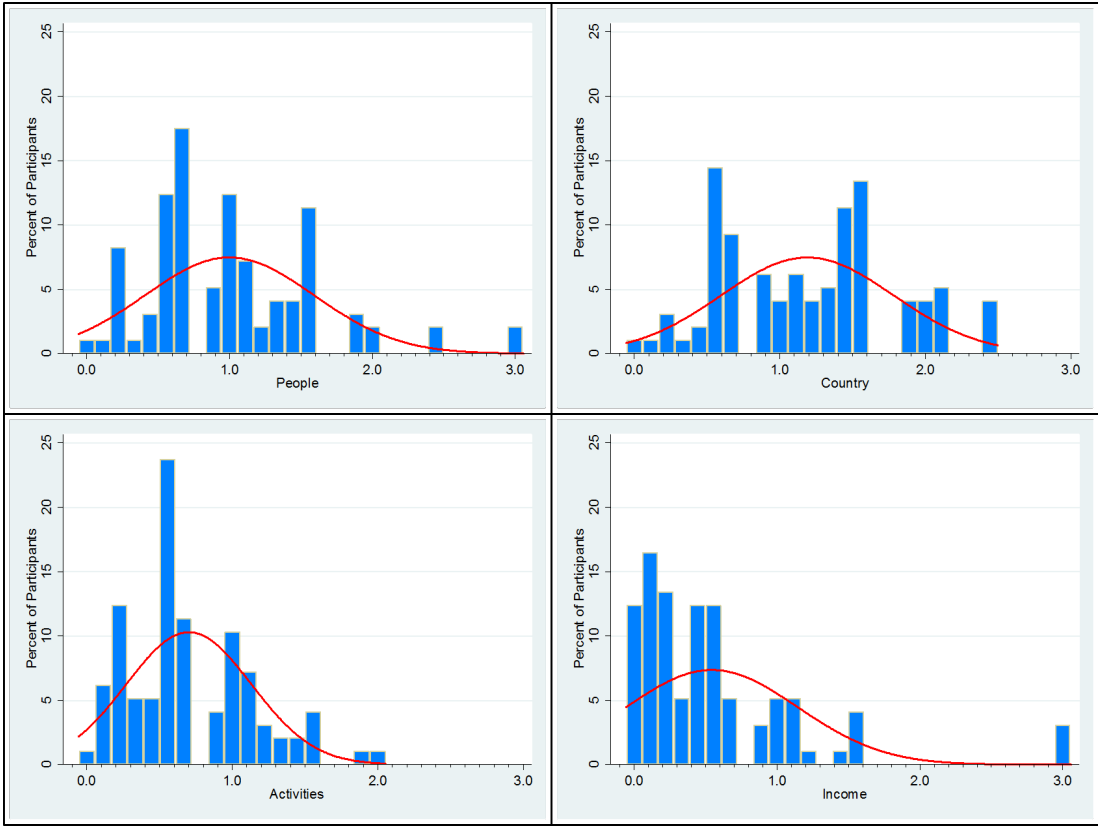
This investigation of the arithmetic cause of these maxima revealed that two individuals always chose the income attribute as Worst, irrespective of level, suggesting that these respondents may have misunderstood or sought to game the model. Given the overall low probability ranking of the income attribute in Table 7-6, these two respondents were not considered to be sufficiently extraordinary that they should be excluded from further analysis.

The investigation also found two respondents selecting the lowest level of the people attribute as Worst when available and the other two levels as Best, irrespective of the other elements of the profile, as well as a final respondent who chose the lowest level of

income attribute as Worst when available and the higher levels as Best when available. These responses indicate a strong preference for higher levels and a strong dislike for the lowest level of this attribute, rather than any inconsistency or gaming behaviour. This is consistent with the note in Louviere et al. (2015, p. 246) explaining that attribute SS (referred to in that text as attribute empirical SS or empirical scale parameter) are a confound of preferences and variances, not just a measure of choice consistency.

Graphing individual SS measures also provides an indication of preferences. The histograms at Fig. 7-6 show distributions of individual preference measures skewed towards lower values for all attributes. The Country attribute has the least skewed distribution which suggests that it is the most highly valued attribute with greatest consistency overall. The people attribute is the second most evenly spread, suggesting again a higher value than the activities attribute or the income attribute, which is the most strongly skewed towards the minimum. These are consistent with the relative valuing of the attributes reflected in the total mean (frequency) Best and Worst scores in Table 7-4 and ratio measures in Table 7-5.

Fig. 7-6 Distribution of respondents' Sum of Squares measures by attribute

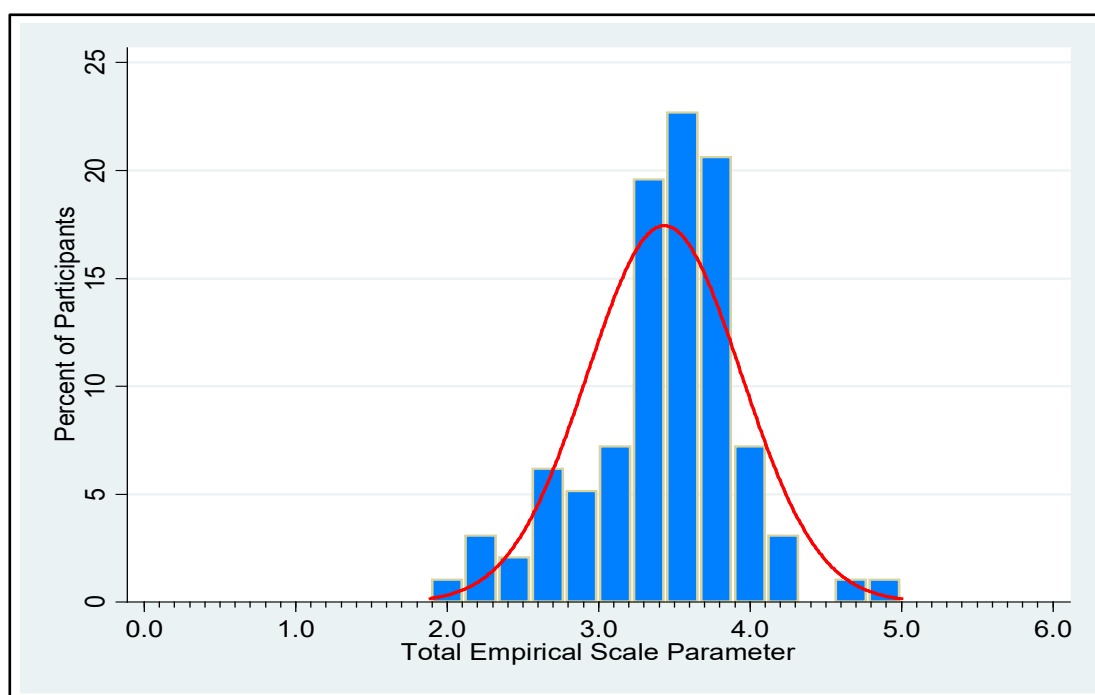


Data Source: Phase 2 survey data collected and compiled by author.

Variances against the normal distribution, reflected in the number of peaks in the distribution of SS values, are more marked in the people and Country attributes.

The distribution of the total SS across attributes or TESP measures for individual respondents shown in Fig. 7-7 gives an indication of the comprehension of the overall choice task as well as pointing to possible groupings of respondents in terms of clustering of responses.

Fig. 7-7 Distribution of respondents' Total Empirical Scale Parameters



Data Source: Phase 2 survey data collected and compiled by author.

Limited clustering appears in Fig. 7-7 around two, three or even four modes (around 2.2, 2.7, 3.6 and 4.9) however the numbers of respondents lying at 2.2 and 4.9 are extremely small and not significantly different from a normal distribution.

A TESP measure of 6.0 would arise if a respondent consistently selected one attribute as Best, another as second Best, a third attribute as third Best and the other as Worst, irrespective of their levels.

The absence of respondents with the maximum TESP of 6.0, and the reasonably normal distribution, with few variances, confirms that respondents appear to have understood the choice task and not sought to game their responses. This confirms that the cognitive challenge in the choice model did not exceed the respondents' capabilities, confirming

the feasibility and appropriateness of the method in response to the research question. Further heterogeneity testing with LCA regression modelling techniques was also undertaken and is reported in Chapter 8.

Having analysed counts of Best, Worst and the stacked Best and Worst choices, the next step in analysis is to consider the specific Best-Worst pairs that were chosen by respondents in each profile. While still a non-model count analysis, this provides a comparator with more specificity and power than the Best and Worst count analysis in previous sections.

7.3.3 Best-Worst pairs

There are essentially two approaches to analysing the Best-Worst pair data, known as the marginal and paired approaches. The naming of these approaches follows their appearance in a table of Best-Worst pairs set out by each of the Best attribute levels in rows by the Worst attribute levels in columns as per Table 7-7. The marginal approach analyses the aggregate occurrence of Best-Worst pair counts by attribute level as Best and Worst as the means at the margins of the table. The paired approach analyses the individual Best-Worst pairs represented in each cell. The paired approach is theoretically consistent with the maxdiff model discussed in Sub-section 6.7.2 in Chapter 6, where the behavioural response is assumed to be selection of the Best-Worst pair that maximises the difference between Best and Worst.

Shading in Table 7-7 provides a visual indication of the frequency of choices of particular pairs, with the darkest shading indicating a higher number of respondents selecting that pair than the lighter shading or no shading. The cross hatched areas on the diagonal are impossible combinations as each attribute is presented once in a profile and not available to be selected as Best and as Worst.

Table 7-7 Best-Worst pair counts by Best (row) and Worst (column) with Best and Worst averages by attribute levels

Attribute	Level	People			Country			Activities			Income			Mean Best
		p1	p2	p3	c1	c2	c3	a1	a2	a3	y1	y2	y3	
People	p1				14	2	–	2	1	–	4	–	1	2.7
	p2				42	6	–	10	1	2	14	3	–	8.7
	p3				45	21	–	49	11	1	27	8	3	18.3
Country	c1	3	–	1				1	–	–	4	–	–	1.0
	c2	20	1	–				10	3	2	4	1	3	4.9
	c3	43	7	3				56	10	1	44	1	6	19.0
Activities	a1	11	–	–	14	1	–				11	–	–	4.1
	a2	25	2	–	33	5	1				1	1	1	7.7
	a3	39	5	–	33	17	–				44	8	1	16.3
Income	y1	13	–	–	18	–	–	2	–	2				3.9
	y2	5	1	1	14	1	–	5	–	–				3.0
	y3	27	2	1	11	6	–	16	3	1				7.4
Mean Worst		20.7	2.0	0.7	24.9	6.6	0.1	16.8	3.2	1.0	17.0	2.4	1.7	
Values shading:		>40		30–39		20–29		10–19		<10		N/A		

Data Source: Phase 2 survey data collected and compiled by author.

Marginal analysis of Best-Worst pair counts

The marginal count (non-model) approach is explored in applications for population based measures and indices in health care by Flynn and others (Flynn et al. 2015; Louviere et al. 2015). Because the marginal approach considers the total counts for Best and Worst, it essentially replicates results of the analysis of Best and Worst counts reported in Sub-sections 7.3.1 and 7.3.2.

The three highest mean Best scores highlighted with blue shading in Table 7-7 indicate that the Country and people attributes score as Best more often than the activities attribute, and that a higher income is not scored as Best by many respondents. However, the mean Worst totals show a matching aversion to low Worst counts for Country and people attributes. The mean Worst score is marginally higher for lowest levels of income than that of activities implying that, on average, respondents were slightly more averse to having a limited income than spending low levels of time on cultural activity.

Rankings of the attribute level means and total attribute means for Best and Worst from this marginal analysis are shown in Table 7-8, along with the difference between Best

and Worst. These attribute means for Best-minus-Worst are the same as the effects coded attribute impacts we see in subsequent analysis of the effects coded attribute impact levels model in sub-section 7.4.4. Attribute impact, which is simply the arithmetic mean of the levels of an attribute, has limited value in cases where the levels are extreme and/or set at two levels (Flynn et al. 2008). In this research some attributes range across more extreme levels, for example the Country attribute ranges from ‘little or no access to traditional Country’ which we have seen is highly disliked and ‘full access to traditional Country’ which is highly liked as indicated by the Worst and Best count data.

Table 7-8 Ranking of attribute level and attribute means for Best, Worst and Best-minus-Worst

Attribute	Level	Best	Worst	Best-minus-Worst	Best-minus-Worst rank
People	p1	2.7	20.7	-18.0	3
	p2	8.7	2.0	6.7	2
	p3	18.3	0.7	17.7	1
	Attribute Mean	29.7	23.3	6.3	2
Country	c1	1.0	24.9	-23.9	3
	c2	4.9	6.6	-1.7	2
	c3	19.0	0.1	18.9	1
	Attribute Mean	24.9	31.6	-6.7	3
Activities	a1	4.1	16.8	-12.7	3
	a2	7.7	3.2	4.4	2
	a3	16.3	1.0	15.3	1
	Attribute Mean	28.1	21.0	7.1	1
Income	y1	3.9	17.0	-13.1	3
	y2	3.0	2.4	0.6	2
	y3	7.4	1.7	5.8	1
	Attribute Mean	14.3	21.1	-6.8	4

Data Source: Phase 2 survey data collected and compiled by author.

Paired analysis of Best-Worst pair counts

Paired analysis of Best-Worst pairs is consistent with a maximum difference scaling or maxdiff behavioural model where respondents select, as Best and Worst, the pair that maximises the difference in utility between the available attribute levels and utilise paired analysis (Flynn et al. 2007, p. 176; Louviere et al. 2015, pp. 117-126). Consistent choices in a maxdiff model would be reflected in close reverse mirroring of choice counts around the shaded diagonal in Table 7-7. Any disparities are likely attributable to the

small OMEP design, limited sample size, inconsistencies in individual choice, heterogeneity of the sample or combinations of these factors.

This reverse mirroring is seen when we compare the counts for pairs chosen as Best-Worst and Worst-Best in Table 7-7. We see, for example, 43 respondents selected c3 as Best and p1 as Worst, but no one selected it the other way. Similarly, in the pairing of a3 and y1, 44 respondents selected a3 as Best, but only two chose y1 as Best. The pattern of shading indicating how often a Best-Worst pair was chosen reflects the overall Best and Worst count frequencies considered in previous sections, but provides a greater degree of granularity of information. However, the modelling of choices using regression analysis (as reported in the following sections) enabled more detailed assessment of the model and preferences.

7.4 Modelling with regression analysis

Modelling Best and Worst choices in linear or non-linear models supports improved estimation of relativities and measurement on a common scale. Given the unique nature of this research, there is value in specifying and reporting on the range of approaches that elicit information about the preferences of the Aboriginal people who participated in this research. This multipronged approach enables comparison of results and tests the reliability of the methods in this novel context, adding to the evidence in response to the research question.

Both linear and multinomial (conditional logit) regression approaches were used to estimate utilities from the BWS model in this research. Non-linear, conditional logit estimation using maximum likelihood, was used to estimate the scale values of attribute levels in the BWS model. Linear regression, which approximates the utility estimated by conditional logit, was also used. These models test the correlations between results or dependent variables (the Best, Worst, stacked or paired choices) and explanatory or independent variables (available attribute levels).

The random utility theory underlying this model was shown in Chapter 6, with the derived Equation (6-4) showing how the model is applied with the choice frequency as dependent variable, V_h being the subjective value of the alternative h in C_n , and K_{Cn} , the constant associated with each choice set, being the denominator of the logit model.

The approach of using weighted least squares (WLS) regression at the aggregate sample level as a first step in estimating the utilities from the main effects of a conditional logit model is well established in choice modelling literature (Flynn et al. 2007, pp. 180–185; Louviere et al. 2015, p. 73; Louviere et al. 2008; Louviere & Woodworth 1983, p. 355). In this model, the frequency of choices of each possible choice is adjusted by a tiny fraction to create non-zero weights, and the natural log of each of these becomes the dependent variable in the linear regression. As linear models most closely approximate the conditional logit model with large numbers of observations, the relatively small sample size in this research reduces the likelihood of such close approximation. To test how closely the linear model approximated the conditional logit, the results are compared for stacked Best and Worst and Best-Worst pair in the relevant subsections.

The results reported on in this section start with modelling of Best and Worst choices separately in Sub-section 7.4.1, then stacked Best and Worst in Sub-section 7.4.2 and finally Best-Worst pair choices in Sub-section 7.4.3. Each set of these choice data were modelled using linear regressions of aggregate sample data as well as more complex logit regressions – using the clogit command in Stata – conditioned for the individual respondent and the profile. The results reported in Sub-sections 7.4.1 to 7.4.3 are from dummy coded models and focus on individual attribute levels. Effects coding results, where attribute impact and level effects are separated, are reported in Sub-section 7.4.4.

Subsequent LCA of the BWS model, estimation of monetary values and analysis of the DCE (accept/reject supplementary question) are covered in Chapter 8.

7.4.1 Modelling Best and Worst separately

Regression analysis of Best and Worst separately, prior to analysis of Best-Worst pairs, tests consistency of Best and Worst results and creates a comparator for the Best-Worst pair models. A range of the results for this base modelling presented here demonstrates the approach and how the results can be interpreted. Most significantly, as with the count analysis, the comparison of results for Best and Worst is a precursor to stacking them for subsequent analysis.

Transformation of the choice data into the dummy coding form, where 1 represents a selection as Best or Worst or presence, 0 represents non-selection as Best or Worst or absence, of an attribute level, facilitates regression modelling. For the 97 respondents

and the 36 Best (or Worst) options available, this transformation results in 3,492 lines of code for Best, and the same for Worst, with the Worst coded as negative values to enable direct comparison of regression results. An illustration of the transformation of a single respondent's choices in the first five profiles to dummy coded data is included in Appendix 9.

Linear regressions of Best and Worst separately

The formula for these linear regressions takes the following form:

$$\ln bw = \alpha + \beta_{p1} p1 + \beta_{p2} p2 + \beta_{p3} p3 + \beta_{c1} c1 + \beta_{c2} c2 + \beta_{c3} c3 + \beta_{a1} a1 + \beta_{a2} a2 + \beta_{a3} a3 + \beta_{y1} y1 + \beta_{y2} y2 + \beta_{y3} y3 \quad (7-13)$$

Where:

$\ln bw$ is the natural log of the Best (or Worst) choice (adjusted by a tiny fraction to create non-zero weights)

α is the constant term

β_{ml} is the coefficient for attribute m level l, for attribute levels p1 to y3

$p1$ to $y3$ are the attribute level codes set out in Table 7-3.

These regressions reveal relativities between the coefficients for Best and Worst and the size of the constant term, which may indicate the completeness of the utility model. The coefficients for the Best and Worst linear regressions at the aggregate sample level resulting from setting the lowest coefficient to zero for comparison are set out in Table 7-9.

Table 7-9 Comparison of linear regression coefficients for Best and Worst models

Attribute	Level	ln(Best) Coeff.	ln(Worst) Coeff.
People	p1	0.979	0.186
	p2	2.157	2.520
	p3	2.906	3.615
Country	c1 (omitted)	–	–
	c2	1.585	1.334
	c3	2.942	5.384
Activities	a1	1.411	0.394
	a2	2.034	2.044
	a3	2.790	3.211
Income	y1	1.356	0.381
	y2	1.097	2.319
	y3	2.005	2.702
Constant term		2.200	5.412

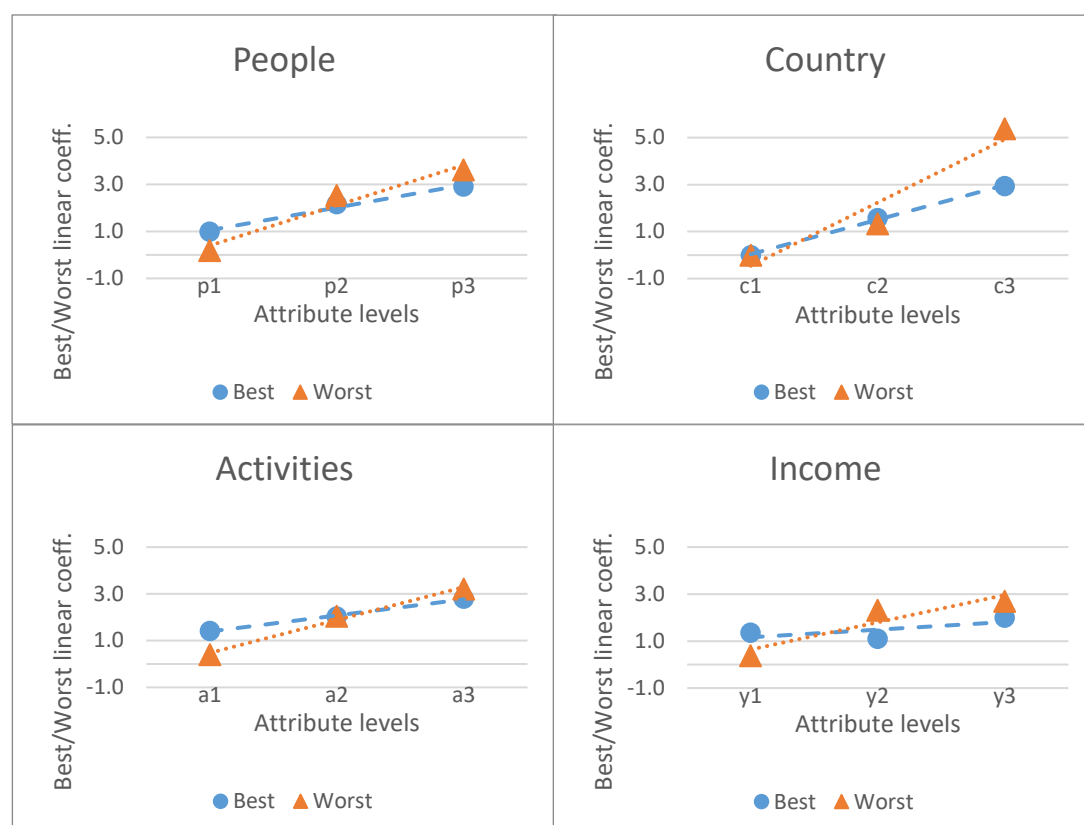
No. of observations = 12.

Data Source: Phase 2 survey data collected and compiled by author.

The relatively large constant terms in these aggregated linear regressions, particularly for the Worst choices, suggests that there may be factors outside the specification influencing the overall utility for the whole sample.

The utility values derived from the linear regressions are graphed for each attribute at Fig. 7-8 to enable comparison of Best and Worst. For all attributes, the gradient of the best fit line for the Worst coefficients (formula not displayed) is higher – the slope is steeper – than for Best, indicating higher marginal utilities. This potentially indicates loss aversion, a bias where people react more strongly to loss than to gain. In the context of this research, any inherent loss aversion may be exacerbated by lack of, or limited, agency resulting from the disempowering effects of colonisation.

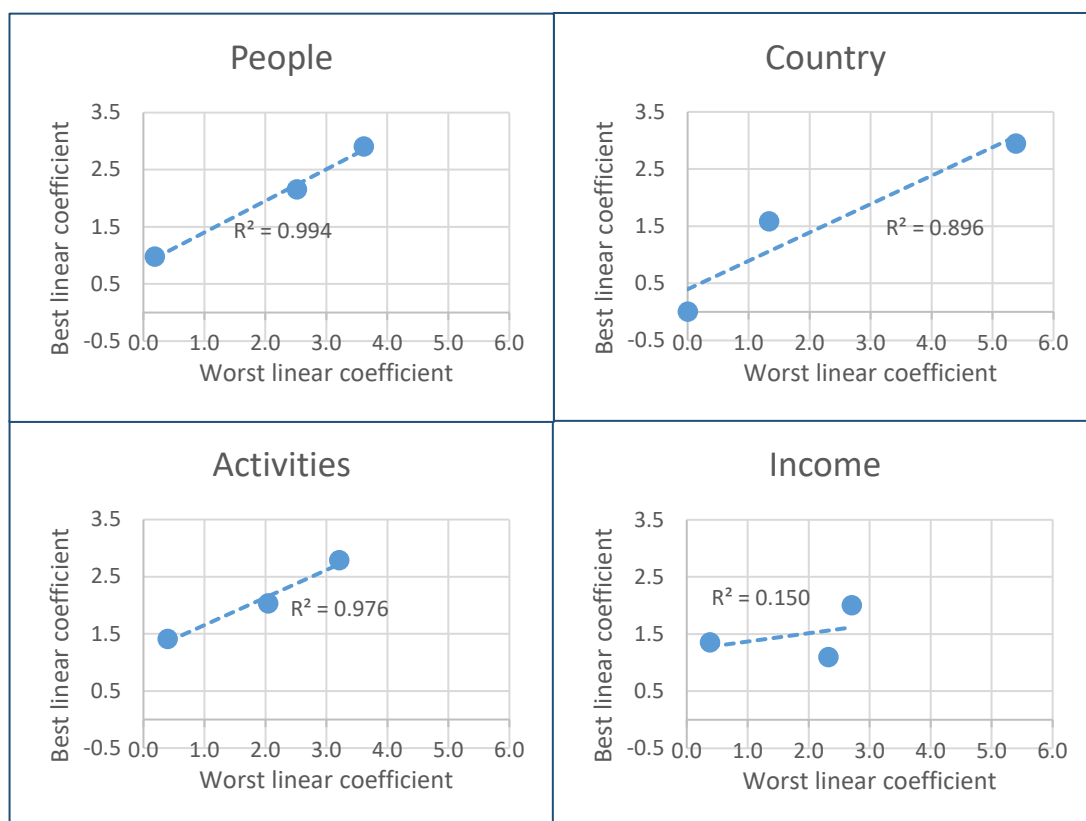
Fig. 7-8 Linear regression coefficients for Best (blue) and Worst (orange) choices by attribute



Data Source: Phase 2 survey data collected and compiled by author.

Linear proportionality of Best and Worst was tested by plotting the linear regression coefficients for Best against Worst for each attribute level in Fig. 7-9. The very high R^2 values (close to 1.00) for the people and activities attributes show strong linear proportionality. However, the income attribute has a relatively poor fit, reflecting the less-linear form of the Best and Worst coefficients shown in Fig. 7-8. The strong linear proportionality of all attributes other than income supports the stacking of Best and Worst data.

Fig. 7-9 Linear regression coefficients for Best versus Worst choices by attribute



Data Source: Phase 2 survey data collected and compiled by author.

Conditional logit regressions of Best and Worst separately

The linear regressions outlined above are aggregate sample approximations of the maximum likelihood multinomial regressions used to estimate individual level utilities and support heterogeneity analysis. The model generally applied in choice modelling is a conditional logit regression (clogit in Stata), an extension of the multinomial logit model that reflects Best and Worst choices are dependent on the alternatives in the profiles presented to each respondent.

The key results of the conditional logit regressions on the Best and Worst selections separately are set out in Table 7-10. These regressions are rescaled with the attribute level with the lowest coefficient set to zero as the reference value, for ease of comparison. These individual level regressions provide more statistically significant and useful results than the aggregate level linear approximations.

Table 7-10 Comparison of conditional logit results for Best and Worst choices

Attribute	Level	Best		Worst	
		Coeff.	Robust S.E.	Coeff.	Robust S.E.
People	p1	0.992 **	0.392	0.577 ***	0.194
	p2	4.027 ***	0.480	3.557 ***	0.293
	p3	5.478 ***	0.480	4.632 ***	0.451
Country	c1 (omitted)	—		—	
	c2	3.457 ***	0.496	2.323 ***	0.222
	c3	5.658 ***	0.475	6.624 ***	1.015
Activities	a1	1.465 ***	0.372	1.375 ***	0.200
	a2	3.681 ***	0.483	2.851 ***	0.232
	a3	5.350 ***	0.481	3.976 ***	0.367
Income	y1	1.419 ***	0.375	1.308 ***	0.224
	y2	3.000 ***	0.505	3.080 ***	0.265
	y3	4.049 ***	0.492	3.573 ***	0.317
AIC		1689.927		1251.283	
BIC		1757.668		1319.024	
Log Pseudolikelihood		-833.964		-614.642	
Pseudo R ²		0.311		0.492	
No. of observations		3,492		3,492	

Notes: Asterisks show the significance level of the p-values *p<0.10, **p<0.05, ***p<0.01.

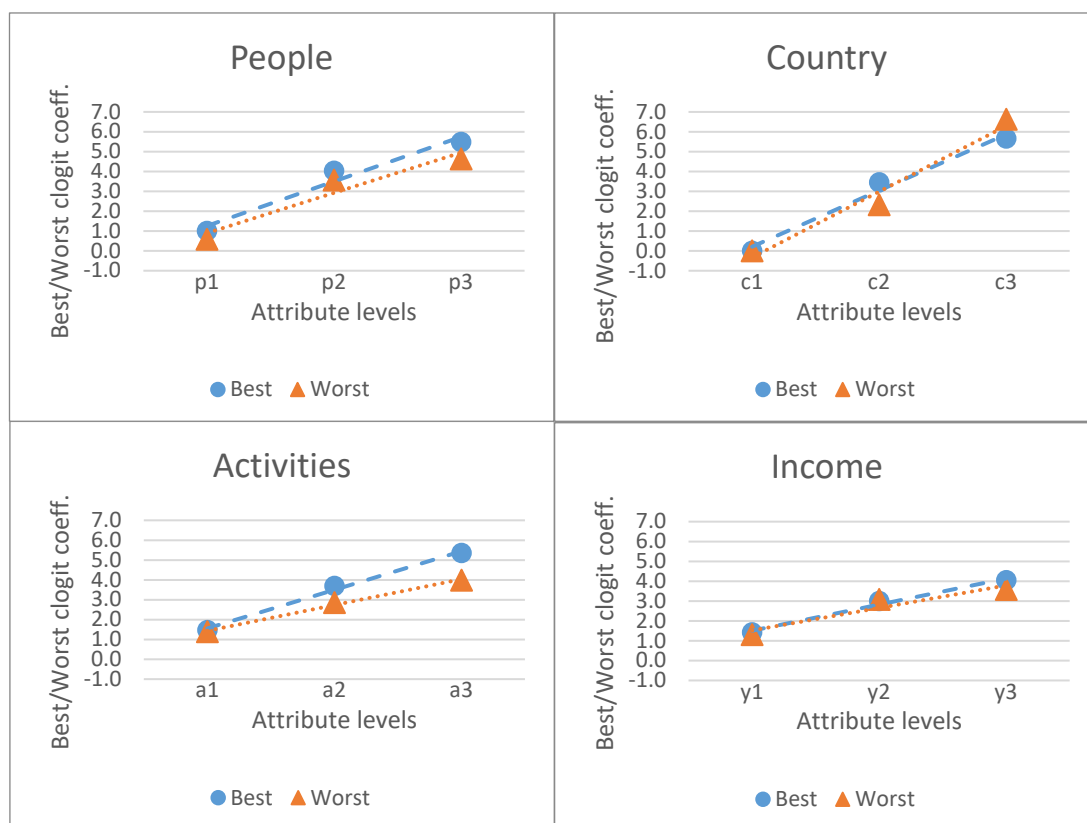
Data Source: Phase 2 survey data collected and compiled by author.

The results are statistically significant at the 1% level ($p < 0.01$) for all attribute levels in both Best and Worst choices other than p1 as Best choice. Plotting these results to compare Best and Worst choices by attribute in Fig. 7-10 reveals a strong alignment of resulting utility estimates for Best and Worst choices. This alignment supported the stacking of Best and Worst for further analysis.

The conditional logit results enabled comparison of the Best and Worst models with pseudo R² measures and specific post-estimation tests. Two post estimation information criteria, the Akaike information criterion (AIC) and the Bayesian information criterion (BIC) were calculated to provide an indication of the quality of the statistical model. The lower AIC and BIC measures for the Worst model in Table 7-10 suggests it explains the data better than Best. The pseudo R² measures in Table 7-10 also indicate that the Worst model is a slightly better predictor than the Best model.

Graphing the results by attribute in Fig. 7-10 reveals marginal utilities, as indicated by the gradients of the fitted lines, are much closer for Best and Worst than shown in Fig. 7-8. As the linear model is an approximation of the conditional logit model, the closer alignment of the Best and Worst in the conditional logit model provides stronger reassurance that stacking Best and Worst is warranted.

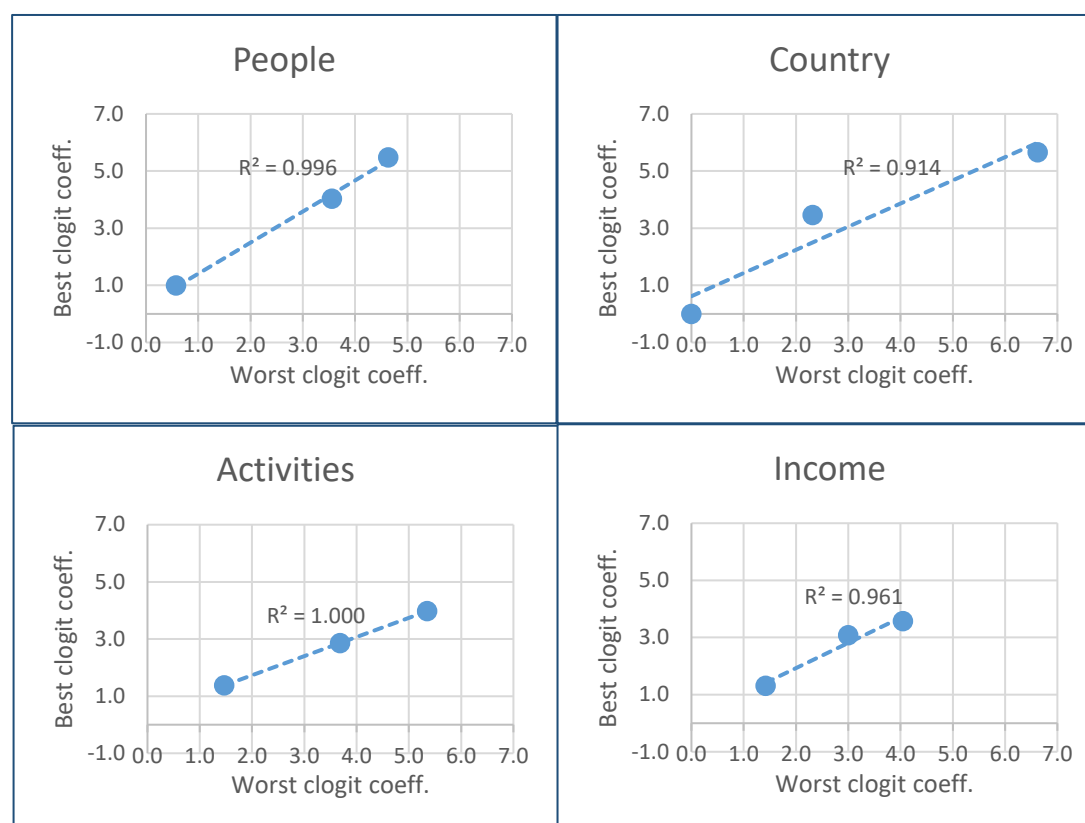
Fig. 7-10 Conditional logit coefficients for Best and Worst separately by attribute



Data Source: Phase 2 survey data collected and compiled by author.

The relationship between Best and Worst in the conditional logit model graphed in Fig. 7-11 shows reasonable linearity for all attributes, with high R^2 measures on the fitted line. Consistent with the comparison by attribute of Best and Worst, these results show stronger proportionality than the linear regression results in Fig. 7-9, further supporting the case for further analysis of stacked Best and Worst choices.

Fig. 7-11 Plots of conditional logit coefficients for Best versus Worst by attribute



Data Source: Phase 2 survey data collected and compiled by author.

Adjusting the scaling of the two data sets by rescaling up the more consistent data can control for heteroscedasticity (Swait & Louviere 1993). In this case, the information criteria (AIC and BIC) and pseudo R^2 post estimation results indicate that Worst is more consistent, and therefore rescaling of Worst data by applying a factor greater than the -1 could be considered (Louviere et al. 2015, p. 139). However, there is sufficient consistency to stack the data without rescaling, and the analysis will proceed on that basis, to demonstrate the power of pooling and stacking Best and Worst data. Understanding the potential source of the greater consistency of the Worst choices and policy implications of that would be worth exploring further.

7.4.2 Modelling stacked Best and Worst choices

The close alignment and proportionality of Best and Worst shown in the previous sub-section supports analysis of the stacked data, which effectively doubles the data available for modelling, as it did with the count analysis. For the linear regression of the aggregate sample, it also enables limited testing of statistical significance which was not possible with the separate Best and Worst.

Aggregate sample level linear regression of stacked Best and Worst

The results below in Table 7-11 and Fig. 7-12 indicate the relative utilities of the attributes at the aggregate sample level. These are then compared with the results of the conditional logit model that the linear model approximates.

Table 7-11 Linear regression results for stacked Best and Worst (aggregate sample)

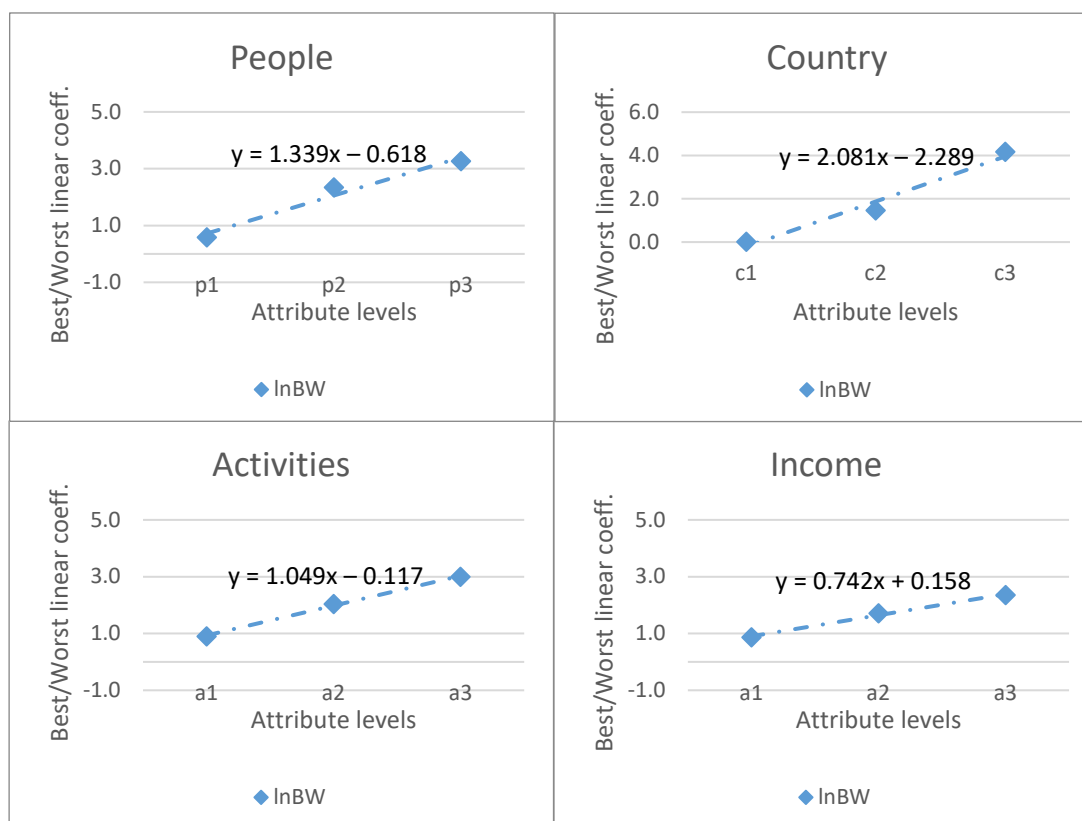
Attribute	Level	Coeff.	Robust S.E.	Signif.
People	p1	0.582	0.551	
	p2	2.338	0.140	***
	p3	3.261	0.276	***
	c1 (omitted)	–		***
Country	c2	1.459	0.282	***
	c3	4.163	1.159	***
Activities	a1	0.903	0.666	
	a2	2.039	0.171	***
	a3	3.001	0.157	***
Income	y1	0.868	0.644	
	y2	1.708	0.530	***
	y3	2.353	0.271	***
BW Indicator		–1.606	0.123	***
Constant term		3.688	0.143	***
No. of observations			24	
R ²			0.8647	

Notes: Asterisks show the significance level of the p-values *p<0.10, **p<0.05, ***p<0.01.

Data Source: Phase 2 survey data collected and compiled by author.

The linear regression coefficients of stacked Best and Worst choices for each attribute plotted in Fig. 7-12 show the relative preferences for the different levels of each attribute. The fitted line for the Country attribute is the steepest, with a gradient of 2.081, indicating higher marginal preferences for this attribute were expressed in the choice model responses. This indicates greater differentiation in preferences for the levels of this attribute.

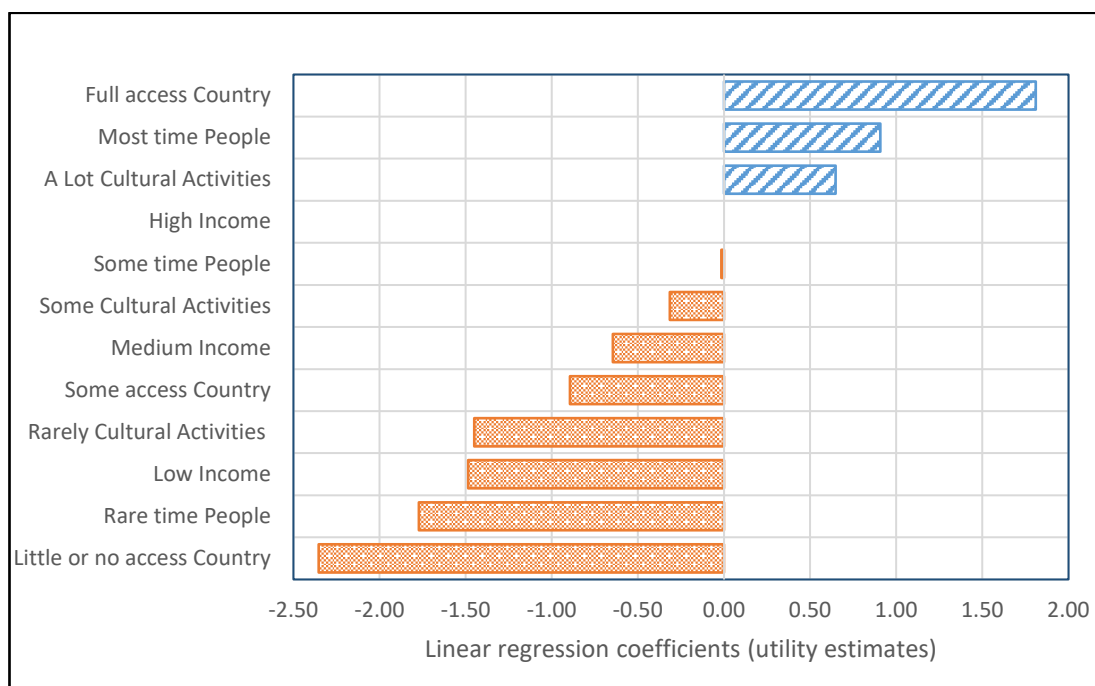
Fig. 7-12 Linear regression coefficients for stacked Best and Worst (aggregate sample)



Data Source: Phase 2 survey data collected and compiled by author.

While the results by attribute are useful indicators of the preference differentials within an attribute, one of the key benefits of BWS is that it enables modelling of attribute levels on a common scale. Plotting the resultant utility estimates from this linear regression of stacked data on a common scale from lowest to highest, before zero-basing, in Fig. 7-13 provides a good illustration of relative utilities for each of the attribute levels for the sample as a whole. We can then repeat this with the conditional logit results which these approximate.

Fig. 7-13 Stacked Best and Worst linear regression coefficients ordered on common utility scale



Data Source: Phase 2 survey data collected and compiled by author.

Conditional logit regressions of stacked Best and Worst

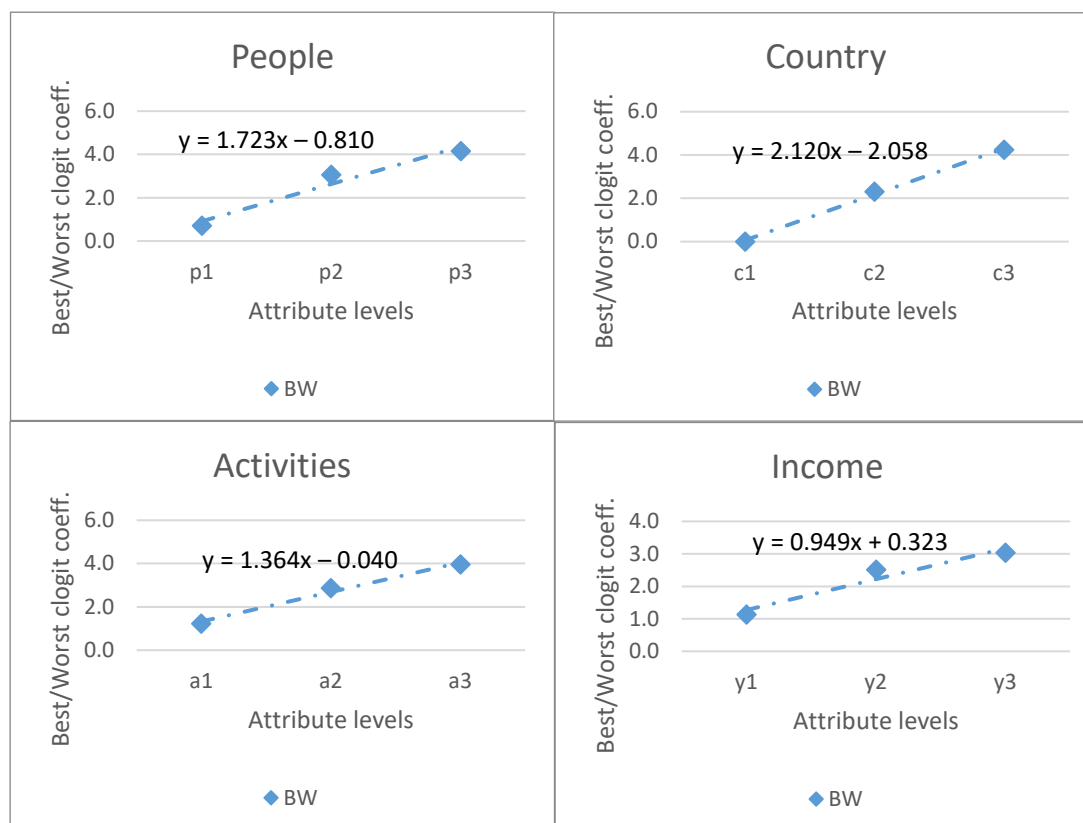
The results of the conditional logit regression of the stacked Best and Worst data are set out below in Table 7-12, with corresponding utility graphed in Fig. 7-14. The results are consistent with the separate conditional logit analysis of Best and Worst presented in Fig. 7-10.

Table 7-12 Conditional logit regression of stacked Best and Worst choices

Attribute	Level	Coeff.	Robust S.E.	Signif.
People	p1	0.704	0.190	***
	p2	3.053	0.191	***
	p3	4.149	0.212	***
Country	c1 (omitted)	–		
	c2	2.304	0.183	***
	c3	4.239	0.194	***
Activities	a1	1.234	0.164	***
	a2	2.868	0.193	***
	a3	3.962	0.212	***
Income	y1	1.129	0.184	***
	y2	2.507	0.179	***
	y3	3.027	0.193	***
BW Indicator		–2.452	0.155	***
AIC			4176.903	
BIC			4259.119	
Log Pseudolikelihood			–2076.451	
Pseudo R ²			0.286	
No. of observations			6,984	

Notes: Asterisks show the significance level of the p-values *p<0.10, **p<0.05, ***p<0.01.
Data Source: Phase 2 survey data collected and compiled by author.

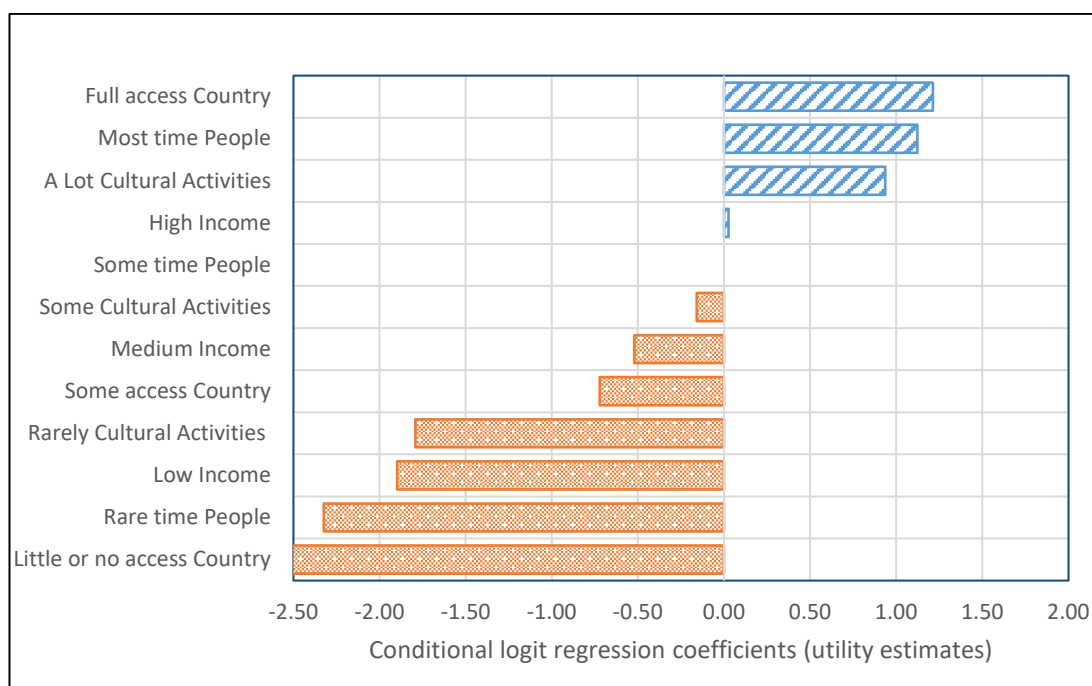
Fig. 7-14 Conditional logit coefficients for stacked Best and Worst



Data Source: Phase 2 survey data collected and compiled by author.

A graphical representation of the utilities estimated by the conditional logit model of stacked Best and Worst, on a common scale prior to zero-basing, is presented in Fig. 7-15. These results, which are directly comparable to those from the linear approximation of stacked Best and Worst in Fig. 7-13, rank attribute levels in the same order, with small scale variations in the coefficients.

Fig. 7-15 Stacked Best and Worst conditional logit regression coefficients ordered on common utility scale

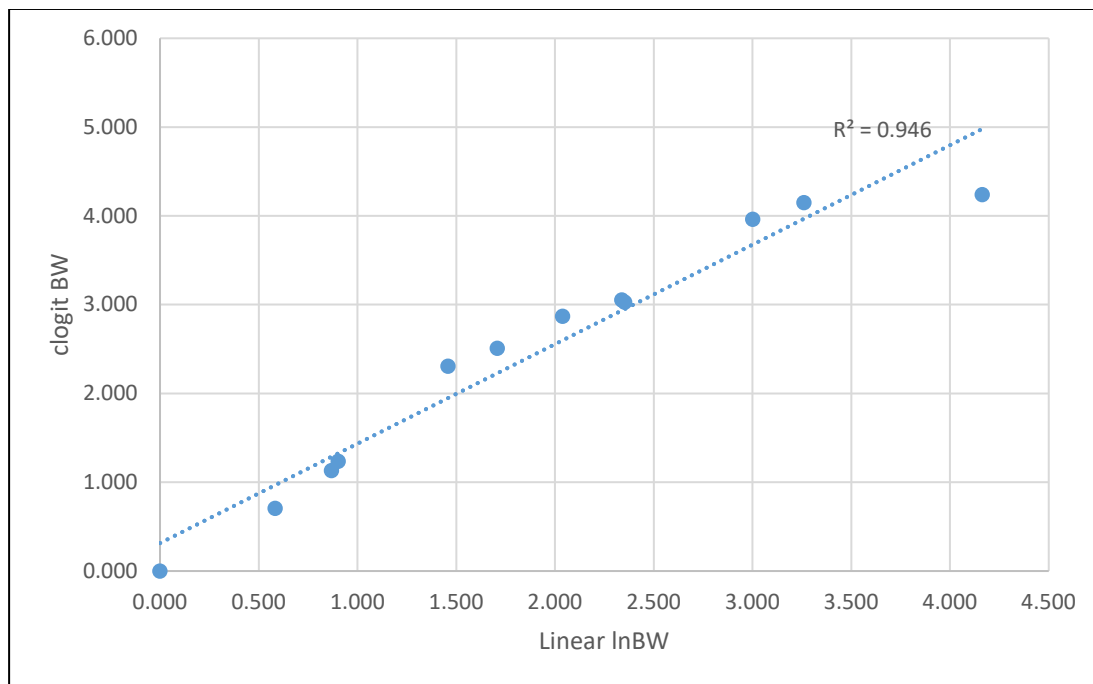


Data Source: Phase 2 survey data collected and compiled by author.

Comparison of models for stacked Best and Worst

The comparison of the two models for stacked Best and Worst is shown in Fig. 7-16, which plots the linear model results against the conditional logit results. The relationship is strongly linear, with a high R^2 value for the fitted line, suggesting that the linear model is a close approximation to the conditional logit model, despite the relatively small sample size. This comparison was repeated with the Best-Worst pairs, and will conclude the following Sub-section 7.4.3.

Fig. 7-16 Comparison of clogit and linear models of stacked Best and Worst



Data Source: Phase 2 survey data collected and compiled by author.

7.4.3 Modelling Best-Worst pairs

Flynn et al. (2007, p. 179) set out a useful schema for the regression models that can be used to analyse Best-Worst pair data from a BWS profile case. By breaking down analysis into paired and marginal approaches, as discussed in Sub-section 7.3.3, they note that aggregate sample level data can be analysed using linear regressions (weighted least squares (Flynn et al. 2007, pp. 180–185; Louviere et al. 2015, p. 73; Louviere & Woodworth 1983, p. 355)), but respondent level data requires the use of maximum likelihood estimation, using conditional logit regression.

Recapping on the marginal and paired approaches to analysing Best-Worst pairs, as discussed in the count analysis in Sub-section 7.3.3, the marginal approach analyses the total Best-Worst pairs by attribute level totals for Best and Worst, whereas the paired approach counts the specific combinations of attribute levels chosen as Best and Worst. The marginal approach considers Best totals and Worst totals separately, consistent with the analysis in Sub-section 7.4.1. Analysis here focuses on the paired approach which involves a higher number of observations (N=10,476) matching the available pairs, and resultant specificity.

When considering Best-Worst pair choices it is important to note that, generally, the profile determines the choice context for each choice. In the balanced orthogonal design for the choice model used in this research: no Best-Worst pair is possible in more than one profile, a level of each attribute is available for selection in each profile, and each attribute level is presented the same number of times, so no adjustment to balance the results is required.

This sub-section uses dummy coding following the same principles described for Best or Worst in Sub-section 7.4.1, but is more complex as the maxdiff approach uses $M(m - 1) = 12$ possible pair combinations that could be chosen in each of the nine profiles presented, or a total of 108 possible Best-Worst pairs presented to each respondent. The transformation yields 10,476 lines of data (observations) for the 97 respondents. An example of the coding transformation is in Appendix 9.

Linear regression of Best-Worst pairs

The results of the linear regression on the aggregate sample (no. of observations=108) are shown in Table 7-13. These results were graphed by attribute and the relativities were found to be similar to those in Fig. 7-14 that showed the conditional logit coefficients for stacked Best and Worst.

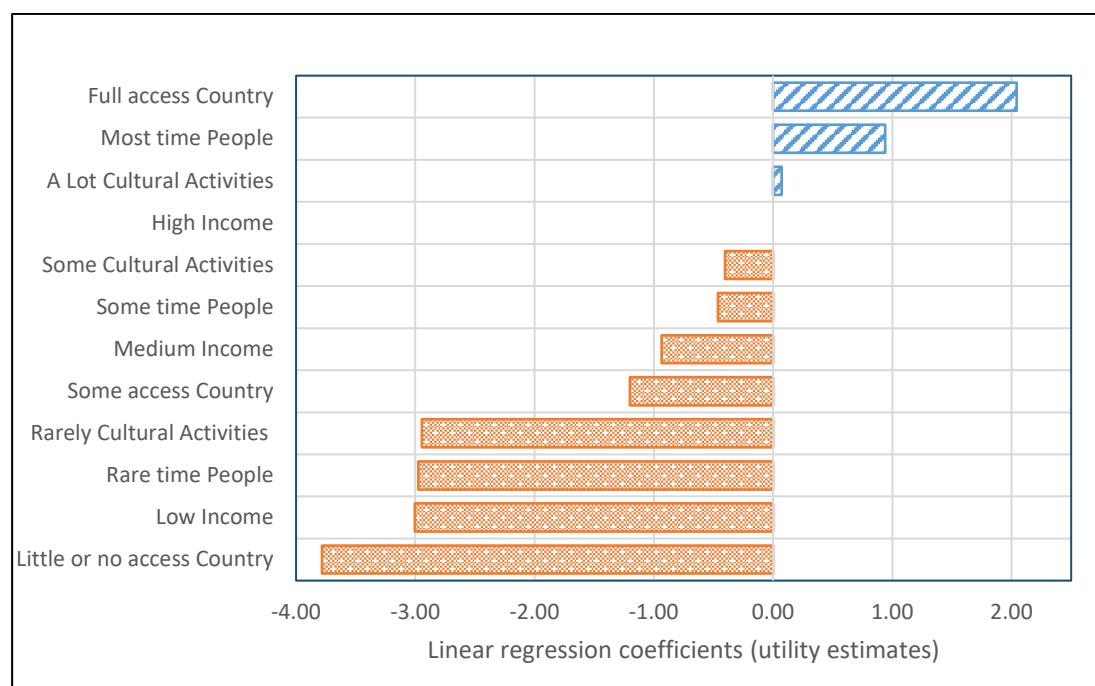
Table 7-13 Linear regression results for Best-Worst pair choices (aggregate sample)

Attribute	Level	Coeff.	Robust S.E.	Signif.
People	p1	0.808	0.607	
	p2	3.320	0.522	***
	p3	4.722	0.716	***
Country	c1 (omitted)	—		
	c2	2.581	0.595	***
	c3	5.824	0.620	***
Activities	a1	0.836	0.546	
	a2	3.379	0.587	***
	a3	3.854	0.598	***
Income	y1	0.778	0.640	
	y2	2.847	0.599	***
	y3	3.781	0.551	***
Constant term		−0.081	0.180	
No. of observations			108	
R ²			0.6538	

Notes: Asterisks show the significance level of the p-values *p<0.10, **p<0.05, ***p<0.01.
Data Source: Phase 2 survey data collected and compiled by author.

The resultant estimated utilities from linear regression results for Best-Worst pairs are shown in Fig. 7-17 on a common scale prior to zero-basing, in order of preference. This demonstrates how these attribute level utilities compare with each other for the sample as a whole. When we compare this result of the analysis of Best-Worst pair choices with that of the stacked Best and Worst choices in Sub-section 7.4.2 there are only minor differences in the ordering, with two swaps of adjacent attribute levels.

Fig. 7-17 Best-Worst pair attribute level linear regression coefficients ordered on common utility scale



Data Source: Phase 2 survey data collected and compiled by author.

Conditional logit regression of Best-Worst pairs

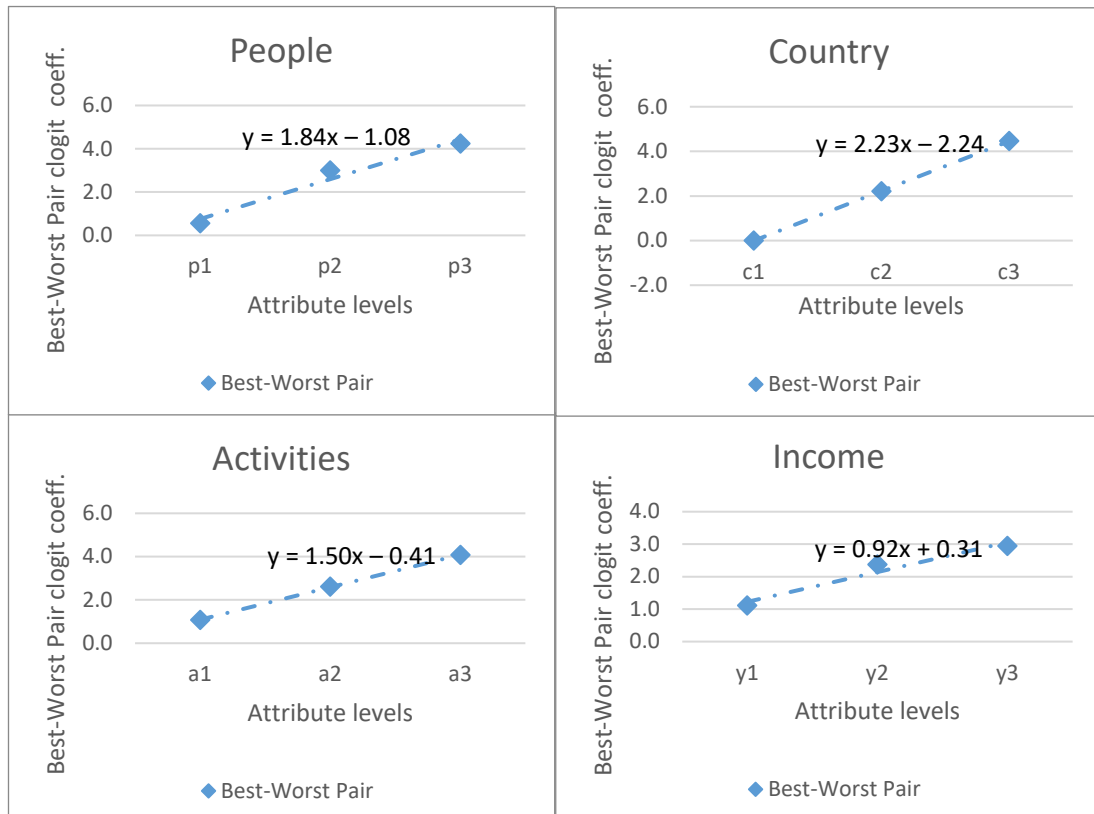
The results of conditional (fixed-effects) logit regression of the Best-Worst pairs shown in Table 7-14, and plotted by attribute in Fig. 7-18, are comparable to the linear regressions in Table 7-13. The rank ordering of marginal utilities for attribute reflected in the beta values (gradients of fitted lines) in Fig. 7-18 range from the Country attribute at 2.23 as the highest through to the lowest of 0.92 for the income attribute.

Table 7-14 Conditional logit results for Best-Worst pairs

Attribute	Level	Coeff.	Robust S.E.	Signif.
People	p1	0.553	0.162	***
	p2	3.002	0.181	***
	p3	4.232	0.208	***
c1 (omitted)		–		
Country	c2	2.203	0.180	***
	c3	4.463	0.200	***
Activities	a1	1.074	0.147	***
	a2	2.611	0.172	***
	a3	4.072	0.215	***
Income	y1	1.108	0.174	***
	y2	2.375	0.162	***
	y3	2.943	0.180	***
AIC			2809.779	
BIC			2889.605	
Log Pseudolikelihood			–1393.890	
Pseudo R ²			0.358	
No. of observations			10,476	

Notes: Asterisks show the significance level of the p-values *p<0.10, **p<0.05, ***p<0.01.
Data Source: Phase 2 survey data collected and compiled by author.

Fig. 7-18 Conditional logit coefficients for Best-Worst pair choices (dummy coded)

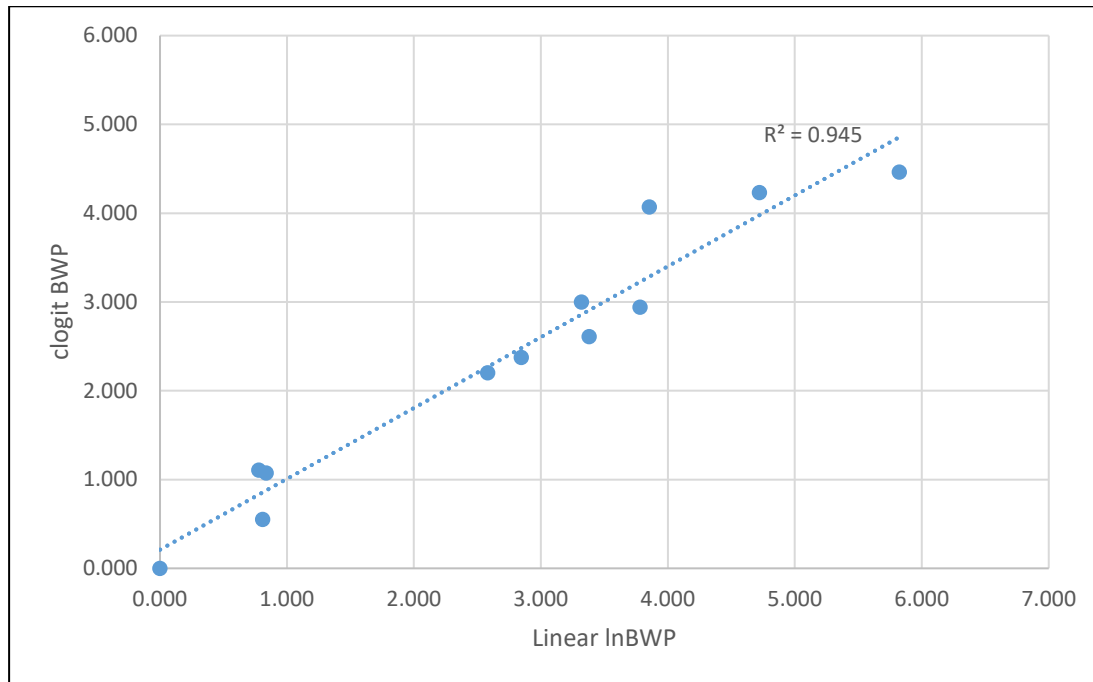


Data Source: Phase 2 survey data collected and compiled by author.

Comparison of models for Best-Worst pairs

Plotting the linear estimates against the conditional logit estimates of utility derived from the models of Best-Worst pair choices in Fig. 7-19 exhibits a reasonably strong linear relationship, with a high R^2 . This supports the argument that the linear model is a good approximation of the conditional logit model, despite the small number of respondents.

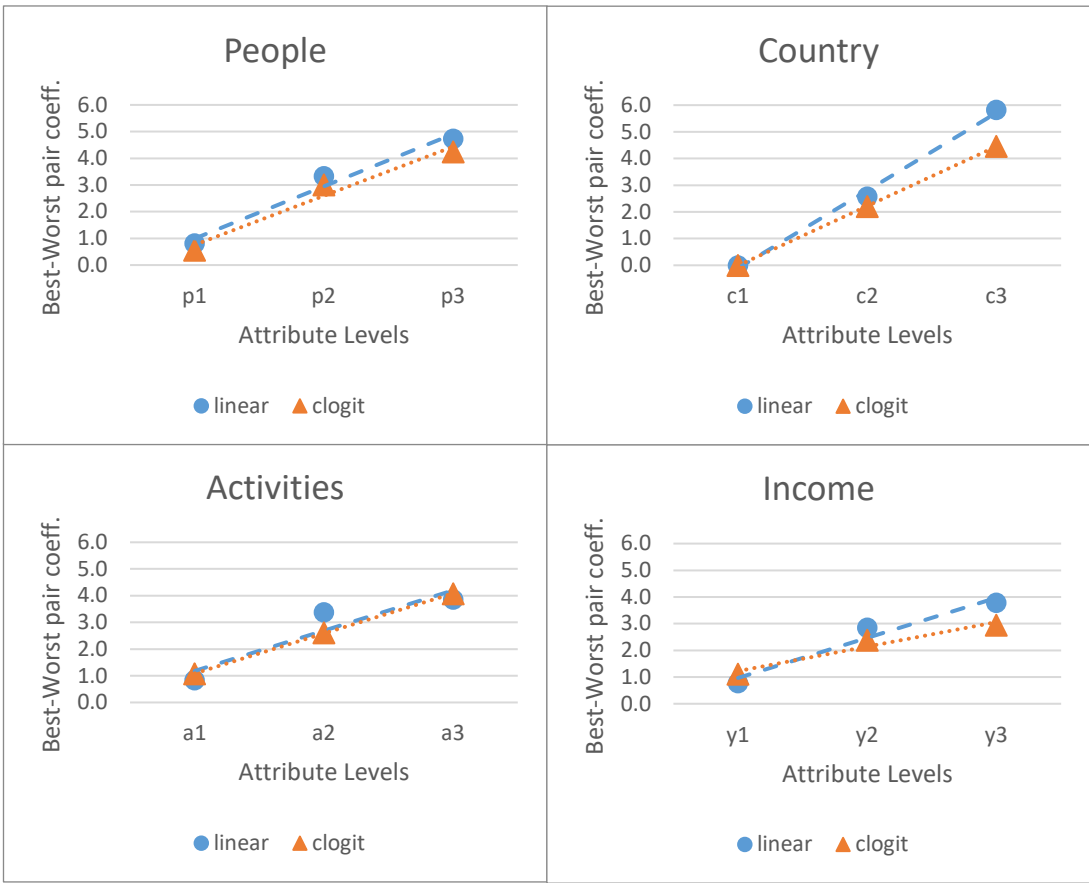
Fig. 7-19 Comparison of conditional logit against linear method estimates for Best-Worst pair choices



Data Source: Phase 2 survey data collected and compiled by author.

Comparing the models by attribute provides insights about how closely the linear model approximates the conditional logit model for attributes, which becomes particularly relevant when the marginal valuations in monetary terms are estimated in Chapter 8. In Fig. 7-20 we see close alignment of the coefficients and gradients for the linear and conditional logit models for the people and activities attributes. For both the Country and income attributes, however, the linear approximation provides a steeper gradient than the conditional logit. These steeper gradients indicate higher marginal utilities for both of these attributes.

Fig. 7-20 Comparison of linear and conditional logit models of Best-Worst pairs by attribute



Data Source: Phase 2 survey data collected and compiled by author.

7.4.4 Separating overall impact level from scale values

A risk with analysing the responses to attribute levels, as in Sub-section 7.4.3, is that it may confound scale and impact on utility. Some choice modelling researchers adopt effects coding, rather than dummy coding, in order to estimate attribute impact variables separately from the utility level scale values, thereby enabling direct estimations and comparisons of attribute impacts and the significance of level scale values (Flynn et al. 2007, 2008; Louviere et al. 2015; Marley et al. 2008; Soto et al. 2016).

The attribute impact is the average of the level scales for the attribute as a whole. Importantly, attribute impact is not the same as attribute importance (Flynn et al. 2008; Marley et al. 2008), a possible interpretation from earlier research (Coast, Salisbury, et al. 2006; Lancsar et al. 2007). Notably in this research, as attribute impacts reflect the average of the utility for all presented levels of an attribute, they are inconsistent with the relative scale or marginal utility results shown in a number of tables and figures, including Fig. 7-18. The most important attribute might be the one with the highest

marginal value or steepest gradient, given that it generates the strongest response differential between Best and Worst for the presented levels. However, these relativities are the product of investigating the level scales rather than attribute impacts.

One of the advantages posited for effects coding is that it overcomes a potential identification problem with dummy coding (Bech & Gyrð-Hansen 2005). This problem can arise where the reference variable (an attribute level) set to zero causes the remaining coefficients to be correlated to the intercept where there is one. Effects coding can overcome this because the effects are not correlated with the intercept, with the reference level coded to -1 instead of 0 , and the coefficient being the negative sum of the other levels of that attribute thereby internalising the referencing to the attribute level coefficients.

Applying effects coding

Effects coding of the attribute levels is undertaken by selecting a reference point or base level in each attribute, and coding these at -1 when they are present in a Best-Worst pair. The other attribute levels are coded as 1 if present or 0 if absent. This coding makes attribute level effects mean centred at zero, with the reference or base level coefficient being the negative sum of the estimates of other levels.

To enable parameter estimation of the overall average impact of an attribute, for each possible Best-Worst pair, the impact variable will be 1 for the Best attribute, -1 for the Worst attribute and 0 for the attributes not present.

As with the transformation of the Best-Worst pairs for dummy coding outlined in Sub-section 7.4.3, transformation involves expanding the 97 respondents to 10,476 lines of code, a line for each of the 12 Best-Worst pairs available in each of the nine profiles). A sample of attribute impact and effects coding for a single profile is included in Appendix 10.

While effects coding was used to analyse Best, Worst, stacked Best and Worst, as well as Best-Worst pairs at both the aggregate sample level using linear regressions and individual level using conditional logit (multinomial) regression, discussion here is limited to conditional logit regression of Best-Worst pairs to highlight an issue with effects coding in this situation.

Best-Worst pairs attribute impacts and level effects

The summary results for multinomial regression of Best-Worst pairs using attribute impact and effects coding are presented in Table 7-15. Note that the coefficients for the base or reference level of each attribute are the negative sum of the other levels of the attribute, making the level effects centred on zero.

Table 7-15 Conditional logit (clogit) regression results for attribute impacts and level effects using effects coded Best-Worst pairs

Attribute impact/ Level effect	Coeff.	Robust Std. Err.	Signif.
<i>Attribute Impacts</i>			
Spending time with Aboriginal people	0.453	0.088	***
Access to traditional Country	0.080	0.085	
Spending time on cultural activities	0.444	0.082	***
Earning income (omitted)	–		
<i>Level Effects</i>			
Rarely working or spending time with Aboriginal people #	–2.043		
Working or spending some time with Aboriginal people	0.406	0.092	***
Working or spending most of the time with Aboriginal people	1.637	0.106	***
Little or no access to traditional Country #	–2.222		
Some access to traditional Country	–0.019	0.098	
Full access to traditional Country	2.241	0.110	***
Rarely spending much time on cultural activities #	–1.512		
Spending some time on cultural activities	0.025	0.092	
Spending a lot of time on cultural activities	1.487	0.111	***
Earning a low income #	–1.034		
Earning a medium income	0.233	0.089	**
Earning a high income	0.801	0.097	***
AIC		2809.779	
BIC		2889.605	
Log Pseudolikelihood		–1393.890	
Pseudo R2		0.3575	
No. of observations		10,476	

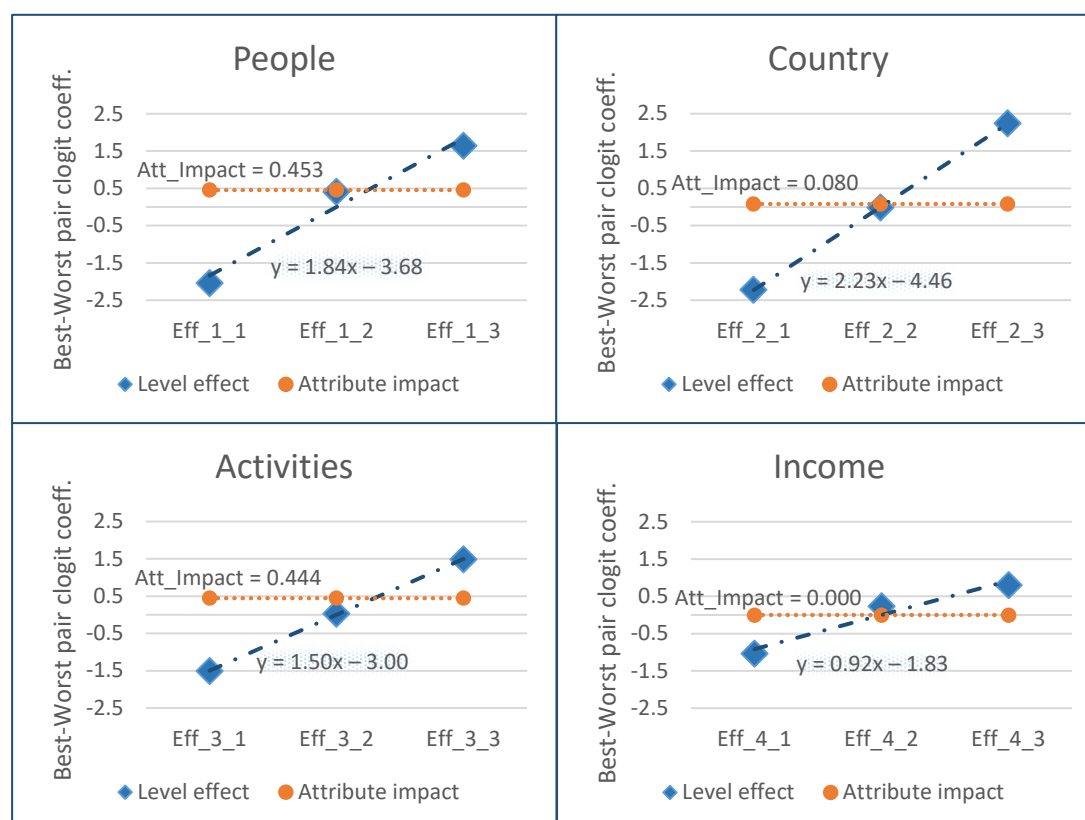
Notes: Asterisks show the significance level of the p-values *p<0.10, **p<0.05, ***p<0.01.

Levels excluded from regression, coefficients calculated as negative sum of other levels in attribute.

Data Source: Phase 2 survey data collected and compiled by author.

Plotting the attribute impacts and level effects by attribute in Fig. 7-18 shows the same marginal relativities between level effects (Eff_m_l), enumerated by the beta values on the lines of best fit, as those shown for the dummy coded attribute levels in Fig. 7-18.

Fig. 7-21 Conditional logit results for attribute impact and effects level for Best-Worst pairs by attribute



Data Source: Phase 2 survey data collected and compiled by author.

As the attribute impacts are the means of the attribute levels, they indicate the average impact of an attribute at the levels presented. In this case, the balance of Best and Worst choices in some attributes is affected by large Worst scores for the lowest levels, lowering the attribute mean relative to other attributes with weaker responses to low levels. This gives rise to disparity across attributes between attribute impact measures and marginal level effects.

As we see in Table 7-15 and in Fig. 7-21, the value of attribute impact is lower for the Country attribute than the people and activities attributes. This contrasts with the marginal level effects, depicted in Fig. 7-21 by the slope of the fitted line for the Country attribute, which is steeper than all other attributes. This demonstrates the important distinction between attribute impact and attribute importance, particularly where levels of an attribute and marginal values are the focus of any research.

Understanding the significance and potential source of this difference is important for future design considerations. Two particular factors appear to be relevant in this

research, namely the degree of specificity of attribute level descriptions and the extremeness of maximum and minimum levels of attributes.

In this research, attributes and levels were chosen following the Phase 1 qualitative field research, and reflect the views and reality for the participants. For example, the Country attribute has reasonably specific and quite extreme levels at the two ends of the spectrum, namely 'little or no access to traditional Country' and 'full access to traditional Country'. This reflected the range of experiences, with some research participants having no access to their traditional Country at all, through extinguishment of native title or development that excludes access, while others enjoy full access, often associated with recognition of full native title rights.

Other attributes did not have such extreme levels, with the lowest and highest levels reflecting the experience of participants in the research. Notably the income attribute had a minimum set at the level of income support, reflecting the safety net at the time. Since that time the imposition of penalties through the CDP scheme has left more people without any income, albeit temporarily. In this more recent situation adding a new attribute level, where income is zero, may have ensured a range of income levels that more accurately reflects the current lived experience, with resultant impacts on relative utility across the board.

While the levels of the Country and income attributes were quite specific, levels of the other two attributes were expressed in more general terms. Primarily this was to avoid including measurements or specificity that would increase the cognitive load on respondents. However, the result is that the marginal impacts reflect the experience and understanding of the participants rather than a concrete objective measure.

In this research marginal utility values of the levels are relevant to the question of the value of intangible aspects of culture, making separate analysis of the impact of particular attributes from the level scales less important than it might be if considering wholesale change, such as the removal of an attribute. When we compare the coefficients resulting from conditional logit regressions of effects coded data with dummy coded data in Table 7-16 we see that, while the coefficients for the dummy coded attribute levels set with c1 as the reference (0) appear markedly different from the effects coded level effect coefficients, the margins are identical.

Table 7-16 Comparing marginal differences in attribute level conditional logit coefficients using dummy and effects coding

Attribute	Level	Dummy coded model		Effects coded model	
		Coeff.	Margin	Coeff.	Margin
People	p1	0.553		-2.043	
	p2	3.002	2.449	0.406	2.449
	p3	4.232	1.230	1.637	1.230
Country	c1	–		-2.222	
	c2	2.203	2.203	-0.019	2.203
	c3	4.463	2.260	2.241	2.260
Activities	a1	1.074		-1.512	
	a2	2.611	1.537	0.025	1.537
	a3	4.072	1.461	1.487	1.461
Income	y1	1.108		-1.034	
	y2	2.375	1.267	0.233	1.267
	y3	2.943	0.568	0.801	0.568

Data Source: Phase 2 survey data collected and compiled by author.

Given the ultimate aim of this research is to consider relative marginal values, it is interesting to note that the choice of dummy or effects coding has not affected the end result in the analysis discussed in this chapter. Some valuation approaches rely on effects coding, and comparison of monetary valuations in Chapter 8 includes both coding forms. Otherwise, further analysis of the BWS model reported in Chapter 8, including LCA, utilised dummy coding.

7.5 Conclusion

This Chapter has discussed several approaches to analysing the data in the BWS Case 2 choice model in this research to show respondents' relative preferences for attribute levels. The consistency of results across different approaches is a strong indication of the reliability and appropriateness of the methods, with evidence of cognitive ease and limited bias as indicated by the small number of outliers in heterogeneity testing of count data.

Comparing the results of measures of attribute level relativity, from counts, through count frequencies, probabilities and ratios to estimated utilities using linear regression to more precise utility measures using multinomial regressions, there is a high degree of consistency. The relative ranking of attribute levels were shown for a range of the analytical techniques in Fig. 7-1, Fig. 7-5, Fig. 7-12, and Fig. 7-17. The ranking of preferences for attribute levels indicated by the utilities in the conditional logit model of

Best-Worst pairs is compared with a selection of other models explored in this chapter in Table 7-17 below. There is a degree of consistency of ranking across these techniques, particularly for the highest and lowest ranked attribute levels.

Table 7-17 Ranking attribute level preferences in a selection of analytical methods

Rank	Multinomial model of Best-Worst pairs	Linear model of Best- Worst pairs	Linear model of stacked Best and Worst	Frequency of Best- minus- Worst	Frequency of Worst	Frequency of Best
Lowest	c1	c1	c1	c1	c1	c1
	y1	y1	p1	p1	p1	p1
	p1	p1	y1	y1	y1	y2
	a1	a1	a1	a1	a1	y1
	c2	c2	c2	c2	c2	a1
	y2	y2	y2	y2	a2	c2
	p2	p2	a2	a2	y2	y3
	a2	a2	p2	y3	p2	a2
	y3	y3	y3	p2	y3	p2
	a3	a3	a3	a3	a3	a3
	p3	p3	p3	p3	p3	p3
Highest	c3	c3	c3	c3	c3	c3

Data Source: Phase 2 survey data collected and compiled by author.

Of particular note is the consistently strong response by respondents to different levels of the Country attribute and resultant high marginal utility. The strength of the results for this attribute, both in terms of it being the most desirable of all attributes at their highest level and the least desirable of all attributes at their lowest levels, accords with the qualitative data and observations in the field. As noted in Sub-section 6.5.1, access to country incorporates aspects of rights to access as well as the practicalities affecting frequency of access, which is likely to have strengthened the responses to the extreme levels of this attribute. Access to traditional Country is the driver behind the establishment of small communities and family outstations or micro-communities on traditional lands. Pastoral leases cover much of the Nyikina and Mangala Country, and Aboriginal people historically worked for pastoralists while maintaining access to Country and adapted their customs to work around their obligations to the pastoral owners and managers.

The next chapter extends this research to consider heterogeneity within the sample, analysis of the DCE (supplementary accept/reject question), and estimation of monetary values from the BWS and the DCE.

Chapter 8 Beyond relative utility: Heterogeneity and valuation

8.1 Introduction

The purpose of this chapter, building on the results in Chapter 7, is to provide further evidence of the feasibility, reliability and appropriateness of the choice modelling methods for quantifying cultural values for First Nations peoples.

Chapter 7 estimated the relative utilities of the attribute levels in the BWS choice model using count and regression techniques. This chapter further analyses the BWS, and analyses DCE, providing comparisons with the results in Chapter 7, in several ways. Firstly, it explores heterogeneity of the respondent sample's preferences using LCA. It then estimates utilities associated with the attributes in the choice model using responses to the supplementary accept/reject question, which is a DCE. Finally, it addresses the ultimate aim of the research, with the estimation and comparison of monetary values based on the relative marginal utilities from the BWS and DCE models.

The results in this chapter, particularly the comparisons of consistency across analytic techniques, within the sample, and between the BWS and DCE, inform the judgement on feasibility, reliability and appropriateness of the methods.

The LCA explores the heterogeneity of the sample by modelling individual preferences using a modified conditional logit regression that identifies classes or clusters of participants. The latent class membership from the LCA modelling is compared with the cluster analysis using ESP measures in Chapter 7. The association of sociodemographic characteristics with latent class membership is analysed to identify any observable characteristics that may differentiate class membership.

The supplementary accept/reject question, where respondents are asked if the profile as a whole is OK or not OK for them, is a binary DCE. This DCE yields different information to, and is statistically less efficient than, the BWS choice task, because it focuses on profiles as a whole rather than the attribute levels within the profile. Analysis of the DCE in Section 8.3 starts with count analysis before modelling with linear and

conditional logit regression to estimate the relative utilities associated with the attribute levels. The results are compared with and, in the case of Best, Worst and OK, not OK counts, combined to assess how they estimate relative attribute level utility.

Valuations in monetary terms are derived from the BWS and DCE relative utilities in Section 8.4 by scaling the utilities associated with levels of each non-monetary attribute against the dollar values associated with levels of the income attribute. Willingness to pay or willingness to accept (WTP/WT A) estimates reflect the marginal differences between attribute level valuations. The two choice methods, BWS and DCE, yield similar relative utilities but different scales of valuations for non-monetary attributes, and possible reasons for differences are discussed.

This chapter concludes with a discussion of other potential approaches and analysis that could be undertaken including combining results of the BWS and DCE beyond the simple count combinations in this chapter to provide optimal estimates of utility and valuations from BWS Case 2 choice models that use a supplementary accept/reject question.

8.2 Latent class analysis

This section reports on the results of LCA testing for unobserved heterogeneity and identification of any observable membership characteristics using collected sociodemographic and cultural data. Identification of highly correlated observable characteristics of classes potentially enables the model to be generalised beyond the sample or population of study. The heterogeneity of First Nations populations in Australia limits appropriate generalisation to small localised populations. However, the limited clustering shown with SS and TESP results reported in Sub-section 7.3.2 of Chapter 7 warrant further exploration with LCA.

Heterogeneity in utility arises from variations in the observed (V_{iq} in Equation (6-1) of Chapter 6) and random or unobserved (ε_{iq} in Equation (6-1)) factors. Observed factors that might affect preferences could include gender and age for example.

The two sources of heterogeneity in individual preferences elicited in choice modelling are preferences and scale variances (Louviere et al. 2000). Scale heterogeneity is

essentially variation in absolute sensitivity, and recent literature suggests that is not possible to disentangle scale heterogeneity from other sources of heterogeneity (Hess & Rose 2012; Hess & Train 2017).

Rather than using a scale-adjusted procedure, such as that in specialised proprietary software such as Latent GOLD® more commonly used in BWS (Flynn et al. 2015), this research uses the latent class logit command (lclogit) and associated post-estimation commands for Stata developed by Pacifico and Yoo (2013) building on earlier work by Pacifico (2012). The lclogit and associated post-estimation commands implement an expectation-maximisation algorithm for fitting a latent class logit model.

Having established the optimal classes, the model is used to compare the differences in expressed preferences between the classes. Subsequent investigation with cross tabulation and univariate analysis sought to identify any observed characteristics, such as age, gender, education, work experience or cultural indicators that might distinguish the classes. The coding schema has no bearing on the results and dummy coding results are presented below.

8.2.1 Selection of classes

The first step in LCA is to determine how many distinct groups or classes of respondents are in the sample. The selection of an optimal number of latent classes was guided by testing model stability with different starting seeds and minimising information criteria, such as the Bayesian information criteria (BIC) and the Akaike information criteria (AIC) or the consistent Akaike information criteria (CAIC). Several latent class logit specifications, in a number of seeds (random starting values) were estimated with the information criteria (Pacifico & Yoo 2013). The results, shown in Table 8-1, identified a two-class model with membership of 67 respondents (Class 1) and 30 respondents (Class 2). Despite the possibility of over-segmentation using latent class logit BWS modelling (Zhou 2017), this analysis achieved a parsimonious model.

Table 8-1 Comparison of information criteria results with starting seed 987654

Classes	LLF	Nparam	CAIC	BIC
2	−1367.81	24	2869.421	2845.421
3	−1336.42	37	2879.096	2842.096
4	−1318.36	50	2915.456	2865.456
5	−1308.97	63	2969.141	2906.141

Source: Phase 2 survey data collected and compiled by author.

8.2.2 Latent class results

The preference results from the latent class logit (lclogit) procedure, followed by the more highly specified lclogitml procedure, that predicts the probabilities of choice and class membership after lclogit using the gllamm (generalised linear latent and mixed models) procedure, and involves more stringent convergence criteria, are presented in Table 8-2 below. The attribute level with the lowest (negative) coefficient in the largest class (c1) was selected as the reference or zero value. This yielded positive coefficients for all other attribute levels except one (p1) in the smallest class. While Class 1 has the largest share of the sample, the coefficients for Class 2 are larger across most attribute levels, suggesting stronger differentiation of preferences.

Table 8-2 Comparison of latent class regressions (lclogitml using gllamm) with two classes

Attribute	Level	Class1			Class2		
		Coeff.	S.E.	Signif.	Coeff.	S.E.	Signif.
People	p1	0.796	0.208	***	−0.277	0.636	
	p2	3.038	0.215	***	3.501	1.021	***
	p3	3.958	0.321	***	6.706	1.210	***
Country	c1	—			—		
	c2	2.064	0.209	***	3.322	1.350	
	c3	4.090	0.418	***	7.262	1.105	
Activities	a1	1.005	0.196	***	1.879	1.076	***
	a2	2.501	0.288	***	3.638	0.801	
	a3	3.461	0.384	***	7.661	1.722	
Income	y1	0.836	0.206	***	2.452	1.721	***
	y2	2.202	0.241	***	3.636	1.018	
	y3	2.912	0.233	***	3.714	0.821	
Class Share		69.1%			30.9%		

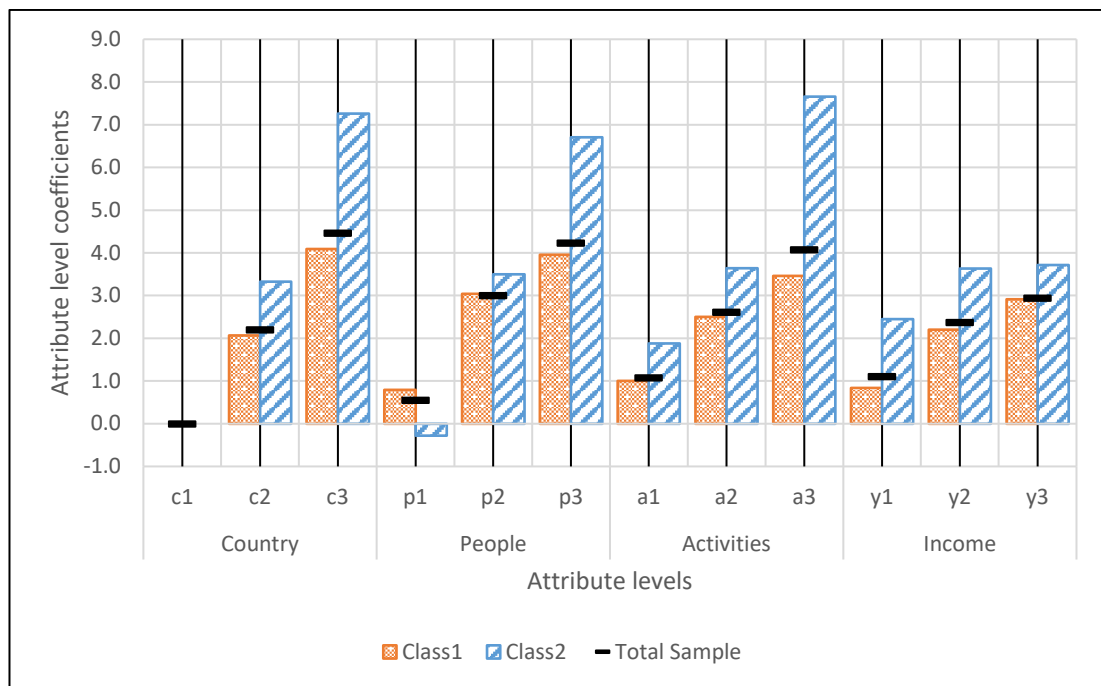
Source: Phase 2 survey data collected and compiled by author.

Notes: Asterisks show the significance level of the p-values *p<0.10, **p<0.05, ***p<0.01.

We see in Fig. 8-1, which plots the attribute level coefficients for each class against the total sample, that the relative rankings are consistent across the classes and the total

sample. There is greatest difference between the coefficients for levels of the people and activities attributes, with the income attribute showing the least difference. Most of the Class 2 coefficients are between 1.5 and 2 times the Class 1 coefficients, except significantly higher values (between 2 and 3 times) for the highest level of the activities attribute and the lowest level of the income attribute and the lowest level of the people attribute where the Class 2 is a lower (negative) value.

Fig. 8-1 Comparison of latent class conditional logit coefficients by class, compared with the total sample



Data Source: Phase 2 survey data collected and compiled by author.
Note: Lowest level of Country attribute is reference (zero) value.

8.2.3 Types of participants in classes

By examining the differences in preferences of the two classes and then the observed characteristics of the participants in the classes we can gain a picture of the type of participants in each class.

Expressed preferences of classes

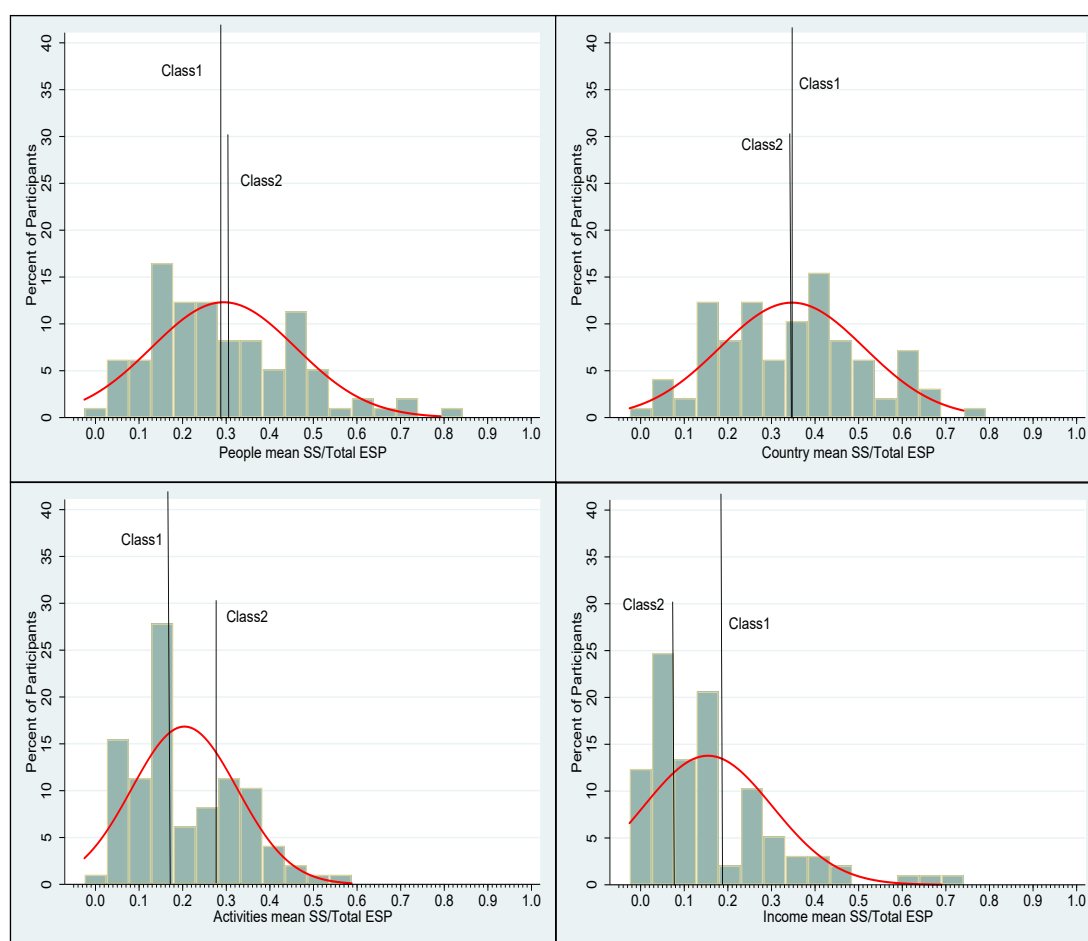
The results shown in Fig. 8-1 suggest that, overall, Class 2 members expressed stronger preferences in the choice model. To compare class and individual preferences building on the previous cluster analysis in Sub-section 7.3.2 of Chapter 7 using individual SS

measures scaled by TESP measures to give the SS/TESP ratio. This enables comparison of class means and individual preference variability.

As we saw in Fig. 7-6 in Chapter 7, the distribution of individual respondent's SS measures were more skewed towards lower levels for attributes where the attribute is less consistently and less highly valued.

Scaling the individual SS measure by dividing by individual ESP measures provides a mean SS/ESP measure. The overlay of latent class mean SS/ESP ratios over individual mean SS/ESP ratios in Fig. 8-2 reveals how class membership relates to the patterns of individuals preferences for these attributes. Unsurprisingly the mean ratios for the largest class (Class 1) lie closest to the means. For the activities and income attributes where class membership is more varied, class means lie close to clusters of individual ratios. This indicates a degree of accord between results of the cluster analysis undertaken with the counts and the modelled LCA.

Fig. 8-2 Distribution of individual and latent class scaled SS/ESP measures



Data Source: Phase 2 survey data collected and compiled by author.

Observable variability of classes

Exploring the correlation between observable variations and classes seeks to identify any sociodemographic and cultural variability between the two classes. Testing was undertaken in a stepwise process to identify possible predictors of class membership (Huynh et al. 2017; Patel et al. 2005; Peters et al. 2003). As a first step, comparison of observed characteristics of the classes with basic cross tabulation can identify where a class has a significantly different proportion of that characteristic relative to the total sample. The statistical significance of these notable indicators can then be tested in univariate analysis against class membership, and multivariate analysis. Any resultant indicators of significant variation can then be tested as explanatory variables in the latent class model.

Table 8-3 sets out sociodemographic characteristics of members of the two classes, noting where the number of members with these characteristics in the smallest class (Class 2) vary by more than 5% or 10% against the total sample share for Class 2.

Table 8-3 Sociodemographic characteristics of latent classes

	Class				Total number	Class 2 var.
	1		2			
	Row %	S.E.	Row %	S.E.		
Class Share	69.1		30.9		97	
<i>Gender</i>						
Female	65.4	(6.598)	34.6	(6.598)	52	
Male	73.3	(6.592)	26.7	(6.592)	45	
<i>Broad age categories</i>						
18–29	70.4	(8.788)	29.6	(8.788)	27	
30–49	64.6	(6.903)	35.4	(6.903)	48	
50 plus	77.3	(8.935)	22.7	(8.935)	22	#
<i>Highest Education Level Completed (HEAP L1)</i>						
None	0.0	(0.000)	100.0	(0.000)	1	##
Junior Secondary Year 9 or less	70.0	(14.492)	30.0	(14.492)	10	
Cert II or less	66.7	(27.218)	33.3	(27.218)	3	
Senior Secondary Year 10–12	73.2	(6.920)	26.8	(6.920)	41	
Cert III or IV	60.0	(8.281)	40.0	(8.281)	35	#
Advanced Diploma or Diploma	100.0	(0.000)	0.0	(0.000)	4	##
Bachelor	100.0	(0.000)	0.0	(0.000)	1	##
Postgraduate	100.0	(0.000)	0.0	(0.000)	2	##
<i>Lived away from home for education</i>						
No	68.3	(7.268)	31.7	(7.268)	41	
Yes	69.6	(6.145)	30.4	(6.145)	56	
<i>Broad activity category this month</i>						
Unemployed/Income Support	80.0	(8.000)	20.0	(8.000)	25	##
CDP	53.6	(9.425)	46.4	(9.425)	28	##
Paid employment	72.7	(6.714)	27.3	(6.714)	44	
<i>Permanent or temporary paid employment</i>						
Not in paid employment	66.0	(6.505)	34.0	(6.505)	53	
Permanent	73.0	(7.301)	27.0	(7.301)	37	
Temporary	71.4	(17.076)	28.6	(17.076)	7	
<i>Sector of paid employment</i>						
Not in paid employment	66.0	(6.505)	34.0	(6.505)	53	
Government	100.0	(0.000)	0.0	(0.000)	1	##
Private sector	75.0	(21.652)	25.0	(21.652)	4	#
NGO	71.8	(7.206)	28.2	(7.206)	39	
<i>Weekly hours in paid employment</i>						
Under 20 hrs	50.0	(35.357)	50.0	(35.357)	2	##
20–29 hours	100.0	(0.000)	0.0	(0.000)	3	##
30–39 hrs	74.1	(8.434)	25.9	(8.434)	27	#
40 hrs or over	66.7	(13.609)	33.3	(13.609)	12	

(Continued next page)

Table 8-3 Sociodemographic characteristics of latent classes (cont.)

	Class				Total number	Class 2 var.
	1		2			
	Row %	S.E.	Row %	S.E.		
<i>Income level</i>						
Low	65.5	(6.412)	34.5	(6.412)	55	
Medium	70.3	(7.515)	29.7	(7.515)	37	
High	100.0	(0.000)	0.0	(0.000)	5	##
<i>Reside in town or more remote</i>						
Town	80.0	(7.303)	20.0	(7.303)	30	##
Remote	64.2	(5.858)	35.8	(5.858)	67	
<i>TOs of normal residence</i>						
No	78.6	(7.755)	21.4	(7.755)	28	#
Yes	65.2	(5.734)	34.8	(5.734)	69	
<i>Native title recognition</i>						
Recognised	69.0	(4.960)	31.0	(4.960)	87	
Not recognised	0.0	(0.000)	100.0	(0.000)	1	##
Unsure	77.8	(13.859)	22.2	(13.859)	9	#
<i>Level of access to traditional Country</i>						
Full access	65.5	(6.241)	34.5	(6.241)	58	
Some access	69.0	(8.591)	31.0	(8.591)	29	
No access	100.0	(0.000)	0.0	(0.000)	1	##
Unsure	88.9	(10.476)	11.1	(10.476)	9	##
<i>Language mainly spoken traditional or Kriol</i>						
Don't speak language	70.7	(7.106)	29.3	(7.106)	41	
Traditional	71.7	(6.639)	28.3	(6.639)	46	
Kriol	50.0	(15.812)	50.0	(15.812)	10	##
<i>Nyikina or Mangala first named language group</i>						
No	76.0	(8.542)	24.0	(8.542)	25	#
Yes	66.7	(5.556)	33.3	(5.556)	72	
Total number	67		30		97	

Source: Phase 2 survey data collected and compiled by author.

Note: Difference in Class 2 shares between variable and total, # denotes 5–10%, ## denotes >10%.

The greatest variations from total class shares identified in Table 8-3 arise in categorical variables related to education levels, activity, employment sector, paid working hours, income level, native title recognition, level of access to traditional Country, and language mainly spoken.

The correlation of these variables, that were potential observable characteristics of class membership, were tested in univariate logistic regression and multivariate regressions. None of the models identified significant correlates with membership of the classes, suggesting that the observed characteristics are not useful indicators of the taste

preferences of participants in the research. In light of the limited association with observed characteristics with class membership no further analysis exploring the extent of this association was undertaken. Had significant correlates been identified in this process they could then have been tested as explanatory variables in the latent class model, and final valuations could be presented for the classes and the total sample.

While LCA has potential to explain preference variations in population subgroups, in this case with the small sample size, only two classes and preferences largely unobserved, it does not add significantly to our understanding of the preferences in the study population.

8.3 Analysis of discrete choice experiment

A supplementary accept/reject question asked after each hypothetical choice set or scenario was presented – ‘Is this situation OK or not OK for you?’ This question is a binary DCE that is framed by, and augments, the BWS Case 2 model. While a specific alternate is not provided to choose from, it would seem reasonable to assume that respondents consider their own situation as a comparator in assessing the profiles presented. The information such a DCE provides is different to the BWS Case 2, as respondents are assessing the profile as a whole rather than explaining which attribute levels in a profile make it more or less attractive. Because respondents can accept or reject the profile as a whole it is said to be an unconditioned choice, whereas in the BWS Case 2 one attribute level in the profile must be selected as best and another as worst and the choices are conditioned within the profile (Flynn et al. 2007).

As an expression of unconditioned preference, DCEs are a commonly applied tool for estimating willingness to pay or accept values from choice models. The BWS Case 3 multi-profile case is increasingly used in environmental valuations because it allows preferences between scenarios, much like (non-binary) DCEs where a preferred profile is selected from more than one, although the cognitive load associated with comparing two or more profiles at a time is far greater than considering a single profile. Given the limited application of BWS Case 2 in valuation (Louviere et al. 2015, pp. 225–239), the comparison of the two choice modelling approaches adopted in this research is relatively novel. It also enables some assessment of the consistency and, therefore, the reliability of choice modelling methods for valuation in this context.

The responses to the supplementary question provide insights to the strength of feeling respondents had about particular scenarios or profiles as a whole and the attribute levels presented therein. Potentially, by providing an indication of whether the Best outweighs the Worst or vice versa, it can anchor the otherwise relative scaling of a BWS Case 2 (Lagerkvist et al. 2012). It can also strengthen the BWS model by providing additional information about attitudes to attributes and levels. Traditionally, DCEs are used to estimate the marginal WTP/WTa for changes in levels of attributes.

Framing of the supplementary accept/reject question immediately after the respondent assesses the profile and identifies the Best and Worst attribute levels within the profile ensures that respondents have already carefully considered the profile and its constituent attribute levels. This reduces the likelihood of responses being biased by ‘yay-saying’, as could happen with accept/reject DCEs.

Analysis of the DCE in this section follows a similar process to that of the BWS in Chapter 7, starting with count analysis, first separately and then combined with Best and Worst choices, before moving to regression modelling. The results are combined with, and compared to, those of the BWS, providing some insights to the degree to which the attribute levels chosen as Best/Worst influence the overall acceptability of the profile.

The final stage of DCE analysis presented in the next section of this chapter is translation of the estimated utilities of attribute levels from both the BWS and DCE models to monetised values, and comparison of the results.

8.3.1 Count analysis of discrete choice experiment

Analysis starts with the basic counts of OK/not OK by profile and available attribute level, before combining information from both choice tasks. Combined count analysis includes OK/not OK by attribute levels chosen as Best and Worst, and finally OK/not OK by attribute levels in Best-Worst pair selections.

Counts of OK and not OK by profile

A basic count by profile analysis of the aggregate sample DCE results provide an indication of the average preference ranking for the profiles.

Table 8-4 below shows the raw counts, proportion of the sample that indicated the profile was OK, and the resultant preference ranking for the profiles. Interestingly, the total count of not OK responses is higher than the OK responses. This supports the proposition that there was not an overall tendency to ‘yay-saying’, a behavioural response that can bias results.

Table 8-4 Analysis of the counts of OK/Not OK by profile

Profile	A	B	C	D	E	F	G	H	I	Total
Not OK	92	59	43	63	30	39	51	45	28	450
OK	5	38	54	34	67	58	46	52	69	423
OK %	5.2	39.2	55.7	35.1	69.1	59.8	47.4	53.6	71.1	48.5
Rank OK	9	7	4	8	2	3	6	5	1	

Note: Profiles A–I are described in Appendix 8.

Counts of OK and not OK by available attribute level

The relative frequencies of the counts of OK and not OK by the four attribute levels available in each of the nine profiles presented in Table 8-5 gives a preliminary sense of the relative preferences of attribute levels. These can then be compared with the BWS count results.

Table 8-5 Analysis of OK and not OK counts by attribute levels

Attribute	Level	Not OK count	OK count	Not OK frequency	OK frequency	(OK–not OK) frequency	Attribute range (OK–not OK) frequency
People	p1	194	97	0.667	0.333	–0.333	0.481
	p2	132	159	0.454	0.546	0.093	
	p3	124	167	0.426	0.574	0.148	
Country	c1	206	85	0.708	0.292	–0.416	0.660
	c2	134	157	0.460	0.540	0.079	
	c3	110	181	0.378	0.622	0.244	
Activities	a1	176	115	0.605	0.395	–0.210	0.357
	a2	150	141	0.515	0.485	–0.031	
	a3	124	167	0.426	0.574	0.148	
Income	y1	150	141	0.515	0.485	–0.031	0.014
	y2	151	140	0.519	0.481	–0.038	
	y3	149	142	0.512	0.488	–0.024	
Total		1,800	1,692	0.515	0.485	–0.031	

Source: Phase 2 survey data collected and compiled by author.

8.3.2 Comparing choices in the DCE and BWS

Evaluating the choices in the accept/reject binary DCE (expressed as OK/not OK) and BWS (expressed as Best/Worst), and the relative preferences for attribute levels that they indicate, supports two outcomes. Firstly, it deepens our understanding of the models and how the differences in preference information can be interpreted, and secondly, it informs the interpretation of the value estimates derived from them. In this sub-section we compare counts from the two choice models, before proceeding to modelling the DCE.

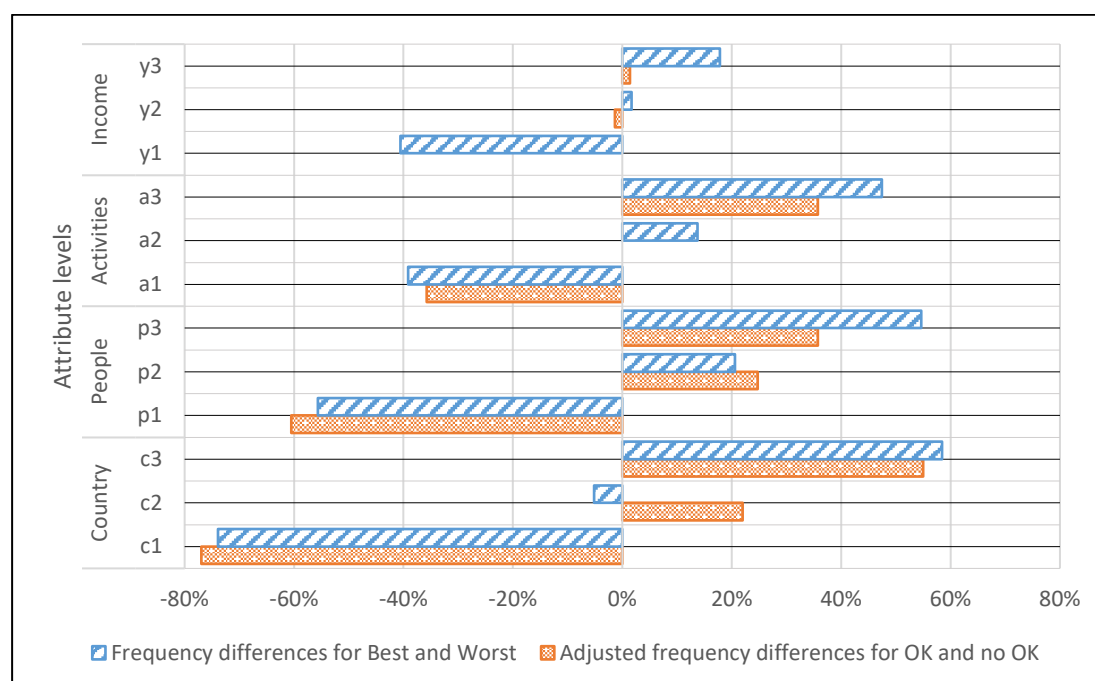
Comparing OK/not OK and Best/Worst choices

Comparing the counts, by attribute level, of OK/not OK choices with the Best/Worst choices analysed in Sub-section 7.3.1 of Chapter 7, is the first step in this analysis. Intuitively, it would be reasonable to expect a degree of consistency between the Best and OK results, and the Worst and not OK results.

However there are two key distinctions in the frequency differences of OK/not OK (Freq. (OK–not OK) in Table 8-5) and Best/Worst (Column (3) (B–W) of Table 7-5 in Chapter 7). The first is that the frequency differences for Best/Worst choices are zero-centred because there are the same number of counts of each, whereas the OK/not OK count frequency differences total to -0.031 , reflecting the higher number of not OK counts. The second notable difference is that the scale of frequency variations between OK/not OK and Best/Worst differs because the single choice of OK/not OK applies to all four attribute levels in a profile, whereas the Best/Worst choices apply to only two of the four attribute levels available in a profile.

To facilitate comparison with the Best/Worst frequency differences, the OK/not OK frequency differences were re-centred to zero, by subtracting the total OK/not OK frequency difference, and then rescaled by doubling. Graphing these results by attribute level in Fig. 8-3 shows relative preferences and the effects of the adjustment.

Fig. 8-3 Comparison of frequency differentials for Best and Worst and adjusted OK and not OK choices



Data Source: Phase 2 survey data collected and compiled by author.

Note: OK/not OK frequency differences zero-centred and rescaled by doubling for direct comparison with Best/Worst frequency differences.

In Fig. 8-3 we see that for both Best/Worst and OK/not OK, the differences within attributes between the lowest and highest levels are greatest for the Country attribute (c1, c3), followed by the people attribute (p1, p3), and then cultural activities attribute (a1, a3). The most notable difference between the two sets of results relates to the income attribute, where the variations between OK/not OK frequency differences are small and comparable for all three levels, whereas the Best/Worst frequency differences are more marked. This suggests that the income attribute, at all levels, had minimal impact on the decision about the acceptability of profiles.

Given the OK/not OK choices for each profile were made by respondents immediately following their selection of Best and Worst attribute levels within that profile, it might be assumed that the Best and/or Worst choices influence, if not determine, the acceptability of the profile. For example, if a profile is acceptable, then it could be because the strength of preference (utility) for the Best choice is deterministic, or outweighs the negative preference (disutility) for the Worst. On the other hand, in an unacceptable profile, the preference for the Worst attribute level may be deterministic or outweigh the utility for the Best.

On the other hand, the accept/reject decision could be based entirely on assessment of the profile as a whole, weighing up all of the attribute levels, without the Best or Worst choices being the primary determinant of acceptability. Without a counterfactual testing of accept/reject choices that were not framed by the preceding choice of Best and Worst attribute levels in the profile, it is not possible to really test the degree of influence.

To better understand how influential the Best or Worst choice is in determining the acceptability of a profile, we can analyse how the share of Best/Worst choices are associated with OK/not OK choices. Aggregate sample level counts, by attribute level, for OK coupled with Best, and not OK coupled with Worst, in Table 8-6, indicates a reasonably high correlation of OK and Best at the higher levels, and not OK and Worst at the lower levels, in three of the four attributes, namely Country, people and cultural activities. The weaker association for the income attribute might indicate that this attribute was less influential in respondents' assessments of profiles as a whole.

Even if Best and Worst choices are assumed to influence or determine the acceptability of the overall profile resulting in high consistency, the Best and Worst choice data is likely to be a more reliable indicator of overall preferences, given the level of specificity of choice by individual attribute level rather than profile. However, a weaker correlation between Best and OK or Worst and not OK may indicate that the OK/not OK choice weighs up the preferences of all attribute levels present and makes a judgement about acceptability of the profile as a whole irrespective of the Best and Worst choices.

Table 8-6 indicates that there is weaker differentiation of attribute levels present in OK/not OK than there is in Best/Worst choice counts. In an acceptable profile, an attribute level also being selected as Best would be a stronger indication of its preference than simply being present in that profile, and even more so than if it was selected as Worst. Similarly, an attribute level in an unacceptable profile that was selected as Worst would be a clearer indication of aversion to it than just its presence, or being chosen as Best.

Variations in OK/not OK (Columns (2) and (6)) and Best/Worst (Columns (1) and (5)) choices depend on psychological processes and decision rules. It has been suggested that using the binary DCE results of the OK/not OK type to weight the Best/Worst

choices in a manner consistent with psychological theory may be optimal for analysing this combination of choice models (Louviere et al. 2015; Louviere & Woodworth 1983; Orme 2009). Without finding a developed and tested model in the literature, I have limited analysis in this thesis to the comparison of counts.

As Best or Worst choices are specific to attribute levels, it seems reasonable to assume that they are a better indicator of the preferences of attribute levels than the attribute level being present in a profile selected as OK/not OK.

Table 8-6 Aggregate sample count totals of OK, Best, not OK and Worst by attribute level

Attribute	Level	(1) Best	(2) OK	(3) Best & OK	(4) (Best & OK)/ Best	(5) Worst	(6) Not OK	(7) Worst & Not OK	(8) (Worst & Not OK)/ Worst
People	p1	24	97	2	0.083	186	194	115	0.618
	p2	78	159	43	0.551	18	132	2	0.111
	p3	165	167	92	0.558	6	124	1	0.167
Country	c1	9	85	3	0.333	224	206	153	0.683
	c2	44	157	24	0.545	59	134	25	0.424
	c3	171	181	102	0.596	1	110	–	–
Activities	a1	37	115	1	0.027	151	176	68	0.450
	a2	69	141	23	0.333	29	150	5	0.172
	a3	147	167	90	0.612	9	124	4	0.444
Income	y1	35	141	3	0.086	153	150	65	0.425
	y2	27	140	11	0.407	22	151	7	0.318
	y3	67	142	29	0.433	15	149	5	0.333
Total		873	1,692	423	0.485	873	1,800	450	0.515

Source: Phase 2 survey data collected and compiled by author.

Comparing OK/not OK with Best-Worst pair choices

Testing the relationship between counts of the OK/not OK and Best/Worst choices by comparing the OK/not OK choices with the Best-Worst pair selections, Table 8-7 maps how often the presence of OK, not OK, and the difference between them, relates to each Best-Worst pair. This mapping of choices provides information on marginal and paired choices of the combinations of OK/not OK and Best-Worst pair choices as it did for the Best-Worst pair choices alone in Table 7-7 of Chapter 7.

The three panels of Table 8-7 present the combinations of OK, not OK, and the difference between OK and not OK, coinciding with Best-Worst pair choices. As with

Best-Worst pair count analysis in Table 7-7 of Chapter 7, the totals and averages for each attribute level in the margins of each panel indicate relative preferences. In Table 8-7, the right-hand margins contain the number and averages that OK and not OK were chosen, and the difference between them, when the Best-Worst pair choice was Best. The bottom rows of each section in Table 8-7 indicate when they corresponded with Worst choices. The final panel of Table 8-7, combining the difference between OK and not OK counts relative to Best and Worst choices in Best-Worst pairs, provides the clearest indication in this table of overall relative preferences for attribute levels.

The effect of combining the counts in this way modifies the depiction of relative preferences indicated by the similar analysis of Best-Worst pairs in Table 7-7 of Chapter 7. It could be argued that, because it combines overall profile acceptability – counting all available attribute levels in OK/not OK – with Best/Worst choices, this combined analysis is not as accurate a reflection of preferences of individual attribute levels. Despite this, the table reflects symmetry around the diagonal as seen in Table 7-7.

Table 8-7 Attribute level mapping of OK and not OK matched to Best-Worst pair choices

OK &		Worst											Best		
		People			Country			Activities			Income				
Best		p1	p2	p3	c1	c2	c3	a1	a2	a3	y1	y2	y3	Total	Avg.
People	p1				–	–	–	–	1	–	–	–	1	2	0.2
	p2				17	6	–	6	1	2	9	2	–	43	4.8
	p3				19	11	–	27	9	–	18	5	3	92	10.2
Country	c1	1	–	1				–	–	–	1	–	–	3	0.3
	c2	8	1	–				7	2	2	2	–	2	24	2.7
	c3	22	5	2				32	10	–	28	–	3	102	11.3
Activities	a1	–	–	–	1	–	–				–	–	–	1	0.1
	a2	8	2	–	5	4	1				1	1	1	23	2.6
	a3	22	5	–	17	10	–				29	7	–	90	10.0
Income	y1	–	–	–	2	–	–	–	–	1				3	0.3
	y2	3	1	1	5	–	–	1	–	–				11	1.2
	y3	7	2	1	5	3	–	10	1	–				29	3.2
Worst	Total	71	16	5	71	34	1	83	24	5	88	15	10	47.0	
	Avg.	8	2	1	8	4	0	9	3	1	10	2	1	47.0	

Not OK &		Worst											Best		
		People			Country			Activities			Income				
Best		p1	p2	p3	c1	c2	c3	a1	a2	a3	y1	y2	y3	Total	Avg.
People	p1				14	2	–	2	–	–	4	–	–	22	2.4
	p2				25	–	–	4	–	–	5	1	–	35	3.9
	p3				26	10	–	22	2	1	9	3	–	73	8.1
Country	c1	2	–	–				1	–	–	3	–	–	6	0.7
	c2	12	–	–				3	1	–	2	1	1	20	2.2
	c3	21	2	1				24	–	1	16	1	3	69	7.7
Activities	a1	11	–	–	13	1	–				11	–	–	36	4.0
	a2	17	–	–	28	1	–				–	–	–	46	5.1
	a3	17	–	–	16	7	–				15	1	1	57	6.3
Income	y1	13	–	–	16	–	–	2	–	1				32	3.6
	y2	2	–	–	9	1	–	4	–	–				16	1.8
	y3	20	–	–	6	3	–	6	2	1				38	4.2
Worst	Total	115	2	1	153	25	–	68	5	4	65	7	5	50.0	
	Avg.	13	0	0	17	3	–	8	1	0	7	1	1	50.0	

(Continued next page)

Table 8-7 (cont.) Attribute level mapping of OK and not OK matched to Best-Worst pair choices

OK minus not OK &		Worst											Best		
		People			Country			Activities			Income				
Best		p1	p2	p3	c1	c2	c3	a1	a2	a3	y1	y2	y3	Total	Avg.
People	p1				-14	-2	-	-2	1	-	-4	-	1	-20	-2.2
	p2				-8	6	-	2	1	2	4	1	-	8	0.9
	p3				-7	1	-	5	7	-1	9	2	3	19	2.1
Country	c1	-1	-	1				-1	-	-	-2	-	-	-3	-0.3
	c2	-4	1	-				4	1	2	-	-1	1	4	0.4
	c3	1	3	1				8	10	-1	12	-1	-	33	3.7
Activities	a1	-11	-	-	-12	-1	-				-11	-	-	-35	-3.9
	a2	-9	2	-	-23	3	1				1	1	1	-23	-2.6
	a3	5	5	-	1	3	-				14	6	-1	33	3.7
Income	y1	-13	-	-	-14	-	-	-2	-	-				-29	-3.2
	y2	1	1	1	-4	-1	-	-3	-	-				-5	-0.6
	y3	-13	2	1	-1	-	-	4	-1	-1				-9	-1.0
Worst	Total	-44	14	4	-82	9	1	15	19	1	23	8	5		-3.0
	Avg.	-8.8	2.8	0.8	-16.4	1.8	0.2	3.0	3.8	0.2	4.6	1.6	1.0	-5	

Source: Phase 2 survey data collected and compiled by author.

Extending this comparison of the combinations of OK/not OK and Best/Worst in Best-Worst pairs enables us to unpack the relationships between the BWS and DCE choices. Table 8-8 compares the proportional shares of Best/Worst (Columns (1) and (2)), and combinations of OK/not OK with Best/Worst (Columns (3) to (6)), by attribute level. Because the DCE profile acceptability choice extends to all attribute levels in a profile, this analysis captures situations where an attribute level in a profile that is OK is selected as Worst, or in a profile that is not OK is chosen as Best. Columns (4) and (5) show these combinations that may appear to be contrary but are inevitable given the design. These choices indicate attribute levels chosen as Best/Worst in a profile that do not determine, or influence more than the other attribute levels in the profile, the acceptability of that profile.

Table 8-8 OK/Not OK share of Best and Worst counts in Best-Worst pairs by attribute level

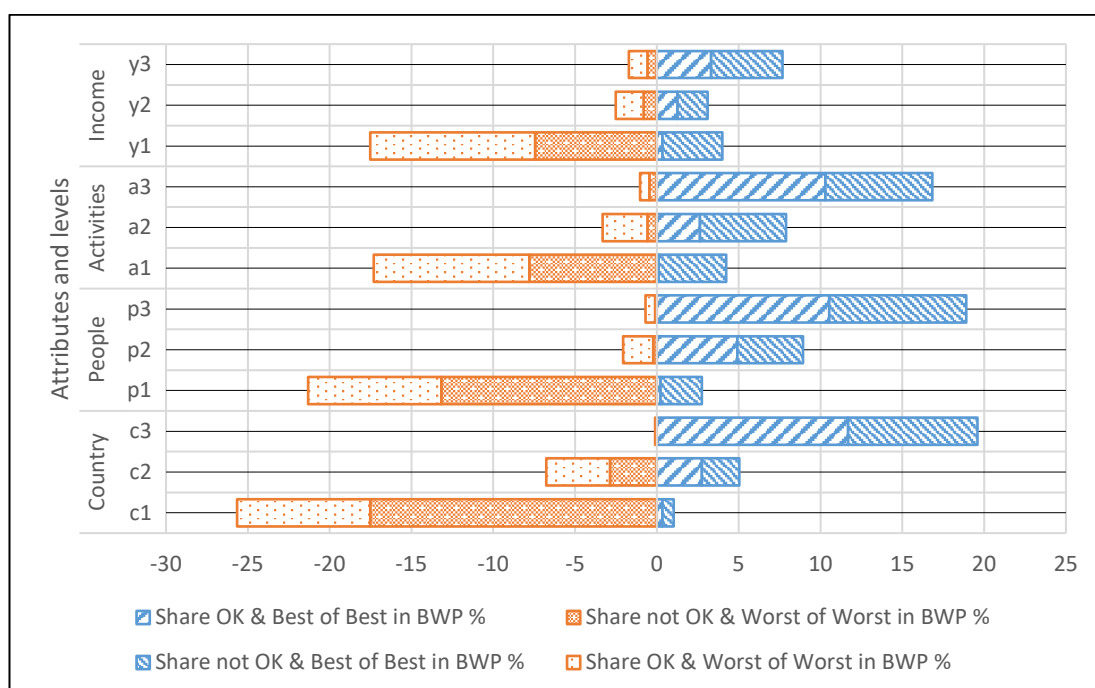
Attribute	Level	(1) Share Best in BWP %	(2) Share Worst in BWP %	(3) Share OK & Best of Best in BWP %	(4) Share OK & Worst of Worst in BWP %	(5) Share not OK & Best of Best in BWP %	(6) Share not OK & Worst of Worst in BWP %
People	p1	2.75	21.31	0.23	8.13	2.52	13.17
	p2	8.93	2.06	4.93	1.83	4.01	0.23
	p3	18.90	0.69	10.54	0.57	8.36	0.11
Country	c1	1.03	25.66	0.34	8.13	0.69	17.53
	c2	5.04	6.76	2.75	3.89	2.29	2.86
	c3	19.59	0.11	11.68	0.11	7.90	0.00
Activities	a1	4.24	17.30	0.11	9.51	4.12	7.79
	a2	7.90	3.32	2.63	2.75	5.27	0.57
	a3	16.84	1.03	10.31	0.57	6.53	0.46
Income	y1	4.01	17.53	0.34	10.08	3.67	7.45
	y2	3.09	2.52	1.26	1.72	1.83	0.80
	y3	7.67	1.72	3.32	1.15	4.35	0.57
Total		100.00	100.00	48.45	48.45	51.55	51.55

Source: Phase 2 survey data collected and compiled by author.

The results of the combinations of apparently consistent choices of OK and Best (as a share of Best), and not OK and Worst (as a share of Worst), are graphed as the base levels of the stacked columns in Fig. 8-4, with the combinations of not OK and Best and OK and Worst choices added as the top of these stacked columns. Overall, the graph shows a familiar pattern of relativities between of Best and Worst by attribute levels depicted in Fig. 7-1 of Chapter 7. The relative share of apparently consistent choices (Best with OK and Worst with no OK) demonstrates which attribute levels are more likely to influence or determine the choices in the DCE. For example, a clear majority of c1 is not OK and Worst (with only a small proportion being OK and Worst), suggesting that the presence of this attribute in a profile was highly influential in respondents rejecting the profile. Similarly c3, p3 and a3 reveal majority shares of Best being OK and Best, albeit a proportionally smaller majority than the not OK and Worst result for c1.

While no further analysis of these particular choices was undertaken, there could be value in exploring them further with modelling and consider their behavioural bases.

Fig. 8-4 Attribute level shares of Best and Worst in Best-Worst pair, split into selections of OK and not OK in same profiles



Data Source: Phase 2 survey data collected and compiled by author.

8.3.3 Regression modelling of discrete choice experiment

Unlike the BWS where choices are made from within a profile, the DCE asks respondents to consider the situation or scenario as a whole. So if the balance of attribute levels is not attractive, the respondent can reject that profile. We saw in the previous section that the Best and OK and Worst and not OK choices are not perfectly aligned given the different questions being asked and the fact that the accept/reject decision applies to all attribute levels in the profile. And so, with the modelling of the DCE, it would be reasonable to expect that while the relativities between attribute levels may be similar, the coefficients or utility estimates may vary.

Modelling of the DCE with linear and logistic regressions (conditional fixed effects and random effects logit) were undertaken prior to estimation of the valuations. Results of the conditional logit regressions in Table 8-9, with the OK choice as the dependent variable, show relative attribute level results broadly consistent with the count analysis presented in Table 8-5, noting that one level of each attribute is set to zero to address collinearity in this model, resulting in all coefficients being zero or positive.

Table 8-9 Conditional logit regressions of profiles accepted (OK) in DCE

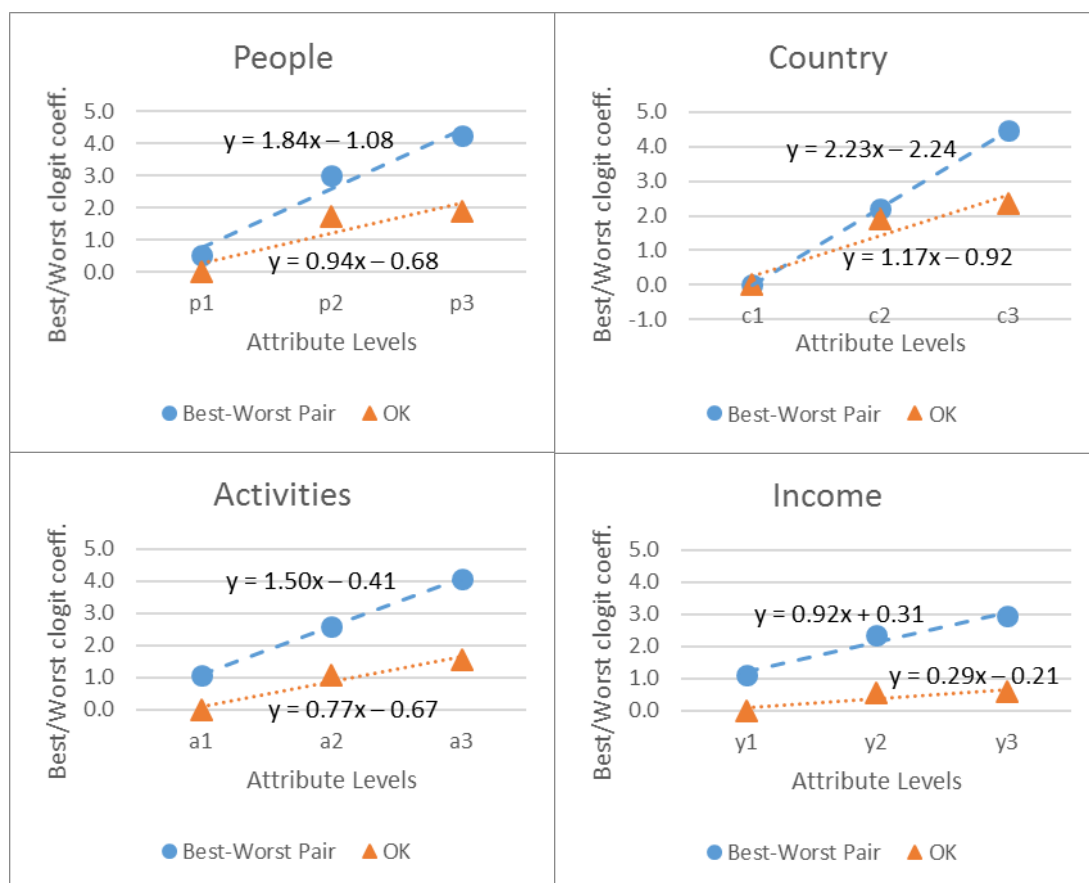
Attribute	Level	OK		
		Coeff.		Robust S.E.
People	p1	—		
	p2	1.718	***	0.356
	p3	1.874	***	0.386
Country	c1	—		
	c2	1.904	***	0.303
	c3	2.338	***	0.318
Activities	a1	—		
	a2	1.086	***	0.301
	a3	1.546	***	0.292
Income	y1	—		
	y2	0.541	*	0.280
	y3	0.585	**	0.285
AIC		567.143		
BIC		604.539		
Log pseudolikelihood		-275.571		
Pseudo R ²		0.246		
No. of observation		792		

Notes: Asterisks show the significance level of the p-values *p<0.10, **p<0.05, ***p<0.01.

Data Source: Phase 2 survey data collected and compiled by author.

Building on Fig. 7-18 of Chapter 7 showing the attribute utilities from modelling Best-Worst pairs in the BWS model, conditional logit modelling of the DCE was overlaid for comparison in Fig. 8-5. There are two notable differences between these BWS and DCE models. Firstly, the gradients of the fitted lines of DCE regressions are less than those of the BWP regressions, and secondly, the linear approximation of the BWS model is a closer fit than that of the DCE. One of the challenges is this comparison lies in differences in the data sets, meaning direct comparisons of regression modelling using dummy coded data may not be appropriate. As we move onto the estimation and comparison of valuations, we use alternative random effects logit modelling of the DCE, and effects coding, in line with some of the literature.

Fig. 8-5 Conditional logit regression results of BWS Best-Worst pair and DCE preferences



Data Source: Phase 2 survey data collected and compiled by author.

8.4 Estimating and comparing monetary values

Estimating monetary values from the modelling of the BWS and DCE enables direct comparisons between the models in dollar terms.

Valuations from choice modelling traditionally use WTP or WTA. WTP measures reflect the marginal rate of substitution of specified attributes/levels for money (price or income levels). This trade-off lies at the heart of welfare economics and the maximisation of utility or random utility maximisation, built on random utility theory outlined in Sub-section 6.3.1 in Chapter 6. Depending on the perceived ‘goodness’ of the particular attribute and level, and whether the money is a cost or a financial benefit, the trade-off will be expressed as a WTP or WTA.

It has been posited that an alternative approach using the Small and Rosen (1981) compensating variation or equivalent variation is more consistent with random utility theory and therefore more appropriate for DCEs (Lancsar & Savage 2004b). Lancsar

and Savage (2004a) separately note, however, that the traditional WTP may be consistent with the compensating variation in circumstances where there are only two alternatives. Such consistency would apply to the DCE estimation in this research, and the traditional WTP/WT A approach was adopted.

The Lancsar and Savage (2004b) comparison of compensating variation and traditional WTP methods does not extend to the situation of BWS Case 2 choices of attribute levels within a profile, rather than comparisons of profiles as a whole. One of the benefits of BWS is that it provides common scaling of the utility of all attribute levels. The inclusion of an attribute with monetary value, in this case income earned, enables that scaling of other attribute levels against monetary values and calculation of WTP measures (Louviere et al. 2015, pp. 233–234).

However, the key limitation of BWS Case 2 in relation to valuation is that the choices are conditional rather than discrete, potentially limiting estimation of predicted probability analysis or welfare measures (Lancsar et al. 2013). While the standard WTP/WT A approach has been adopted in this research, future consideration of estimation of compensating variation may be warranted for comparative purposes.

By combining a BWS Case 2 model with a binary DCE, this research supports extension of analysis of the BWS Case 2 results beyond relative utilities as discussed in Chapter 7 to estimation of valuations and direct comparison of these results with the DCE results from the supplementary question.

Determining the value of the non-monetary attributes on average can be calculated using the marginal rate of substitution technique:

$$X = \beta_m / \beta_y \quad (8-1)$$

Where:

X = marginal value (WTP/WT A)

β_m = utility coefficient for attribute m

β_y = utility coefficient for monetary attribute

This is calculated in the BWS model by using the coefficients from the conditional logit modelling of Best-Worst pairs and substituting the dollar values associated with the income levels. A similar approach has been used in health sector studies considering willingness to wait for specialist care where time was the denominator (Coast, Salisbury, et al. 2006).

The linearity displayed by conditional logit regression coefficients for all attributes in Fig. 7-18 and Fig. 7-21 of Chapter 7, suggests that the marginal utilities are sufficiently constant to support the calculation of marginal values without excessive concern about decreasing marginal utility of income.

8.4.1 Values from Best-Worst Scaling

While the validity of estimating marginal valuations using BWS is contested, as discussed earlier, it is useful to model them for comparison with the valuations estimated by the DCE.

McIntosh and Flynn (Louviere et al. 2015, pp. 231–234) take an approach to calculating WTP in using linear estimates of utility in a BWS Case 2 model. Similar estimation techniques were undertaken on both linear and conditional logit BWS models in this research. We saw in Table 7-16 of Chapter 7 that the marginal differences in attribute level coefficients from the conditional logit of Best-Worst pairs was the same irrespective of the coding schema used (dummy or effects coding). Substituting the dollar values for the income attribute levels in both the linear and conditional logit models yields the results shown in Table 8-10 and Fig. 8-6. While the relativities are similar, the scale of variations is notably greater in the conditional logit model of utility. Given the linear model is an approximation of the conditional logit model, the higher marginal valuations from the conditional logit model are assumed to be more accurate.

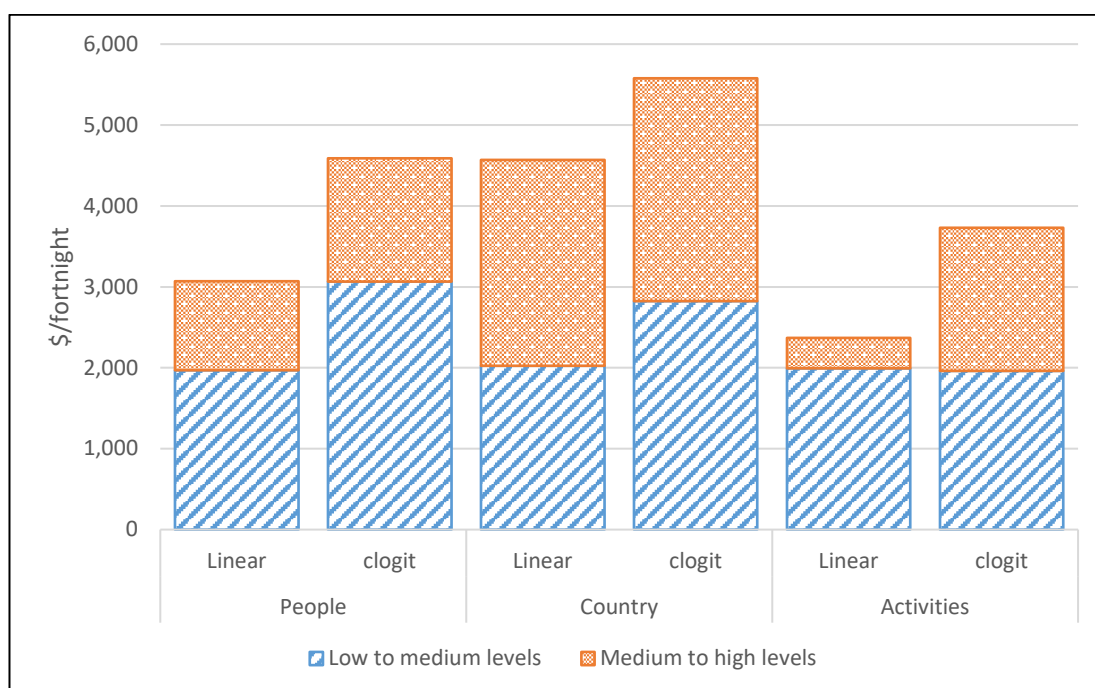
Table 8-10 Comparison of BWS Case 2 marginal valuations from linear and conditional logit models of Best-Worst pairs

Attribute	Level difference	Linear \$/f.n.	clogit \$/f.n.
People	Low-Med	1,970	3,065
	Med-High	1,100	1,526
	Low-High	3,070	4,590
Country	Low-Med	2,025	2,822
	Med-High	2,544	2,758
	Low-High	4,569	5,580
Activities	Low-Med	1,995	1,962
	Med-High	372	1,767
	Low-High	2,367	3,729

Data Source: Phase 2 survey data collected and compiled by author.

It is evident in the graphical representation of these two models in Fig. 8-6 that the models are not directly proportional, with the marginal valuations for the Country attribute varying proportionally less between the two models. The cause of this proportional difference can be traced back to the marginal utilities for each of the four attributes estimated by both models, as represented in Fig. 7-20 of Chapter 7. That figure showed that higher marginal utilities were estimated by the linear model than the conditional logit model for the Country and income attributes, while the marginal utilities for the people and activities attributes were closely aligned. In the conditional logit model, the effect of the lower marginal utility for income results in higher valuations for the non-monetary attributes, other than Country which also had a similarly lower marginal utility.

Fig. 8-6 Derived marginal valuations from linear and conditional logit (clogit) models of Best-Worst pairs



Data Source: Phase 2 survey data collected and compiled by author.

8.4.2 Values from Discrete Choice Experiment

The results from the DCE can be used to calculate the WTP/WTa estimates for each of the non-monetary attributes. This approach is widely used for non-market valuation in environmental economics and other fields.

This approach of supplementing a BWS Case 2 with an accept/reject DCE was used in forestry valuation (Soto et al. 2016) to circumvent a perceived limitation of BWS being a conditional demand model (Flynn et al. 2007), and arguably, therefore, not being able to estimate WTP.

Using a random effects logistic (xtlogit) regression of the effects coded data in line with two studies that use a BWS Case 2 with a supplementary accept/reject DCE (Coast, Salisbury, et al. 2006; Soto et al. 2016), we see a pattern of implied utility values in line with previous analysis of relative preferences. Model 1 in Table 8-11 includes the results of the regressions with all attribute levels effects coded, while Model 2 presents the results of the regressions when the income attribute is expressed in dollar terms, enabling the calculation of willingness to pay or accept estimates in the WTa column.

Table 8-11 Results of random effects logit analysis of DCE

Attribute	Level	Effects coded variable	Model 1 ¹	Model 2 ²	
			All effects coded	Income quantitative	WTP/WTa \$/fortnight
People	p1	Eff_1_1 ³	-1.0842	-1.0326	-8,228.27
	p2	Eff_1_2	0.4643	0.4364	3,477.50
	p3	Eff_1_3	0.6199	0.5962	4,750.77
Country	c1	Eff_2_1 ³	-1.3053	-1.2573	-10,018.39
	c2	Eff_2_2	0.4311	0.4068	3,241.47
	c3	Eff_2_3	0.8742	0.8505	6,776.93
Activities	a1	Eff_3_1 ³	-0.7559	-0.7044	-5,612.50
	a2	Eff_3_2	0.1418	0.1154	919.55
	a3	Eff_3_3	0.6141	0.5890	4,692.95
Income	y1	Eff_4_1 ³	-0.2525		
	y2	Eff_4_2	0.1052		
	y3	Eff_4_3	0.1473		
	Inc_fn			0.0001	
	_cons		-0.2088	-0.3702	

Notes: 1. Model 1 All effects coded.

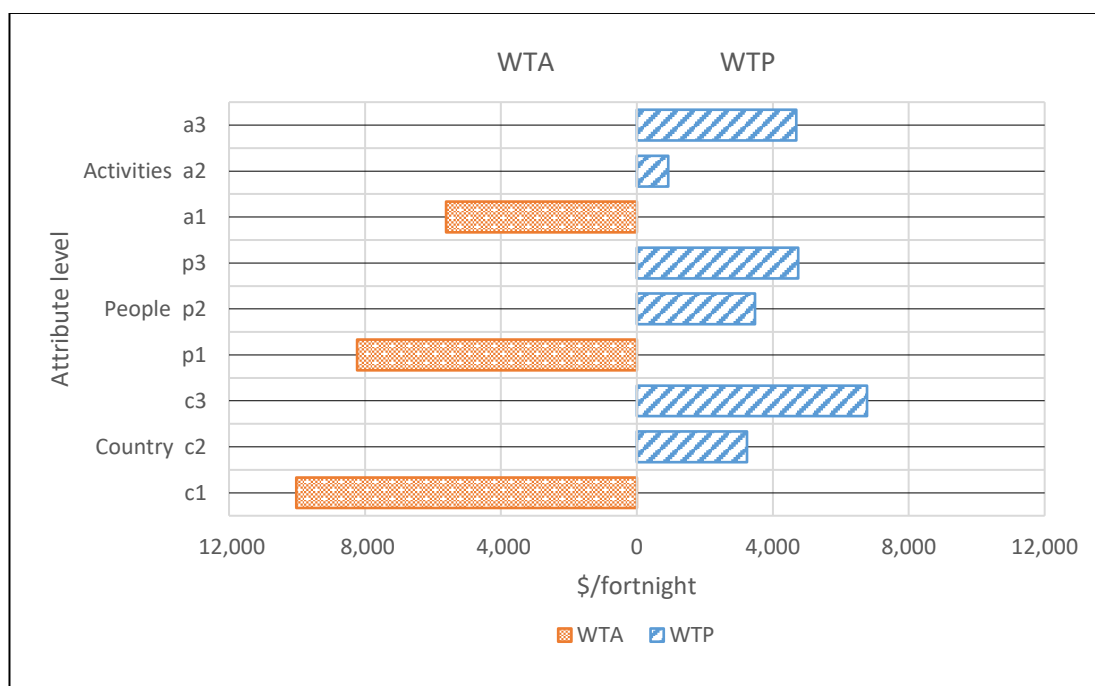
2. Model 2 Income quantitatively coded as dollar values, others effects coded.

3. Calculated – negative sum of other levels.

Data Source: Phase 2 survey data collected and compiled by author.

These results for WTP/WTa, shown graphically in Fig. 8-7, are broadly consistent with previous comparisons of the relative strength of feelings or utility of respondents to the lowest and highest levels of each of the non-monetary attributes, with access to Country having the strongest negative and positive response.

Fig. 8-7 WTP/WTa for the levels of non-monetary attributes derived from DCE



Data Source: Phase 2 survey data collected and compiled by author.

In the context of valuation however, the marginal values that relate to changes in the levels of attributes, being the difference in WTP/WTa between levels of each attribute, are particularly relevant. The marginal values, which represent marginal WTP/WTa for a shift between the levels of an attribute, are derived from Table 8-11 and shown in Table 8-12. For example, an 'average' individual in the sample would be willing to accept \$3,535 per fortnight for a shift in the access to traditional Country from full access to some access.

Table 8-12 Marginal values from random effects logistic model of DCE

Attribute	Level difference	Random effects (xtlogit)	
		\$/f.n.	\$ p.a.
People	Low-Med	11,706	305,395
	Med-High	1,273	33,219
	Low-High	12,979	338,614
Country	Low-Med	13,260	345,940
	Med-High	3,535	92,238
	Low-High	16,795	438,178
Activities	Low-Med	6,532	170,416
	Med-High	3,773	98,445
	Low-High	10,305	268,862

Data Source: Phase 2 survey data collected and compiled by author.
f.n. = fortnight, p.a. = per annum.

While the linearity of the income attribute, suggested by the results shown in Fig. 7-18 of Chapter 7, indicates that extrapolation might be reasonable, it is important to exercise caution in use of these marginal valuations given they exceed the income levels presented in the choice model. It is likely that any attribute of significant importance would be valued more highly than incomes, however identifying an income or payment attribute, with associated dollar value, that would not need to be extrapolated is highly unlikely. While presenting more levels of a dollar value attribute would enable more accurate modelling of its utility, it would come at a cost of a more complex choice model that would increase cognitive load on participants. And it may not be sufficient to overcome the extrapolation issue, in the context of this research, given the limits of respondents' experiences with higher values.

8.4.3 Model comparisons

Several models were analysed to the point of calculating WTP/WTa and marginal values, including linear and conditional logit regressions of Best, Worst, stacked Best and Worst, Best-Worst Pairs from the BWS and OK/not OK choices from the DCE components. The resultant marginal WTP/WTa values from three of these models, namely conditional logit models of stacked Best and Worst and Best-Worst pairs and the random effects model of OK/not OK, are compared in Table 8-13.

Table 8-13 Comparison of marginal values from regression models of stacked Best and Worst, Best-Worst pairs and DCE

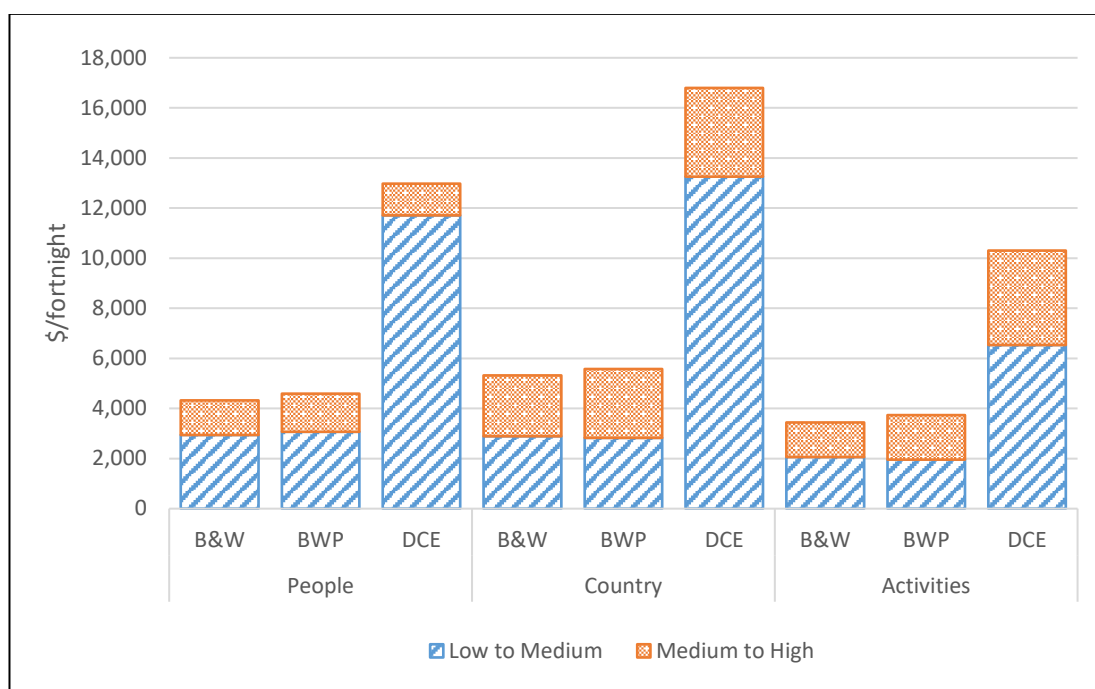
Attribute	Level difference	(a) Stacked Best Worst clogit \$/f.n.	(b) Best-Worst pair clogit \$/f.n.	(c) OK/not OK DCE random effects xtlogit \$/f.n.
People	Low-Med	2,943	3,065	11,706
	Med-High	1,374	1,526	1,273
	Low-High	4,317	4,590	12,979
Country	Low-Med	2,896	2,822	13,260
	Med-High	2,429	2,758	3,535
	Low-High	5,325	5,580	16,795
Activities	Low-Med	2,055	1,962	6,532
	Med-High	1,380	1,767	3,773
	Low-High	3,435	3,729	10,305

Notes: (a) results from conditional logit (clogit) model of stacked Best and Worst provided here for comparison; (b) results from Table 8-10; (c) results from Table 8-12. f.n = fortnight.

Data Source: Phase 2 survey data collected and compiled by author.

Unsurprisingly, the marginal values derived from the BWS conditional logistic models of Best-Worst pairs and stacked Best and Worst choices are very similar in scale and relativities between attribute levels. The most notable difference in Fig. 8-8 is the scale difference of values from the DCE.

Fig. 8-8 Marginal values from models of stacked Best and Worst (B&W), Best-Worst pairs (BWP) and OK/not OK (DCE) choices by attribute



Data Source: Phase 2 survey data collected and compiled by author.

This difference in scale raises questions about the appropriateness of the models and which model most accurately reflects the valuation of these cultural attributes by participants. Assuming a maxdiff model reflects behavioural responses to the BWS with respondents selecting the Best and Worst that maximise the difference between attribute levels presented within the choice model, the Best-Worst pair model is the most appropriate and provides most granular results from 10,476 possible pairs, with the stacked Best and Worst a less precise model that approximates it.

While estimation of marginal values from the supplementary question may be preferable, as it is unconditional demand and therefore more consistent with economic theory, the magnitude of difference in results in this research are difficult to accept without further investigation. The marginal values from lowest to highest for the supplementary question DCE range from 2.76 to 3.01 times those of the BWS estimates. On a per person fortnightly basis this may not seem to be a significant dollar

value, but applied to say compensation for removing access to traditional Country for 100 people who previously had full access, this translates to a value ranging from \$14.5 million per annum for the BWS to nearly \$44 million per annum for the DCE model. Extrapolating this to decades, even with future discounting, the value differential is enormous and further research testing these models is warranted given the potential for such valuation methods to be applied to issues like native title compensation. The greater power of the BWS model may suggest its results are more accurate despite the more common use of DCEs in valuation exercises.

While few studies directly compare BWS and associated results, in one study the random effects logit model of the supplementary accept/reject choice yielded results (not shown) were noted to be of a different magnitude to the best-worst choice task, and this difference was attributed to the fact that the choice tasks are quite different, and the resultant models are likely to have different random utility component (Coast, Salisbury, et al. 2006). In comparing results from a BWS Profile with supplementary accept/reject DCEs and multi-profile cases testing preferences for nursing jobs, Yoo and Doiron (2013) point to differences in preferences for the pecuniary attribute (salary) in the two models, being much stronger in the multi-profile case, while preferences between non-pecuniary gains are fairly similar. They also show that the close alignment of coefficients from the random effects logit model of the DCE and those from the latent class rank-ordered logit model of the multi-profile case, including in relation to the salary attributes, points to something other than cognitive difficulty causing a differential in preferences for pecuniary gain.

Reflecting on the differences in attribute utilities in the models of the BWS and DCE shown in Fig. 8-5, the marginal utility of income in the DCE model (0.29) relative to BWS model (0.92) is proportionally much lower than in the other attributes, where the marginal utility in the BWS model is around double that in the DCE model. This contrasts with the Yoo and Doiron study (2013) indicating that the monetary attribute (salary) was valued more highly in the multi-profile case which has similar results to the supplementary DCE. The impact of the relatively higher marginal utility of income in the BWS Case 2 scaled down the monetary value of the non-pecuniary attributes when compared to the DCE.

In this research the impact on WTP estimates of relative values of the monetary attribute being lower in the DCE than the BWS model may go some way to explaining the significant differences between the models. Understanding why this is the case and why it might be different in this First Nations cultural context from other studies comparing the two is worthy of further research.

8.5 Interpretation of values

Despite the variation in dollar valuations between models shown in Fig. 8-8, the relative values of the cultural attribute levels were broadly consistent across quantitative techniques and with the qualitative findings from earlier phases of the research. The marginal values estimated from the DCE model are very high, with the smallest marginal value of \$1,273 per person per fortnight (\$33,105 per annum) for a shift from attribute levels p2 to p3 (working and spending some time to spending most of the time with Aboriginal people).

Access to traditional Country has the highest marginal utility of all the attributes, with the shift from little or no access (c1) to full access (c3) having a marginal value estimated by the DCE model of \$16,795 per fortnight per person. The strong quantitative results were consistent with the qualitative findings of strong negative reactions to, and concern about, access to traditional Country being limited to little or no access. While having access to Country was identified as important to most people, several factors play into people's concerns about limits on access to Country. These include: perceptions and understanding of native title rights of access; factors such as mutual obligation requirements of CDP that constrain the time available to travel to, or spend time on, Country; resources such as vehicles and fuel that may be required to access Country; and pastoralists' attitudes and relationships limiting ability to access Country. Historical factors affecting access to Country include constraints on movements that may flow through to current day relationships with Country and the siting of towns and communities by churches, governments or community members. Limited service provision affects the viability of remote communities, and while the value of access to Country is accepted by most TOs, it has rarely been a factor in decisions about service provision, and often works against it.

Spending time with other Aboriginal people was observed as fundamental to lives in communities and in town, and its value was upheld in analysis of the BWS and DCE. The marginal valuation of a shift in this attribute, from p1 to p3 (rarely working or spending time to spending most of the time with other Aboriginal people), estimated by the DCE model is \$12,979 per fortnight per person. This attribute, however, is the strongest challenge to the independence of irrelevant alternatives (IIA) assumption, because for participants in this research, as with First Nations peoples around the world, this sociocultural connection is central to daily life, and separating it out as a distinct attribute to consider alongside other cultural attributes is challenging.

The original thinking behind this research related to the tensions between employment to earn income and spending time on cultural activities to sustain cultural knowledge and practices and support transmission through generations. Even though there was evidence of cultural activity in various forms, this attribute was the least valued through expressed preferences in the choice modelling. The marginal valuation of a shift in this attribute, from a1 to a3 (rarely spending time to spending a lot of time on cultural activities), under the DCE model is \$10,305 per fortnight per person.

The qualitative findings identified an overlap between work and culture, with several people considering that their work is cultural in its nature, or who work in clearly cultural realms, including in the arts, tourism, caring for Country, and heritage clearances. Language is a cultural activity that has broad support, with significant efforts made by governments, NGOs and communities in reviving and supporting keeping language alive. Despite this, and the existence of some Nyikina language teaching programs and resources (Hattersley 2014), in my experience, more people use English and Kriol than traditional languages in the fieldwork area.

8.6 Further potential analysis

The objective of this research was to answer the research question “what methods are feasible, reliable and appropriate for quantifying cultural values for First Nations people?”. In large part, the emphasis of this research has been on testing the feasibility of undertaking choice modelling, given identified limitations and concerns with the applicability of such methods with Indigenous populations.

There is strong theoretical interest in the interdisciplinary science of choice modelling and its application in a range of contexts. The developing nature of the practice and theory of choice modelling is reflected in the diversity of terminology used, the range of methods and design approaches, as well as the different approaches to analysis.

In large part the analysis undertaken in this thesis has stepped towards the endpoint of deriving marginal WTP/WTB values. The key purpose, of what could be seen to be largely repetitive analysis, was to test the reliability of the methods and investigate any differences between results from the two models and the analytical techniques that may flag concerns relating to the research question.

This section flags the potential to extend the analysis with this and other related research. Of particular interest to First Nations scholars and those working with them, is exploring the reason behind different results in the comparative valuations from the BWS and DCE models in this context relative to the limited studies elsewhere.

8.6.1 Combining Best-Worst Pair and OK/not OK choices

Since the introduction of the concept of a supplementary profile accept/reject question in choice modelling (Louviere & Woodworth 1983) there has been a recognition that the information from such a supplementary question would be different from that focusing on choices within profiles.

Given the BWS exercise is testing preferences within a profile, and the supplementary DCE is testing acceptability of the profile as a whole, it is intuitively appealing to find a way of combining the responses for the most accurate representation of preferences. The two techniques essentially complement each other in a way that maintains the lower cognitive load of the BWS Profile Case while providing information that is more comparable to the more cognitively demanding BWS Multi-profile Case.

While possible approaches to combining results from a BWS Profile Case and a supplementary DCE have been mooted, none have been tested to my knowledge. Several studies have used BWS profile case choice models with a supplementary accept/reject DCE, and in some cases compared results, none have sought to combine them (Coast, Salisbury, et al. 2006; Flynn et al. 2008; Soto et al. 2016; Yoo &

Doiron 2013). A possible approach would be to use the DCE data to anchor and then rescale the BWS data (Flynn et al. 2008; Orme 2009).

In a recent study that pooled results from a BWS Profile case and a multi-profile BWS, Huyn et al. (2017) tested consistency of preferences to ensure they were proportionally similar before stacking the data and recoding attribute levels as continuous linear decrements. This work was undertaken in the context of a capability approach for end of life care, enabling setting of upper and lower bounds of attributes. For cultural attributes that could be framed this way, testing a pooling approach in line with this could be worthwhile.

8.6.2 Relaxing the IIA assumption

A significant issue in choice modelling is the assumption of the IIA property mentioned in Sub-section 6.6.5 of Chapter 6. The validity of this assumption can be tested in larger BWS Case 2 designs that allow the independent estimation of main effects and two way interactions (Louviere et al. 2015). However in the small design adopted here, there are insufficient degrees of freedom to support two way interactions.

The conditional logit models are not appropriate if the IIA assumption does not hold, and alternative modelling that allows for different substitution patterns within a unified model such as the nested logit model (Timmermans & Golledge 1990), multinomial probit model or mixed logit model can be used (Hoyos 2010). Each of these alternative models have requirements and limitations but warrant consideration in future research of this nature.

8.7 Conclusion

This chapter built on the relative utility estimates developed using different models in Chapter 7 to consider latent classes within the sample population, analyse the supplementary OK/not OK DCE, and to derive and compare monetary estimates from the BWS and DCE elements of the choice model. Each of these analyses yielded information about the feasibility, reliability and appropriateness of the choice modelling approach to quantifying cultural values.

The LCA identified two distinct classes of respondents, although it was unable to identify any observable sociodemographic or cultural characteristics to distinguish them, suggesting that unobservable taste differences were responsible for this differentiation. The LCA results were compared with the clustering analysis using the mean SS/ESP measures derived in Chapter 7. In the absence of marked observable differentiation, no further analysis of the latent class models was pursued. It was evident from both the earlier cluster analysis and the LCA, that the absence of particular outliers or observable characteristics of classes suggests that the methods are appropriate in the context of First Nations cultural values.

Analysis of DCE followed a similar pattern to the BWS choice model, with count analysis, then linear, conditional logit and random effects logit models, the latter being the most frequently utilised in the literature. At each stage the DCE results were compared with the BWS results, revealing similar relativities between, and rank ordering of, attribute levels. Again this consistency of results provides comfort about the reliability of the methods in this context.

Marginal dollar values were then estimated from the BWS and DCE. While key final models showed similar relativities, there were differences in the scale of the values, with the DCE values up to three times that of the BWS model for the same attribute. This highlights an area for further investigation, particularly in the context of First Nations cultural values, given the potential to utilise these methods in a range of policy and legal settings.

The policy implications and potential applications of this research are considered in the next chapter, which concludes the thesis.

Part IV

Conclusions & Policy Implications

Chapter 9 Conclusion and Policy Implications

9.1 Introduction

This research set out to answer the following research question:

What methods are feasible, reliable and appropriate for quantifying cultural values for First Nations people?

In part, this research was inspired by a Nyikina elder I had travelled with on Martu Country some years before. This man had spoken of the challenges of engaging youth in employment while maintaining connection to culture and Country in the face of disruptions including technology, changing government policies, alcohol and drugs. I was keen to work with his mob²⁵ to better understand the tensions and trade-offs he spoke of, and see if they could inform valuation of those cultural values that really mattered and were critical for cultural continuity.

There have been few attempts to develop measures of cultural value that can be used to guide policy frameworks and legal decision making, other than in relation to languages, cultural artistic production, and tourism. This is largely due to the inherent intrinsic qualities in cultural values that largely set them outside markets and thereby render them invisible or marginalised in ‘evidenced-based’ policy. Some would argue that intrinsic values cannot, and should not, be measured. This is reflected in the following quote (often mistakenly attributed to Albert Einstein) from sociologist William Bruce Cameron (1963) ‘Not everything that counts can be counted and not everything that can be counted counts’.

Seeing cultural values as immeasurable may be seen as placing them above and beyond valuation. The risk associated with this approach is that those values are set aside instead. Claims that the Commonwealth Minister decided to allow the destruction of Gomeroi heritage to allow construction of a coal mine, despite acknowledging the ‘immeasurable’ cultural value of the sacred places and objects, is noted in comparison with the destruction of the Juukan Gorge by Rio Tinto (Hunt 2020). Processes for

²⁵ ‘mob’ is an Aboriginal English term that generally means people in a family, kinship or language group

heritage protection do not require monetary valuation of the heritage. Nevertheless, both examples reveal how economic values, so readily measured in monetary terms, prevail in the absence of cultural value comparators.

In a sense this research designed a method that can help bridge the gap in understanding between the viewpoints of Aboriginal people, where culture is inherent in wellbeing, and western ways of thinking, reflected in the policy and legal frameworks in Australia.

Importantly, the quantification of value I am demonstrating does not equate to commoditisation, nor does it suggest that culture is for sale. Instead it is seeking to quantify its value, by exploring relative values to the Aboriginal people I worked with.

Well-intentioned priorities in policy generally reflect the dominant cultural viewpoint about what matters most. Recognition of cultural values in policy and legal contexts is constrained by the lack of measures for these values. The latest Closing the Gap agreement explicitly recognises the importance of culture and the need for First Nations voices in policy making. However, without the tools to translate the less tangible forms of cultural values into measures that can be used to set targets and inform progress, these cultural values are not necessarily featured in consequent policy and program development.

Similarly, legal frameworks in this country struggle to measure First Nations cultural values. This gap is particularly stark in relation to native title compensation determinations by courts. The first native title compensation determination made by the Federal and High Courts included recognition for the cultural losses over and above the market value of the land. Without relevant precedent, Justices were challenged in settling on how to determine the monetary value of the cultural loss, attributing their decisions to intuition, relative market value, and likely Australian community acceptance.

9.2 Values in culture

The literature reviewed in Chapter 2 shows how the concepts of culture, cultural and other forms of capital, values, and value, central to this research, are conceived in different disciplines, and how these concepts can be brought together in a cultural economic framework. In the First Nations context, intangible or intellectual forms of cultural capital are built through ongoing investment in cultural activity and learning.

The literature shows that traditional First Nations cultures have collectivist bases, with circular notions of time and deep connection to Country reflecting key underpinning values.

Application of economic concepts in First Nations contexts requires a shift in mindset to recognise the limitations of neoliberal frameworks in identifying what is valued and what is productive, and the key role of sociocultural context in human (cultural) capital development. Altman's hybrid economy model, a key development in anthropological-economic theory, identifies the customary sector of the economy centred on the production, consumption and exchange of food harvesting. The limited valuation in this customary sector has relied on market equivalence such as the value of food hunted and consumed. Valuation of cultural arts and tourism production is undertaken on the basis of the market sector in which it occurs simultaneously with the customary economy.

The concept of cultural economy adopted in this research extends beyond the hybrid economy model to incorporate cultural activity that is central to sustainable economic lifeways of First Nations people. This recognises that facets of cultural education, health, and wellbeing lie outside the cultural and market sectors of the hybrid economy and build critical capabilities for sustainable First Nations economies. Indigenous knowledge has traditionally been transmitted orally, through stories, song and dance, sometimes in the context of cultural events or on Country.

First Nations concepts, of and attitudes to, work are influenced by historical experiences, educational qualifications, the nature of work and tensions with cultural practices. It was the tension between paid employment and culture that originally informed this research. While paid employment may increase the resources available to support engagement in some cultural activity, ethnographic research overwhelmingly points to employment conflicting with cultural obligations.

The survival of Aboriginal cultures in the face of the pressures of colonisation demonstrates the resilience and adaptability of Aboriginal cultures. Despite the loss of access to Country, knowledge and languages resulting from colonisation, Aboriginal cultures have survived, adapted and evolved in response.

Continuity of cultural knowledge and practice is critical to sustaining First Nations cultures and lifeways as well as for the nation more broadly. Lessons from the recent

2019/2020 summer bushfires that ravaged the east coast of Australia increased the general population's awareness of the value of cultural burning practices developed from over 60,000 years of living with our natural environment. Bush medicines and bush foods are another example of where continuity of culture and knowledge can benefit the broader national populace and beyond. These knowledges and practices have instrumental value creating benefits that can be identified and measured, demonstrating the importance of cultural continuity. These examples promote understanding of the importance of supporting cultural practices. The quantification of cultural values would enable them to be recognised and supported. This thesis has identified and demonstrated the feasibility of a method that enables quantification of these intrinsic, and largely non-market, cultural values so that they can be counted.

9.3 Approaches to valuation

The consideration of the most appropriate valuation method to apply in this research centred on the need to privilege the perspective of the First Nations people and the nature of values in culture relative to the market. Chapter 3 showed that a utility approach to valuation, based on random utility theory, which captures and privileges the First Nations perspectives and can assess intrinsic values is more appropriate than an impact approach that relies on secondary data sources. Valuation techniques such as contingent valuation and choice modelling are used in other fields, including environmental economics, to assess and measure intrinsic values so that they can be incorporated in cost benefit analysis and other decision-making frameworks and tools.

Given the inherent biases in contingent valuation, choice modelling is seen as a more rigorous and reliable form of non-market valuation. Conceptually, this tests the worth or utility in which something is held and, therefore, how that might guide decisions or choices that maximise utility or provide a good life. Forms of choice modelling range from simple DCEs through multi-profile DCEs, as well as three forms of BWS. DCEs ask respondents to consider entire profile(s) representing a situation or scenario and comprising a number of attributes at varying levels. The simplest form asks respondents to accept or reject a single profile, and more complex forms ask respondents to select their preferred profile from two or more profiles. Several sets of single or multiple profiles are presented to each respondent.

A key consideration of an appropriate choice model design in this research was the need to maximise participation by minimising cognitive load. This was achieved by minimising the number of profiles and constituent attribute levels presented and ensuring that the attributes and levels were relevant and comprehensible. Relatively low response and completion rates by First Nations respondents in some previous studies reinforced the need for a cognitively manageable and appropriate design, particularly given the relatively small catchment population in this research.

Key issues around choice modelling with First Nations peoples identified in theoretical studies discussed in Chapter 6 informed the selection and design of the choice model. Particularly relevant issues included individual versus communal interests, sharing of resources, and interviewer and compliance bias. Other issues that were considered to be less relevant in the context of this research included: unfamiliarity with the purchasing power of money; poor English and numeracy skills; and low level of knowledge and understanding of non-Indigenous forms of natural resource management. Lessons from choice modelling undertaken with First Nations people were applied, including the use of images or graphics to supplement the written choice model.

9.4 Research process

Several aspects of the research process were critical to ensuring that the valuation methods were appropriate.

The multiphase mixed methods approach adopted in this research ensured that the quantitative tools deployed in the final phase of fieldwork were grounded and appropriate to the participants and the place. A scoping phase, primarily with town based Aboriginal leaders of relevant organisations and researchers, hearing about priorities and contextual issues affecting local Aboriginal people, and discussing my ideas, framed a substantive research proposal that was subsequently agreed with the Nyikina and Mangala native title holding body WAC, and cleared by the relevant ethics committee.

Consistent with cultural protocols, and guided by Directors of WAC, the Phase 1 fieldwork involved discussions with elders and then others in the communities and towns I worked in. Chapter 4 highlighted the two key objectives achieved in this

qualitative phase of the research, namely building trust, and building an understanding of the people and the places. Working across several sites provided an understanding of the different dynamics of community and town life, and the mobility of people around these communities to access services and maintain connections with kin. The interactions were informal interviews or discussions, mostly one-on-one, and occasionally in pairs or small informal or family groups who gathered at the periphery of discussions.

Phase 1 was critical to building my understanding of the context and key issues around culture and work for people in the communities and towns I worked in. Most discussions initially focused on participants' experiences and attitudes to work and culture, with several key themes emerging including the importance of access to Country and spending time with kin and other Aboriginal people, the nature of cultural activity, and experiences of work and CDP. These key themes from the qualitative fieldwork informed the final design of the survey and selection of attributes and levels for the choice model deployed in Phase 2.

Survey sampling in Phase 2 followed cultural protocols in a snowball sampling style approach, starting with elders and then referrals to others. Chapter 5 attributes the strong participation rate in Phase 2 to the degree of trust built with participants in Phase 1 and the survey not being overly demanding. While difficult to accurately estimate in all locations, the participation rate was very high where it could be assessed (up to 81% in one field location), and the 99% completion rate was an endorsement of the decision to minimise cognitive load in the choice model design. The high participation rate demonstrated that the methods were feasible and appropriate for the context.

Analysis of the survey results focused on assessing the sociodemographic and cultural characteristics of participants, and on exploring the relationship between participants' expressed experiences of, and attitudes to, work and culture. Comparison of these descriptive statistics, particularly the sociodemographic characteristics of the sample, with available census data suggests that the sample was broadly representative of the Aboriginal population in the specific locations and West Kimberley region. The most marked divergence of the sample from the census data was in relation to incomes, with proportionally more of the survey sample being on low incomes. The mutual obligation

requirements of the CDP reduced people's ability to undertake cultural and other family activities, and was a major concern to participants. This time constraint reflected tensions between work and culture for many of the participants who were in paid employment. The same mutual obligation requirements weakened the nexus between income and time spent working, making income a useful monetary attribute in the choice modelling.

The cultural indicators collected in the survey reveal that, while native title recognition is high, coming about a year after a major determination for the area, traditional languages are not dominant. There was evidence that cultural knowledge and standing created some returns through employment and income, consistent with the proposition that these can be seen as embodied forms of cultural capital in this First Nations context. Tensions between work and culture were keenly felt by most in paid employment. Early concerns about barriers to accessing traditional Country were confirmed in the survey, and reinforced by the choice modelling results. The exception to these findings was where income from employment provided resources, such as vehicles, facilitating access to traditional Country.

9.5 Modelling preferences and utility

The selection of an appropriate form and design of choice model that could appropriately and feasibly address the valuation objective, discussed in Chapter 6, drew on the lessons of early qualitative phases.

By asking respondents to select best and worst, BWS yields more information than DCEs that only ask for the best choice, and this power to cognitive load ratio was a key reason to select a BWS model. BWS Case 1, the Object Case, is used to identify preferences from a larger list of individual attributes and cannot be used to compare and value different levels of attributes. Both BWS Case 2, the Profile Case, and BWS Case 3, the Multi-profile Case, present profiles with attributes at different levels. Respondents select the best and worst attribute levels within each profile presented in BWS Case 2, but select the best and worst profiles of several presented at a time in BWS Case 3. BWS Case 2 is a highly efficient way of ranking attribute levels, and presents significantly less cognitive burden than considering several profiles at a time. BWS Case 3 ranks profiles, and thereby ranking the attribute levels in them. As an extension of multi-profile DCEs

that had already been established in valuation, the BWS Case 3 is more commonly used in non-market valuations.

Minimising cognitive load and the time it would take to complete the survey and choice model in Phase 2 was important to maximise participation, and demonstrate the appropriateness and feasibility of the methods. The relative power to cognitive load ratio of BWS Case 2 made it a particularly attractive technique to elucidate preferences in this research. The BWS Case 2 design, premised on the key themes arising in Phase 1, was as small as practicable – a minimal OMEP design with 9 profiles presented to each participant, each containing one of three levels of four attributes. Supplementing the BWS Case 2 with a DCE, asking about acceptability of the same profile as a whole, added to the preference information with minimal additional cognitive load.

9.6 Choice modelling results

Analysis of the BWS and DCE results discussed in Chapters 7 and 8 used count analysis to estimate relative values before the utilities were estimated from both models with regression modelling using two different coding schema. The heterogeneity of, and presence of any outliers in, the sample was tested with cluster analysis of Best and Worst count data, and LCA of the BWS model. The final step in the analysis was translation of the relative utilities of the cultural attributes to WTP/WT A estimates.

There was a high degree of consistency in the relativities between attribute levels across the results from both count and regression analyses of the BWS and DCE results. This consistency points to the reliability of the methods in assessing relative preferences and quantifying cultural values. Access to traditional Country had the greatest variation in estimated utility between the lowest level and the highest level, in accord with the indication in the qualitative findings of this being highly valued. The concept of rights to access as well as practicalities of accessing Country are likely to have contributed to the these strong results. A more constrained definition such as ‘time spent on Country’ is likely to have yielded lower values given the existence and rights to access are so important to culture and identity for First Nations peoples.

The absence of indicators of particular biases in the count analysis, and no evidence of gaming or misunderstanding of the BWS was found in the cluster analysis, which

confirmed that the method was cognitively feasible and appropriate for participants. LCA identified two distinct classes of respondents with similar relative preferences but at different scales. No observable characteristics that could distinguish between the classes were found, suggesting that the scale differences in preferences for two of the attributes were unobserved taste characteristics, and no further modelling was pursued. The results from the cluster analysis and the LCA were shown to be consistent in terms of broad preferences in attributes.

Although DCEs are the more traditional form of choice model used to estimate non-market values in the form of WTP/MTA, both the BWS and DCE were analysed to estimate these values. The results show similar relativities, consistent with the utilities, but marked differences in scale. The BWS yields higher marginal utility of income, resulting in smaller estimates for marginal WTP/MTA of the non-pecuniary attributes. This result in this research contrasts with limited comparison of the two techniques in the literature that suggest that the marginal utility of income is usually smaller in BWS, possibly due to a greater focus on the attribute with tangible dollar values in DCEs. While this psychological response may be pertinent to multi-profile DCEs given their associated cognitive load, it may be less likely to occur where individual attribute levels have been considered first in the BWS Case 2 with supplementary accept/reject DCEs. Overall, the relative power of the BWS model leads me to conclude that these results may be a more accurate reflection of participants' preferences and, therefore, more reliable.

Further exploration of possible reasons for these differences between this research and the existing literature is warranted, particularly in the context of First Nations cultural values, where it could be argued that the monetary attribute may be relatively less important. A brief discussion on the relevant issue of specification of the First Nations cultural attributes is in Sub-section 9.9.2.

9.7 Policy implications

The introduction to this thesis highlighted several policy areas where consideration of cultural values is constrained by limited cultural indicators. While there has been some recent progress, with the inclusion of First Nations voices in high-level policy making,

gaps in cultural indicators continue to limit recognition of the contribution of cultural values to First Nations people's livelihoods and wellbeing.

First Nations peoples now have a voice, with a seat at the table in national policy discussion on Closing the Gap, if not an enshrined voice through constitutional recognition. The Coalition of Peaks, a body drawing together the expertise of around 50 Aboriginal and Torres Strait Islander community-controlled peak organisations, is a co-signatory, along with federal and state government leaders and the Australian Local Government Association, to the new National Agreement on Closing the Gap.

Two key reforms in the 2020 National Agreement on Closing the Gap arising from this engagement are relevant to this research. Firstly, the importance of culture, cultural safety and delivery of culturally appropriate services is explicitly recognised in many aspects of the agreement. However, even with this engagement, established cultural indicators are limited to the land and waters and language outcomes in the agreement, with need for data development for cultural indicators identified across several other outcomes. Secondly, the agreement provides for formal partnerships related to discrete policy areas, and place-based partnerships with shared decision making, including in relation to funding priorities.

Choice modelling could assist with determining priorities at a community or regional level and developing indicators of localised cultural priorities to ensure that delivery efforts are focused on local needs. This would enhance the current model that relies on the First Nations community-controlled sector organisations that are generally funded for, and focused on, discrete policy areas.

A First Nations voice at the table, combined with the tools to develop indicators that translate intrinsic cultural values into measures, would contribute significantly to bridging the gap between First Nations worldviews and the dominant western paradigm. This would ensure that policy frameworks address the needs and values of First Nations people.

9.7.1 Behavioural change

A key rationale for using choice modelling is its ability to accurately predict actual behaviour. Policies that seek to change the behaviours of individuals through incentives

and penalties are generally framed from the dominant cultural viewpoint. There is limited evidence on the effectiveness of mutual obligation programs in separate remote employment services since the abolition of CDEP, with more onerous conditions and increasingly intensive surveillance applying during the period of this research. This has led to disengagement of First Nations people from the social security system (Fowkes 2019), and loss of income for individuals and families, in situations where incomes are already low and the labour market provides few opportunities for employment.

The results in this research show marginal utility associated with income is significantly lower than that of the cultural attributes in the choice model. This relatively low valuation of income means that financial incentives and penalties are likely to be less effective in settings similar to this research than they might be in other Australian contexts. The design of welfare-to-work programs, like the CDP, rely on financial penalties to incentivise job-seeking behaviours, without due recognition of the value of alternative activities or cultural values, rendering them inappropriate and ineffective.

9.8 Potential applications

9.8.1 Native title compensation

Choice modelling has the potential to determine an appropriate level of native title compensation in a manner which is less damaging than asking directly about the harm or loss from extinguishment. The need for valorisation of cultural values and their stark difference to market values, was highlighted in the recent Timber Creek native title compensation case. This case deals with the hurt caused to TOs that resulted from the illegal acquisition of the native title rights to specific areas of land in Timber Creek in the Northern Territory. Notably, this case took eight years from the time the application was lodged in 2011 to the ultimate High Court decision in 2019.

Justice Mansfield's 2016 Federal Court judgement²⁶ awarded \$3.3 million compensation to the Ngaliwurru and Nungali people for the extinguishment of non-exclusive native title rights and interests. The judgement considers and awards for three elements totalling around \$3.3 million: economic value (\$512,400), interest (\$1,488,261) and

²⁶ Griffiths v Northern Territory of Australia (No 3).

solatium (\$1.3 million). The first two elements have an established market basis. Solatium is generally understood to mean the non-financial loss or hurt caused by the compensable act, and is referred to in the judgement as ‘non-economic’ loss. The judgement relates solatium to the loss or diminution of connection or traditional attachment to the land, and the judge rejected market-based approaches, stating instead ‘The process required is a complex, but essentially an intuitive, one.’^[302]

Reinforcing his earlier statements about the need to rely on intuition in relation to compensation for the loss of cultural and spiritual relationship to the land, Justice Mansfield states ‘The selection of an appropriate level of compensation is not a matter of science or of mathematical calculation.’^[383]

The 2019 High Court judgement²⁷ on the appeal reduced the compensation awarded in relation to the economic components of the Federal Court decisions but did not adjust the cultural loss component. The judgement makes four points relevant to guiding assessments of cultural loss. Firstly, the judgement confirms the principle that compensable loss is specific to the act and not a loss generally derived from a loss of access to Country. Secondly, it confirms that the *Racial Discrimination Act 1975* requires a bifurcated approach to valuation that involves an object or economic component and a non-economic or cultural loss component. Thirdly, it determined that the cultural loss component is made on an *in globo* basis to the claim group, and that it was not appropriate for the award to reflect the number of native title holders at the time that the native title was determined to have existed. Finally, it guides labelling of the cultural loss away from the term ‘solatium’, given that term originates under English common law, and from a different belief system to the traditional laws and customs considered in native title compensation.

With a number of compensation cases pending consideration by the courts²⁸, and more likely to be lodged, consideration of alternative approaches to valuation of native title is particularly timely.

²⁷ Northern Territory v Mr A. Griffiths (deceased) and Lorraine Jones on behalf of the Ngaliwurru and Nungali Peoples and Anor, Commonwealth of Australia v Mr A. Griffiths (deceased) and Lorraine Jones on behalf of the Ngaliwurru and Nungali Peoples and Anor, Mr A. Griffiths (deceased) and Lorraine Jones on behalf of the Ngaliwurru and Nungali Peoples v Northern Territory.

²⁸ See e.g. https://www.ashurst.com/en/news-and-insights/legal-updates/compensation-update-some-interesting-test-cases-on-the-horizon/?utm_source=bd&utm_medium=email

Hypothetical scenarios

It is clear that the ‘access to traditional Country’ attribute used in the choice modelling in this research does not equate to the hurt feeling or loss evoked or caused by any specific compensable act in relation to native title. This was not the basis of that attribute being chosen. However, it is potentially relatable if concerns about access to Country related to specific compensable acts. Any future application of choice modelling would need to be more tightly specified to relate more directly to native title compensation.

Subject to this qualification, two hypothetical scenarios in Table 9-1 demonstrate how the valuations from this choice modelling, if they were related more directly to native title, might guide an appropriate compensation determination.

The assumptions underlying the calculations in these scenarios include only counting the 453 WAC adult members registered in September 2020, with no adjustment for future generations. In calculations, the values from this research are price adjusted in line with the Consumer Price Index (CPI) to current 2020 values; and the present value is calculated for 100 years into the future using the long term discount rates used by the Australian Government in determining employee benefit liabilities.

Table 9-1 Hypothetical scenarios applying choice modelling valuations to native title compensation

Scenario description	Discrete Choice Experiment		Best-Worst Scaling	
	Annual loss \$ million	Present value \$ million	Annual loss \$ million	Present value \$ million
Exclusive possession native title compulsorily acquired, affecting all 453 adult WAC members	(211)	5,912	(70)	1,964
An area of exclusive possession native title illegally acquired (post <i>Racial Discrimination Act 1975</i>), meaning WAC members no longer able to access all traditional Country	(44)	1,244	(35)	971

Notes: calculation is based on the 453 WAC adult members registered in September 2020, with no adjustment for future generations.

Values from research are price adjusted in line with CPI to current 2020 values.

Present value is calculated for 100 years into the future using long term discount rates used by the Australian Government in determining employee benefit liabilities.

In the first hypothetical scenario, we imagine that native title has been compulsorily acquired for a nationally significant project, meaning TOs are no longer able to access their traditional Country, having had full access and enjoyment of their native title rights to that point in time. The resultant compensation payable would be \$5.91 billion using the traditional DCE marginal WTP/WTB value method or \$1.96 billion with the BWS values.

The second hypothetical scenario assumes that native title was extinguished by acquisition of a small fraction (1%) of the traditional Country after the introduction of the *Racial Discrimination Act 1975*, thereby making it illegal. This action means that TOs are no longer able to access all their traditional Country. In this example the loss is smaller than the first scenario and is related to the shift from full access to some access in the choice model. The resultant compensation payable would be \$1.24 billion using the DCE value or \$0.97 billion using the BWS value.

These valuations are high relative to the only precedent in the Timber Creek case, and could exceed an amount determined by a court in line with the test, applied by the High Court in the Timber Creek case, of being accepted by the Australian community as appropriate, fair or just. And, as stated previously, the assumptions for this hypothetical modelling, and the underlying attribute being valued, do not directly match the legal framework applied by the courts. However, it does reflect an additive total value to current WAC membership of access to Country, and points to the potential value of using choice modelling to specifically address cultural losses related to native title.

9.8.2 Indigenous knowledge

Recognising the limited protection of Indigenous Knowledge that exists under existing copyright and IP instruments, Intellectual Property Australia (IPA) commissioned a discussion paper considering issues for protection and management of Indigenous Knowledge (Janke & Sentina 2018). The commercial use of Indigenous Knowledge without consent and benefit sharing, and the need for further research on the potential value of Indigenous Knowledge flagged in this report, led IPA to commission research around methods for estimating the market value of Indigenous Knowledge (Blackwell et al. 2019).

While the focus of this more recent report was on market values, there is potential for choice modelling to identify the value of Indigenous Knowledge in two ways. Firstly, it can be used to value the non-market values from the First Nations perspective, enabling Indigenous Knowledge owners to demonstrate the value in support of their decision to allow Indigenous Knowledge to be shared or not. Secondly, it could be used to test the potential market value with end users or consumers. The use of choice modelling is well established in market research and could be used to value particular attributes (such as Indigenous Knowledge) in consumer goods.

9.8.3 Heritage protection

Heritage protection legal frameworks do not require valorisation of cultural heritage values. Recent failures in federal and state systems to adequately protect cultural heritage suggest that it may be useful to demonstrate the value of sites to TOs using choice modelling to ensure that their value is taken into account in decisions. Submissions to a current parliamentary inquiry into the Juukan Gorge destruction highlight the broader benefits to the nation, but no attempt to value it from the TO perspective. Understandably, as was articulated in the Timber Creek compensation case, TOs would not want to ‘sell’ the sites for any amount of money, but understanding and measuring their relative value could underline why protection is warranted and inform improved protection decisions.

9.9 Limitations and areas for further research

9.9.1 Community led research

Within the constraints of the doctoral research requirements, and recognising that the ideas for this research predated engagement with the broader Nyikina and Mangala and West Kimberley communities, this research sought to maximise their input through the scoping and qualitative phases in identifying what matters most. Given the highly conceptual nature of the research and the methodology, my gratitude for the generosity of participants in supporting this research cannot be overstated.

It would be more appropriate for future research demonstrating and measuring cultural values using choice modelling to be led by First Nations groups supported by those with

relevant expertise. Applications to valuations in native title, Indigenous Knowledge and heritage protection could be pursued. Native title claimants wishing to demonstrate the value to them of the native title rights they have lost could lead teams of legal and technical experts in research identifying relevant cultural and monetary attributes and applying appropriate choice modelling methods.

In the face of growing awareness of the potential for Indigenous Knowledge to meet needs beyond customary use, choice modelling could be used not only to value it from the First Nations perspective, but also to test the value of the specific Indigenous Knowledge with potential consumers in the market. The opportunities for development of social or cultural ventures utilising Indigenous Knowledge are as yet largely untapped. Where Indigenous Knowledge owners become aware of interest in their Indigenous Knowledge they would want to consider their willingness to share any part of their Indigenous Knowledge, legal protections and the potential value of the Indigenous Knowledge. Again, this should be led by owners of the Indigenous Knowledge with support of appropriate technical expertise.

9.9.2 Specification of First Nations cultural attributes

The specification of attributes and levels was challenging in this research, particularly given the need for an appropriate and feasible small design that avoided excessive cognitive burden. The resultant specificity of the attributes and their levels in this research was variable, a factor that could influence choices.

The income attribute had a very specific quality with well-defined levels with dollar values. Similarly the access to Country attribute was well-defined, with levels reflecting the range of experiences clearly articulated in the qualitative research that informed the design. The people attribute was fairly broad, and while it was specific in its definition of living and working with other Aboriginal people, the levels were reasonably general. The activities attribute was deliberately broad, given the range of cultural activities identified in the qualitative research that informed the design, and the levels were also reasonably general. The lack of specificity in the people and activities attributes may have contributed to broader responses in terms of the choice models where these were concerned, and particularly in relation to the DCE, where respondents may have

focused on the more highly specified and concrete attributes in deciding whether to accept or reject a profile.

9.9.3 Images in choice modelling

Another potential area for further research in the context of choice modelling is the design, testing and use of diagrams and images and how they influence choices. The use of images is not uncommon in choice modelling, and is particularly important if the respondent and researcher conducting any face to face or online choice modelling do not share the same first language.

The inclusion of images in the choice model in this research was prompted by one of the first participants when they trialled the choice model. While my experience with people in the fieldwork locations had suggested there was a high level of English literacy, I was aware of some limitations in this regard. In response, I developed some simple diagrams to represent the written attribute levels in each profile presented to respondents.

There may be value in testing diagrammatic representations in the field, prior to deployment with choice models, to ensure that they appropriately represent the attribute levels, and, more importantly, are not misinterpreted.

9.9.4 Independence of attributes

In the First Nations context, where most facets of lives and livelihoods are inexorably linked, it is difficult to conceptually separate the attributes of culture. In this research for example, spending time with kin and other Aboriginal people was identified as an important attribute, but cultural activities are often undertaken in a sociocultural context with other people. The nature of this research, and the objective of minimising cognitive load, meant that the attributes identified were reasonably broad, and more specific attributes in a larger model may increase potential independence. Chapter 8 flags the potential to address or circumvent the IIA assumption through design and analysis. For example, rather than the minimal OMEP design, a larger model could also allow for testing of interactions between attributes. Alternative analytical techniques could also circumvent the constraint of the IIA assumption.

9.9.5 Aggregation of individual utility

Welfare theory approaches to valuation, as discussed in Chapter 2, require aggregation of individual utilities to provide social valuations, sometimes termed additivity. In First Nations contexts where communal values may have significant bearing on preferences and decisions, this challenges the additivity of individual utilities to determine social welfare. Rule utilitarian theory is more likely to accommodate values that extend beyond individualistic ideals to produce a higher level of social utility and may be a more appropriate approach to aggregation.

Adapting choice modelling in ways to accommodate group expression of preferences and decision-making mechanisms that are more reflective of First Nations governance approaches may be worth investigating. Comparison of group based with individual responses to a choice model could indicate whether aggregation of individual responses would be appropriate.

9.9.6 Replicability and generalisability

The heterogeneity of First Nations peoples in Australia means that it is not appropriate to generalise the findings here to other groups, regions or nationally. One of the challenges in policy making in the First Nations space is the need to recognise that local issues and solutions do not translate into national ‘one-size-fits-all’ solutions. Respecting the heterogeneity of First Nations peoples and enabling local control are critical to success of programs.

Similarly, the choice model and methods developed in this research could not be replicated in other areas, without first doing the ground work to determine what question is being asked and what are the appropriate attributes and levels in a model that might answer it. On the basis that First Nations people must drive research and policy making at a local level, it should be left to interested groups to pursue research to meet their own needs, with appropriate technical support.

Despite these qualifications, further studies could be undertaken in order to ascertain the extent to which the findings can be generalised.

9.10 Contribution

In response to the research question ‘What methods are feasible, reliable and appropriate for quantifying cultural values for First Nations people?’, this thesis presents an approach to quantifying cultural values that is novel in several ways.

Firstly, it seeks to measure First Nations’ cultural values that largely lie outside markets. Most previous cultural valuation in a First Nations context has focused on market equivalence measures of production and consumption in the customary economy sector of Altman’s hybrid economy model, or market values in cultural tourism and the arts.

Secondly, it privileges First Nations perspectives in the identification of what is important to value. Previous choice modelling studies, primarily DCEs in the context of natural resource management, have framed choice models from the dominant viewpoint and incorporated Indigenous and non-Indigenous valuations to make them inclusive of key stakeholders. A notable exception to this is Yap’s grounded research that uses BWS Case 1 (the Object Case) to rank attributes contributing to Yawuru wellbeing (Yap 2017). This privileging of First Nations viewpoints is critical to its success in addressing the appropriateness criteria in the research question.

Finally, this study compares results for a BWS Case 2 and a supplementary DCE using the same choice model profiles. BWS Case 2 has rarely been used for monetary valuations. And in the few cases where BWS Case 2 with a supplementary acceptance DCE question has been used, any valuation has used the latter. I have not encountered other research reporting comparisons of both models in terms of utility and monetary valuation techniques. This comparison and the analysis that was undertaken in several ways, including testing for bias or misunderstanding by respondents, provides reassurance about the reliability of the method.

The high participation and completion of the choice model in this research demonstrates that BWS Case 2 is cognitively manageable, particularly where language is not a barrier to participation. This result addresses the appropriateness and feasibility criteria in the research question.

9.11 Reflections

My journey in this research has involved so much more than the physical dislocation of long flights and even longer drives across the continent to the field sites. It has involved the evolution of trust and knowledge sharing, and I have learned so much more on a personal level than this thesis reveals. Over and above the technical skills that I have developed on this journey, I have learned to listen better and to become more reflexive.

In reflecting on her journey with me in this research at the native title conference in Broome in 2018, Patricia Riley, a Nyikina Mangala TO and Director/CEO of Pandanus Park community on the Fitzroy River, said:

For the past three years, since I've been working with Kaely, from day one we've been building our confidence in understanding two sides of the world, and we have created a strong friendship. Each time she came back she was learning more about our culture and ways of doing things and worked to help us. And helping us make government know about how important our traditions and customs are, and make them understand how their programs and all the changes affect us.

I went to the Kimberley with an idea inspired by a Nyikina elder and my frustration with the limits of neoliberal economics in accounting for what really matters to people. While I have been back a couple of times, the COVID-19 related travel restrictions have so far prevented my return to share the final findings with Nyikina and Mangala people and hear their reactions and interest in how it might help them more in the future. Any future use of this research by Nyikina and Mangala will be led by them, and I hope to be able to contribute to this.

9.12 Concluding remarks

This thesis essentially presents a proof of concept that choice modelling, premised on things that matter to First Nations people, can be used to value cultural attributes beyond any market value.

The findings, while not generalisable, are unsurprising in view of the context and experiences of Nyikina and Mangala people and their worldview. The overwhelming concern about access to Country reflects their historical and sometimes current experience of exclusion and limited access to Country, and the sense of loss this evokes.

The importance of accessing Country, including Martuwarra (the Fitzroy River), was summed up by Patricia Riley when we co-presented early findings from this research at the Native Title Conference in Broome in 2018:

It heals us emotionally, physically and mentally.

It heals our Liyan.

Jaydia maboo nynoo burru widya liyan.

What I am saying is our good place makes us feel happy.

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Appendices

Appendix 1 Phase 1 Information Sheet



Participant Information Sheet (Phase 1)

Researcher:

My name is Kaely Woods, and I am a postgraduate researcher from the Centre for Aboriginal Economic Policy Research (CAEPR) at the Australian National University.

Project Title: Aboriginal Cultural Activity Counts (Phase 1)

General Outline of the Project:

- **Description and Methodology:** My research explores the relationship between Aboriginal cultural activity and paid work and how Aboriginal people in remote areas would choose to spend their time doing these things. This can tell us a lot about the value of cultural activity and how this might be different to the value placed on such activity by the market when it takes the form of cultural production for the art or tourism markets.
- In Phase 1 of my research which I am doing now I will be talking to people in groups about cultural activity and paid work that is important to them so that I have a better understanding of what is important to Nyikina and Mangala people. I won't be asking people to talk about what they do in secret sacred business.
- In Phase 2 of my research which I will be doing later, together with a local Aboriginal Research Assistant, I will ask individuals to answer some questions about themselves, their education, work, and how they choose to spend their time in different situations. This last part is called choice modelling and it will show how people value paid employment and cultural activity.
- **Participants:** In Phase 1 I will be talking to up to 200 people in groups about cultural activity and paid work that is important to them.
- **Use of Data and Feedback:** I will be using the information I collect in Phase 1 to help me choose the right questions in Phase 2. All together the research will explain how much Nyikina and Mangala people value their cultural activity relative to paid work as part, and I will write about it in a thesis. When I have finished writing my thesis I will write a smaller book explaining what my research says for the people who were involved in my research and I will come back and talk to people about it. I may also write articles about this work with the Aboriginal Research Assistant.

Participant Involvement:

- **Voluntary Participation & Withdrawal:** Being part of this project is voluntary and you can say no to be part of it. If you feel uncomfortable in the group discussion you can choose not to say anything, or leave the group discussion. I will only use information that is offered, and if you leave the group discussion part way through I may not be able to remove everything you say. Later on, for Phase 2, I will come back and talk to you about my research and ask you if you will agree to answer some survey questions, and it is OK to say no. If there are questions you don't want to answer that is OK too.
- **What does participation in the research request of you?** In Phase 1 I will want you to talk to me as part of a group. This might be a family group or a larger group if people are comfortable with that. I will ask people in the community what they prefer. I will ask everyone if they are happy for me to record the discussion so I can check on my notes and make sure I understood what was said. In Phase 2 you will be asked to answer questions by me in an interview and I hope to have a local Aboriginal Research Assistant to help.
- **Location and Duration:** When I talk to groups this will be informal and will give people a chance to talk about work and cultural activity and to get to know me. We might do this in people's homes, under trees or shade somewhere or even by the river. These talks might take an hour or so, or maybe longer if people want to talk a lot. In Phase 2 the individual interviews will take about 30 minutes to 1 hour to finish, depending on how much yarning we do.

Appendix 2 Phase 1 Oral Consent Form



ORAL CONSENT SCRIPT for Participants

Aboriginal Cultural Activity Counts

Phase 1 – Group Discussion

I have read to you the Information Sheet about the research project.

Was this information clear? Yes/No

Do you have any questions about the project? _____

Do you agree to participate in this project? Yes/No

Are you happy for the Aboriginal Research Assistant to sit in on the interview? Yes/No/NA

Do you agree for this discussion to be audio-recorded? Yes/No

When I prepare my thesis and other research outputs, most of what I write about will be about how everyone as a group has responded to my questions. If there is something you say that I think might help explain how people think about cultural activity and paid employment, I might like to include your words. I can say this information came from you using a pseudonym (false name), or no name.

- Would you like to be referred to using a pseudonym (false name)? Yes/No
- Would you prefer your words not to be referred to with any name? Yes/No

Are you happy for the discussion to start now?

Appendix 3 Phase 1 Written Consent Form



WRITTEN CONSENT for Participants
Aboriginal Cultural Activity Counts
Phase 1 – Group Discussion

I have read and understood the Information sheet you have given me about the research project, and I have had any questions and concerns about the project (listed here)

_____)

addressed to my satisfaction. I agree to participate in the project. YES ☐ NO ☐

I agree to this discussion being audio-recorded YES ☐ NO ☐

I agree to the Aboriginal Research Assistant sitting in YES ☐ NO ☐ NA ☐
on this group discussion

I agree to be identified in the following way for any quotes that might be used in the research reports:

Pseudonym YES ☐ NO ☐

No attribution YES ☐ NO ☐

Signature:.....

Appendix 4 Phase 2 Information Sheet



Participant Information Sheet (Phase 2)

Researcher:

My name is Kaely Woods, and I am a postgraduate researcher from the Centre for Aboriginal Economic Policy Research (CAEPR) at the Australian National University.

Project Title: Aboriginal Cultural Activity Counts

General Outline of the Project:

- **Description and Methodology:** My research explores the relationship between Aboriginal cultural activity and paid work and how Aboriginal people in remote areas would choose to spend their time doing these things. This can tell us a lot about the value of cultural activity and how this might be different to the value placed on such activity by the market when it takes the form of cultural production for the art or tourism markets.
- In Phase 1 of my research that I did earlier I talked with people in groups about cultural activity and paid work and that has helped me understand what is important to Nyikina and Mangala people.
- In Phase 2 of my research, which I am doing now, working with a local Aboriginal Research Assistant I will ask individuals to answer some questions about themselves, their education, work, and how they choose to spend their time in different situations. This last part is called choice modelling and it will show how people value paid employment and cultural activity.
- **Participants:** In Phase 1 I heard from about 200 people about cultural activity and paid work that is important to them. In this Phase 2 I will then ask between 100 and 200 individual people questions about themselves and how they would choose to spend their time in different situations between cultural activity and paid work.
- **Use of Data and Feedback:** I will be using all the information I collect to explain how much Nyikina and Mangala people value their cultural activity relative to paid work as part of a thesis I will write. When I have finished writing my thesis I will write a smaller book explaining what my research says for the people who were involved in my research and I will come back and talk to people about it. I may also write articles about this work with the Aboriginal Research Assistant.

Participant Involvement:

- **Voluntary Participation & Withdrawal:** Being part of this project is voluntary and you can say no to be part of it. If you change your mind and want to withdraw from Phase 2 after agreeing to be part of it I can take any information you have given me in the survey out of the project. If you withdraw from Phase 2 of the research I won't use your survey information.
- If there are questions you don't want to answer that is OK too.
- **What does participation in the research request of you?** In Phase 2 you will be asked to answer questions by me in an interview and I hope to have a local Aboriginal Research Assistant to help. If you aren't sure what the questions mean, or if you are having trouble understanding the English I use, you can ask me or the Research Assistant for help to understand. If you don't want to answer the questions in front of the Research Assistant you can just tell me. Part of the questions will involve a choice model, where you will be asked to say what the best thing is and what is the worst thing is in each group of things presented. If you agree, I will record the interview on a digital audio recorder so I can listen back later if I need to check what you have told me.
- **Location and Duration:** Phase 2 individual interviews will take about 30 minutes to 1 hour to finish, depending on how much yarning we do. We will do the interview somewhere quiet where you are comfortable. If you think of other things you want to tell me after the interview I can come and talk with you again.

- **Risks:** If you find talking about yourself and work and culture in the research is upsetting you can talk to someone at Headspace, the youth mental health service in Broome, or Lifeline Australia (ph 131114).
- **Benefits:** the main benefit of this research is showing how cultural activity is valued by Aboriginal people in a way that policy makers can understand it. This could be useful in making the case to support Aboriginal people living in communities on traditional lands and for improving support for cultural leave and other working conditions helping Aboriginal people stay connected to culture. It is unlikely that you will personally benefit from participating in this research.

Confidentiality:

- **Confidentiality:** I will record the individual interviews and the Aboriginal Research Assistant and I are the only people who will have access to the information you provide. The Aboriginal Research Assistant will be asked to sign an agreement saying that they will keep the information confidential. I will keep the recordings and notes from our discussions private and secure while I am doing the research and afterwards at the university in Canberra. All the information will be locked in a computer system with password protection. People taking part in interviews will be asked not to say what has been said, and should take care not to say anything confidential or defamatory of another person. Confidentiality will be protected as far as the law allows.
- When I am writing my thesis I will be talking about the results for everyone that answered the questions. If you say something that I think would be really good to write in the research reports or thesis I will say that thing was said by a pseudonym (false name) or no name unless you would like me to use your real name. If someone in an interview names someone else I won't use that other person's name in my report. My supervisor may review my analysis of the data but not with names on it.
- **Data Storage:**
- **Where:** I will be keeping all the notes, recordings and data I collect securely on my computer that I travel with, and will be regularly backing up to a secure external drive that I will maintain in town (Broome or Derby). When I have finished talking to everyone I need to I will take all the information back to Canberra where I will analyse it and write up my thesis on the computer in my office that no-one else can access.
- **How long:** All the information will be kept securely at the university in Canberra for five years after my report is published
- **Destruction of Data:** After five years after the research is published, the data will be destroyed, unless the surviving people involved in the research and I agree that we should keep it and use it for some future research project.

Queries and Concerns:

- **Contact Details for More Information:** The best way to find out more about this project is to talk to me or my supervisor.
- I can be contacted by phone on 0438588925, or by email at kaely.woods@anu.edu.au.
- My supervisor, Professor Matthew Gray can be contacted by telephone on 02 6125 8265 or by email on matthew.gray@anu.edu.au

Ethics Committee Clearance:

The ethical aspects of this research have been approved by the ANU Human Research Ethics Committee. If you have any concerns or complaints about how this research has been conducted, please contact:

Ethics Manager
The ANU Human Research Ethics Committee
The Australian National University
Telephone: +61 2 6125 3427
Email: Human.Ethics.Officer@anu.edu.au

Appendix 5 Phase 2 Oral Consent Form



ORAL CONSENT SCRIPT for Participants

Aboriginal Cultural Activity Counts

Phase 2 – Individual Surveys

I have read to you the Information Sheet about the research project.

Was this information clear? Yes/No

Do you have any questions about the project? _____

Do you agree to participate in this project? Yes/No

Are you happy for the Aboriginal Research Assistant to sit in on the interview? Yes/No

Do you agree for this interview to be audio-recorded? Yes/No

When I prepare my thesis and other research outputs, most of what I write about will be about how everyone as a group has responded to my questions. If there is something you say that I think might help explain how people think about cultural activity and paid employment, I might like to include your words. I can say this information came from you using your name or a pseudonym (false name), or I might not say who said this and hold your information confidentially.

- Would you like information attributed using your full name? Yes/No
- Would you like to be referred to using a pseudonym (false name)? Yes/No
- Would you prefer that your information be not attributed to anyone at all? Yes/No

May we start the interview now?

Appendix 6 Phase 2 Written Consent Form



WRITTEN CONSENT for Participants
Aboriginal Cultural Activity Counts
Phase 2 – Individual Surveys

I have read and understood the Information sheet you have given me about the research project, and I have had any questions and concerns about the project (listed here)

_____)

addressed to my satisfaction. I agree to participate in the project. YES ☐ NO ☐

I agree to this interview being audio-recorded YES ☐ NO ☐

I agree to the Aboriginal Research Assistant sitting in on this interview YES ☐ NO ☐

I agree to be identified in the following way for any quotes that might be used in the research reports:

Full name YES ☐ NO ☐

Pseudonym YES ☐ NO ☐

No attribution YES ☐ NO ☐

Signature:.....

The Australian National University | Canberra ACT 0200 Australia | CRICOS Provider No. 00120C

Appendix 7 Phase 2 Survey with Choice Model

Aboriginal Cultural Activity Counts - Phase 2 – Research Survey

Survey Date _____/_____/2015

Survey place _____

Unique respondent identifier _____

General questions (Questions to ask in ***bold italics***. Notes, guidance and options plain text)

1. ***What is your Name?*** (Given name(s) and Surname) _____
2. ***What language group(s) do you belong to or identify with*** _____
3. Gender M / F / Other
4. ***How old are you?*** (exact if known or by group) _____
(NB ethics clearance currently covers 18-65 only – ‘standard’ working age)
☐ 15-24
☐ 25-34
☐ 35-44
☐ 45-54
☐ 55-64
☐ Over 65
5. ***Who were the main people who grew you up?***
☐ Own mother and/or father
☐ Aunty, Grandparents or other family
☐ People who were not family (eg foster family or institutional care)
6. ***How many children have you had?*** (number) _____
7. ***How many children are living with you and being cared for at your home?*** (under 18 years of age, including foster children) (number) _____
8. ***Do you care for other family members at home?*** (eg older parents or relatives) YES / NO
9. (If YES to Q 8) ***How many?*** (number) _____
10. ***Where do you live most of the time?*** _____
11. ***Is the place you normally live your traditional lands?*** YES / NO

Aboriginal Cultural Activity Counts - Phase 2 – Research Survey

12. (If NO to Q11) *Why do you live somewhere that isn't your country?*

- ☐ You live where you work or study
- ☐ You live on your partner's country
- ☐ It is affordable (eg rent)
- ☐ It is a good place to live
- ☐ Other (specify) _____

13. *Are your traditional lands covered by a native title determination or agreement?* Yes / No / Unsure

14. *What sort of access do you have to your traditional lands?*

- ☐ Full access whenever I wish
- ☐ Access with some limits (eg other activities on parts of country – eg mining, pastoral, government)
- ☐ No access (other uses that prevent access – eg land used by government)
- ☐ Unsure

15. *Thinking about ways you connect with your culture, can you tell me how much time you spend, and how often, on activities? Let's start with a list and you can add others if you think of others.*

Activity	Frequency	Time spent
Law and ceremony (yearly, how many years between)	Every years	
Cultural Funerals (how many per year on average?)		
Storytelling, teaching culture or broadcasting		
Performing Music or Dance		
Making arts or crafts		
Travelling on country to important sites		
Speaking language at home and with family		
Fishing		
Hunting		
Gathering wild foods or medicines		
Others (SPECIFY) _____ _____		

16. *Do you ever find yourself in a situation where you are not able to meet the demands of culture and work?*
YES / NO

Aboriginal Cultural Activity Counts - Phase 2 – Research Survey

17. *Can you give me an example of this and what you did?* _____

18. *What is your highest level of formal (western/kartiya) education?*

- ☐ Never attended school
- ☐ Completed Year 6 equivalent (primary school) or lower
- ☐ Completed between Year 7 to 9 or equivalent
- ☐ Completed Year 10 equivalent
- ☐ Completed Year 11 equivalent
- ☐ Completed Year 12 equivalent
- ☐ Completed TAFE qualification (Certificate, Diploma or Advanced Diploma)
- ☐ Completed University Bachelor degree or higher
- ☐ Other (RECORD) _____

19. *Did you ever go away for education and live at boarding school, a hostel or with family?* YES / NO

20. *Have you ever had paid work, excluding CDEP RJCP or working for Centrelink benefits?* YES / NO

21. *If so, How many years paid work experience have you had?*

- ☐ 0-5 years paid employment experience
- ☐ 5-10 years paid employment experience
- ☐ >10 years paid employment experience

22. *What work are you doing this month?*

- ☐ In paid employment – regular ongoing work
- ☐ In own business, or working in a family business
- ☐ In casual or temporary employment
- ☐ Working or training for Centrelink benefits (RJCP/CDP requirements)
- ☐ Not in paid employment or working for benefits (eg disability or carer)

23. *Do you sometimes get asked to work on cultural heritage surveys or other cultural business?*

Aboriginal Cultural Activity Counts - Phase 2 – Research Survey

24. **Thinking about your income from work, benefits and other sources like royalties, what level of income would you earn?**

- ☐ Low (\$0 to \$800 per fortnight before tax— eg Centrelink benefits)
- ☐ Medium (\$801-2,000 per fortnight before tax)
- ☐ High (over \$2,000 per fortnight before tax)

25. **What, if any, problems you have had getting a job?**

- ☐ Transport problems or too far to travel
- ☐ No jobs at all
- ☐ No jobs in local area or line of work
- ☐ Insufficient education, training or skills
- ☐ Own ill health, or disability
- ☐ Treated badly because you are Aboriginal
- ☐ Too young or too old
- ☐ Have criminal record
- ☐ Don't have driver's licence
- ☐ Unable to find suitable child care
- ☐ Other (specify) _____
- ☐ No difficulties

26. **Thinking about your regular job, how many hours a week do you usually work?** (if FIFO note times and calculate average, if Centrelink 25) _____

27. (only for paid job not Centrelink) **Thinking about your regular paid job, is it permanent or a temporary contract** (that has an end date)?

- ☐ Permanent
- ☐ Temporary contract
- ☐ Not sure

28. (only for paid job not Centrelink) **Thinking about your regular paid job what sector is it in?**

- ☐ NGO/Aboriginal organisation work (eg Ranger work, Winun Ngari, Kimberley Land Council etc)
- ☐ Government work (eg working in a department or shire council)
- ☐ Private sector (eg building or mining company)

Aboriginal Cultural Activity Counts - Phase 2 – Research Survey

29. *Thinking about your regular job, what is the industry of work?*

- ☐ Municipal services, electricity, gas, water or waste
- ☐ Mining (eg heritage clearances)
- ☐ Construction
- ☐ Tourism (accommodation & food services)
- ☐ Health care and social assistance
- ☐ Education and training
- ☐ Public administration and safety (eg community council)
- ☐ Employment or other administrative and support services
- ☐ Arts
- ☐ Natural resource or land management
- ☐ Agriculture, forestry or fishing
- ☐ Trade
- ☐ other services
- ☐ Not sure

30. *Thinking about your regular job, does this job involve cultural knowledge?* YES / NO
(examples include rangers, working with Aboriginal people, tourism)

31. *Thinking about your regular job, is this job working mostly on country?* YES / NO

32. *Because you work, is it possible to meet all your cultural responsibilities?*

- ☐ Yes
- ☐ No
- ☐ Don't have cultural responsibilities

After Choice Model ask:

33. *What does work mean to you?* _____

34. *What does culture mean to you?* _____

Thank them for their time and offer them a grocery voucher to acknowledge the value of their time and as a token of appreciation.

Aboriginal Cultural Activity Counts - Phase 2 – Research Survey

Choice model

Present the choice sets one by one on laminated cards asking the respondent to select the best thing and the worst thing and whether the overall situation would be acceptable.

With each respondent, change the order of the choice sets presented so that each respondent considers them in a different order.

Give an example of each situation if necessary – taking care to match the choice set identifier.

A	Displaced from own people and country, based in town for say health care
B	Working a job with kartiya, say government or FIFO mining, with some access to traditional country
C	Working alone in tourism for non-Aboriginal tourists, has full native title rights not affected by other activities
D	Working for a NGO in town, maybe going fishing and hunting on weekends
E	Unemployed in town, supplementing income with artwork sales and fishing
F	Native title holder working a high paid job that precludes spending time on cultural activities
G	Working a high paid job in town in cultural business (eg cultural adviser for mining company Perth)
H	Working in an Indigenous NGO in a place distant from traditional country
I	Working for own community on traditional lands for Centrelink benefits, some weekend fishing and hunting

Choice Set A		
 Best	Situation	 Worst
	Rarely working or spending time with Aboriginal people	
	Little or no access to traditional country	
	Rarely spending much time on cultural activities	
	Earning a low income (eg Centrelink) \$600 per fortnight before tax	
Is this situation OK for you?		Yes/No

Aboriginal Cultural Activity Counts - Phase 2 – Research Survey

Choice Set B		
 Best	Situation	 Worst
	Rarely working or spending time with Aboriginal people	
	Some access to traditional country	
	Spending some time on cultural activities	
	Earning a high income \$2700 per fortnight before tax	
Is this situation OK for you?		Yes/No

Choice Set C		
 Best	Situation	 Worst
	Rarely working or spending time with Aboriginal people	
	Full access to traditional country	
	Spending a lot of time on cultural activities	
	Earning a medium income of \$1200 per fortnight before tax	
Is this situation OK for you?		Yes/No

Choice Set D		
 Best	Situation	 Worst
	Working or spending some time with Aboriginal people	
	Little or no access to traditional country	
	Spending some time on cultural activities	
	Earning a medium income of \$1200 per fortnight before tax	
Is this situation OK for you?		Yes/No

Choice Set E		
 Best	Situation	 Worst
	Working or spending some time with Aboriginal people	
	Some access to traditional country	
	Spending a lot of time on cultural activities	
	Earning a low income (eg Centrelink) \$600 per fortnight before tax	
Is this situation OK for you?		Yes/No

Aboriginal Cultural Activity Counts - Phase 2 – Research Survey

Choice Set F		
 Best	Situation	 Worst
	Working or spending some time with Aboriginal people	
	Full access to traditional country	
	Rarely spending much time on cultural activities	
	Earning a high income \$2700 per fortnight before tax	
Is this situation OK for you?		Yes/No

Choice Set G		
 Best	Situation	 Worst
	Working or spending most of the time with Aboriginal people	
	Little or no access to traditional country	
	Spending a lot of time on cultural activities	
	Earning a high income \$2700 per fortnight before tax	
Is this situation OK for you?		Yes/No

Choice Set H		
 Best	Situation	 Worst
	Working or spending most of the time with Aboriginal people	
	Some access to traditional country	
	Rarely spending much time on cultural activities	
	Earning a medium income of \$1200 per fortnight before tax	
Is this situation OK for you?		Yes/No

Choice Set I		
 Best	Situation	 Worst
	Working or spending most of the time with Aboriginal people	
	Full access to traditional country	
	Spending some time on cultural activities	
	Earning a low income (eg Centrelink) \$600 per fortnight before tax	
Is this situation OK for you?		Yes/No

Appendix 8 Summary counts by profile

A summary of the aggregate count results for all 97 respondents, by profile, of the Best and Worst choices in the BWS, and the OK and not OK choices in the DCE, are set out in Table A-2. It should be noted that although the nine profiles were presented to each respondent, they were presented in a different order, by rotating the starting profile. For each of the profiles A-I, each attribute was presented at one level (not shaded).

[illegible]

Appendix 9 Dummy Coding data transformation, with Best and Worst sample

The data from the choice model needed to be transformed prior to regression modelling in the statistical package Stata. The most common form is known as dummy or binary form (0,1). Dummy coding is essentially a longer form of coding where 1 represents a selection or presence and 0 represents non-selection or absence of a characteristic. This appendix illustrates how the data transformation of the BWS model occurred.

In the first instance, each profile or choice set was transformed with a line of coding for each available attribute level, and the available attribute level and the Best (Worst) choice was coded as 1 (–1 for Worst), all other elements as zeros (0). In this research, each profile contains four elements or attribute levels that were available to be selected as best or worst. Therefore, the coding involved four lines of dummy code for each of the nine profiles, a total of 36 lines, identifying which attribute levels were available and which were chosen as Best (Worst). The result for the 97 respondents who completed the choice model component of the survey was 3,492 lines of code each for Best and Worst. The stacked coding of Best and Worst used 6,984 lines of code.

An example of how a single respondent's choices in five profiles (A to E) is transformed for Best choices is at Table A-3 and Worst choices is at Table A-4. This shows the dummy coding of Best and Worst selections against the available attribute levels p1 to y3 in the profile V. This reverse coding (–1) of attribute levels for the worst choices enables direct comparability of the regression results.

Table A-3 Sample dummy coded transformation of Best choices

Best		Dummy coding of Available and Choice													
Profile	Choice	Available	Best	p1	p2	p3	c1	c2	c3	a1	a2	a3	y1	y2	y3
A	p1	p1	1	1	0	0	0	0	0	0	0	0	0	0	0
		c1	0	0	0	0	1	0	0	0	0	0	0	0	0
		a1	0	0	0	0	0	0	0	1	0	0	0	0	0
		y1	0	0	0	0	0	0	0	0	0	0	1	0	0
B	a2	p1	0	1	0	0	0	0	0	0	0	0	0	0	0
		c2	0	0	0	0	0	1	0	0	0	0	0	0	0
		a2	1	0	0	0	0	0	0	0	1	0	0	0	0
		y3	0	0	0	0	0	0	0	0	0	0	0	0	1
C	c3	p1	0	1	0	0	0	0	0	0	0	0	0	0	0
		c3	1	0	0	0	0	0	1	0	0	0	0	0	0
		a3	0	0	0	0	0	0	0	0	0	1	0	0	0
		y2	0	0	0	0	0	0	0	0	0	0	0	1	0
D	a2	p2	0	0	1	0	0	0	0	0	0	0	0	0	0
		c1	0	0	0	0	1	0	0	0	0	0	0	0	0
		a2	1	0	0	0	0	0	0	0	1	0	0	0	0
		y2	0	0	0	0	0	0	0	0	0	0	0	1	0
E	a3	p2	0	0	1	0	0	0	0	0	0	0	0	0	0
		c2	0	0	0	0	0	1	0	0	0	0	0	0	0
		a3	1	0	0	0	0	0	0	0	0	1	0	0	0
		y1	0	0	0	0	0	0	0	0	0	0	1	0	0

Table A-4 Sample dummy coded transformation of Worst choices

Worst		Dummy coding of Available and Choice													
Profile	Choice	Available	Worst	p1	p2	p3	c1	c2	c3	a1	a2	a3	y1	y2	y3
A	a1	p1	0	-1	0	0	0	0	0	0	0	0	0	0	0
		c1	0	0	0	0	-1	0	0	0	0	0	0	0	0
		a1	1	0	0	0	0	0	0	-1	0	0	0	0	0
		y1	0	0	0	0	0	0	0	0	0	0	-1	0	0
B	c2	p1	0	-1	0	0	0	0	0	0	0	0	0	0	0
		c2	1	0	0	0	0	-1	0	0	0	0	0	0	0
		a2	0	0	0	0	0	0	0	0	-1	0	0	0	0
		y3	0	0	0	0	0	0	0	0	0	0	0	0	-1
C	p1	p1	1	-1	0	0	0	0	0	0	0	0	0	0	0
		c3	0	0	0	0	0	0	-1	0	0	0	0	0	0
		a3	0	0	0	0	0	0	0	0	0	-1	0	0	0
		y2	0	0	0	0	0	0	0	0	0	0	0	-1	0
D	c1	p2	0	0	-1	0	0	0	0	0	0	0	0	0	0
		c1	1	0	0	0	-1	0	0	0	0	0	0	0	0
		a2	0	0	0	0	0	0	0	0	-1	0	0	0	0
		y2	0	0	0	0	0	0	0	0	0	0	0	-1	0
E	i1	p2	0	0	-1	0	0	0	0	0	0	0	0	0	0
		c2	0	0	0	0	0	-1	0	0	0	0	0	0	0
		a3	0	0	0	0	0	0	0	0	0	-1	0	0	0
		y1	1	0	0	0	0	0	0	0	0	0	-1	0	0

The dummy coding transformation of Best-Worst pairs used the same principles as described for Best and Worst – where an attribute level is available as Best it is coded as 1, and if it is available as Worst it is coded as –1. The coding of Best-Worst pairs is more complex, as there are $M(m - 1) = 12$ possible pair combinations that could be chosen in each of the 9 profiles or choice sets presented, with a total of 108 possible best-worst pairs presented to each participant. The transformation of Best-Worst pairs for all 97 respondents yields 10,476 lines of data.

The dummy coding of best-worst pair options in profile B, for example, is illustrated in Table A-5. The best-worst pair chosen by a respondent would be coded as 1, the others coded as 0.

Table A-5 Dummy coding of Best-Worst pairs single profile sample

V	Best-Worst pair			Attribute level Available as Best/Worst											
	BWP	Best	Worst	p1	p2	p3	c1	c2	c3	a1	a2	a3	y1	y2	y3
B	13	p1	c2	1	0	0	0	-1	0	0	0	0	0	0	0
B	14	p1	a2	1	0	0	0	0	0	0	-1	0	0	0	0
B	15	p1	y3	1	0	0	0	0	0	0	0	0	0	0	-1
B	16	c2	p1	-1	0	0	0	1	0	0	0	0	0	0	0
B	17	c2	a2	0	0	0	0	1	0	0	-1	0	0	0	0
B	18	c2	y3	0	0	0	0	1	0	0	0	0	0	0	-1
B	19	a2	p1	-1	0	0	0	0	0	0	1	0	0	0	0
B	20	a2	c2	0	0	0	0	-1	0	0	1	0	0	0	0
B	21	a2	y3	0	0	0	0	0	0	0	1	0	0	0	-1
B	22	y3	p1	-1	0	0	0	0	0	0	0	0	0	0	1
B	23	y3	c2	0	0	0	0	-1	0	0	0	0	0	0	1
B	24	y3	a2	0	0	0	0	0	0	0	-1	0	0	0	1

Notes: V denominates choice set, BWP is the code for the specific Best-Worst pair (108 presented to each respondent).

Appendix 10 Effects coding data transformation, with Best-Worst pairs sample

Effects coding involves selection of a reference attribute level as a reference point or base in each attribute, and coding these at -1 when they are present in a Best-Worst pair. The other attribute levels are coded as 1 if present or 0 if absent. This coding makes attribute levels mean centred, with the reference or base level being the negative sum of the estimates of other levels.

To enable parameter estimation of the overall average impact of an attribute, for each possible Best-Worst pair, the impact variable will be 1 for the best attribute, -1 for the worst attribute and 0 for the attributes not present.

To illustrate effects coding of Best-Worst pairs in this research, Table A-6 sets out the effects coding for each of the 12 possible best-worst pairs in profile B (a total of 108 Best-Worst pairs are presented to each participant). The table shows how the lowest attribute levels (p1, c1, a1 and y1) as reference or base levels, would be transformed to attribute impacts (blue shaded columns) and the other attribute levels (p2, p3, c2, c3, a2, a3, y2 and y3) would be effects coded according to their availability. As with dummy coding, the Best-Worst pair chosen by a respondent would be coded as 1, the others coded as 0.

Effects coding was also used in analysing best, worst, stacked best and worst as well as Best-Worst pairs at both the aggregate sample level using linear regressions and individual level using multinomial regression to facilitate comparison with dummy coding results.

Table A-6 Attribute impact and effects coding of Best-Worst pairs single profile sample

Best-Worst pair			p1	p2	p3	c1	c2	c3	a1	a2	a3	y1	y2	y3
			People			Country			Activity			Income		
No.	Best	Worst	Att_1	Eff_1_2	Eff_1_3	Att_2	Eff_2_2	Eff_2_3	Att_3	Eff_3_2	Eff_3_3	Att_4	Eff_4_2	Eff_4_3
13	p1	c2	1	-1	-1	-1	-1	0	0	0	0	0	0	0
14	p1	a2	1	-1	-1	0	0	0	-1	-1	0	0	0	0
15	p1	y3	1	-1	-1	0	0	0	0	0	0	-1	0	-1
16	c2	p1	-1	1	1	1	1	0	0	0	0	0	0	0
17	c2	a2	0	0	0	1	1	0	-1	-1	0	0	0	0
18	c2	y3	0	0	0	1	1	0	0	0	0	-1	0	-1
19	a2	p1	-1	1	1	0	0	0	1	1	0	0	0	0
20	a2	c2	0	0	0	-1	-1	0	1	1	0	0	0	0
21	a2	y3	0	0	0	0	0	0	1	1	0	-1	0	-1
22	y3	p1	-1	1	1	0	0	0	0	0	0	1	0	1
23	y3	c2	0	0	0	-1	-1	0	0	0	0	1	0	1
24	y3	a2	0	0	0	0	0	0	-1	-1	0	1	0	1