

Population in Australia:

A study into the attitudes of residents regarding
population size, policy and the notion of taboo

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Affidavit

I hereby affirm that this Master's Thesis represents my own written work and that I have used no sources and aids other than those indicated. All passages quoted from publications or paraphrased from these sources are properly cited and attributed.

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Abstract

In the face of significant social and environmental impacts resulting from global overpopulation, Australian governments have consistently pursued policies aimed at increasing the national population. This study informs the work of organisations dedicated to the promotion of population stability by addressing the Australian public through an online survey to reveal prevailing community attitudes regarding the ways in which population issues are discussed, conceptualised and rationalised.

The findings indicate consensus that increasing population size has negative implications for personal quality of life, societal wellbeing and environmental health, but that it may result in economic benefits. Anthropocentric and nationalistic values are shown to dominate perceptions of population optimality, with significant differences detected between the assigned importance of various considerations in determining national and global population levels. Nationalism is shown to promote the manifestation of a 'tragedy of the commons' at the international scale, while the egocentric nature of individual procreation decisions leads to the same result at the community level. More variety was detected among opinions relating to the use of different policies, yet the current federal policies of providing maternity payments and prohibiting euthanasia are shown to be contrary to prevalent community desires. These and further findings are used to make recommendations for policy makers and the work of population stability advocates.

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List of abbreviations

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
ARHA	Australian Reproductive Health Alliance
AuSSI	Australian Sustainable Schools Initiative
CIA	Central Intelligence Agency
CO₂	Carbon Dioxide
DINK	Double Income No Kids
GDP	Gross Domestic Product
IPAT	Impacts = Population x Affluence x Technology
IPCC	Intergovernmental Panel on Climate Change
JCPML	John Curtin Prime Ministerial Library
MDG	Millennium Development Goals
NEF	New Economics Forum
NGO	Non-governmental Organisation
NSW	New South Wales
NT	Northern Territory
OECD	Organisation for Economic Cooperation and Development
PA	Per Annum
PPP	Purchasing Power Parity
QLD	Queensland
SA	South Australia
TAS	Tasmania
UN	United Nations
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNHCR	United Nations High Commissioner for Refugees
UNPA	United Nations Parliamentary Assembly
VIC	Victoria
WA	Western Australia

1 Introduction

The biosphere which supports all life on earth is facing multiple threats resulting from human activities. Population size has a multiplicative effect on the scale of these impacts, yet issues of population size are often conspicuously absent from both media reporting of environmental problems and from international discussions aimed at mitigating environmental impacts (Mayer, 1997). This perplexing situation has been termed the “population taboo” (Hardin, 1993), or the “Hardinian taboo” after the ecologist who coined the phrase (Gardner, 1998). In his 2010 “People and Planet” lecture, Sir David Attenborough identified breaking the “absurd” taboo as imperative for tackling the world’s environmental challenges and enabling a decent life for all people. Population organisations around the world have taken up this challenge, but their success is limited by an incomplete understanding of the forces which conspire to maintain the silence. Various commentators have proposed general explanations for the taboo; commonly citing racial and religious sensitivity, the undesirability of potential control mechanisms, and philosophical conflicts between governmental control and individual freedoms (Hardin, 1993). However, the relative significance of each of these drivers has not been empirically tested; leaving organisations unsure as to where to best direct their efforts.

In regard to environmental issues, population size has been described as ‘the elephant in the room’ (Chefurka, 2007a). This metaphor makes reference not only to the fact that population is largely ignored in policy discussions, but also to the enormity of the topic in terms of the myriad effects of human activities and the manifold considerations relevant to the development of appropriate policies. Given the wide scope of the subject matter, this paper draws on the contributions made by a wide range of disciplines including the natural sciences, economics, psychology and philosophy in order to establish the context in which decisions about population are made.

The following literature review establishes the concept of population growth as being problematic by charting the course of population growth at the global level and relating this rise to planetary dominance to the ensuing negative impacts and the limitations imposed by our finite world. The adoption of a laissez faire approach to this problem is challenged through an analysis of the deficiencies of the widely accepted model of Demographic Transition, mainly through the demonstration that, contrary to popular opinion, the population problem also exists in the developed countries of the world. Attention is then focussed on the situation in Australia where the phenomenon of population growth is documented with reference to the government

policies and community attitudes which have led to the current predicament. The literature review then draws on multiple academic, statistical and media sources to depict the state of public discussions about population. Focus here is on the current debate, or lack of it, within industrialised countries with a particular emphasis on Australia. The discussion then moves to population policies which must endeavour to reconcile conflicting interests at the personal and societal level. This requires an understanding of the specific drivers of population growth, especially the reproductive decisions made by individuals, and a thorough analysis of the ethical and legal basis for government intervention. This leads to the presentation of a range of policy options which have been proposed by commentators as partial solutions to the population problem.

Having established the historical, cultural, ethical and legal contexts in which people form their opinions about population, the study addresses the Australian population directly through an online survey in order to contribute to scientific knowledge by revealing the prevailing attitudes regarding: the presence of any taboo; the important consideration factors in determining an optimal population size; the reproductive decision-making process; and the desirability of various government policies. The intellectual contribution of the study is largely descriptive, as it seeks to characterise the attitudes prevailing in different groups within the population, yet further statistical analysis of the data has allowed some explanation of these attitudes by identifying the factors which are associated with various postures. Finally, the findings have been used to develop recommendations for policy makers and population NGOs.

1.1 Research aims and objectives

Various organisations within Australia are committed to achieving population stability through a combination of educational programs to reform public attitudes and lobbying to encourage the adoption of appropriate governmental policies. Not since the National Population Inquiry in 1975 has the Government engaged the public in widespread consultation in order to characterise the prevailing opinions on the topic. Furthermore, the perception of a taboo limiting frank public discussion of relevant issues has led to uncertainty about the current beliefs of Australians which limits both political motivation for change and the effectiveness of public campaigns run by population stability groups. This study seeks to inform the valuable work of these organisations by addressing the research question:

What are attitudes of Australians to issues of population size and the policies which could be used to control it?

In particular, the study explores levels of public interest in the topic and perceptions that cultural conventions restrict its open discussion. Attention is paid to the values and specific determinants which guide public conceptions of the optimal size of populations both domestically and globally and the desirability of various governmental policies which could be used to achieve the optimal level. Based on the results yielded by a survey of the Australian community and a review of contemporary literature, the final outcomes of the study are formulated as a series of recommendations for policy makers and advocates of population stability which are intended to inform the design of their public communications and identify specific target groups.

2 Literature Review

World population growth has followed an exponential trend over the previous two centuries. The course of this growth is charted within this section with reference to the various positive and negative consequences of larger population sizes at the global scale, before attention is then focussed on the situation in the developed world with the emphasis on Australia. The discussion shows that national policies aimed at population growth, while motivated by increasing human welfare, may in fact be detrimental to the long term interests of the people.

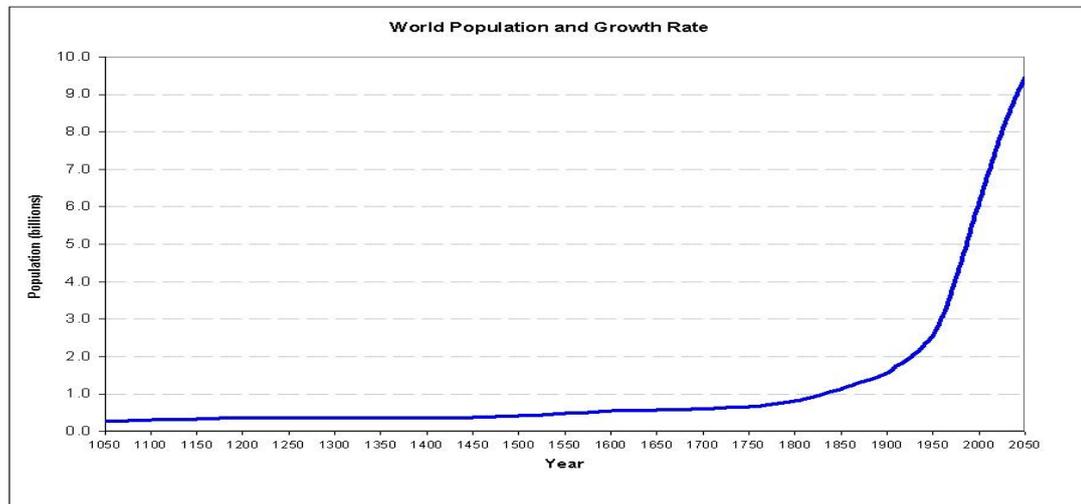
It would appear that in the context of various positive and negative impacts of population growth, a government should be able to formulate a socially desirable population policy based on a cost-benefit analysis. Indeed, one would expect far less variability in the strategies proposed by Australia's leadership than has been experienced in recent times. However, the development of appropriate policy is dependent on some form of consensus as to the objectives of the policy and a clear understanding of the dynamics of the system. Consensus, of course, implies open debate of the topic; the state of public dialog is first addressed in this section. Subsequently, any decision about the 'right' course of action necessitates consideration of the concept of 'value' in order to address specific questions relating to: how the success or failure of a given policy could be measured; how potential parents actually reach the decision to have children; whether or not the state can ethically intervene in this decision; and to whom the various costs and benefits of childbearing accrue. These contentious issues are explored in this section with reference to current scientific literature on the subject, eventually leading to a discussion of the various policy options which have been proposed by different authors.

2.1 A history of world population growth

For the great majority of the history of mankind, world population size has been close to stable; growing at an average rate of less than 0.002% per year during the past million years (Hardin, 1993). This average takes into account the significant increases in population which occurred as a result of technological advances such as the tool-making and agricultural revolutions. At this rate of growth, the population doubled every 35,000 years. This situation has changed dramatically in the past two hundred years as can be seen in Figure 1. Aided by the exploitation

of fossil fuels and the subsequent industrial revolution, humans have expanded their productive capacity and increased their population to use that capacity (Ehrlich, 1971).

Figure 1: Population size throughout history (DSS, 2011)



Population increase occurs when the number of births exceeds the number of deaths in any time period. Population size remains stable when each person merely replaces themselves, i.e. two children per couple, plus some additional births to compensate for those children who become infertile or die before reaching reproductive age. The number of births per woman required for population stability therefore depends on the health conditions experienced within the specific society. The slow population increase during previous millennia resulted from a large number of births per woman combined with a high level of child mortality which left, on average, only slightly more than two children per woman to reproduce.

Since that time, improvements in material living conditions and the development of modern healthcare have extended life expectancies and reduced child mortality; thereby reduced the number of births per woman required to sustain a steady population size. In most developed countries, the level currently stands at 2.1 births per woman (Singer, 1999). This phenomenon is referred to as the ‘demographic transition’, which will be further discussed herein. There has been a lag, however, in reducing the number of births per woman which has resulted in the high rates of population increase depicted in Figure 1. The annual growth rate climbed to a peak of 2.2% in 1963, reducing the population doubling time to only 32 years, before declining to 1.2% in 2011 (UN, 2012). These growth rates sound negligible and may be disregarded by laypeople, but Albert Einstein once referred to compound interest as “the most powerful force in the universe” (Calaprice, 2005), while Albert Bartlett (2004) warned that “the greatest shortcoming of the

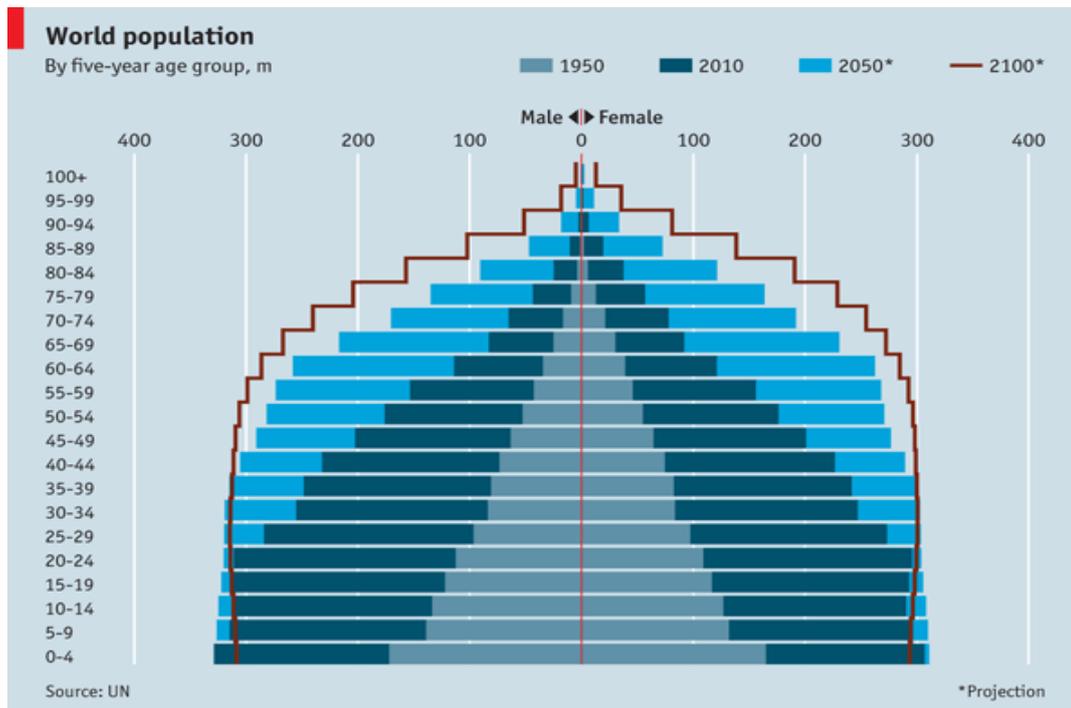
human race is our inability to understand the exponential function". In truth, no constant, positive rate of growth can be considered as small, particularly in the context of a finite planet. Despite the declining growth rate, the population base is now so great that the absolute annual increase is almost as great now as it has ever been.

Fertility rates are falling in most countries around the world. The world fertility rate in 2011 stood at 2.6 births per woman, a significant reduction from the 3.1 births per woman in 2003 (NationMaster, 2012a). As part of this shift, the fertility rate in many countries has dropped to, or below, the replacement rate, but the global statistic hides significant variation between countries and regions. At the top end, 37 African countries are among the 40 countries with fertility rates above 4 births per woman; Niger being the extreme case with 7.6 births per woman (Ibid.). Of course, owing to high mortality rates in many of these countries, the replacement level would be much higher than the 2.1 in more developed countries. At the lower end, more than 100 countries have fertility rates below the replacement level, with Singapore being the extreme case with a fertility rate of just 1.1 births per woman (Ibid.). Australia also fits into this category with a fertility rate of 1.78. This does not necessarily mean that the natural populations (excluding the effects of immigration) of these countries are declining however, as a further factor to be considered is the demographic distribution across various age groups. The implication is that absolute population may increase when women have an average of 2.1 births or less when a large proportion of the population is at or below reproductive age.

2.2 Population projections

Demographers are able to project future developments in population size by charting historical changes in fertility rates and mortality rates and applying to this data their assumptions about how these factors are likely to change. An instrumental tool in performing these calculations is the population pyramid, which provides a graphical representation of the way a population is distributed across various age groups.

Figure 2: World Population Pyramid (UN, 2011)



As can be seen in Figure 2, the contemporary and historical world age distribution does conform to the pyramidal shape implied by the name of the graphic. There are far more children in the world than elderly people, thereby giving the pyramid a large base and an even tapering towards the pinnacle. When looking to the projection for 2050, it can be seen that the number of children is not anticipated to increase markedly from the current level; this reflects the idea that fertility rates will be very close to the worldwide replacement level. Nevertheless, the total area covered by the graphic (representing the total world population) is projected to increase substantially as the people currently alive become older and fill in the 'shoulders' of the pyramid. This effect is largely attributable to foreseen improvements in material living conditions, while the nearly vertical shape of the figure throughout the youth segment represents foreseen improvements in child mortality rates. According to these projections, it seems that the 'population pyramid' will soon need to be rebranded as the 'population dome'.

Although UN agencies are quick to note that their projections are not forecasts of future events and that they are instead intended to provide benchmarks against which potential policy options can be assessed, the UNFPA (2011) nevertheless cites the dynamics of delayed effects discussed here as justifying the claim that "some future population growth is inevitable, if only because the number of potential future parents is at an all-time high". There is no question that improvement in life expectancy is desirable and that the population pyramid should grow

'shoulders' as a result of this trend, but future population growth will only occur if future births continue at a rate higher than the rate of deaths. When considering the projections for 2050 in Figure 2, it should be noted that none of the people under the age of 35 have yet been conceived. This segment amounts to around 40% of the projected population in 2050, so the global population size at that time is certainly not inevitable; rather, it depends on the decisions made by people and the policies adopted by authorities until that time. Population stability and even reduction are possibilities, and the only question is whether the issue is important enough to implement the actions required.

2.3 The population problem

The case built in this section that the size of human populations may prove problematic is founded on a weak anthropocentric argument that our aim should be to promote wellbeing among human populations, both now and into the indefinite future. This stance has been adopted not because it reflects the standpoint of the author, but because it represents the most difficult case to argue for environmental protection. The adoption of any other environmental ethic would add more weight to the case for the stabilisation of human populations.

The human population on earth is subject to absolute thermodynamic limits to growth which require that it must stabilise at some point in the future, at very least when there is no further matter available for the creation of more bodies and no further space on the shrinking planet to accommodate them (Daly, 1977). Given the irreconcilable concerns of other species and future generations, it will be desirable to stabilise the population at some point before reaching these absolute physical limits. The question, posed as the "population problem" (Carr-Saunders, 1922), is at what point it is desirable to stabilise the population of the world and of individual nations; the idea of an optimum population. Answers to this question differ depending on the framing of the problem as a "problem for people" or a "problem for the planet".

2.3.1 A problem for people

The extreme case of population causing a problem for people is the "standing room only" scenario in which the entire landmass is covered by people. Standing one person per square

metre, the earth's current population of seven billion people would take up 7000km²; a square with sides 83km long. At this population density the world's land area could accommodate 510 trillion people, which, if the present growth rate of 1.2%p.a. could be maintained, would be reached in only 900 years. As absurd as this may sound, this same reasoning is used by those who point to uninhabited areas of the world as proof that the world's population can further expand.

The fact is that humans require more than a physical space to locate their person. City populations are not sustained merely by the land on which they live, but by a wider expanse of "ghost acres" on which food is grown, recreation is pursued and various ecosystem services are generated (Hardin, 1993). Marquis de Condorcet (1795) recognised that increasing demand for land could be problematic for people when he wrote:

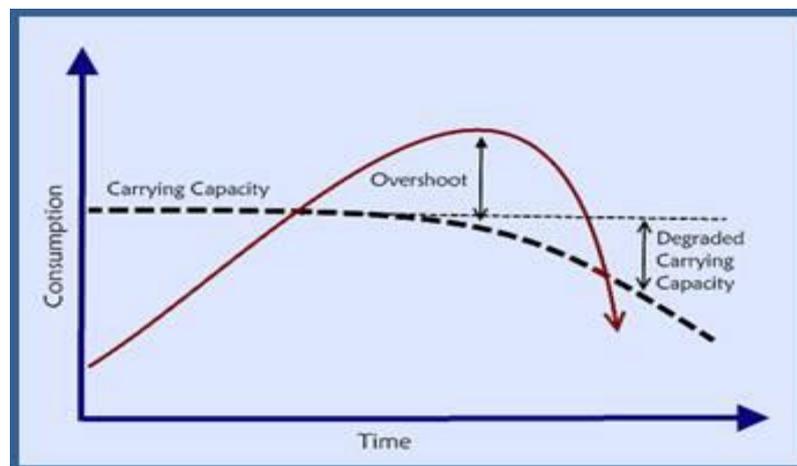
"Must there not come a time when. . . the increase in the number of men surpassing that of their means, there shall result necessarily, if not a continual decrease in prosperity and in population, if not a truly retrograde course, at least a sort of oscillation between the good and the bad? And will not this oscillation, in societies arrived at this point, be a constant source of almost periodic calamities?"

The idea that excessive population size creates a problem for people is older than the idea that it is problematic for the planet. Based on trajectories of population growth and food production levels at the time, Thomas Malthus (1826) claimed that further population growth would result in human "vice and misery" and a subsequent collapse in population. Although his projections proved to be incorrect and his work was discredited by many, the mechanism by which he proposes population size is controlled by resource limits remains relevant today. The Malthusian Demo-stat dictates that when the population exceeds carrying capacity, it will be reduced by "misery" in the form of disease or starvation and "vice" such as murder (Hardin, 1993). When population falls below carrying capacity, it rises due to higher fertility rates and lower mortality rates resulting from the relative abundance of resources. Malthus advocated the circumvention of vice and misery by stabilising population levels at levels that could be sustained by the environment, albeit through methods which would be unacceptable to most contemporary advocates of population control.

Calculating the carrying capacity of the earth involves making assumptions about the average level of consumption in the population. The concept of "ecological footprint" helps in this regard by providing a measure of the biologically productive land and sea area required to supply the

resources consumed by a given population, and to assimilate the wastes produced (Wees, 1992). Estimates using 2007 data indicate that the world-average ecological footprint is 2.7 global hectares per person, while the world affords a bio-capacity of only 1.8 global hectares per person (Global Footprint Network, 2010). In other words, we would need one and a half earths for the 2007 population to continue living at the levels of consumption they then enjoyed into the future. Meanwhile, both population and per capita consumption have increased while levels of poverty remain unacceptably high. According to the Malthusian Demo-stat, this situation can only result in misery and vice for the human population which we can see in rising levels of absolute poverty and wars motivated by the securing of scarce resources. It can safely be concluded that our population in excess of the earth's carrying capacity is generating problems for people. Furthermore, current levels of consumption and pollution in excess of the flow of environmental services provided by the biosphere are only enabled by the depletion of the stock of resources which generates the ecosystem services. Consequently, the planet's bio-capacity is being reduced every year meaning that, even assuming a constant population, the level of consumption per capita will also have to reduce in the long run; causing a problem for future generations. The dynamics of this system are shown in Figure 3, where the red line representing total consumption is shown to decrease as the productive capacity of the biosphere diminishes.

Figure 3: Relationship between consumption and carrying capacity (Chefurka, 2007b)



It is clear that population sizes above the carrying capacity of the supporting environment cause problems for people, but this anthropocentric approach fails to take into account the bio-capacity required by other species and it fails to indicate which population size is best for people. While there must logically be a population size which optimises human wellbeing, our inability to measure utility renders us unable to conclusively state whether the additional happiness of one

more person compensates for any reduction in utility throughout the rest of the society through factors such as increasing demand on infrastructure or the inability to find sufficient space and enjoy solitude. Fortunately, there is another angle from which we can approach the question of population size; population as a problem for the planet.

2.3.2 A problem for the planet

Human activities, beyond a certain scale, have a detrimental effect on the planet's vital systems (Ehrlich, 1971). Some poignant examples of these impacts include resource depletion, land degradation, species extinctions and global warming. The relationship between human activities is best expressed by the IPAT identity (Impact = Population x Affluence x Technology), which emerged from a debate between ecologist Paul Ehrlich and biologist Barry Commoner during the early 1970s (Commoner, 1972). Although the two disagreed about the relative weighting of the various factors contributing to the impacts on the planet, they did agree that the effect of each was multiplicative.

“Impact” refers to the detrimental changes resulting in the biosphere and includes, but is not limited to, the list given above. “Population” refers to the sheer number of people and may relate to a given community, nation, or the world, depending on the scale of the analysis. “Affluence” represents the average consumption level of each person in the population. Gross Domestic Product (GDP) per capita is commonly used as a proxy for consumption because, although GDP measures production, this metric is closely correlated with consumption levels. Finally, “technology” describes the resource intensity of producing affluence and includes the environmental impacts involved in creating, transporting and disposing of the goods, services and amenities used. Simply stated, environmental impact is equal to the number of people, multiplied by the amount each person consumes, multiplied by the environmental impact associated with this consumption.

The world is acutely aware that many human impacts on the planet are currently too great; attendance of international conferences to discuss environmental problems bears testament to this awareness, while the forthcoming agreements represent stated commitments to reducing human impacts. For the sake of further analysis, the discussion will be limited to the

environmental impact of climate change which is largely attributable to the production of CO² through human activities (IPCC, 2007).

Impact (Climate change) = Population x Affluence x Technology

The IPAT identity informs us that reducing the severity of climate change can be achieved by reducing any of the three independent variables, which begs the question of whether it is even necessary to tackle the population problem. Firstly, let's examine what would be required to simply stabilise the environmental impact, rather than reaching the internationally agreed objective of reducing it. The world population is growing at around 1.2% per year, so a reduction in consumption of the same magnitude could compensate. However, GDP per capita has grown in almost every country in the world during each of the past ten years, even throughout the financial crisis. The current world GDP per capita growth rate (PPP) is around 2.6% per year (World Bank, 2012). More importantly, world leaders are almost universally committed to increasing the growth rate of this metric in their own countries, while the Millennium Development Goals (MDGs) reveal an international commitment to increasing GDP per capita in the least developed countries. Given this situation, the prospect that decreasing affluence could compensate for a rising population seems extremely unlikely.

Could technological advances compensate for both rising population and rising affluence? As we cannot predict what new technologies will be developed, the honest answer must be that we don't know, but historical records do provide an indication. With regard to climate change, the relevant metric is the carbon intensity of GDP. Since 1990, technological advances have facilitated an average decoupling of CO² emissions from world real GDP at 0.8% per year (Jackson, 2009). Clearly this development falls well short of the 3.1% p.a. decoupling rate which would be required to compensate for rising population and rising affluence (1.2 x 2.6), merely to stabilise the already unacceptably high environmental impact. Jackson (2009) calculates that decoupling would need to progress at over 7% p.a. in order to mitigate the problem entirely. The low probability of achieving this target barely needs to be stated.

Optimists will still have faith in the ingenuity of mankind to provide solutions, but technological advances may even worsen environmental impacts in the long run due to their implicit connection with levels of consumption. As technology increases and carbon intensity decreases, say through improved fuel efficiency, the costs of performing a task such as travelling are reduced. In a rebound effect, consumers are enabled to travel further within their budgets and may even use automobiles for transportation when they previously would have used public

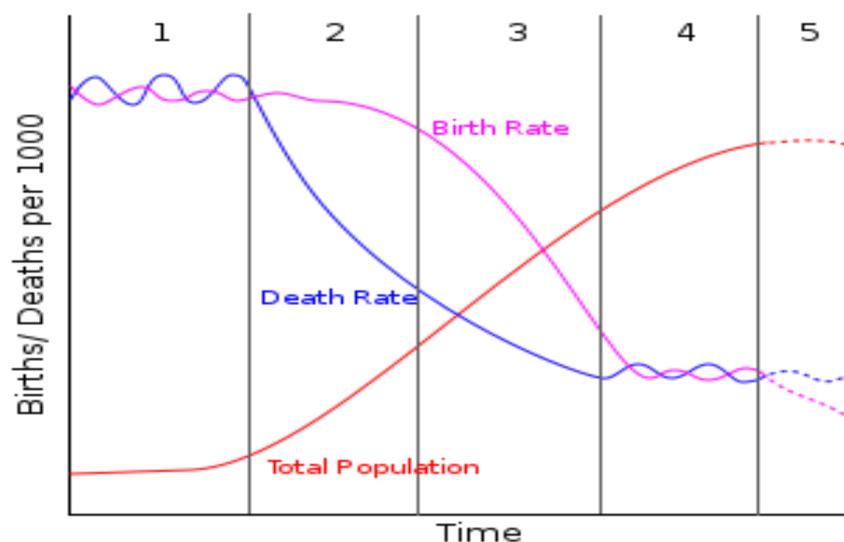
transport; thereby increasing total emissions despite, or even because of, the new technology. This counterintuitive development is termed Jevons paradox (Jevons, 1866).

This analysis demonstrates that population is also a problem for the planet. If we aim to reduce poverty and increase living standards through higher levels of consumption, technology is highly unlikely to be able to mitigate our impacts on the environment. As our earth supports human life, these problems for the planet should also be understood as human problems. Indeed, it is entirely irrelevant whether the issue of population is approached from an eco-centric or anthropocentric viewpoint; the adoption of a long term perspective dictates a need to protect the environment and therefore to at least stabilise the size of human populations.

2.4 Demographic Transition

Even acknowledging population size as a problem on multiple levels, many argue that that overpopulation does not warrant attention as population growth is declining naturally and will soon stabilize at a manageable number. This perception is supported by the widely accepted Demographic Transition Model which represents the transition from high birth and death rates to low birth and death rates as countries develop from pre-industrial to industrialized economic systems.

Figure 4: Stages of the demographic transition (Human Geography, 2011)



The theory states that initially, population is approximately stable due to the balance between high birth rates and high death rates (Phase 1). As a nation develops, death rates drop rapidly as improvements in food supply and sanitation increase life expectancy (Phase 2). During this stage, the gap between birth rates and death rates generates a rapid increase in population. Throughout the third phase, the increasing costs of bearing children, combined with increases in the status and education of women and access to contraception, reduce the birth rate and the population begins to stabilise (Phase 3). In industrialised nations, low birth rates and death rates again reach an approximate parity (Phase 4), although birth rates may drop below replacement levels while death rates may increase due to lifestyle diseases (Phase 5). The natural population in developed countries is shown to be either stable or shrinking (Human Geography, 2011).

Empirical evidence has demonstrated a close correlation between levels of development (measured using labour productivity) and natural population growth rates which exclude the effects of immigration and emigration (Lehr, 2007). However, what is not clear from the model is the direction of the causality; it is not established whether industrialisation leads to lower population growth or if lower population growth leads to industrialisation. Therefore, putting faith in industrial development to naturally reduce population growth may prove to be futile.

Assuming that industrialisation does lead to lower population; it is important to ask whether the traditional model of industrial development could possibly be applied on a global scale. Industrialised countries have increased their labour productivity largely through the exploitation of high-quality exosomatic energy (Daly, 1977). A study by Chefurka (2007) calculates that the annual flow of energy required to bring the world to a stable or declining population through the process of industrialisation would be over five times the quantity of energy used in 2007. Given even the most optimistic projections of future energy supplies, worldwide industrialisation according to the traditional model is clearly an unrealistic expectation.

Assuming that global industrialisation was possible; implicit in the model is the fact that population size must rise in developing countries as the gap between birth rates and mortality rates widens. At the same time, increasing development implies increasing wages and increasing consumption levels. Remembering the IPAT identity, it becomes obvious that demographic transition must dramatically increase environmental impacts through these two factors beyond the already unacceptable levels. Proponents of “letting nature take its course” through the demographic transition should consider at what point they believe population stabilisation will occur, and whether that point is desirable.

A final problem with reliance on demographic transition to stabilise population is the fact that it assumes that the population problem exists exclusively in under-developed parts of the world. The model cannot explain the population growth by natural increase (excluding immigration) which continues to occur in thoroughly industrialised nations such as the United States and Australia.

2.5 The population problem in the developed world

A cursory glance at Australian media reports suggests that the nation does have a population problem; that Australians are not having enough children. This flawed argument, repeated verbatim throughout the developed world, is based on economic reasoning related to changes in the demographic composition as the population ages. The defective reasoning behind this argument will be revealed in due course.

The truth is that Australia does have a population problem; namely that it continues to grow its population through natural increase in an already overpopulated world. The same applies to all other nations which continue to increase their population other than through immigration. Some would argue that these numbers are so small that they hardly bare contemplation, but the multiplicative effect revealed by the IPAT identity magnifies the importance of each person in a developed country from an environmental perspective. Although both the rate of natural increase and the absolute increase are generally lower in industrialised nations than in developing countries like India, the environmental impact of population growth in industrialised countries can be far greater than that of developing countries due to differing consumption patterns.

Table 1: Annual increase in CO² emissions due to natural population increase in selected countries

Country	Pop. (000)	Pop. growth rate (%)	Rate of natural increase (%)	Natural pop. increase (000) p.a.	CO2 emissions per capita (t)	p.a. emission increase due to natural pop. growth (1000t)
Australia	22,015	1.20%	0.60%	132	20.6	2,719
	(ABS, 2012)	(ABS, 2012)	(ABS, 2012)		(NTNU, 2012)	
India	1,205,073	1.30%	1.30%	15,665	1.8	28,197
	(CIA, 2011)	(CIA, 2011)	(CIA, 2011)		(NTNU, 2012)	
United States	313,847	0.90%	0.46%	1,444	28.6	40,432
	(Census, 2011)	(Census, 2011)	(Census, 2011)		(NTNU, 2012)	

Table 1 shows that despite the far greater population of India and the significantly higher rate of natural increase (1.3%), natural population increase in the United States (0.46%) creates a greater environmental impact with regard to climate change. Even the comparatively tiny population increase in Australia (only 0.8% of India’s increase in absolute terms) makes a significant contribution to worsening the impacts of human activities on the environment (around 10% of the impact generated in India). If immigration to industrialised countries from regions of lower consumption is taken into account, the contribution of population growth to environmental impacts in developed countries is still higher.

The common representation in developed nations of overpopulation as an issue to be dealt with only in developing countries while selfishly pursuing domestic growth represents a “tragedy of the commons” scenario (see section 2.5 on the Tragedy of the Commons). This describes the process by which individual countries, acting independently and rationally according to their own self-interest, deplete a shared resource despite understanding that this behaviour is contrary to their long-term interests (Hardin, 1968). In a sparsely populated country such as Australia, the impacts of an increasing population are not acutely felt at a societal level. The

country alone reaps the economic benefits of a greater pool of labour and a larger domestic market to purchase its produce. Meanwhile, many of the environmental costs associated with the increased population, such as increased CO² emissions, are borne equally by all of the countries in the world. In this example, the common pool resources are the atmosphere and climatic systems. Indeed, this “commons mentality” may also be a factor in the individual’s decision to procreate and will be explored later.

Having established that population size is a problem for both people and the planet; that the problem is not going to solve itself (except perhaps through widespread misery and vice); and that the problem exists in countries at all stages of development, the question is why we don’t talk about it and why action is not taken. From this stage on, the discussion will focus on the situation in industrialised countries with a particular attention paid to Australia.

2.6 Australian population and policy development

This section charts the development of Australian population policy, which is considered to be indicative of prevailing public attitudes, since federation in 1901. This is followed by a representation of the growth of the national population, with reference to the means through which it has been achieved, and the current projections for population growth over the coming century which provide some insight into the range of policies currently under consideration. Finally, more in depth analysis is paid to the important contribution of immigration to Australia and the ensuing impacts at both national and international levels.

2.6.1 The history of Australian population policy

Ever since the birth of the nation in 1901, Australian population policy has consistently sought to increase the total size of the population. At federation, the problem was perceived as:

'...whether we shall be able to people the vast areas of the continent which are capable of supporting large populations. This can only be done by restoring and maintaining a high rate of natural increase or by immigration on a large scale, or by both these means...' (National Population Inquiry, 1975).

Immigration during the 1920s was around 350,000 per year and targets for an optimal population of 100 million were widely accepted (National Population Inquiry, 1975), yet not all immigrants were welcome and the various political parties were unanimous in their support of a 'White Australia Policy' to keep out the 'yellow races'. A lone dissenter, geographer Thomas Griffith Taylor, argued that the country's climate, soil and water resources could support no more than 65 million and later reduced the estimate to 20 million after considering the maintenance of a decent standard of living (Cocks, 1998). After World War Two, concerns about national security led to the creation of the Federal Department of Immigration which, under the slogan of "populate or perish", sought to achieve a 1% annual increase in population through immigration and offered free or assisted passage and other financial incentives to a wide range of European migrants while relaxing restrictions on the admission of non-white immigrants (Ibid., 1998).

Not until the 1970s did concerns about increasing congestion and environmental issues enter the population debate, leading to the abandonment of concepts such as optimal levels or growth rates of population in favour of allowing population change to result from actions designed to achieve the goals of a humane and equitable society (Borrie, 1994). In 1992, the Federal Government established the National Population Council (NPC) as an independent advisory body yet rejected their recommendation for the development of an explicit population policy which recognises the significant impacts of population on the economy, environment, society and international issues (Cocks, 1998). The recommendation was repeated by a government inquiry into Australia's human carrying capacity in 1994 which, while failing to set specific targets for immigration, also urged community consultation about the pros and cons of a bigger or smaller population.

Up until this point, the sole focus of population discussions was centred on the rate of immigration to Australia. Natural increase was exempt from discussions and all parties favoured high levels of domestic fertility. This should have changed at a meeting of the world's scientific academies in 1993 where Australia became a signatory to a declaration "that the world population goal should be zero population growth within the lifetime of our children" (Graham-Smith, 1994), which logically implies zero population growth through natural increase in all countries while population growth through immigration would still be permissible under the injunction as it represents a mere population transfer. Australia's rate of natural increase reached its lowest ever level of 0.58% per annum in 2004 (ABS, 2012); substantially higher than the 0% growth to which the country had committed. Rather than applaud the drop, then federal

treasurer Peter Costello urged Australians to “have one for mum, one for dad and one for the country” and backed his appeal by offering financial incentives for having children in the form of a maternity payment dubbed the ‘Baby Bonus’ (BBC, 2006). Although causation cannot be directly attributed, the implementation of the Baby Bonus coincided with a rise in the fertility rate from 1.75 in 2004 to 1.94 by 2010 and an accompanying rise in the annual level of natural increase from 115,000 to 155,000 during the same period (ABS, 2012c). This disregard for international convention was motivated primarily by mounting concerns about the growing aged dependency ratio, yet this problem could have been far more effectively managed through immigration (as discussed in section 1.8.1 on Supporting Welfare Systems). Why this path was not chosen is unclear, but it may have been associated with the re-emergence of White Australia sentiments under the banner of Pauline Hanson’s newly founded ‘One Nation’ party which won 10 per cent of the vote in the 1998 federal election on a platform of strong opposition to Asian immigration and opposition to positive discrimination in favour of disadvantaged indigenous peoples (Cocks, 1998). The Baby Bonus has remained government policy until today. Attitudes about both the effect and the desirability of this policy are examined by the current study.

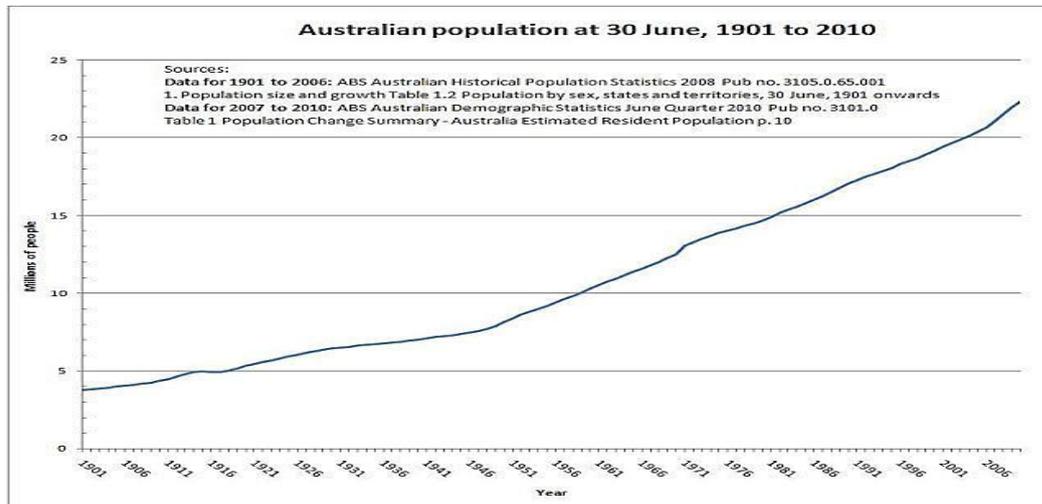
The centre-left Labor Party has governed the country since 2007 with two significant policy developments during that time. In response to projections in the government’s 2009 Intergenerational Report that Australia’s population would rise from 22 million to 35 million by 2050, then Prime Minister Kevin Rudd stated his desire for a ‘Big Australia’ and appointed a Minister for Population to develop a population policy. The significant reliance on immigration to reach the goals was immediately unpopular and was largely responsible for a change in party leadership in 2010 (BBC, 2010). Australia’s first female Prime Minister, Julia Gillard, was quick to shift the official policy from ‘Big Australia’ to ‘Sustainable Australia’ and to rebrand the relevant ministry as the Ministry for Sustainable Population. Despite paying considerable lip service to environmental and social issues, the “sustainable population strategy” released in 2011 failed to specify a target population or even to indicate whether it would be larger or smaller than the current level. Meanwhile, Gillard continues to approve papers which advocate rapid rates of population growth on economic grounds (The Australian, 2011).

2.6.2 Australian population development

The effects of Australia’s policies on population size are presented in this section. The figure below shows the steady and sustained growth of the Australian population since federation. As can be seen from the steepening gradient of the graph, total population increase in absolute

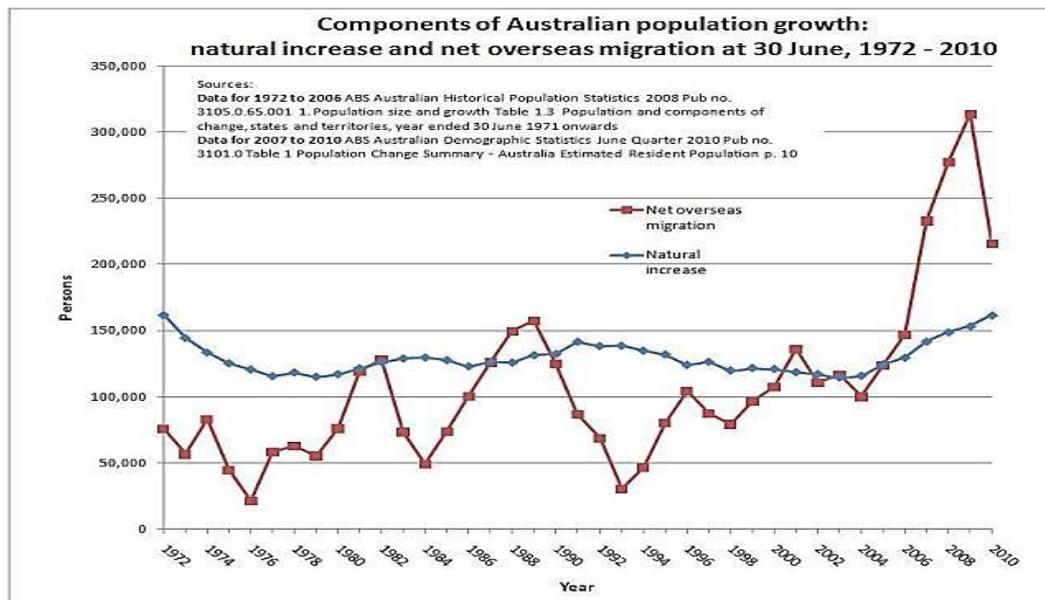
terms has been greater in recent times than at any point in the past (with the exception of a brief anomaly in 1971-72).

Figure 5: Australian population growth 1901-2010 (O'Connor, 2011)



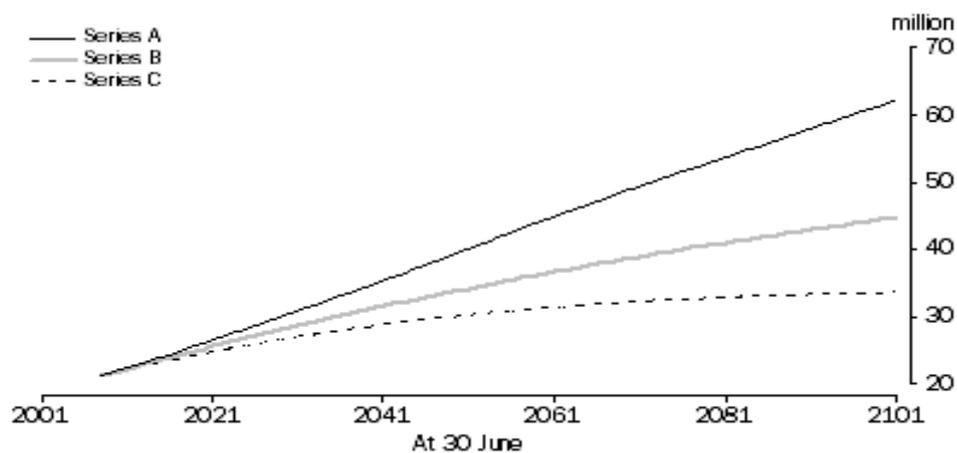
In the year ending September 2012, Australia’s population grew by 382,500 people representing a high growth rate of 1.7%, which is around four times higher than the OECD average (ABS, 2012c). Despite widespread belief that this increase is exclusively due to immigration, natural increase contributed 154,500 people, or 40% of the net gain, while net overseas migration added the other 60% (ABS, 2012c). The strong contribution of natural increase to total growth is typical of previous decades, as shown by the figure below, and only the dramatic increase in immigration in the past decade has made this the major contributor to total population increase.

Figure 6: Components of Australian population increase 1972-2010 (O'Connor, 2011)



Australia's population reached 23 million in April 2013 (ABS, 2013). Where it goes from here will depend largely on the specific policies employed by the Federal Government. While significant natural increase is currently occurring due to the proportion of the population at reproductive ages, the fertility rate of below replacement levels mean that the rate of natural increase will decline and eventually cease. Future growth will therefore depend primarily on the level of immigration. Although the current Sustainable Population Strategy fails to identify any targets, the Australian Bureau of Statistics has released future population projections which depend on the range of policies employed. It is assumed that the three series of projections shown in the figure below incorporate the full range of policies under consideration.

Figure 7: Australian Population Projections (ABS, 2011c)



At current rates of growth, 1.7%, the population would double to 46 million by the year 2054. This is the trend shown by Series A in the figure above. Taking into account the inevitable decline in natural increase, and probable eventual natural decrease, immigration numbers would need to increase over time to sustain this rate of growth. Of greatest interest in Figure 8, however, is Series C, which is regarded by the Government as the lowest possible population outcome given the range of policies under consideration. What this curve reveals is that the Government has no plans to substantially cut immigration and to allow the population to naturally decline.

2.6.3 Immigration to Australia

Current policies regarding immigration are based on two principles: humanitarianism and economics (Cocks, 1998). The humanitarian aspect relates to the intake of refugees which was increased by half in 2012 to 20,000 per year, thereby making it the UNHCR's largest resettlement country on a per capita basis (Australian Government, 2012). Nevertheless, this number

comprises only a minute portion of resettlements worldwide and only around 9% of the net immigration to Australia. Despite the small numbers, media reporting within the country is largely dominated by a focus on this category with a particular focus on the 'illegal asylum seekers' who arrive by boat (Holtom, 2013). The cost of merely processing each refugee arriving in Australia has been estimated by Oxfam and A Just Australia at \$500,000 per person (A Just Australia, 2009). While this figure is used by the NGOs to advocate a change in the process rather than a change in admission levels, if the goal of the humanitarian effort is to 'do good' it should be considered how much 'good' could be done with these funds if they were to be used effectively in the source countries rather than in Australia.

Meanwhile, the vast majority of 'New Australians' are settled in order to enable reunion with family (29%) or selected for the contribution of their specific skills to the country's economic needs (62%)(Australian Government, 2012b). The impacts of a preference for skilled migration can be analysed in terms of its effects within Australia, within the source country, and at the global level. The Government obviously perceives the domestic economic benefits of skilled migration in the form of relieving skills shortages and correcting the dependency ratio as outweighing the negative impacts of greater demands on infrastructure and on the environment; reducing incentives for investing in domestic training for the under-employed; or any negative social effects stemming from changes in the ethnic makeup of the country (Hardin, 1993). While the outcome of this equation is debatable at the national level, the international effects are much clearer.

Source countries, primarily under-developed Asian countries, suffer a 'brain drain' as the best qualified members of society are systematically removed from the population (Ibid., 1993). While population pressures may be incrementally eased by emigration from these countries, prospects for further development are necessarily hindered by reducing the average level of education and training. Regardless of the direction of any causality in the demographic transition model, the loss of human capital is likely to have a greater negative effect on the development of these countries than the reduction of absolute numbers and thereby reduce the rate at which populations in underdeveloped source countries stabilise (Ibid., 1993). Emigration of skilled community members is clearly harmful to source countries.

The Malthusian Demo-stat concurs with the demographic transition model in terms of the effect on global population levels resulting from the transfer of people from underdeveloped countries to more developed nations (Ibid., 1993). As the pressures of overpopulation are eased in source countries, conditions become more favourable for the expansion of the population thereby

generating a rebound effect on fertility rates within the country. In the end, emigration from underdeveloped countries may well have the effect of increasing global population and the associated economic and social impacts. Disregarding any resulting population increase, migration from under-developed countries to Australia implies a shift in affluence and consumption patterns from a relatively harmless level to the worst in the world from an environmental perspective. The world's less affluent people should, of course, have the opportunity to increase their quality of life and levels of consumption, but this does not necessarily mean that development for these people or in these countries should follow the patterns of wayward offenders such as Australia and America.

2.7 Arguments used in favour of population growth

The arguments for population stability are well founded based on the multiple negative impacts which are defined herein as the population problem. Such arguments attract relatively little attention in Australian media reporting and are swamped by reports which promote population growth (Goldie, 2002) based primarily on three lines of reasoning: supporting the function of social welfare systems; enabling the country to defend its borders; and increasing the country's economic and political influence. Each of these arguments is presented in this section with an accompanying critique of the logic behind each claim.

2.7.1 Supporting welfare systems

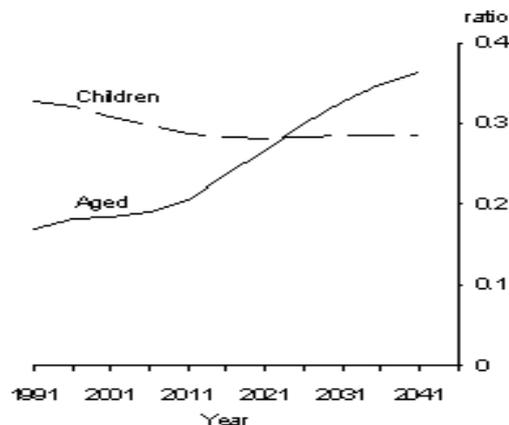
Media reporting of population issues in Australia over the past two decades has been concerned primarily with the phenomenon of the aging population. The median age of the population has steadily risen from 36 years of age in 2002 to 37.7 years in 2011 (NationMaster, 2012b). These figures by themselves present no cause for alarm. They are indicative of an aging trend which can be identified in many developed countries as a result of increasing life expectancies and the 'filling-in' of the shoulders of population pyramids as well-represented age brackets mature, as discussed previously. Instead, concern is focussed on the way in which the demographic shift in age structure affects the age dependency ratio.

The age dependency ratio is defined by the Australian Bureau of Statistics (1992) as "the ratio of dependents (people younger than 15 or older than 64) to the working-age population (those

aged 15-64)". A value of 0.6, for example, reveals that there are 6 dependents for every 10 working-age people. This definition clearly understates the extent of dependency among Australia's youth, given that the age of 15 relates to the minimum schooling required by law, but that 82% of Australians remain dependent until graduating from high school at age 17, while 59% achieve some form of post-schooling qualification and 32% achieve a university degree which requires them to remain in full-time education until at least the age of 20 (ABS, 2012b). Regardless of the accuracy of the definition, shifts in the dependency ration have implications for the ability of the working population to economically support dependent members of the community. Specific concerns relate to the feasibility of paying pensions and subsidising medical care in the context of a growing group of retirees.

As mentioned, the overall age dependency ratio is composed of dependency ratios for two different groups: the old and the young. Based on projected demographic shifts, the Australian Bureau of Statistics has projected the development of the dependency ratio depicted in Figure 5 below.

Figure 8: Projected Dependency Ratios (ABS, 1992)



Neither the phenomenon of the aging population nor the significant social impacts which will need to be dealt with are in contention here. What is questioned, however, is the way in which these phenomena are cited as justification for advocacy of increasing Australia's population, particularly through increased fertility. This reasoning was employed most famously by ex-treasurer Peter Costello in urging parents to "have one for mum, one for dad, and one for the country" (BBC, 2006).

The counter arguments to this policy are manifold. Firstly, assuming that this policy could indeed solve the economic dilemma and alleviate concerns of upcoming societal hardships, it is merely a Ponzi scheme as it relies on an “ever-increasing pool of new investors to pay out returns to prior investors” (Economist, 2011). Any short-term increase in the working age population, regardless of whether this results from domestic fertility or immigration, will eventually require further increases in population to support the additional workers once they retire. The impossibility of indefinitely increasing population size has, hopefully, already been established. The upcoming crisis should therefore be viewed as an opportunity to reform what is an inherently flawed system. Fortunately, many alternatives exist, including raising the retirement age or financially recognising the currently undervalued contributions of retirees to services such as childcare.

Secondly, the current unemployment rate in Australia is 5.6% and is tipped to increase (Economic Times, 2013). Admittedly, some level of unemployment may be considered desirable in a market economy, but the benefits decline as the rate rises. It is bewildering that proponents of a larger working population seek to ‘create’ workers rather than concentrating efforts on increasing the productivity of the current population, despite the additional societal benefits which would ensue from such an approach. While it would not change the official dependency ratio as calculated by a flawed logic which also ignores the proportion of dependent individuals of working age, it would simultaneously increase the tax base and reduce the welfare burden on the state.

Thirdly, it seems prudent in the analysis of any proposal to consider the full ramifications of any action. Again assuming that increasing the workforce would yield economic benefits, these benefits should be weighed against any costs which would be incurred: specifically costs to the environment and society which would result from greater demands on resources and infrastructure. It is quite possible, and yet untested, that retirees would willingly accept lower welfare payments in exchange for the space, relative environmental stability and continued welfare of their offspring which would be promoted by a stabilisation of the population.

Fourthly and perhaps most importantly, is the issue of whether increasing domestic fertility would actually result in a lower dependency ratio. It is clear that an increase of youthful and appropriately skilled immigrants would instantly reduce the ratio and, assuming they were able to find work, would yield economic benefits to the welfare system through taxation. The same cannot be said of increasing domestic fertility. The average child conceived today will not

become an economically productive member of society for around 21 years, or until 2034. By this time, the post-war baby-boom generation will be well past their life expectancy and the aging trend of the population will be stabilising. As noted, newly born children actually add to the dependency ratio for the first fifteen years of their lives and, more accurately, increase the economic burden on society for their first twenty years of existence through greater demands on infrastructure, health care and education. An alternative policy would be to seek population stabilisation and invest the financial savings on these expenditures which will accrue over the next two decades for later use in dealing with the increasing costs of supporting retirees.

Unless society is willing to commit itself to the unrealistic course of never-ending population growth, increasing the size of the work force through any means cannot be viewed as a viable solution to the present problems, and increasing domestic fertility would be the worst of all possible scenarios.

2.7.2 Defending Australia

The advance of the Japanese throughout south-east Asia during the Second World War and the ensuing attacks on Australian soil led the Australian Government to recognise a need to increase population in order to secure the country against the possibility of invasion. While natural increase was the preferred means of achieving this, it was also recognised that domestic fertility alone could never achieve the rapid population expansion which was sought. The Minister of the newly formed Department of Immigration, Arthur Calwell, coined the phrase 'populate or perish' in order to overcome public resistance and scare Australians into accepting the Government's vision of a 1% p.a. increase in population from immigration (JCPML, 1989). As all political parties unanimously supported the 'White Australia Policy' at the time due to the perceived ease of integration, migrants were subsequently encouraged from exclusively northern European countries.

The sentiment that Australia must grow in order defend its borders has persisted in many factions despite significant changes in the nature of warfare and international diplomacy, as well as changes in the nature of the threat. Advances in military technology have altered the traditional premise that the might of an armed force is a simple factor of the number of soldiers it contains. The advent of powerful long-range weapons and unmanned vehicles has created a

situation where the formidability of a nation is largely measured by their level of technical advancement, rather than the number of troops. The claim that more people are needed to support larger armed forces can therefore no longer be sustained.

Politically, Australia is now far more closely associated with its neighbours; largely as a result of the economic interdependence which ensues from the globalisation of world trade. No longer a politically isolated colony, Australia's common membership of numerous international associations with those nations previously regarded as threats has opened a wide range of possibilities for diplomacy in order to avoid the militarisation of disputes. The more immediate threat now facing Australia is the possibility of humanitarian crises affecting neighbouring countries resulting in widespread unauthorised migration.

It is foreseeable that future food shortages and loss of productive land due to sea level rises may stimulate mass migration from overpopulated countries in south-east Asia as people search for better quality of life; Australia would be a likely destination. Two nations, the Maldives and Tuvalu, have already expressed interest in moving their entire populations to Australia in the case that predictions of inundation eventuate (Sydney Morning Herald, 2012). Indonesia, located only 375km from Australia across the easily navigable Timor Gap, has a population of 249 million people living with a population density of 134/km²; 46 times that of Australia (CIA World Factbook, 2013). If only 2% of these people became disenchanted and sought a better life in Australia, the country would face an influx of around 5 million immigrants. It is debatable whether defence of Australia's borders would be the appropriate strategy to pursue in the advent of such a situation, but regardless of opinions on this matter, it must be conceded that no realistic population size in Australia would be sufficient to prevent such a flow. As such, the out-dated notion of 'populate or perish' should be disregarded and efforts should instead focus on maintaining international relations; potentially by using any domestic surpluses to minimise risks to Australians by supporting sustainable development in neighbouring countries rather than militarising the borders.

2.7.3 Political and economic influence

Australian governments have traditionally tended to proudly publicise growth rates of Real GDP while neglecting the perhaps more important statistic of GDP per capita. Despite the fact that

GDP and societal wellbeing are poorly correlated above a certain average income level (Wilkinson & Pickett, 2009) favourable public reception of such reports provides incumbent governments with an incentive for them to seek population growth. Larger populations both increase the amount of consumption in the domestic market and lower input costs for businesses by reducing competition for labour. However, as well as resulting in greater influence in domestic political contests, population growth can also increase power in an international context.

In any market based system, size translates into power. This can be the only plausible explanation for the failure of the world community to sanction the United States for their lack of participation in the commonly accepted Kyoto Protocol or to ratify the Comprehensive Nuclear Test Ban Treaty. It seems that the immense size of the consumer market in the US is regarded as simply too important to the economies of other nations to risk the cutting of economic ties. As well as economic influence, a large domestic population base is also able to support a larger military; thereby affording still greater power through the imminent threat of military action. Any country which seeks to pursue its own objectives in the context of a globalised international community may be drawn towards growth in order to realise the same advantages.

While the economic influence wielded by bigger countries enables them a greater degree of freedom in pursuing their own agendas, their greater political power is also institutionalised through numerous international organisations which allocate voting powers according to respective population sizes. Current proposals for the establishment of a UN Parliamentary Assembly recommend the adoption of this model in the distribution of parliamentary seats (UNPA Campaign, 2013). It seems that bigger is necessarily better if the goal is to pursue national self-interest through the exertion of influence over other countries, yet there is another way to perceive the situation.

Larger populations are not only more important to other countries, but also more dependent on other countries; particularly for the acquisition of specific resources which may not be domestically available. Through this lens, increasing political and economic power through population growth can simultaneously be understood as increasing a nation's vulnerability to factors beyond its immediate control. Accordingly, goals of increasing national sovereignty may be better achieved through a course of action designed to reduce dependence on other nations by enhancing the country's capacity for self-sufficiency; a goal which is immeasurably easier to accomplish with a smaller population.

2.8 Public Discussion of Population Issues

None of the ideas presented thus far are new; in fact all of the theory presented so far has been in circulation since the early 1970s. At that time, the best-selling book “The Population Bomb” by Paul Ehrlich brought the population explosion into the mainstream consciousness; population issues were frequently reported by the media and were incorporated into educational curricula with strong links drawn between population and environmental impacts (Hardin, 1993). Since that time, however, the issue has receded from media reporting, the public consciousness and, consequently, from policy debates. In particular, the link between population size and environmental problems has been either forgotten or deliberately ignored (Mayer, 1997).

The relevance of public interest to action on important issues is revealed by the Public Policy Life Cycle (Lyon & Maxwell, 2004) which provides a framework for understanding how public awareness of issues in the ‘development stage’ leads to public discussion and media reporting of the problem in the ‘politicization stage’. This, in turn, prompts government action in the ‘legislative stage’ and enables administrative agencies to clarify and enforce the policy in the ‘implementation stage’. It is claimed that the actions of NGOs can have a significant bearing on the course and speed of this process. The model therefore reveals the importance of public awareness as a catalyst for change. Furthermore, by analysing the level of attention received by an issue from various groups it is possible to infer the maturity of the issue in terms of societal readiness for reform.

2.8.1 Media coverage

News coverage has a significant bearing on public opinion through the choice of topics which are presented and the way in which problems are framed. The President of Worldwatch Institute, Robert Engelman (2012), suggests that news is, by definition, about things which are current and preferably unprecedented, whereas the steady increase in population makes it the “antithesis of a news story” and is difficult to make exciting for the audience. This, combined with a perception that the topic is sensitive and even offensive to many, he claims is responsible for the lack of media reporting on the subject.

So, is the connection between population and environment being made in the media? A study of Australian media by Goldie (2002) questioned to what extent the media addresses the environment when commenting on population policy. Of the 72 editorials and opinion articles analysed, only 25% made the connection between population and environment while 5% directly dismissed the connection. Although the reasons behind the widespread omission of environmental impacts was not explored, it was noted that the articles tended to emphasise the aging population; an issue on which arguments in favour of population growth tend to be based. The failure of media to link environmental concerns with population policy appears then to be driven largely by economic concerns.

A further economic concern is the profitability of the mainly privately owned media outlets; a factor contributing to all editorial decisions. The question should be asked whether they are more likely to benefit from an increased population, creating a wider pool of cheaper labour while expanding their potential market, or from a stabilised population. This same cost/benefit analysis when applied to all commercial interests reveals a vested financial interest in maintaining an ever increasing population (Engelman, 2012). Even if a media outlet is content with their current market size they still need to keep their advertisers happy and this factor may also be influential in suppressing the population-environment connection.

A similar study by Mayer (1997) in the US reversed the analysis to investigate whether population size was addressed as a causal factor in the discussion of environmental problems. From a random sample of 150 stories about various human induced environmental problems, only ten per cent framed population growth as a source of the problem, while only one article mentioned population stability as a possible solution. Subsequent interviews with the journalists revealed that the reason they had chosen not to address population was the “controversial nature of the issue”. It is precisely this perception of controversy which has led to the population taboo (Hardin, 1993).

2.8.2 Population Taboo

The word *taboo* was assimilated into the English language from the Tongan *tabu* meaning forbidden, but has come to mean “prohibited or restricted by social custom” (Oxford Dictionaries, 2012). According to this definition, the “population taboo” would be more aptly

named the “speaking about population taboo” or, considering the prevalence of media reporting advocating population growth, the “speaking about restrictive population control taboo”. In his extensive work on the topic of taboo, Freud (1918) noted that primitive societies tend to openly institutionalize social taboos thereby allowing individuals to project any forbidden feelings onto demon figures. In contrast, developed societies were observed to not even publicly acknowledge their taboos; leaving individuals no option other than the internalisation of conflicting feelings and the subsequent development of neurotic disorders. This failure to acknowledge the problem is echoed by Kunstler (2005), who refers to “a matter of cultural inertia, aggravated by collective delusion.”

Hardin (1993) suggests that population has become a taboo subject largely due the perceived unacceptability of various means of population control. The term “population control” is also worthy of closer analysis as dictionary definitions vary in their interpretations. Many sources concur with the definition by Collins Dictionaries (2012) of “a policy of attempting to limit the growth in numbers of a population by programmes of contraception or sterilization”. Considering that ‘control’ usually relates to the exertion of influence, it is unclear from where these definitions infer the direction of the influence exerted, or the mechanism which is employed. The reference to sterilisation also imbues the term with a distinctly negative tone. Other definitions take the broader perspective of “control over the growth of population; a government program” (WordWeb, 2012), which includes all possible means and could conceivably include policies to increase the growth rate; this is the interpretation that will be adopted hereinafter. Meanwhile, policies designed to limit growth or reduce population will be termed “restrictive population control”.

Restrictive population control is regarded as a sensitive issue which is unfit for public discussion, even though it currently occurs in every country which imposes immigration restrictions or has social and economic policies which influence the decision of residents to procreate. The primary sources of this sensitivity are thought to be religious beliefs, racial sentiments and respect for individual freedoms (Hardin, 1993), although this notion is yet to be empirically tested. An interesting distinction can be made between racial sensitivities, which can become inflamed regardless of how restrictive population control is implemented, and the other two factors whose sensitivities are dependent on the specific control mechanisms involved.

2.8.2.1 Race

At a national level, restrictive population control can be pursued in three ways; by restricting immigration, by reducing fertility, or by increasing mortality. Most people would agree that increasing mortality should only be pursued on a voluntary basis through the legalisation of euthanasia, if at all. Discussion of this issue will be deferred until the section on policy options.

That restricting immigration raises racial sensitivities is evident as it draws a clear distinction between “us” and “them”. Immigrants are most severely affected by such interventions as they may be unable to reunite with family in other countries. Moreover, restricting immigration can legitimately be called racist if policies promoting increased domestic fertility are simultaneously being pursued.

In many countries, notably the United States, fertility rates differ markedly between different racial groups; the Caucasian population having far fewer children than black or Latino populations (US Census, 2012). Any talk of reducing fertility rates may be interpreted as critical of those groups whose fertility rates exceed the national average (Engelman, 2012). This sensitivity relates more to the recognition of the problem than the proposal of any particular solution and is therefore stimulated regardless of how the decrease in fertility is proposed to occur.

2.8.2.2 Religion

Reverend Thomas Malthus, an Anglican clergyman as well as a scholar, is a name synonymous with restrictive population control. In fact, the basic idea of restrictive population control need not offend the religious beliefs of any denomination as abstinence, which could be promoted through incentives, is considered at worst acceptable and at best a virtue by all of the world’s major religions. The issue only becomes sensitive when particular alternative means for reducing fertility are considered. In the case of Catholicism, these particular means happen to include the most widespread method of fertility reduction in the developed world; contraception. Meanwhile, the issue of legalised abortion offends a wider range of religious beliefs. Nevertheless, religious sensitivity need not stifle debate about the objectives of population control if the means are excluded from the discussion.

2.8.2.3 Individual freedom

A further and common criticism levelled against restrictive population control policies is that they represent unjustifiable restrictions on human liberty. As population control can take many forms, it is important to be more specific on this issue. Some forms of restrictive population control, including education and legal access to contraception and abortion, clearly increase human liberty by opening a wider range of alternatives from which individuals can choose. Incentives systems, while they may have an influence on individual decisions, cannot be said to violate individual freedoms any more than a tax on fuel violates a person's right to drive. While Australian governments have traditionally taken the stance that they 'stay out of people's bedrooms', this policy has recently given way to a pro-natal approach which indeed enters into individual procreation decisions (see section 1.7.1 on Australian Population Policy). If the role of the state in positively influencing fertility rate is accepted, it seems a small step to apply subtle influences in the opposite direction.

Legislative controls, on the other hand, do restrict freedoms. Laws forbidding murder, for instance, restrict the freedom of individuals to express their urge to kill. Where laws are enacted in democratic societies they can be understood as placing the interests of the society as a whole above those of the individual, referred to by Hardin (1968) as "mutual coercion, mutually agreed upon". The issues of individual rights and justifications of government interventions are thoroughly addressed in the following sections.

2.9 Value Theory

Any discussion of what should be done requires contemplation of the idea of value. Generally, a policy can be said to be desirable if it maximises this ambiguous concept, yet this raises questions as to where value resides and by whom or what value is created. Plato first drew an important distinction between instrumental value and intrinsic value in ancient times. The two categories defined are not mutually exclusive, but can be differentiated in that instrumental value is assigned to things based on their usefulness, whereas intrinsic value can be said to exist regardless of any perceived usefulness (Palmer, 2003).

Instrumental value is evidenced by the way a tool is valued by humans for its function in generating utility for people. Fundamental to the concept of instrumental value is the work of

Jeremy Bentham on utilitarianism and the underlying moral principle that "it is the greatest happiness of the greatest number that is the measure of right and wrong" (Bentham, 1776). Although the existence of instrumental value is not challenged by any philosophical school, debate continues as to whether the concept should be extended beyond the usefulness of objects to human beings to include non-human entities. Extensionist approaches apply Bentham's utilitarian ethical paradigm to all sentient animals in the case of Peter Singer's "animal liberation", or to all organisms in the case of Paul Taylor's "biocentrism" (Palmer, 2003).

The existence of intrinsic value, on the other hand, remains contentious. In his early environmental ethics work *The Land Ethic*, Leopold (1949) argues that "a thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise". Consequently, it is claimed that species with little instrumental value which are members of the biotic community, the stability of which depends on its integrity, are therefore entitled to continuance; this value is said to go beyond economic value and exist in a philosophical sense. Of course, the ever growing recognition that the human subsystem is reliant on its environment for subsistence results that maintenance of the supporting ecosystem can also be interpreted as a worthy cause from a purely anthropocentric perspective, thereby partially negating Leopold's invocation of philosophical value. Discussion of intrinsic value inevitably leads to further debate about its origin; specifically whether it exists independently of mankind and is merely recognised by people (the value objectivist perspective), or whether it is created by people (the value subjectivist perspective) (Palmer, 2003).

It is not the aim of this paper to resolve these philosophical disputes, but rather to discuss issues of population size in the context of a philosophical framework which is beyond contention and may therefore provide a useful starting point for the development of feasible population policies. For this pragmatic reason, and not in reflection of the researcher's ethical stance, both arguments of extensionism and intrinsic value have been disregarded. An anthropocentric viewpoint based on utilitarianism, yet including the consideration of future generations in reflection of the consensus reached by the UN General Assembly (UN, 1987), has been adopted because it represents the most difficult case to argue for environmental protection. This does not discount the validity of other environmental ethics approaches which, if they were adopted, would add more weight to the case for the stabilisation of human populations. This stance is most closely aligned with the work of Norton (1984) who argues that it is unnecessary to resort to "difficult to justify claims" of intrinsic value and that a weakly anthropocentric perspective is

both a sufficient and a pragmatic approach to engendering “concern for the protection of the resource base through indefinite time”.

2.9.1 Utilitarian theories

Despite restricting moral considerations to concern for human wellbeing, problems still remain in applying this ethical approach to the development of population policy. As utility can be broadly defined as the excess of pleasure over pain, a fundamental critique of utilitarianism is the fact that the metric which lies at its core, utils, cannot be empirically measured. Some utilitarians nevertheless claim that pleasure can be measured quantitatively using objective aspects such as intensity, duration and fecundity (White, 2007), and extensive research is ongoing in the field of happiness evaluation. Economists have sought to overcome this dilemma through the inference of relative utilities, or revealed preferences, which are demonstrated by consumer choice and reflected by people's willingness to pay (Marshall, 1920). While this logic may be useful in evaluating the relative utilities experienced by one person, it nevertheless fails to facilitate a comparison between the various utilities experienced by different subjects, particularly in the prevailing context of an uneven distribution of wealth. This leaves unanswered the question of whether a loss by one party is adequately compensated by the gain to another in fulfilling Bentham's dictum of “the greatest happiness of the greatest number” (Bentham, 1776). Indeed, what is in the public interest often conflicts with the private interests of individuals, and the challenge is further amplified when attempting to consider the interests of future generations.

Another debate, over exactly what should be maximised, has given rise to two branches of utilitarianism; Total Utilitarianism and Average Utilitarianism. In his essay *The Tragedy of the Commons*, Hardin (1968) draws attention to the fact that Bentham's goal is mathematically impossible in that ‘population’ and ‘good’ (interpreted as meaning per capita happiness) cannot be simultaneously maximized. This leads him to the conclusion that “we want the maximum good per person” (Ibid., 1968); a stance which is harmonious with the Average Utilitarian approach. This focus on quality is defensible in that it promotes policies which seek to improve the quality of life for all existing people while recommending population increase only in the case that it does not have a negative effect on the average level of happiness. This guideline may prove particularly restrictive in determining optimal population sizes according to the assessment by Hurka (1983) that happy people are of diminishing marginal value- as the value

which an extra happy person contributes is a decreasing function of the total population. Similarly, critics have noted that if applied strictly, Average Utilitarianism would appear to morally justify the killing of any persons displaying below average happiness on the grounds that this would raise the average (Parfit, 1984). This criticism may be overcome, however, with reference to the likely negative effects of arbitrary killings on societal happiness in the long run.

In contrast, the Total Utilitarian approach seeks to maximise the total quantity of happiness in existence, regardless of the average level of happiness within the population (Hardin, 1968). The implication of this approach is advocacy of dramatic population increase based on the marginal happiness which each new person brings. However, Parfit (1984) foresees such an approach leading to an intuitively undesirable future where large numbers of people each have extremely low utility values; what he refers to as "the repugnant conclusion". This is clearly not the future envisioned by world leaders when they considered the welfare of future generations in the development of the Brundtland Report (UN, 1987) and it reveals the danger of adopting a 'more people means more happiness' approach to population policy. Both abortion and euthanasia, considered to be fundamental rights by some and useful policies by others, are morally offensive according to the total utilitarian approach (Fox, 1996).

Given the legality of abortion and contraception in Australia and most other industrialised countries, it appears that Average Utilitarian approach is closest to the ethical approach prevailing in these societies. This claim is further evidenced by the normative value placed on average utility by measurement instruments such as the Human Development Index (UNDP, 2012) or the National Accounts of Well-being (NEF, 2012), while no such value is placed on absolute increases in population size. The radically different conclusions about optimal population size drawn by these two different approaches to utilitarianism highlight the fact that the adoption of a non-anthropocentric ethical approach would also lead to different and far more restrictive policies regarding population size.

While a discussion of different philosophical approaches is necessary to understand the range of possible policy objectives with regard to population size, it does not yield information as to which policy tools may be the most useful for attaining the established objectives. This requires an understanding of the dynamics which cause population size to change. As previously noted, population size changes as the result of the demographic spread across various age groups (which cannot be altered without changing the population size), through emigration and immigration (which will be discussed in due course), as well as from differences between fertility

rates and mortality rates. Life expectancy is viewed normatively by the majority of human kind; the attitude that longer is always better is reflected in the way that life expectancy is used as an indicator for levels of human development by such as OECD's Better Life Index (OECD, 2013). The implication is that policy must seek to reduce mortality, consequently increasing population size, which leaves fertility rates and immigration rates as the sole variables towards which different policy approaches can be adopted. Understanding the dynamics of fertility rates requires investigation into the decision processes behind procreation.

2.10 The decision to procreate

It must first be acknowledged that there are strong biological and evolutionary factors which drive people to have children through the workings of the hormonal system (Leslie, 2002). Indeed, it seems likely that those featuring strong primal urges of this nature have been actively selected for during the course of human evolution as they came to outnumber those for whom the biological drive was weaker. A discussion of endogenous biological factors is beyond the scope of this research as many would consider that manipulation of such variables is too invasive to be considered by public policy. More importantly, the widely accepted theory of demographic transition is based on the principle that exogenous cultural factors are sufficient in their effects to overcome biological factors in determining fertility levels; at least in the presence of contraceptive alternatives to contraception (Dalphonse, 1997). The following discussion therefore disregards evolutionary factors and focusses on cultural factors.

The field of decision theory is primarily concerned with explaining the way in which agents seek to make the best possible choice in the face of uncertainty (Hansson, 1994); the decision of whether or not to have a child presents a wide range of future possibilities which can clearly be interpreted as generating uncertainty. According to Schoemaker (1982), the rational course of action having identified all possible outcomes is to assign each a value in terms of its utility and then multiply this by the probability of each outcome eventuating; thereby revealing the optimal choice as the one with the highest expected utility. Of course, this theory is based on unrealistic assumptions about the availability of full information and the rationality of the subject. So are potential parents seeking to maximize their utility? Not according to studies which reveal that having children makes no positive contribution to happiness and actually decreases happiness in the case of subsequent children (Oswald, 2006), possibly because the tasks of child care are

among the least desirable of all tasks (Kahneman et al., 2004). These and similar studies indicate that potential parents are not seeking to maximize their utility or, more likely, that procreation decisions are taken either irrationally or in the absence of complete and accurate information. With reference to surrogacy, Wilson (2004) argues that prospective mothers “cannot ex ante have perfect, or even minimally adequate, information”.

In attempting to explain the significant departures of human behaviour from expected-utility maximization, prospect theory recognises that people do not evaluate final outcomes, but that they apply heuristics in evaluating the losses and gains associated with various choices against a subjective benchmark which can be strongly influenced by a range of anchoring biases (Kahneman & Tversky, 1979). These biases affect the types and quality of information which are taken into consideration and the ways in which that information is processed. So what are the impacts of procreation which are considered by potential parents? Although scientific literature is scarce on this subject, leading Austin and Levinson (1974) to call for additional information on attitudes in the parental procreation decision-making process, commentators have suggested that the following factors are generally thought about: emotions; finances; health; logistics; aspirations; time/energy/work; and relationships (Carter, 2011). One particularly telling bias is the finding by Gilovich and Medvec (1995) that people are far more apt to regret things that they haven't done than things they have; a finding that has become a catch phrase in popular culture. It would not be surprising to find that such beliefs have an impact on rational decision making processes. Of particular note is that each of the considerations identified is individualistic by nature; extending at most to the 'significant other', but certainly not to the community or beyond. This proposition is tested in the current research.

While prospect theory recognises the role of heuristics as a departure from pure rationality, its roots are still grounded in the concept of a cost-benefit analysis. Lehrer (2009) finds that this cogent weighing of positive and negatives takes place in the important context of emotional influences, and that “even when a person tries to be reasonable and restrained . . . emotional impulses secretly influence judgment”. This emotional state is said to be influenced, whether conscious or not, by factors such as the actions of friends and family as well as the portrayal of family in the media (Ibid., 2009). Other studies have also identified social pressures to procreate (Dalphonse, 1997) with some claiming that the strength of these pressures may override any other considerations. The case is made by Valenti (2012) that the force of social expectation has led motherhood to become a “default setting” for women- thereby negating the individual decision making process and limiting its scope to questions of timing and quantity. She cites the

refusal of many doctors to perform tubal ligations on women who are considered too young as evidence of the norm that parenthood is the only logical decision for a rational person.

It is clear from this discussion that while the procreation decision process is insufficiently understood, societal pressures play an important role in determining fertility rates. The decision process is considered by the current research in order to validate these claims, but it appears that challenging societal norms may provide opportunity for non-governmental organisations to influence fertility rates. Some human rights advocates, however, claim that external influences should not be allowed to infringe on the fundamental 'right' of people to bear children. The origins and extent of this 'right' are explored in the next sections.

2.11 The right to procreate

Article 16.1 of the Universal Declaration of Human Rights (1948) states that: "Men and women of full age, without any limitation due to race, nationality or religion, have the right to marry and to found a family". Explicitly absent from the declaration is the identification of responsibilities associated with this right, which might include an obligation to nurture children appropriately, or its limitations. 'Founding a family' could be narrowly interpreted as meaning the birth of a single child, yet the text is commonly inferred as recognising an unlimited right to procreate (Hardin, 1993). In investigating the origins of this right, Statman (2004) finds that it has its roots in the deep value attached to parenthood by human beings which results from their interest in, among other things, "achieving a kind of immortality by continuing to live through descendants, the desire to live vicariously through one's children, the desire for the deep and enduring intimate relations, and the longing for a home or a nest." He further finds that, despite cultural differences in the interpretation of the notion of 'family', these interests can be satisfied by having two children and that this justifies a narrow interpretation of the right to parenthood.

In the collection of articles entitled "Should Parents Be Licensed?: Debating the Issues", Peg Tittle (2004) highlights the significant stake of prospective children in the decision to procreate as creating responsibilities for parents which are not currently enforced. It is indeed perplexing that state requirements for driving licences are commonly accepted due to the potential impacts of driving mistakes on other people, but that the far greater impacts of parenting mistakes are entirely left to chance. Although the question of what standards to apply could be presented as

a challenge, Tittle (2004) contends that criteria lists already inform decisions in adoption cases and that it would be entirely unacceptable to the public if no criteria were applied to potential adoptive parents. The question is raised as to why it is believed that people have a right to create life via sexual reproduction when they don't have a right to adopt or to create life via cloning.

Some authors recognise the responsibility of parents towards the children they conceive and subsequently approach the issue from another perspective by questioning whether it is, in fact, morally permissible to have children in all cases. Purdy (2011) makes the case for prenatal screening and selective abortion based on the thesis that reproduction in the context of a high probability of transmitting serious diseases or defects is morally wrong. Similarly, Meyer (1997) contends that "we might be under an obligation not to procreate under certain circumstances- people may have a right to non-existence where, if born, they would lead lives not worth living." While worthy of consideration, these viewpoints encompass only the interests of the child and parent in determining the morally correct course of action while excluding the interests of society as a whole and, potentially, the interests of other sentient life forms. Given the current global situation, it seems that the interests of these parties would be contrary to an unlimited right for humans to procreate. The question which arises is how exactly to reconcile these conflicting interests- the very problem for which the sustainability movement emerged to address.

In recent times, the right to have children has been tested mainly with reference to 'special reproductive cases' appearing before the courts in which issues of surrogacy and in vitro fertilisation have been examined, as well as the case of 'special parents' such as inmates, the disabled and the incompetent (Flynn, 2004). In some cases, the right to parenthood has been found to be less important than the rights of the unborn children, thereby justifying a violation of the parents' negative rights to non-interference in the satisfaction of their interests through the imposition of restrictions on procreation as part of probation conditions (Ibid., 2004). Similarly, societal welfare issues have been judged in other cases as sufficient to overcome the parents' positive rights to procreate, thereby justifying the withholding of public assistance for the satisfaction of their interests (Ibid., 2004). These decisions run contrary to the further description of the family in The Universal Declaration of Human Rights (1948) as "the natural and fundamental unit of society", which was later interpreted by a UN Secretary-General such that: "it follows that any choice and decision with regard to the size of the family must irrevocably rest with the family itself, and cannot be made by anyone else" (U Thant, 1968). It

seems that legal interpretations of the expression of rights in the Universal Declaration of Human Rights are not as absolute as is often inferred; that it may not apply in all situations, and that there may be limits to its extent.

2.12 Tragedy of the Commons

Garrett Harding (1968) provides a staunch refutation of the implied right to reproduce due to the irreconcilable interests of individuals and society. Harding popularised the notion of the 'Tragedy of the Commons' as an exorcism of the tendency of thought promoted by Adam Smith's 'invisible hand' that decisions reached by individuals who "intend only their own gain" will necessarily be the best decisions for an entire society. If this were true, follows the logic, then an optimal population (understood as the one which maximises "good per person") would result from the individual fecundity decisions made by people and justify a laissez-faire policy towards reproduction, yet if it proved untrue then it justifies a re-examination of philosophies regarding individual freedoms in order to reconcile the conflict between private and public interests.

With reference to cattle herders using common land, Hardin showed that the positive utility of each grazier increasing his stock accrued exclusively to him, while the negative utility in the form of degradation of the pasture was shared between all users of the common land. In pursuit of personal gain, each grazier therefore has an interest in increasing his herd indefinitely regardless of the lesser negative consequences which he also experiences, and which accumulate to the detriment of the community as a whole. The same situation can be found in relation to individual procreation decisions where any positive impacts accrue primarily within the family while the negative impacts, say environmental degradation, are shared among the community. Hardin identifies that this was not the case before the emergence of the welfare society when families dependent on their own resources would pay the price for overbreeding through starvation, yet the contemporary commitment to welfare and equality appears to be an enduring principle of modern society.

While Hardin's argument focussed exclusively on decision making by individuals, the same reasoning can also be applied at the national level. Where a country perceives a national benefit from increasing population, policy discussions are likely to discount the negative environmental

impacts which ensue internationally. Optimistically, one might hope that appeals to conscience to 'do the right thing' would be effective in restraining personal choice; yet as these calls will be heeded by some and disregarded by others, the long-term outcome would be the elimination of this form of conscience from the human race according to natural selection (Darwin, 1960).

Hardin's conclusion is that the unrestrained freedom of individuals to breed will result in "ruin" and that the rights established by the Universal Declaration of Human Rights are therefore morally bankrupt. He insists that remedies to this race to the bottom are limited to the privatisation of property rights (which is not directly applicable to the population issue) and various forms of coercion. All laws created in democratic societies, he argues, are coercive as they limit the freedoms of individuals to violate the regulations, yet they are accepted due to the net effect on society and represent "mutual coercion, mutually agreed upon".

2.13 Policy options

Overpopulation can be viewed as an example of market failure in that the pursuit by individuals of self-interest leads to results that are not socially optimal. Given the findings by Oswald (2006) that subsequent children actually reduce happiness, it can even be argued that having more than one child in the context of overpopulation fails the strict criteria of Pareto efficiency, in that alternative scenarios with fewer births can make others better off without making the fecund parents any worse off. According to Stiglitz (2010), market failures provide justification for government intervention and are associated with, among other things, information asymmetries and externalities. In the case of population increase, the existence of information asymmetries faced by prospective parents is supported by the literature (Dalphonse, 1997; Valenti, 2012; Wilson, 2004) with biases further distorting the already imbalanced information in the decision making process (Kahneman & Tversky, 1979; Gilovich & Medvec, 1995; Lehrer, 2009), while externalities manifest themselves as environmental impacts and demands on infrastructure. If it is accepted that the ineffective self-regulation of the current system is causing a population problem, then government intervention may be justified in helping to remedy the situation.

Regardless of the need for external influence to reform a malfunctioning system, the theme of government intervention on population issues evokes strong sentiments, raises questions about the role of the state and is often perceived as an issue without acceptable solutions (Hardin, 1993). However, failure to discuss the issue publicly does not mean that population control is

not already happening in every country in the world. A wide range of social and economic policies currently influence both immigration rates and the decision of residents to procreate or not. This is also population control, and it is proposed that these interventions should only occur within the context of public discussions enabling the determination of long term population objectives.

The experience of China has soured many to the idea of government intervention in population issues due to the incidental impacts of their One Child Policy between 1979 and the present time. Considerable attention has been paid to negative social impacts such as demographic shifts in the sex ratio through the prevalence of gender selective abortion which results from the cultural preference to bear male children (Hardee, 1984). Much less consideration is given to the intended consequences which have seen the fertility rate decline from 5.9 in 1971 to around 1.7 at the present time (Hesketh et al., 2005), thereby stabilising the national population and easing the burden on the rest of the world. Although Chinese statistics are notoriously unreliable, the Government claims that some 300 million births have been avoided through the policy. Some cite the declining birth rates in neighbouring countries as evidence that this decline would have occurred without implementation of the policy (Ibid., 2005), yet given the uncertainty about the direction of causality in the demographic transition model, it seems equally plausible that population stabilisation in China has been responsible for their development and increasing affluence rather than the reverse. As well as considering the social harms, any balanced analysis of the policy must also speculate about what would be the state of welfare in the country and the state of the global environment if the policy had not been implemented.

Fortunately, the wide range of tools available to governments means that population control need not be prescriptive or coercive. The United Nations population division, UNFPA (2011), acknowledges both the legitimacy and effectiveness of state intervention to control population in claiming that:

“Evidence shows that Governments can influence population growth through effective, rights-based policies that expand individual choices and opportunities. Attaining the Millennium Development Goals in terms of ensuring universal access to sexual and reproductive health and voluntary family planning, empowering women, ensuring universal primary education and increasing enrolment in secondary education, especially among girls, would not only improve human well-being and build human capital but also shape population trends, contributing to the stabilization of population.”

Worldwide there is significant potential for the stabilisation of population through voluntary measures increasing access to contraception and education as well as the empowerment of women. In Australia there exists room for improvement in terms of both education and the empowerment of women. Such reforms, however, necessarily imply a significant time lag before results are evident in terms of fertility rate decline; leading some researchers to propose additional interventions which may generate more immediate effects. Strict regulation as practised by the Chinese regime lies at one extreme, but more moderate compromises which incorporate the operation of the free market system have also been suggested.

In his prescription for a Steady State Economy, Daly (1977) proposes a system of divisible and transferrable birth licences whereby child permits in one tenth increments are allocated to women at a level which is suited to the overall population goals of the jurisdiction. Women would then be free to trade the permits, with the expected result that more affluent families would buy permits while poorer families would sell permits for monetary gain and restrict their family size; if this was to eventuate it would generate the positive externality of helping to distribute the concentration of wealth in affluent families among their offspring (Ibid., 1977). It is considered unlikely that such a system would gain democratic support in most countries in the foreseeable future due to the major criticisms of infringing on individual freedoms and the perceived impossibility of humane enforcement. Valid counter-arguments to the first criticism have already been presented herein (see section 2.4 on the Right to Procreate), while Tittle (2004) hypothetically suggests the mandatory use of a permanent conceptive drug which requires an antidote as a means of humane enforcement by avoiding the conception of unsanctioned children.

More politically feasible are the less invasive methods investigated by Edward Rabin (1971) of "Population Control through Financial Incentives". The greater political feasibility is evidenced by current use of such controls, at least in a pro-natal fashion, in Australia and other countries (see section 1.7.1 on Australian Population Policy). Restrictive financial controls could range from the penalisation of those who exceed a given number of children through taxation, which would be entirely compatible with the widely accepted 'polluter pays principle', to the use of an incentives system whereby women of reproductive ages are financially rewarded on an annual basis for not having children during that time (Ibid., 1971). With regards to Australia, fertility rates may even change as a result of simply abandoning the current system of rewarding births through the 'baby bonus' or by reducing the level of subsidies provided for child related expenses.

Still more politically acceptable would be the state driven influence of public attitudes through the use of appropriate media campaigns to engender the social acceptability of remaining child free as a viable alternative to parenthood. In line with conceptualisation of legalised contraception and abortion as expanding personal freedoms, the legalisation of euthanasia may simultaneously reduce the population and improve the dependency ratio. Sikora and Lewins (2007) find that Australians support access to voluntary euthanasia of the terminally ill and the non-voluntary euthanasia of babies and adults in situations defined as 'letting die' rather than 'killing'. Nevertheless, euthanasia remains illegal in Australia and has not been put to a referendum.

Finally, in addressing the size of Australia's national population, immigration policy plays a dominant role. The use of government policy in influencing immigration rates has varied significantly over the past 225 years; ranging from incentives schemes to strict regulation (see section 1.7.3 on Immigration to Australia). Despite the fluctuations, Australians are unanimous in their attitude that immigration rates must be restricted at some level by state intervention (Simon & Lynch, 1999).

As can be seen, there exists a wide range of possibilities for government to influence population size and many of them are currently being used. As the literature indicates that some of these methods may be more socially acceptable than others, public opinions about the use of specific policies are examined by the current research.

2.14 Conclusions

The limited and biased reporting of population issues by the media indicates that this topic is still in its infancy in terms of the Public Policy Life Cycle. It appears that an honest and open discussion of the issues which would suggest the 'politicization stage' has not yet eventuated and that the issue is still in the initial 'development stage' of building public awareness. The level of public awareness and interest in the topic are examined by the current study. The apparent stagnation and potential regression in the public linking of population and environmental issues since the 1970s is at once disturbing and confusing for proponents of population stability. The proposed drivers of this resistance are also tested by the study. Indeed, given the conflicting arguments for and against population growth, it appears to be unclear as to exactly which issues

should be considered in deciding on targets for Australia's population. This again is addressed by the current study.

Public attitudes are not only important catalysts for the development of appropriate policies; the literature also reveals that they may have a significant influence on the decision of individuals to reproduce. This and other factors are examined by the study in order to shed light on the individual decision making process, which in turn should influence the selection of appropriate policies and, in particular, should allow a more thorough analysis of the tools employed to pursue the present governmental policy of pro-natalism.

3 Methodology

3.1 Introduction

The population taboo operating in Australia, as previously defined, is evidenced by the lack of media reporting on the links between the size of Australia's population and the consequent environmental and social impacts. Despite the periodic vacillation between governmental policies advocating a "big" or "sustainable" population, the failure of any of these policy statements to identify specific population targets or to develop instruments which could achieve the broad goals further demonstrates the sensitivity of population issues and a widespread resistance towards a candid public discussion. The development of governmental policy and decisions about the content of media reports do not occur within a vacuum; they are strongly influenced by powerful stakeholders, who, as we have seen, have a vested interest in an increasing Australian population. This powerful influence is far from conclusive however, and it can be overcome by the strength of attitudes and beliefs prevailing within the society; which represents both the democratic legitimacy of the government and the market for all media channels. It is at the societal and individual level where the population taboo has its roots, and for this reason the current study seeks to address this population to determine the pervasiveness of the taboo and the drivers behind it.

Various commentators have proposed a range of reasons why population size has become a taboo subject at the societal level. These include, among others: racial sensitivity; religious sensitivity; misinformation; the undesirability of potential control mechanisms; and conflicts between governmental control and individual freedoms (Hardin, 1993). However, these drivers are largely anecdotal and none of the existing studies have sought to quantitatively measure the relative strength of each of these factors; leaving proponents of stable or reduced population size uncertain as to where to direct their efforts. There is little expectation of yielding further information through an expert opinion based research methodology. Conversely, the highly individualistic nature of reproductive decisions advocates a research approach which seeks direct contact with those taking these decisions on a daily basis; the general public.

3.2 Selection of methodology

The current study employs a survey in order to address the general public directly. More qualitative approaches such as interviews could also be useful in identifying the drivers behind the population taboo, but the benefit of using this largely quantitative approach is the way in which it facilitates statistical analysis of the responses in order to determine which of the identified drivers are more relevant and influential than others for the society as a whole.

3.3 Research instrument

The survey design process is one characterised by compromise. The primary conflict arises between the needs of the researcher for accurate responses to a wide range of detailed questions from a representative sample and the perceived willingness of respondents to provide such information. It was anticipated that a comprehensive list of highly technical questions would generate a strong response bias favouring respondents with both pre-existing interest in and information about the subject matter. With this consideration in mind, efforts have been made to minimise the complexity and length of the survey to make it user-friendly for the average Australian. Indeed, these considerations have had a bearing on all aspects of the survey design from the number, ordering and wording of questions to the response options presented.

The majority of the questions are closed answer questions in which respondents are asked to indicate their level of agreement with a given statement. Particular care has been taken in the wording of the statements so as not to lead the respondents to certain answers which they deem to be more acceptable than others. This is achieved, for instance, by alternating the use of positively and negatively phrased statements. Complementary questions are also used in order to allow respondents to accurately express their opinion and to allow the researcher to clearly interpret the response. For example, an answer of “strongly disagree” to the statement: “an increase in Australia’s population would be **beneficial** for the environment” would not reveal whether the respondent believes that there would be no impact on the environment, or if they believe the impact to be detrimental. The addition of the complementary question: “an increase in Australia’s population would be **detrimental** for the environment” enables an accurate interpretation of the response. An answer of “disagree” or “strongly disagree” to both questions enables the interpretations that the environmental impact is believed to be negligible or non-

existent respectively. Furthermore, each question has been worded so as to contain only one variable.

The resulting survey, included as Appendix A, contains seven pages of questions which are grouped in themes relating to the following topics: level of knowledge and interest in the subject; global population considerations; domestic population considerations; expected impacts of population increase; the decision to reproduce; policies for population control; perspectives on equity; and demographic information.

Respondents were required to answer each and every question before moving on to the next question. This mechanism was intended to promote a higher rate of survey completion than might otherwise be the case. Respondents were given the possibility to return to previously answered questions in order to reconsider their responses, however, so that they should feel that their responses are as accurate as possible and will not become frustrated with the survey. The potentially sensitive nature of the data sought dictates that the survey was anonymous in order to reduce the resistance of respondents to providing information regarding their political and religious persuasions. Several of the more sensitive demographic questions also offer an “I’d rather not say” option in order to encourage a higher rate of survey completion.

3.3.1 Scale

Respondents recorded their level of agreement with each statement by placing a single response along a five point Likert scale offering the following response options: Strongly Disagree; Disagree; Neither Disagree nor Agree; Agree; Strongly Agree. As the most universal method for survey collection (Tourangeau et al. 2000), the Likert scale is already understood by a large cross-section of society. Using the scale consistently throughout the majority of the survey further promotes ease of use by not requiring respondents to acquaint themselves with new scales for each question.

Responses collected across a Likert scale are ordinal by nature. They enable comparisons to be made between different responses to the same question as well as comparisons between the levels of agreement expressed by one respondent to different yet similar statements. What cannot be interpreted is the magnitude of the differences. From the researcher’s perspective, responses are easy to code by assigning a numerical value to each response option. This process

renders the responses subjective to further mathematical analysis. While a seven point scale may have been beneficial in that it may have produced greater variability in the responses, thereby enabling more detailed statistical analysis, it was determined that this benefit would not have compensated for the increased complexity faced by participants.

An incremental scale has been employed for the survey in which the response options are displayed from negative (strongly disagree) to positive (strongly agree) as the page is scanned from left to right. This decision was influenced primarily by the theory of satisficing which proposes that, rather than processing each response option individually, respondents are more likely to choose the first item in a list that they can reasonably agree with as they scan the page from left to right (Tourangeau et al., 2000). Given the nature of the questions in the current survey, it was anticipated that more positive responses would be received than negative ones. It was thought that the satisficing primacy effect would strongly promote responses of “strongly agree” if a decremental scale was used, thereby reducing the degree of variability in the data and reducing the possibility for statistical analysis. Nevertheless, it is recognised that the use of an alternative scale may have influenced the data collected.

3.3.2 Distribution

An online survey has been chosen as the preferred method of data collection due to the efficiency with which responses can be collected from a large number of respondents. The survey has been created using the online platform SurveyMonkey, which enables participants to follow a link to the survey and complete it online. Despite the availability of a free service, the researcher has chosen to pay a minimal subscription fee in order to gain access to extra features; particularly the ability to download responses in the format required for further analysis.

The survey was able to be accessed at: http://www.surveymonkey.com/s/australia_population.

Links to the survey were distributed through word of mouth as well as through the social media platform ‘facebook’ (<https://www.facebook.com/>), through the online forum ‘Australia forum’ (<http://www.australiaforum.com/>) and on the website of ‘Sustainable Population Australia’ (<http://www.population.org.au/>). The choice of these access points and the potential resulting biases are discussed below in Section 3.5 on Sampling Procedures and Section 3.7 on Validity Threats.

3.3.3 Timeline

The collection of primary research took place over the course of three months. The finalised survey was posted online in December 2012 and links to the survey were distributed in early January 2013. Participants were able to complete the survey until 5 April 2013, when the data collection period was closed and the responses were downloaded from the hosting website.

3.4 Pilot tests

A series of pre-tests was used to evaluate three aspects of the survey. Firstly, three volunteers were asked to complete the survey in order to calculate the amount of time required. It had been previously determined that ten minutes was the upper limit for maintaining the attention of respondents, and the survey was subsequently shortened in order to comply with this requirement.

The same volunteers were then questioned about their understanding of the wording used in the questions. The volunteer group included two persons for whom English was not their native language. On the identification of several phrases which were considered to be confusing, further changes were accordingly made to the wording of the questions.

Finally, one participant was asked to talk through their thought processes while completing the survey in order to ensure that their understanding of the phrasing of the questions was the same as that intended by the researcher. It was eventually determined that the resulting questionnaire was free from errors, an appropriate length, clearly understandable for respondents, and that the interpretation of the questions was consistent with the intention of the researcher.

3.5 Sampling procedures

It was the intention of the researcher that the results would be able to be generalised to the entire Australian population of voting age; giving a study population of around 18 million people (ABS, 2012). This was deemed to be a relevant population for assessing the political sensitivity of population issues because of its coincidence with the political jurisdiction at which immigration

is controlled. A confidence interval of 5% and a confidence level of 95% have been selected; generating a required sample size of 384 for a methodologically representative sample.

A methodologically representative sample would have been desirable in order to extrapolate the findings to the entire Australian community, but the challenges in obtaining such a sample are manifold. Electoral registers are confidential in Australia, so telephone books would have to suffice as a proxy for the complete sampling frame. Unfortunately, the rise in mobile phone ownership has reduced the number of listed people in recent years. As such, a complete sampling frame was not available to the researcher. Furthermore, the process of selecting either a random or stratified sample from the proxy sampling frame (the telephone directory) would introduce the difficulty of obtaining email addresses for the selected sample. This would have required initial contact to be made via telephone; a time consuming process which may have introduced a further bias into the sample as those with the time and willingness to participate are likely to demonstrate certain common characteristics. The major problem with this method was the expectation of an extremely low response rate. Even if the desired number of responses was eventually obtained, the “methodologically representative” sample would likely have been subject to biases relating to the specific interests of the respondent in the topic or the amount of spare time available to complete the survey. For these reasons, a methodologically representative sample has not been sought.

The solution which was sought to this problem was to seek large numbers of responses using non-probability convenience sampling techniques (voluntary responses to direct mail and word-of-mouth contact, as well as the posting of survey links on various platforms and forums). The collection of a range of demographic data as part of the survey: age, gender, religion, political persuasion, income, educational attainment, state of residence, ethnic background etc. was designed to allow the subsequent analysis of how representative the sample is of the wider population. In order to enable comparisons to the demographic characteristics of the country and facilitate the weighting process, census categories have been used as response options for these demographic questions. Following this analysis, it may be deemed necessary to apply a statistical weighting to the survey responses in order to reflect the demographic spread of the study population.

3.6 Data analysis

The use of a five point Likert scale for responses makes the data easy to code for statistical analysis. A coding system ranging from 1 to 5 has been used, where 1 relates to a response of Strongly Disagree while 5 relates to a response of Strongly Agree. This scale has been applied in an ordinal fashion, in that a value of 5 is interpreted as representing a greater level of agreement with a given proposition than a value of 4, yet the extent of the difference is not interpreted. Mean scores for different questions, or for the response of different groups to the same question, have likewise been interpreted as either higher and lower and the existence of any difference has been statistically verified, while the extent of the difference has not been commented on.

The data analysis initially describes the sample group according to a range of demographic criteria, before identifying two groups relating to their perceptions of the optimal size for Australia's population. The use of regression modelling is intended to identify any demographic characteristics which may be useful as predictors of overall attitudes about population size. The intention is that these results may inform the work of population control advocates by helping them to segment the Australian community according to the identification of groups towards whom they should direct their communications and those groups who may also be useful population control advocates.

Responses to other attitudinal questions have then been analysed for the sample group as a whole while the existence of any differences between the attitudes of advocates of a larger and smaller population have been sought through the use of non-parametric testing. Regression analysis has also been used to identify and weight the relative importance of psychographic factors which are associated with the formation of various attitudes towards population control. The resulting information is intended to shed light on the reasons behind the formation of specific attitudes towards population size and may find application in informing the design of educational programs and public awareness campaigns. In addition, complex lists of variables have been simplified using factor analysis to reveal the fundamental drivers behind related responses to a range of questions, while bivariate correlations and cross-tables have been used to check minor hypotheses seeking to explain anomalies in the data. IBM SPSS software has been employed for these multiple purposes.

Based on the findings of these analyses, the researcher has been able to make recommendations as to: which groups should be targeted by educational campaigns; which misconceptions about population size need to be addressed and; how messages can be framed and presented so as to avoid the prevailing resistance to population debate within the community.

3.7 Validity threats

Internal: Thorough pretesting has sought to ensure that the questions are clearly comprehensible by the study population, and that they are understood in the manner intended by the researcher. This process involved several phases of re-wording and re-testing. It was also deemed important that the questions not be leading; thereby promoting what are deemed to be socially desirable responses. This risk has been minimised by removing all mentions of sustainable development or the environment from the survey title, which is simply “population”, while questions related to the environment are balanced by questions regarding economic and social concerns. Meanwhile, caution has been taken in the wording of questions to balance positively and negatively phrased statements; such that neither “agree” or “disagree” could be interpreted to be the ‘best’ answer throughout. In addition, careful attention to the ordering of questions has aimed to ensure that the answer to one question is not logically dependent on the answer to preceding questions. Most importantly, the anonymity of the survey was intended to encourage respondents to express their actual views rather than socially desirable responses.

External: The challenges in obtaining a representative sample, as discussed above, have resulted in a sample group which is not methodologically representative of the population. Furthermore, the target sample size of 384 was not obtained: from a total of 327 respondents, only 291 completed the survey and are consequently considered as valid responses. The lower than required response rate has thereby compromised the desired confidence interval. While measures have been taken to ensure the researcher can comment on the representativeness based on demographic characteristics, and potentially to counter any discrepancies through statistical weighting, it is not possible to assess whether the sample is representative of the psychographic spread in the study population. As a result of the sampling inadequacies and to maintain the integrity of the research, the findings must be restricted to commenting on the sample group and cannot be extrapolated to the wider study population. Nevertheless,

significant findings in terms of the association between various demographic and psychographic characteristics may well apply in the Australian community as a whole.

4 Results and discussion

4.1 Introduction

The following section presents the results obtained from the survey. In total, 327 people accessed the online survey and 291 completed the full list of questions; giving a high completion rate of 89%. The 36 respondents who did not complete the survey generally exited the site after contributing very few answers. As the deletion of these responses does not affect the representativeness of the sample group, these respondents have been eliminated from the analysis which follows where each of the percentages and absolute counts provided are limited to the 291 valid responses.

This section is divided into two sections: the first provides a description of the sample in terms of its demographic characteristics; while the second presents the opinions expressed in response to the survey questions and includes statistical analyses which seek to uncover patterns in the data. A brief discussion follows the presentation of the data in each section, while references to the raw data which can be found in the appendices are included throughout.

4.2 Sample Demographics

In order to compensate for the unfeasibility of methodologically representative sampling procedures, a range of demographic questions was used to enable comment on the correlation of the sample group with the adult Australian population which is of interest. The demographic questions were selected according to their potential for use by organisations in segmenting the population and enabling the targeting of specific communications to different groups. The categories relate to: age; income; gender; educational qualifications; political persuasion; state of residence; residency status; the ownership of real estate; religion; place of birth; ethnic background; and how the link to the survey was accessed. The relatively small sample size of 291 resulted in uneven distributions of responses across the various response options for religion, place of birth and ethnic background; these characteristics have therefore been disregarded from further analysis and it would be inappropriate to infer any information from the non-response bias of the underrepresented groups.

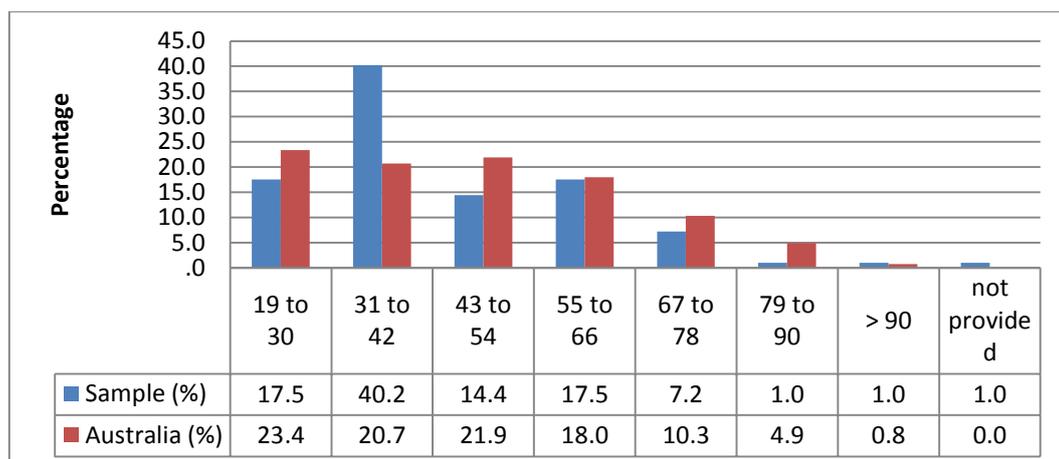
The remaining characteristics are presented with comparisons to prevailing Australian averages. The data which follows reveals that significant deviations from the study population were detected in the categories of age distribution, income, political persuasion, educational attainment and state of residence. An attempt was made to correct the data to better reflect the actual distribution of these demographic characteristics across the Australian population. However, it was found that the application of any weighting to one characteristic had the effect of throwing at least one other characteristic even further out of balance with the population. The researcher must therefore accept the lack of representativeness of the sample population due to the overrepresentation of certain groups and restrict attempts to extrapolate findings to the broader study population. These demographic characteristics are nevertheless useful for the subsequent statistical analysis as predictors of various psychographic characteristics.

The data tables relating to the following graphical presentations are included in Appendix B.

4.2.1 Age

The age distribution among the sample group varies significantly from that of the general Australian population (ABS, 2011a), primarily due to the dramatic overrepresentation of the 31 to 42 year old age bracket and a corresponding underrepresentation across the remaining age brackets.

Figure 9: Age distribution of sample group



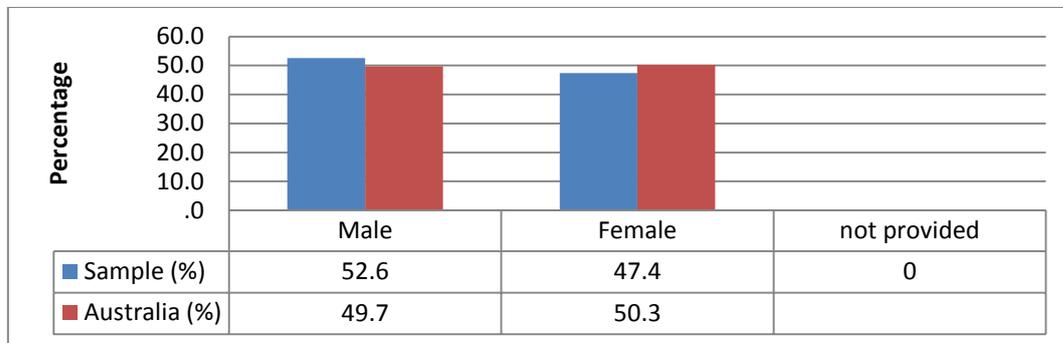
It was hypothesised that this bias ensued from the distribution of the survey link to acquaintances of the researcher, who is also a member of the overrepresented age bracket, but this prediction was not borne out by a crosstabs analysis which found that the proportion of

respondents aged 31 to 42 who accessed the link as a result of referral by friends and relatives was exactly the same as for the total sample group (see Appendix B). The discrepancy may instead be explained by a combination of greater interest in the topic and a greater likelihood of younger age groups using the internet, although this theory has not been tested.

4.2.2 Gender

Both of the dominant gender groups are quite evenly represented in both the sample group and the Australian population as a whole (ABS, 2011a).

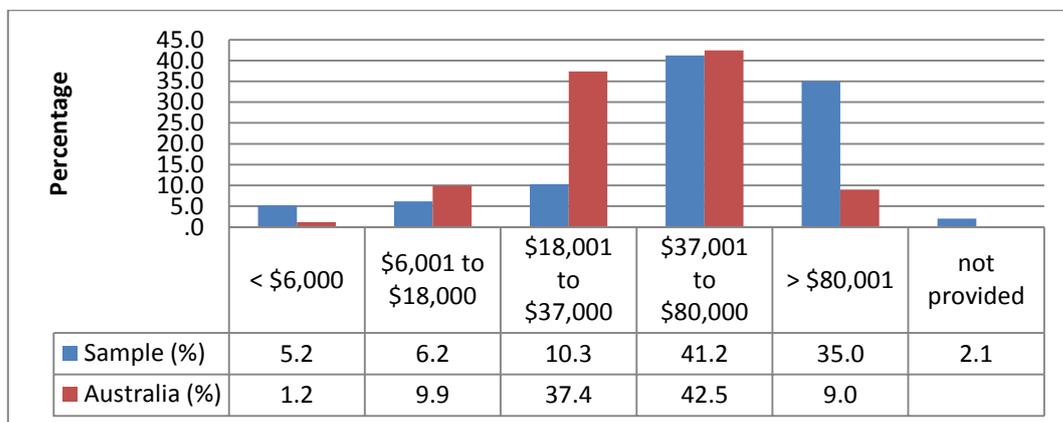
Figure 10: Gender distribution of sample group



4.2.3 Income

The income distribution among the sample group varies significantly from that of the general Australian population (ABS, 2011b). As shown in the Figure below, higher income brackets are substantially overrepresented in the sample at the expense of lower income brackets.

Figure 11: Income distribution of sample group

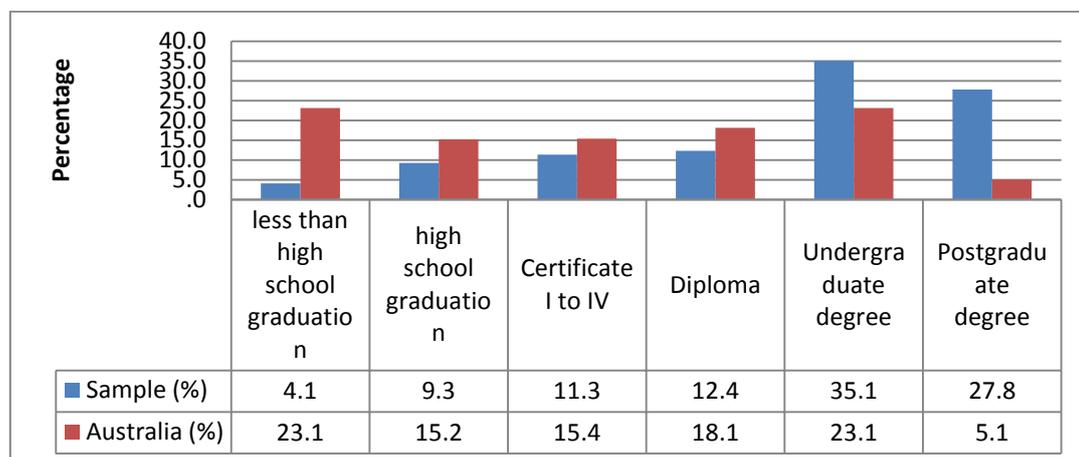


Although no statistically verifiable explanation can be offered for this sampling bias, the moderate (correlation coefficient 0.212) and highly significant ($p < 0.01$) correlation between income and educational attainment level in the sample group (Appendix B) suggests that levels of awareness and interest in the subject matter may have influenced the non-response bias against lower educated and lower income brackets.

4.2.4 Education

As indicated above, the sample group displays a strong tendency to be comprised of more highly educated individuals than the average levels prevailing in Australian society (ABS, 2012b).

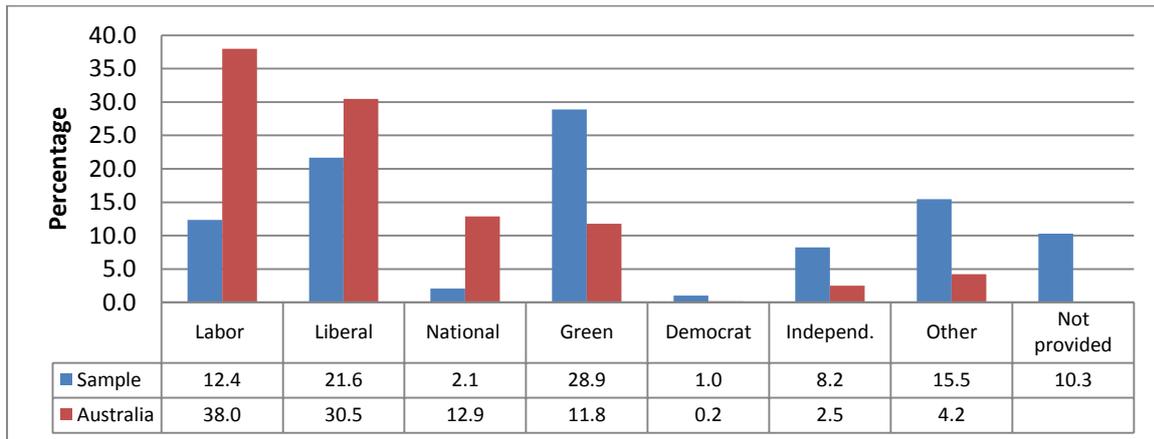
Figure 12: Educational attainment of sample group



4.2.5 Political persuasion

Further deviations from Australian demographic averages were revealed in the political persuasion of the sample group, whose preferences were compared with the electoral results from the 2010 federal election voting for the House of Representatives (AEC, 2010) for which voting is compulsory for the entire study population. The figure below shows a substantial underrepresentation of supporters of the current government (Labour) and the major opposition party (Liberal), while the Green Party is substantially overrepresented.

Figure 13: Political persuasions among sample group

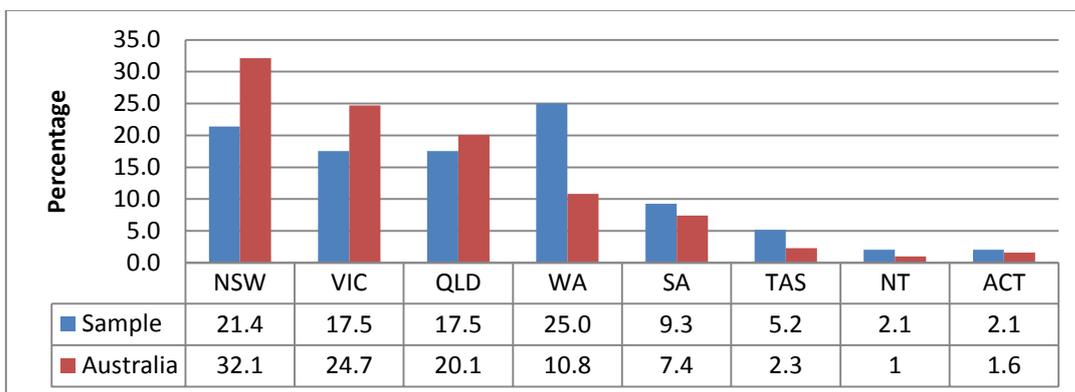


While the non-response bias for Labour supporters (a centre-left party) is likely to be associated with the underrepresentation of lower income and education levels in the sample group, this hypothesis could not be substantiated statistically. Meanwhile, the overrepresentation of Greens supporters is predicted to stem from a greater level of interest in the topic.

4.2.6 State of residence

Western Australians are significantly overrepresented in the sample group, while the most populous states of New South Wales and Victoria are underrepresented according to national statistics (ABS 2012c).

Figure 14: Distribution of respondents by state of residence



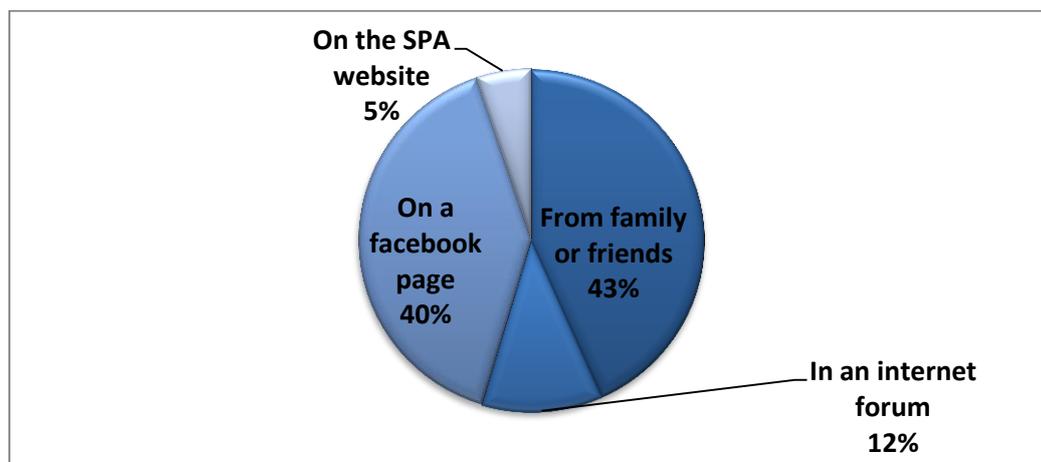
Again the theory was tested that this bias resulted from wider distribution of links to the survey within the home state of the researcher, and a cross-tabulation (Appendix B) appears to confirm this methodological weakness as being responsible for the deviation. Whereas it would be

anticipated from the sample averages that only 41 Western Australian respondents should have accessed the link from referrals by family and friends, the actual count was found to be 60. This must be acknowledged as a methodological weakness which has influenced the geographical distribution of the sample group.

4.2.7 Access point for survey

A final demographic question asked respondents how they had come across the link to the survey. The primary motivation behind this question was to control for the presence of obvious psychographic biases. In particular, it was suspected that respondents who had accessed the survey via the website of the NGO Sustainable Population Australia (SPA) may have tendencies to favour smaller population sizes and specific policies associated with this goal. Respondents from this source comprise only 5% of the sample group, yet this suspected bias provides another reason that the findings cannot be directly extrapolated to the entire Australian population.

Figure 15: Source of links to survey



4.3 Attitudinal data

The information presented in this section displays the range of responses to the psychographic questions which comprised the bulk of the online survey. The data tables relating to the following graphical presentations are included in the Appendix C.

4.3.1 Optimal Australian population size

An essential opinion which was captured by the study is the overall attitude of the sample group towards the optimal population size for Australia. This opinion was measured through the use of two questions which asked respondents to indicate their level of agreement with the statements:

(A.) “The optimal AUSTRALIAN population is larger than the current level”; and

(B.) “The optimal AUSTRALIAN population is smaller than the current level”.

The resulting distribution was:

Figure 16: Optimal Australian population is larger than the current level

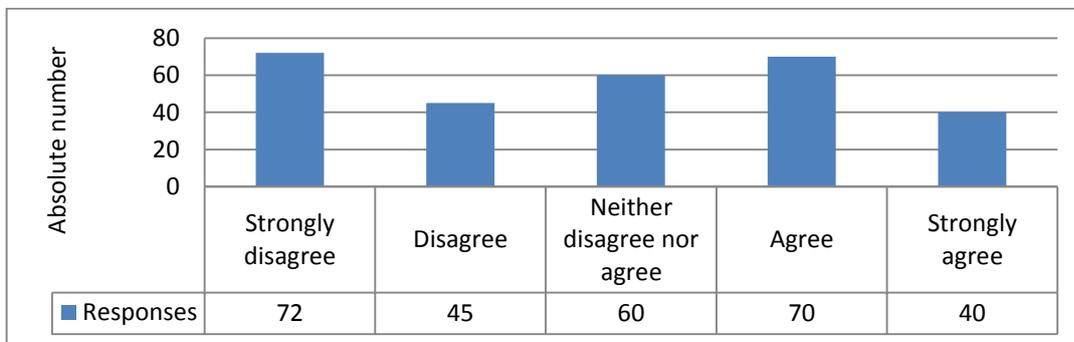
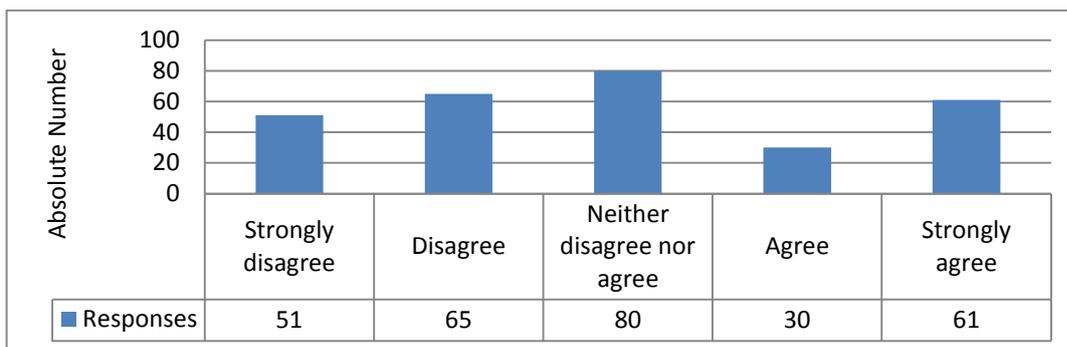


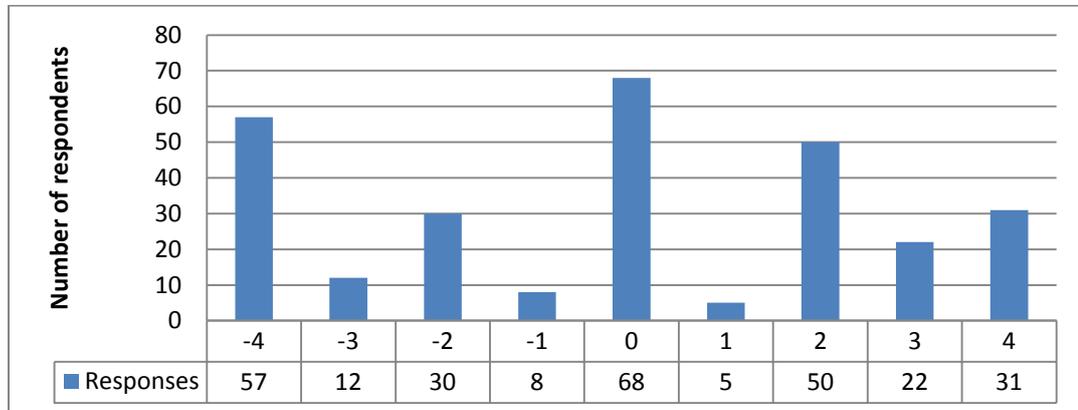
Figure 17: Optimal Australian population is smaller than the current level



In order to facilitate further analysis, this data was transformed by combining the responses to the two questions by each individual through a process of subtraction to create two new variables. The first (calculated by subtracting each response to B. from the corresponding response to A.) can be interpreted as the “strength of the conviction that population should increase”. A value of -4 indicates strong disagreement with the proposition of population increase; a value of zero represents a desire for population

stability; while a value of 4 represents strong agreement with the proposition of population increase. The final distribution was as follows:

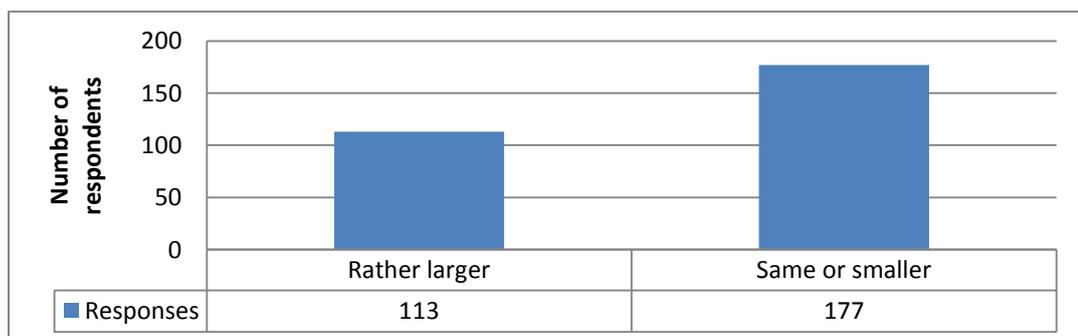
Figure 18: Conviction that Australia’s population should increase



The figure above shows a very even distribution with 107 respondents in favour of a smaller population, 68 in favour of population stability, and 108 in favour of a larger population.

The second variable was also formed by comparing the answers of each respondent to the same two questions, but this time values for ‘optimal population is larger than current level’ which were larger than values for ‘optimal population is smaller than current level’ were interpreted in absolute terms as meaning a preference for a larger population, while values which were the same or greater for ‘optimal population is smaller than current level’ were determined to represent a preference for a stable or smaller population size. Equal values for the two questions, reflecting a desire for population stability, has been included in this second category as both smaller and stable population sizes would reflect a change in current population policies.

Figure 19: Absolute preference for larger or stable/smaller Australian population

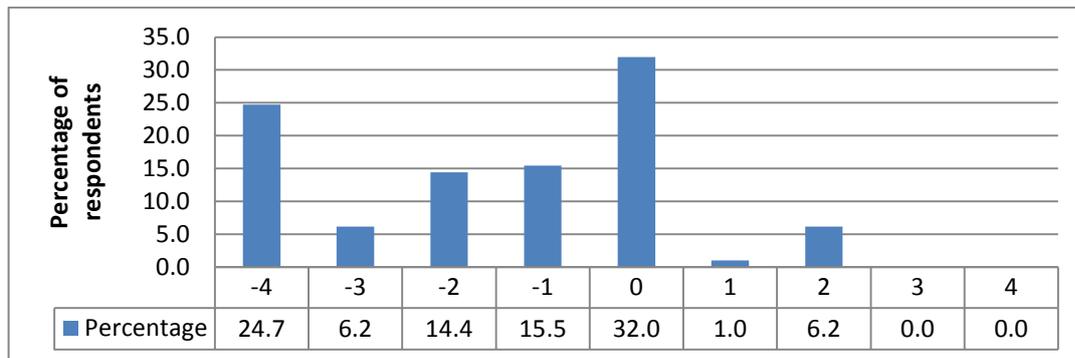


The lack of representativeness of the sample prevents extrapolation of these findings to comment on the prevailing attitudes in Australia as a whole. However, they are of use in analysing the other factors in order to determine which variables are associated with specific attitudes towards population size.

4.3.1.1 Anticipated impacts of an increase in Australia’s population

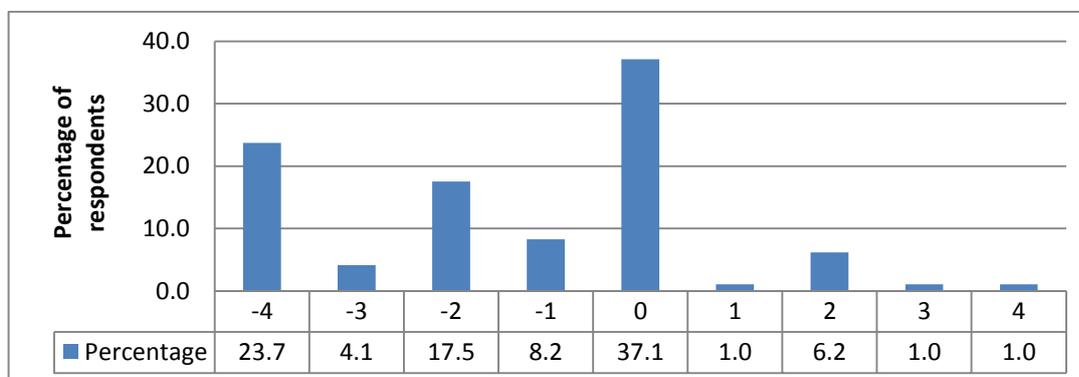
A similar procedure was used to amalgamate responses to the positively and negatively worded questions relating to the anticipated impacts of an increase in Australia’s population on: personal quality of life; societal wellbeing; the economy; and the environment. The following figures display the consolidated data for each set of questions:

Figure 20: An increase in Australia's population would improve personal quality of life



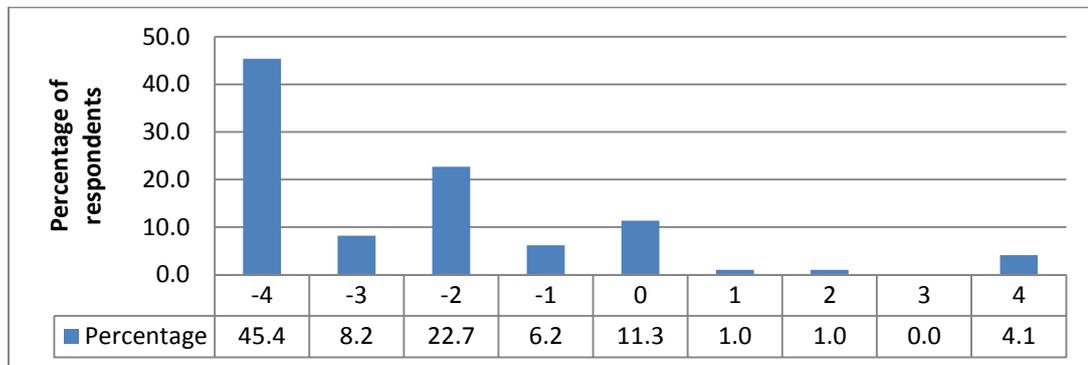
The mean value of -1.48 indicates a general belief among the sample group that an increase in Australia’s population would have a negative impact on the quality of life experienced by respondents.

Figure 21: An increase in Australia's population would improve societal wellbeing



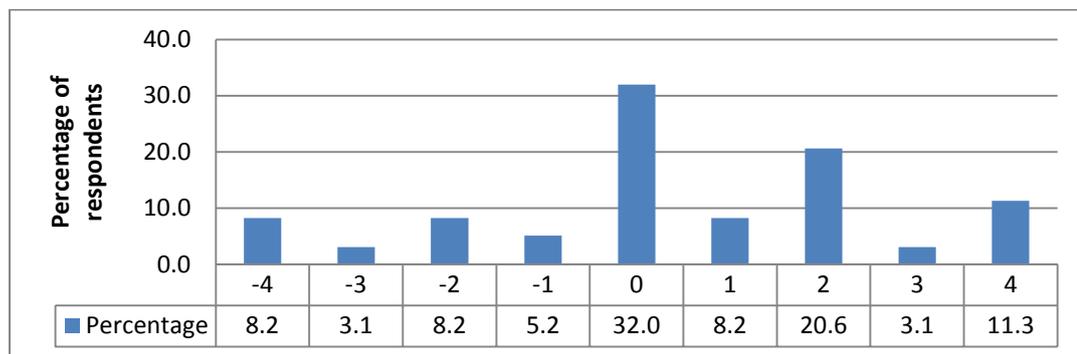
The mean value of -1.30 indicates a general belief among the sample group that an increase in Australia’s population would have a negative impact on the level of wellbeing in society as a whole.

Figure 22: An increase in Australia's population would be environmentally beneficial



The mean value of -2.38 indicates a strong conviction among the sample group that an increase in Australia’s population would have a negative impact on the environment.

Figure 23: An increase in Australia's population would be economically beneficial



The mean value of 0.40 indicates a general belief among the sample group that an increase in Australia’s population would have a positive impact on the economy, although the conviction in this belief is not particularly strong.

It would be anticipated that higher values for each of these factors would be associated with higher values for the optimal population level, i.e. respondents who think that an increase in population will be beneficial are likely to advocate larger population sizes. A regression analysis using the anticipated effects of an increased population as independent variables to predict attitudes towards the optimal population level was performed to test this hypothesis. The model was found to be globally significant (ANOVA $p < 0.01$), yet only

two of the independent variables (quality of life effects and economic effects) were found to be significant predictors.

Table 2: Anticipated effects of increasing population as predictors of optimal population

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.395	.243		1.628	.105
Quality of life wellbeing	.547	.106	.370	5.149	.000
environment	-.113	.072	-.084	-1.577	.116
economy	.320	.071	.261	4.487	.000

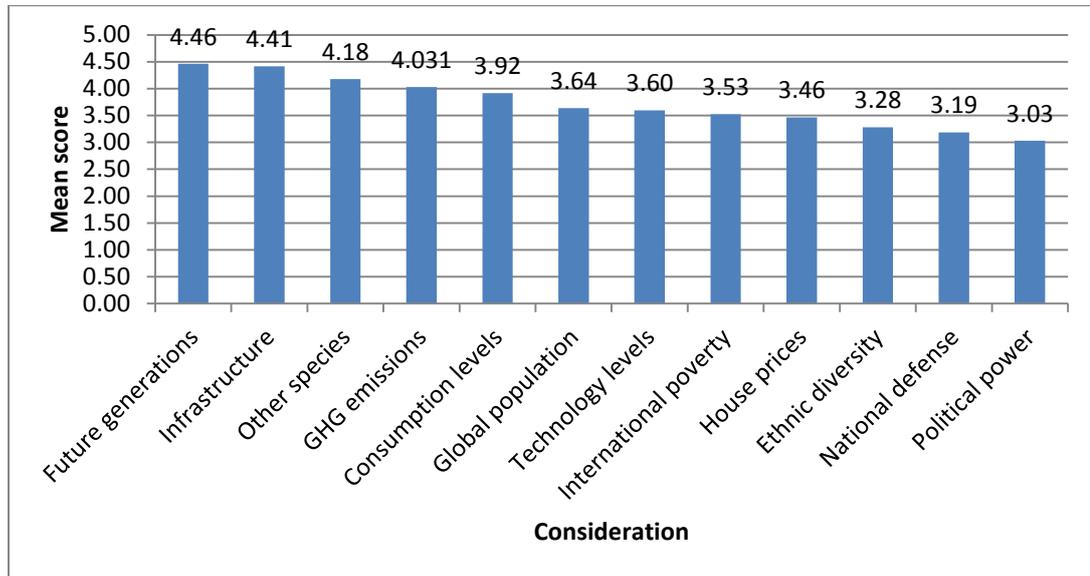
a. Dependent Variable: AUSTRALIA total

While expectations of positive effects on the economy, social wellbeing and personal quality of life were positively correlated with convictions that Australia’s population should increase, as would be logically expected, anticipated effects of an increased population on the environment showed a counterintuitive negative correlation with population size; meaning that those who thought the effects of population increase on the environment to be more positive are nevertheless likely to advocate a smaller population. This irregular finding can be disregarded, however, given the statistical non-significance of the variable.

4.3.1.2 Determinants of an optimal Australian population size

Another series of questions asked respondents to indicate their level of agreement with the proposition that the determination of an optimal population size for Australia should consider the following factors: national defence capabilities; greenhouse gas emissions; international political power; demands on infrastructure; current technology levels; size of the global population; other species; housing prices; international poverty levels; future generations; level of ethnic diversity; and desired consumption levels.

Figure 24: Relative importance of considerations in determining Australia's optimal population



It is not surprising to note that all of the considerations were deemed, on average, to be worthy of consideration in the determination of the optimal population size with all values exceeding the neutral value of 3. Indeed, any analysis of prospective policies should consider the full range of impacts which will ensue; be they positive or negative and intended or otherwise. The relative importance of each factor, which can be interpreted from the strength of the respondents' conviction that each factor should be considered, reveals that concern for future generations is of paramount importance, followed by the demands on the country's infrastructure, then a range of environmental factors and global concerns, with economic issue rated as least important.

A multiple linear regression was performed to test the validity of the null hypothesis that the assigned importance of considering these factors cannot be used as predictors for opinion about Australia's optimal population size (conviction that population should increase) against the alternative hypothesis that these factors are useful predictors.

Table 3: Regression: predicting Australia’s population from consideration variables

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.698	1.093		1.554	.121		
	National defense	-.080	.187	-.032	-.429	.669	.477	2.096
	Greenhouse gas emissions	.275	.187	.105	1.471	.142	.529	1.889
	international political power	.600	.205	.230	2.929	.004	.442	2.261
	Demands on infrastructure	.347	.260	.092	1.334	.183	.568	1.759
	Future generations	-.369	.276	-.104	-1.339	.182	.447	2.237
	ethnic diversity	.067	.156	.028	.430	.668	.656	1.523
	technology levels	-.171	.209	-.058	-.820	.413	.539	1.856
	global population	-.211	.169	-.090	-1.244	.215	.517	1.934
	Other species	-1.103	.202	-.425	-5.452	.000	.448	2.233
	House prices	.050	.162	.020	.310	.757	.625	1.601
	International poverty	-.196	.161	-.084	-1.218	.224	.568	1.760
	desired consumption levels	.500	.213	.197	2.343	.020	.384	2.607
a. Dependent Variable: AUSTRALIA total								

The model created was found to be globally significant ($p < 0.001$) and to explain 24.3% of the variance in the data (R square). Multicollinearity was found to not be problematic as each variable displayed a tolerance level in excess of 0.38. Three of the variables included in the analysis were found to be significant predictors of conviction that population should increase: International political power ($p = 0.004$); other species ($p < 0.001$); and consumption levels ($p = 0.02$). Although the ordinal nature of the original variables precludes interpretation of the absolute strength of the influence on population size opinions (given by the unstandardized coefficients), it is nevertheless appropriate to interpret the direction and the relative influence exerted by the three variables (as presented by the standardized coefficients). The degree of consideration of other species has the most significant influence on optimal population size estimates, with the negative correlation revealing that those who regard this consideration as being important are likely to advocate smaller

population sizes. On the other hand, giving greater importance to the consideration of international political power is shown to have a positive influence on perceptions of Australia’s optimal population size. These findings are consistent with the concepts derived from the literature.

A factor analysis was subsequently performed to reduce the complexity of this data by identifying any patterns which link the variables. The analysis was found to be globally significant (ANOVA $p < 0.001$) and two factors were extracted with eigenvalues above 1; cumulatively explaining 55% of the variance in the data. The following component matrix resulted:

Table 4: Factor analysis of consideration variables

Component Matrix^a		
	Component	
	1	2
National defence	.069	.823
Greenhouse gas emissions	.679	-.027
international political power	.076	.840
Demands on infrastructure	.645	.089
Future generations	.752	-.088
ethnic diversity	.069	.639
technology levels	.714	.081
global population	.724	.009
Other species	.728	-.292
House prices	.217	.680
International poverty	.683	.005
desired consumption levels	.825	-.169

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

The two components extracted have been interpreted as representing ‘environmental and social factors with a long term perspective’ (Component 1) and ‘political and economic factors’ (Component 2). A further regression analysis was performed to test the viability of these two components as predictors of opinions about population size. Again the ANOVA test found the results to be highly significant ($p < 0.001$), while the preceding factor analysis

had ensured that the independent variables were perfectly unrelated (tolerance 1.0). As shown below, both of the components are highly significant in the model ($p < 0.001$).

Table 5: Regression: predicting Australia’s population from consideration factors

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.072	.146		-.493	.623		
	REGR factor score 1 for analysis 1	-.638	.147	-.237	-4.347	.000	1.000	1.000
	REGR factor score 2 for analysis 1	.800	.147	.297	5.453	.000	1.000	1.000

a. Dependent Variable: AUSTRALIAtotal

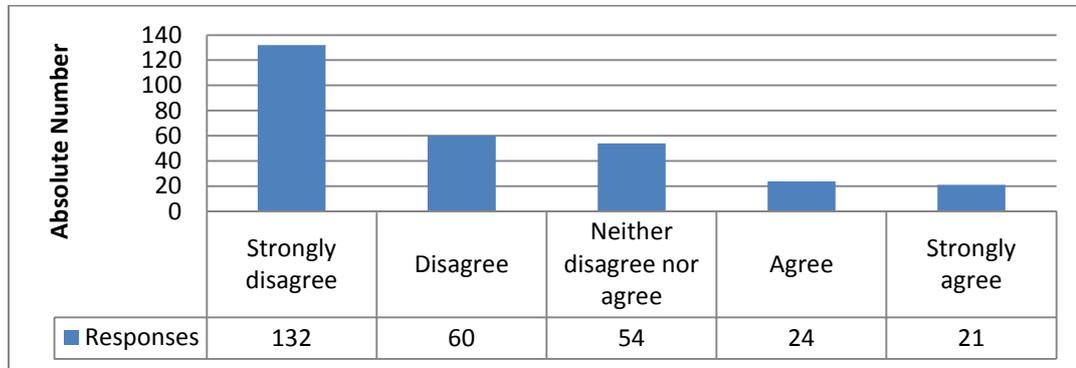
It can be interpreted that respondents who place more emphasis on environmental and social factors in their consideration of Australia’s optimal population are likely to advocate a smaller population size than those who consider such factors as less important. Conversely, the more weight that respondents give to political and economic factors in determining the optimal population size, the more likely they are to advocate a larger population than those who consider such factors as less important. The findings regarding economic, environmental and political factors are entirely consistent with the notions extracted from the literature, while the finding that consideration of social factors is associated with lower levels of population size is a valuable result which cannot be explicitly derived from existing material due to the wide range of positive and negative arguments on this topic.

4.3.2 Optimal global population size

Respondents were then asked to give their opinion of the optimal size for the global population. The primary motivation in doing so was to determine whether people conceptualise population issues differently at this scale to their approach to the national

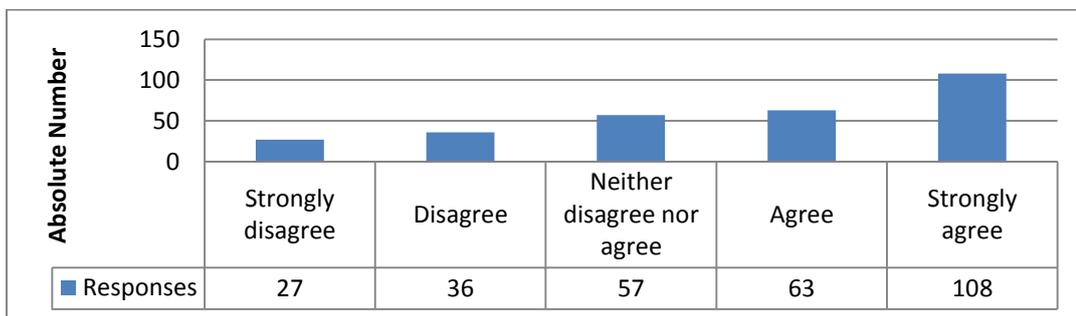
level. The results for the actual survey questions are displayed in the following two figures which clearly indicate a preference for a smaller global population.

Figure 25: Optimal global population is larger than the current level



The mean score of 2.11 for this question is significantly below the neutral answer of 3, thereby indicating general disagreement with the idea that the optimal global population is larger than the current level.

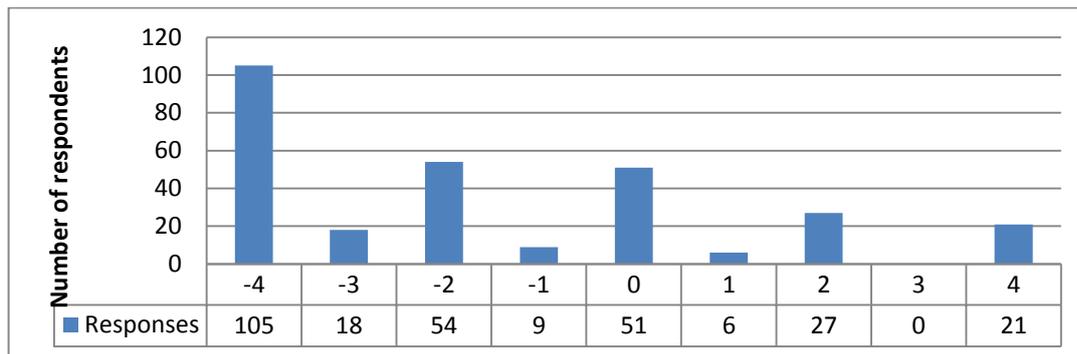
Figure 26: Optimal global population is smaller than the current level



The mean score of 3.65 for this question is significantly above the neutral answer of 3, thereby indicating general disagreement with the idea that the optimal global population is larger than the current level.

The data for the preceding questions was then consolidated to determine an overall value for each respondent in the same way that opinions about Australia's optimal population were transformed. This process resulted in the creation of two new variables. The first measures the overall attitude of each respondent to global population size (where negative values indicate a preference for a smaller population, a value of zero represents a desire for population stability, and positive values indicate conviction that the global population should increase), with the distribution of respondents shown in the figure below.

Figure 27: Conviction that global population should increase



A Wilcoxon Signed Ranks Test was used to compare the attitudes of each respondent to both global population and Australian population sizes on a case by case basis. The results detected a significant deviation between answers to the two questions ($p < 0.01$), with a systematic tendency evident for respondents to feel more strongly that global population should decrease than Australian population. The rankings are shown in the table below.

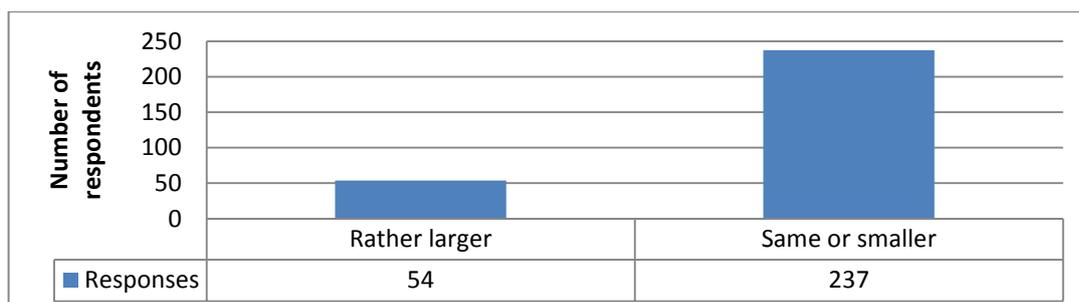
Table 6: Relative conviction regarding optimal Australian and global population sizes

Wilcoxon Signed Ranks Test- Ranks			N	Mean Rank	Sum of Ranks
AUSTRALIAtotal	-	Negative Ranks	27 ^a	42.17	1138.50
GLOBALtotal		Positive Ranks	138 ^b	90.99	12556.50
		Ties	126 ^c		
		Total	291		

a. AUSTRALIAtotal < GLOBALtotal
b. AUSTRALIAtotal > GLOBALtotal
c. AUSTRALIAtotal = GLOBALtotal

The second variable formed divides respondents into two groups according to their absolute preference for either a larger or a stable/smaller global population.

Figure 28: Absolute preference for larger or smaller global population

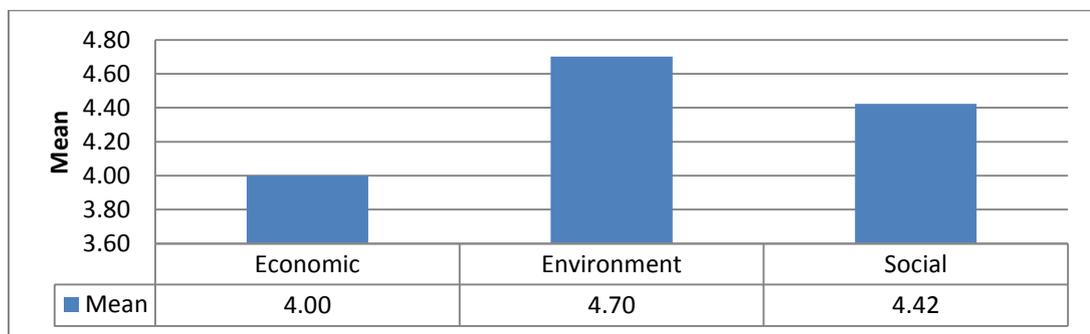


The previous figure shows a clear preference among respondents for the global population to remain stable, if not reduce in size.

4.3.2.1 Determinants of an optimal global population size

Respondents were asked to indicate their level of agreement with the proposition that economic, environmental and social factors should be taken into consideration when determining the optimal global population size.

Figure 29: Relative importance of considerations in determining optimal global population



The figure above shows that while all of the factors exceed the neutral score of 3 and are therefore all viewed as significant, environmental considerations were regarded as the most important factor, followed by social considerations and then economic considerations.

A regression analysis was employed to test for the utility of attitudes regarding the importance of these consideration factors as predictors of attitudes towards optimal global population size.

Table 7: Regression: predicting global population from consideration variables

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.214	1.176		1.033	.302
	Economic	.511	.206	.187	2.487	.013
	Environment	-.673	.315	-.160	-2.135	.034
	Social	-.368	.311	-.105	-1.183	.238

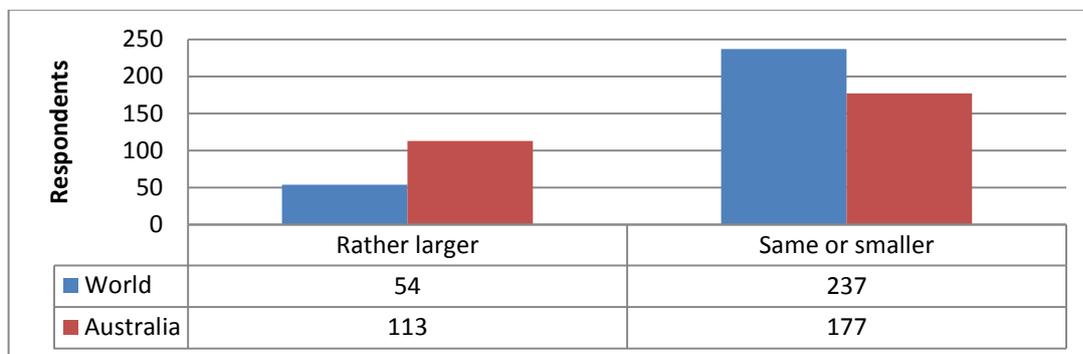
a. Dependent Variable: GLOBALtotal

Economic ($p=0.013$) and environmental ($p=0.034$) considerations were found to be statistically significant predictors of attitudes toward global population size. The most important of these is the weighting attributed to environmental considerations, which has a strong negative correlation with attitudes towards optimal population size (-0.673). Conversely, the attribution of importance to economic considerations was positively correlated with optimal population attitudes (0.511). The consideration of social issues, while not statistically verifiable, is also associated with attitudes favouring a smaller global population. These findings are entirely consistent with the effects of certain attitudes on perceptions of optimal population size in Australia: greater consideration of environmental and social factors corresponds to a desire for lower population sizes, while greater importance attributed to economic factors is associated with larger population sizes.

4.3.3 Comparison of Australian and global population perceptions

Despite the similarity in the mechanism, respondents did not come to the same conclusions about the ways in which the two populations should change. The figure below shows that respondents were twice as likely to advocate a larger Australia as a larger global population.

Figure 30: Comparison of attitudes to global and Australian population sizes



Having established that greater concern for environmental issues is associated with attitudes of lower optimal populations, it was investigated whether the environment was rated as equally important in determining the size of both populations. A Wilcoxon Signed Ranks Test was used to compare the importance attributed to environmental issues by each respondent when considering both global and Australian population sizes. The consideration of greenhouse gas emissions was used as a proxy for environmental factors in the case of Australia. The rankings are shown in the table below.

Figure 31: Relative importance of environmental issues in determining Australian and global population sizes

Wilcoxon Signed Ranks Test- Ranks			N	Mean Rank	Sum of Ranks
AUSTRALIA consider:	Negative Ranks		132 ^a	68.51	9043.50
Greenhouse gas emissions -	Positive Ranks		3 ^b	45.50	136.50
GLOBAL	Ties		156 ^c		
consider:Environment	Total		291		

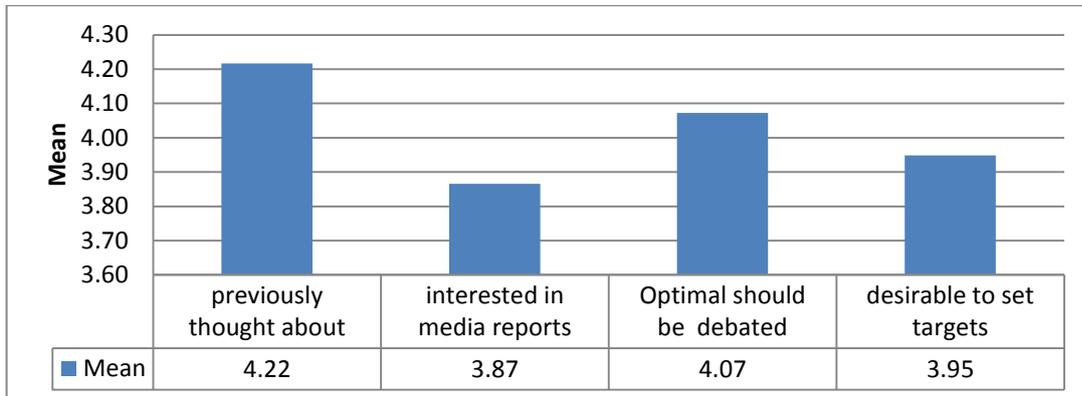
a. AUSTRALIA consider: Greenhouse gas emissions < GLOBAL consider:Environment
b. AUSTRALIA consider: Greenhouse gas emissions > GLOBAL consider:Environment
c. AUSTRALIA consider: Greenhouse gas emissions = GLOBAL consider:Environment

The test detected a significant deviation between answers to the two questions ($p < 0.01$), with a systematic tendency evident for respondents to regard environmental issues as a more important determinant of global population than of Australian population. There is a degree of hypocrisy implied by this finding in that the sample group feel that other countries should consider the environment to a greater extent than Australians should. It also reveals a nationalistic self-interest in that environmental protection in other countries also benefits Australia, in the form of ecosystem services, whereas social and economic benefits which might result from specific population policies accrue primarily in the country in question. This prioritising of short-term national interests above the long-term interests of mankind or the planet represents a 'tragedy of the commons' at an international scale.

4.3.4 Interest and views of population discussions

The sample group, on average, were found to have previously thought about some of the issues surrounding the population size debate. Moreover, they expressed interest in media reporting of the topic and a belief that the topic should be publicly debated with population targets sets to guide policy decisions (see the figure below). This finding suggests that awareness of population size issues have become solidly established in the community psyche (the first 'development' phase in the Public policy Life Cycle) and that a platform exists for progress into the 'politicization' phase where the issue should gain more media attention.

Figure 32: Interest in population issues and media reporting



Of most interest to the researcher was whether respondents differed in their answers to these questions according to their personal opinions about the optimal size of Australia’s population. A regression analysis was therefore employed to test the usefulness of these factors as predictors of attitudes to optimal population size. The results of the globally significant model created ($p < 0.01$) are presented in the table below.

Table 8: Regression: interest levels as predictors of optimal population

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.835	.657		8.878	.000
	interested in media reports	-.565	.183	-.200	-3.087	.002
	Optimal should be debated	-.519	.232	-.195	-2.241	.026
	desirable to set targets	-.407	.206	-.160	-1.978	.049

a. Dependent Variable: AUSTRALIAtotal

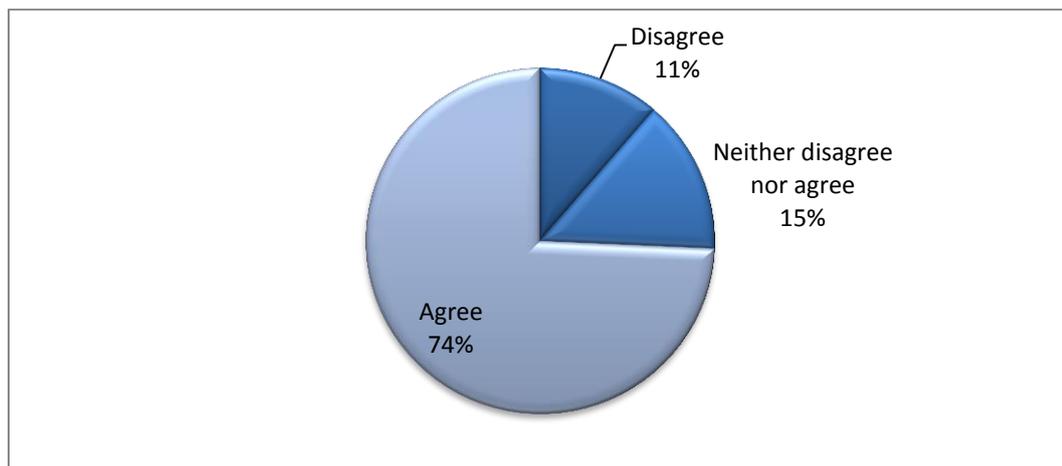
It can be seen that each of the three independent variables were found to be significant predictors. The level of interest in media reports was both the most significant ($p = 0.02$) and the factor which has the greatest effect on optimal population size estimates. In a disturbing finding for advocates of a smaller Australian population, each of the independent variables was found to have a negative correlation to optimal population size. This means that advocates of a larger population are generally less interested in media

reports on the subject and less inclined to see merit in open public discussions or the setting of targets. This reveals that it may be problematic to influence advocates of a 'Big Australia' through the media, or to realise open policy discussions at which the full range of views are properly represented.

4.3.4.1 Population taboo

Linked to the average perception that population size *should* be publically discussed, the survey revealed that there is no 'population taboo' in Australia, according to respondents, in the broadest sense of the term. The figure below displays the aggregate responses to the proposition that it is socially acceptable to publicly discuss population size.

Figure 33: Socially acceptable to discuss population size



A clear majority conveyed agreement or neutral attitudes towards the proposition, with only 11% expressing their perception that a general population taboo exists in society. As discussed in the introduction, however, the ability to discuss a topic does not imply that all views on the issue are equally acceptable. Subsequent questions exploring the social acceptance of arguments for both increasing and decreasing population size were found to reveal significant differences.

Figure 34: Socially acceptable to advocate increasing Australia's population

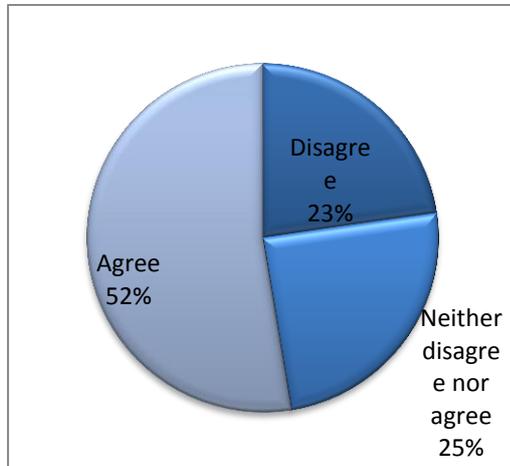
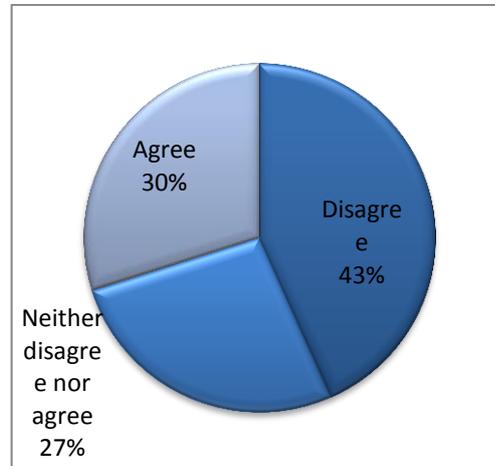


Figure 35: Socially acceptable to advocate decreasing Australia's population



In general, it was found that advocacy of a larger population is socially permissible with 52% of respondents agreeing with this proposition, while the expression of views to the contrary are much less socially acceptable with only 30% of respondents claiming that such views are welcome. A signed ranks test (Appendix C) which considered the data on a case-by-case basis showed a significant ($p < 0.01$) tendency for the attribution of acceptability to apply more strongly to advocacy of a larger population than a smaller one. This finding supports the call in the introduction for a redefinition of the term 'population taboo' as the 'speaking about restrictive population control taboo'. Such a rebranding, although it may require a catchier name, would circumvent the defensive retorts that no population taboo exists and the citation of media reports regarding the aging population as evidence.

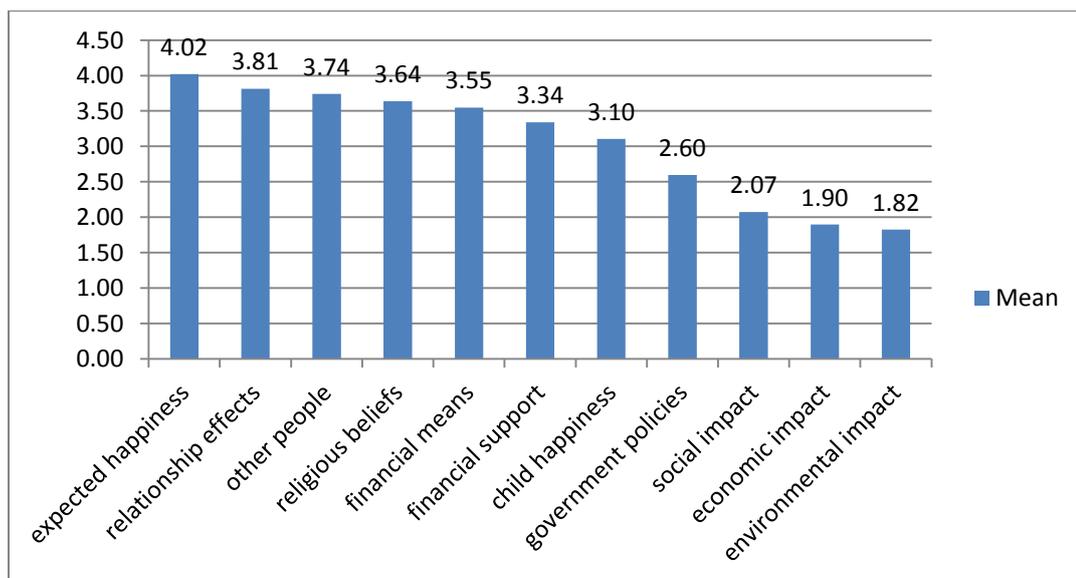
A regression analysis was performed to determine if any of the viable demographic characteristics could be useful as predictors of this taboo (Appendix C). In a globally significant model ($p < 0.01$), the independent variables of age and income (both $p < 0.01$) were found to have an inverse relationship to the dependent variable (social acceptability of advocating population decrease), with income having the largest effect. The interpretation is that higher ages and incomes are associated with a stronger belief that it is not acceptable to discuss decreasing population size. Vested interests may be at play here: older generations are likely to attribute a lot of weight to the misinformation circulated by the media regarding the sustainability of social welfare schemes; while higher income earners are likely to place greater value on the short term economic benefits which are generated by larger populations in the form of cheaper labour and bigger markets.

Although non-significant in the model, those who own real estate were also detected to regard the discussion of decreasing population size as less acceptable than those who don't. This may reflect the vested interests of home owners in the rising real estate prices which are associated with population growth.

4.3.5 Procreation decisions

Respondents were asked to indicate their level of agreement with the proposition that: for most people, the decision to have a child (or more children) is influenced by given range of factors (Appendix C). Therefore, the answers should represent the decision process prevailing in society rather than the factors considered by respondents in making personal decisions.

Figure 36: Relative importance of procreation decision determinants



In interpreting the figure above, it should be borne in mind that the mean scores relate to a Likert scale reflecting the respondent's level of agreement: where mean scores above 3 indicate group consensus that the factor is considered; while mean scores below 3 represent belief that the factor is not taken into consideration. Although the findings cannot be used to comment on the Australian population as a whole, the results show a distinct pattern in the beliefs of the sample group. The consideration factors deemed most influential are inherently related to the direct interests of the prospective parents; what could be termed self-centred motivations. This finding supports the (non-scientific) literature on the topic which has been previously documented. At the other extreme,

considerations related to the interests of the environment or society as a whole (what could be termed philanthropic motivations) were deemed, on average, to be not even considered by prospective parents. This state of affairs sets the scene perfectly for the playing out of a ‘tragedy of the commons’ scenario.

Of concern for proponents of a stable or reduced population size is the fact that government policies are regarded as unimportant in the procreation decision, although this finding is somewhat at odds with the finding that people do consider the level of financial assistance they receive. More promising is the finding that the opinions of other people, most likely those of family and friends, do play a significant role in the decision process. It can be inferred that concentrating on reforming societal perceptions may be more effective in achieving the goal of reducing population growth than reliance on governmental intervention which, if it is to be used, should focus primarily on fiscal tools to influence individual decisions.

4.3.5.1 Societal attitudes towards child bearing

The claim made by Valenti (2012) that the force of social expectation for women to bear children is so strong as to negate the individual decision making process was tested by asking respondents whether women and men who don’t want to have children are considered to be ‘strange’ by the community (Appendix C).

Figure 37: Women who don't want children are considered 'strange'

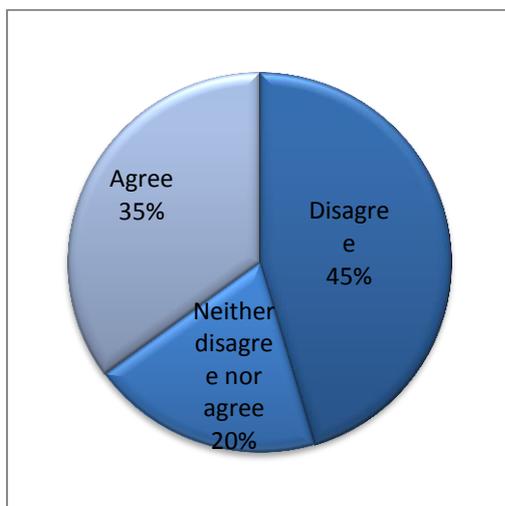
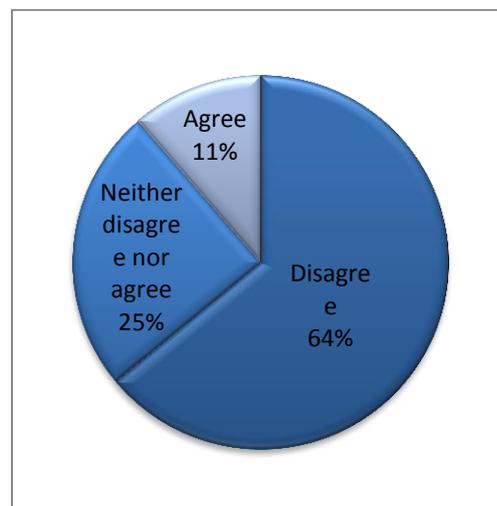


Figure 38: Men who don't want children are considered 'strange'

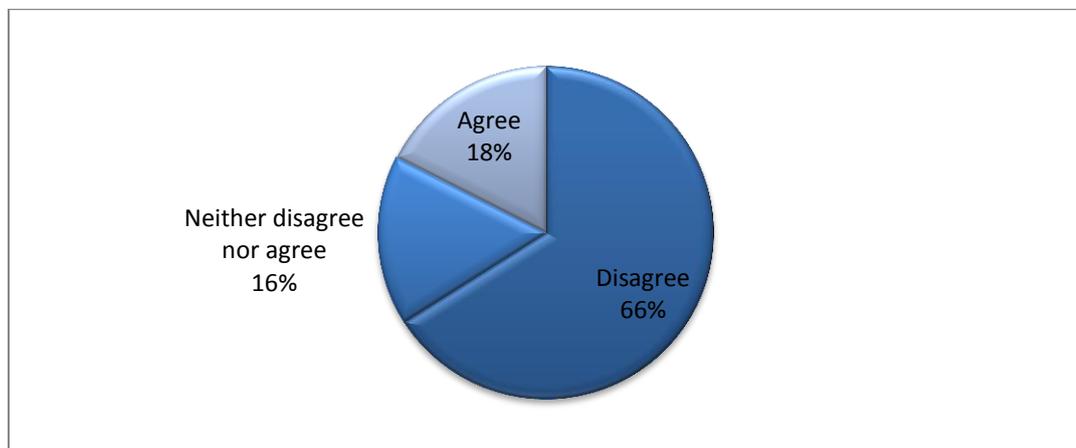


Although the mean scores for women and men of 2.69 and 2.14 respectively fall below the neutral score of 3 and therefore indicate a general attitude among respondents that it is not considered strange to not want children, the finding that 33% of respondents agree with the proposition that intentionally child-free women are somehow strange is striking. Given the previous finding that the decision to procreate is strongly influenced by the views of other people, it is entirely foreseeable that women may be partially motivated to bear children in order to avoid acquiring a necessarily negative perception from a full one third of society. Also striking is the noteworthy difference between the attitudes towards men and women on this issue. A signed ranks test (Appendix C) showed a significant ($p < 0.01$) tendency for the attribution of 'strangeness' to apply more strongly to child-free women than to child-free men.

4.3.5.2 Information about parenting

A further survey question on this theme explored the discussion of parenting by asking whether it is socially acceptable for a parent to express regret at having children (Appendix C).

Figure 39: Socially acceptable to express regret at having children



Only 18% of respondents indicated that such a statement by a parent would be socially acceptable, while a clear majority found that such behaviour is regarded as taboo; this finding is not surprising, and perhaps even desirable, when one considers the effect that an expression of regret would have on the lamented child. This question was not designed to establish whether parents do, in fact, have regrets (it is merely assumed that some parents do, while most do not), but rather it should offer an insight into the type of information in

circulation regarding the experience of parenting. As established by Oswald (2006), most people choose to have children despite empirical evidence that personal happiness (the primary procreation motivator according to this study) suffers as a result; the question is why people take this anti-utilitarian course of action. The results from this question suggest a partial answer to this conundrum; that the decision of prospective parents is taken in the absence of full information and that the information in circulation is strongly biased towards the desirability of parenting due to the systematic repression of dissenting views by social custom.

4.3.6 Population policy tools

Claims found in the literature (Hardin, 1993) that population policies inflame both religious and racial tensions were tested by asking respondents whether they find population policies to be offensive according to these criteria. The resulting consensus displayed in the two figures below was that policies, in general, do not cause offence on these grounds.

Figure 40: Population policies are racially offensive

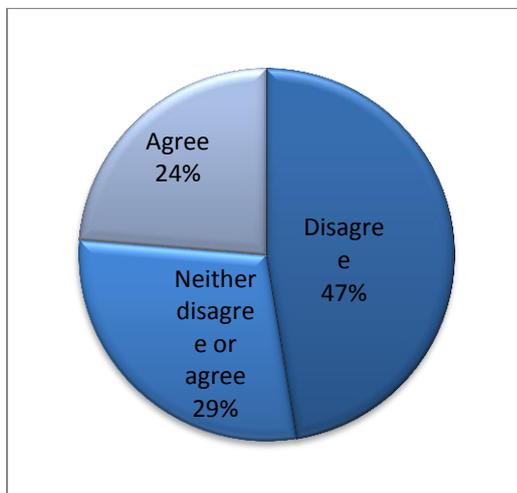
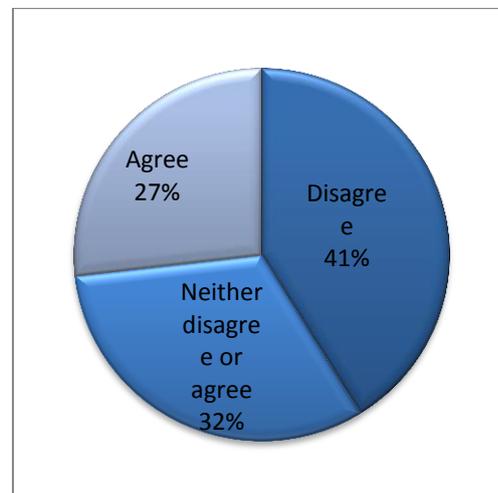


Figure 41: Population policies are religiously offensive

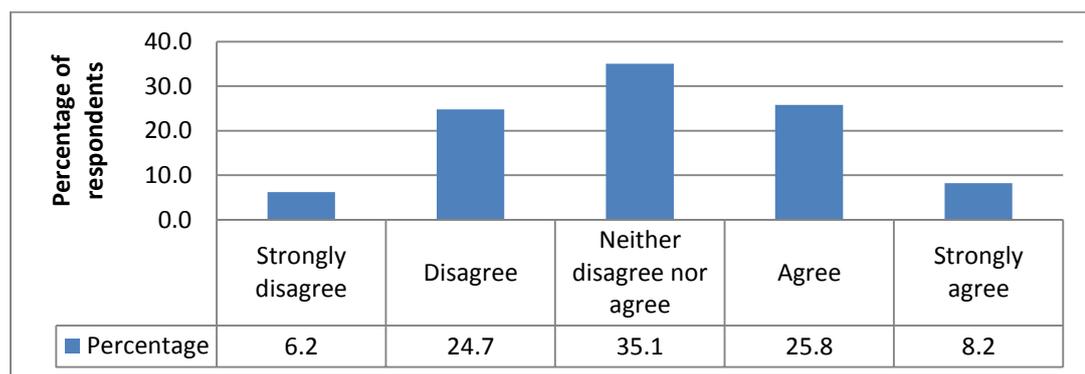


In retrospect, these questions may have been somewhat lacking in detail as they failed to identify which specific policy was the subject of analysis, and some respondents may have interpreted the question as referring to existing policies while others may have considered a broader range of possibilities. It would be useful to repeat this question by analysing perceptions of each prospective policy individually, as it would be expected that some policies do cause religious offence while others do not. Nevertheless, the finding regarding

the absence of racial offence is striking in that it differs from the information found in the literature that restrictive population control engenders racial problems regardless of which specific instrument is employed. Again, repeat testing with a larger sample incorporating a wider distribution of ethnic backgrounds may help to better inform discussion of this topic.

Some respondents took the opportunity to offer alternative reasons why population policies may cause offence. The most common suggestions were that: governmental control restricts individual rights (x31); that restrictive policies are a stepping stone to genocide and communist/fascist control (x7); that offence results from public ignorance of the issue (x6); that restrictive policies restrict economic opportunities (x4); and that it is impossible for any policy to please everyone (x3). The dominant response that government policies restrict individual freedoms was examined by another question; the responses to which are shown below.

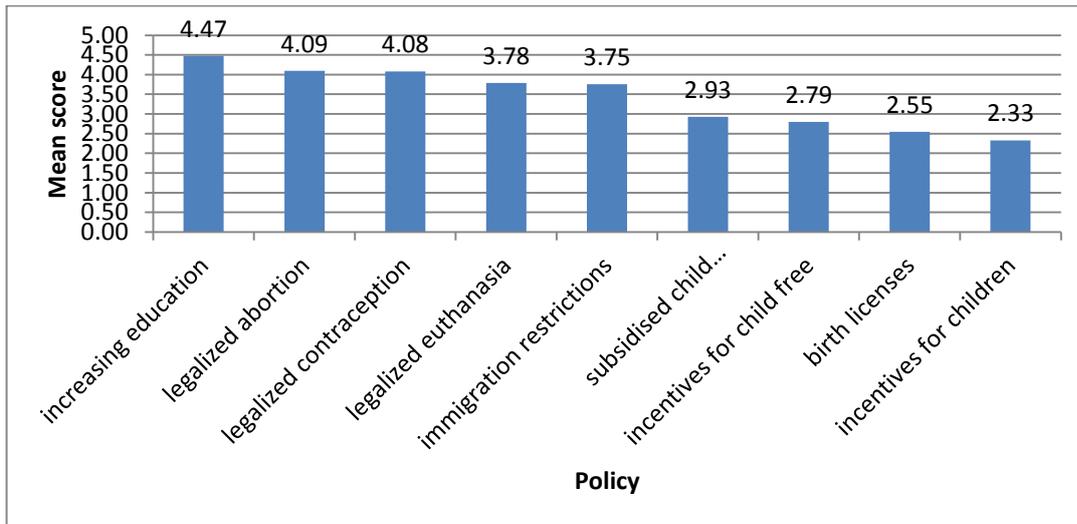
Figure 42: Population policies restrict personal freedoms



With a mean score of 3.05, respondents were only slightly in agreement with the proposition that population policies restrict personal freedoms. This is a highly surprising result for, while some policies such as the legalisation of contraception clearly increase freedoms, other policies such as immigration controls unquestionably limit the options available to people. The lower than expected result for this question indicates that the question may have been interpreted by some respondents as implying that population policies ‘unjustifiably’ restrict personal freedoms.

Respondents were then asked to indicate their level of agreement that specific population policy mechanisms should be used in Australia. The results are shown in the figure below, where mean scores above 3 represent general agreement with the use of the policy while scores below 3 indicate a belief, on average, that the policy should not be used.

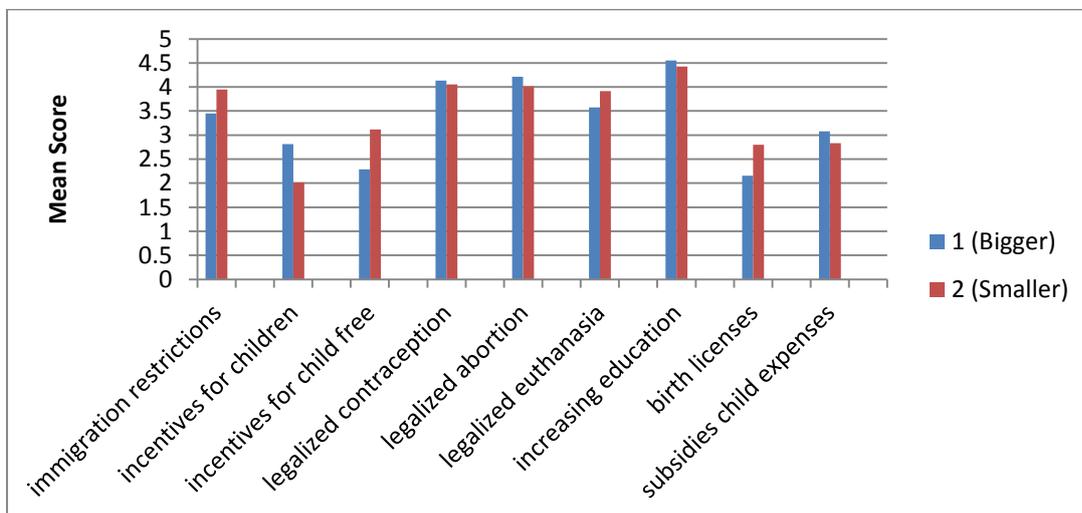
Figure 43: Desirability of various policy options



In total, respondents favoured the use of education and the legalisation of abortion and contraception (which are already legal), as well as the legalisation of euthanasia (which is currently illegal and public opinion has not been tested by referendum) and restrictions on immigration. Conversely, the sample group as a whole was opposed to the use of any financial incentives or subsidies (which are currently used to promote fertility), and opposed the implementation of a system of birth licences.

Next, it was analysed whether those who advocate a larger Australian population (Group 1) differed in their opinions about the policy mechanisms to those who advocate a smaller or stable Australian population (Group 2). The mean scores for the desirability of each policy, separated by the two groups, are displayed in the figure below.

Figure 44: Desirability of policies according to optimal population projections



The figure shows that the two groups do differ in their opinions of the various policies. A Mann-Whitney Test was subsequently used to compare the means of the two groups to determine whether these apparent differences were statistically verifiable.

Table 9: Comparison of groups' opinions of various policies

Mann-Whitney Test: Ranks				
	groups Australia (1 larger, 2 smaller)	N	Mean Rank	Sum of Ranks
immigration restrictions	1	114	123.93	14128.50
	2	177	160.21	28357.50
	Total	291		
incentives for children	1	114	173.79	19812.00
	2	177	128.10	22674.00
	Total	291		
incentives for child free	1	114	111.86	12751.50
	2	177	167.99	29734.50
	Total	291		
legalized contraception	1	114	154.05	17562.00
	2	177	140.81	24924.00
	Total	291		
legalized abortion	1	114	154.88	17656.50
	2	177	140.28	24829.50
	Total	291		
legalized euthanasia	1	114	134.00	15276.00
	2	177	153.73	27210.00
	Total	291		
increasing education	1	114	150.93	17206.50
	2	177	142.82	25279.50
	Total	291		
birth licenses	1	114	116.91	13327.50
	2	177	164.74	29158.50
	Total	291		
subsidies child expenses	1	114	157.92	18003.00
	2	177	138.32	24483.00
	Total	291		

The differences between the two groups were found to be significant regarding all of the policies except: Legalised contraception ($p=0.164$); Increased education ($p=0.361$); and

Legalised abortion ($p=0.123$). The remaining policies have been divided according to their relative appeal to each of the two groups:

Policies favoured by advocates of a larger Australian population (differences significant below $p =0.04$)

- Subsidies for child-related expenses (mean within group of 3.08)
- Incentives for having children (mean within group of 2.82)

Policies favoured by advocates of a stable of smaller Australia population (differences significant below $p =0.04$)

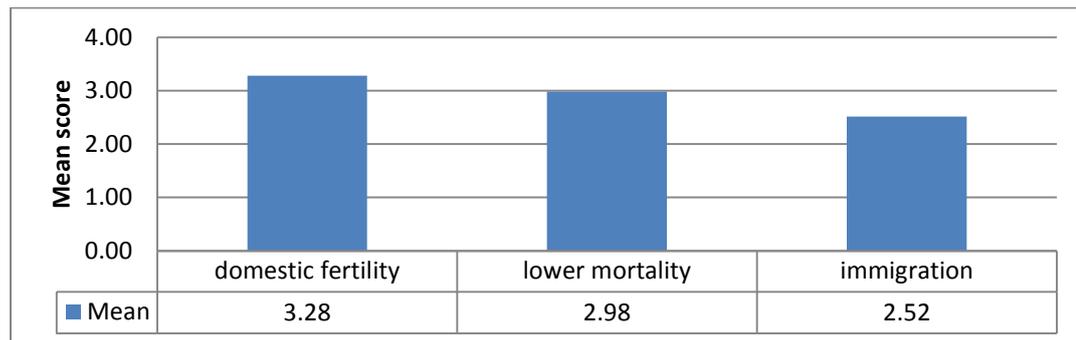
- Immigration restrictions (mean within group of 3.95)
- Legalised euthanasia (mean within group of 3.92)
- Incentives for remaining child free (mean within group of 3.12)
- System of birth licenses (mean within group of 2.80)

The division of policies according to the group which most supports them is entirely predictable: advocates of a larger population are more in favour of policies which encourage population growth, and vice versa. What is noteworthy from the list, however, is that even advocates of a larger population do not support the use of incentives for having children (mean of 2.82) which would include the Baby Bonus that forms part of the existing government population policy. Also, advocates of a stable of smaller Australia population do not, on average, support the use of a system of birth licenses.

4.3.7 Immigration, domestic fertility or mortality rates?

Regardless of their attitudes towards the optimal population size, respondents were asked whether, if Australia's population must increase, the increase should mainly result from higher domestic fertility rates, immigration or lower mortality rates. The results are shown in the figure below.

Figure 45: Preferred means of population increase



Interestingly, no statistically significant deviations could be detected with regards the preferred mode of population increase between the attitudes of larger and smaller population advocates. A clear tendency is evident for the sample group to favour any future increase in Australia’s population to result from domestic fertility, even though this would necessarily increase the world population which most of the respondents find to be already excessive. Lower mortality would appear to be a desirable goal (indeed, this policy is actively pursued by governmental and private health services), but population increase mainly through this mechanism is the cause of the aging population crisis facing many developed countries. Immigration, on the other hand, avoids both of these pitfalls; it does not increase world population directly (although there may be a partial bounce-back in the country of origin as pressures ease in accordance with the Malthusian Demostat), and the admission of the appropriate demographics can ease rather than worsen the age dependency ratio. Why then is immigration the least preferred option?

A regression model was created to determine whether the respondents’ weightings of the determinants of an optimal population could be used as predictors of their attitudes towards immigration (Appendix C). The model was found to be highly significant ($p < 0.01$) and to identify five considerations as useful predictors. Three of the predictors were found to be negatively correlated; the attribution of more importance to house prices, demands on infrastructure and other species was associated with a lower desire for population increase to result from immigration. This finding is surprising as both house prices and demands on infrastructure would increase equally regardless of where the extra demand originates, while other the plight of other species would be aided by the stabilisation of global population and hindered by higher Australian fertility. The other significant predictors, the consideration of greenhouse gas emissions and the global population, were positively and logically correlated with a preference for immigration over domestic fertility.

Admittedly, the sample group as a whole rated the negatively correlated factors of other species and demands on infrastructure as more important considerations than the positively correlated factors of greenhouse gas emissions and the global population, but this still does not fully explain the preference for domestic fertility over immigration.

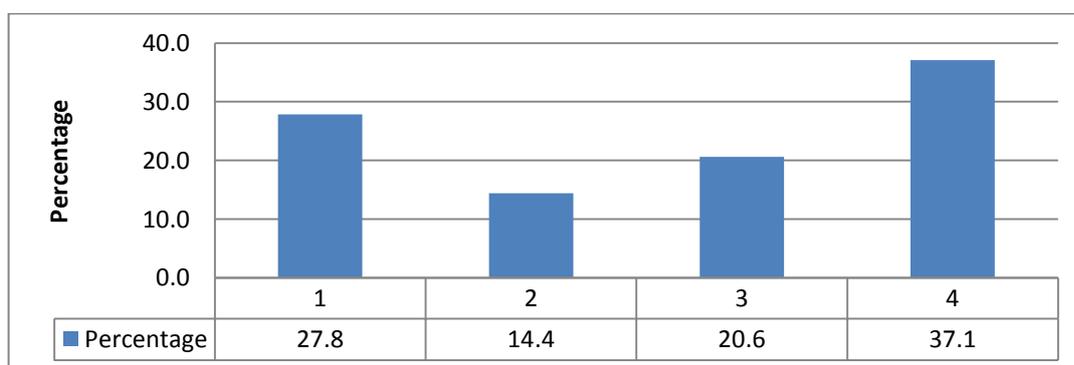
In the search for alternative explanations, a correlation was sought between the consideration of ethnic diversity in the population and the preference for immigration. A two-tailed test was performed given the uncertainty about the direction of any correlation. Although the non-parametric test was narrowly non-significant ($p=0.058$), the negative correlation which indicates that those who think levels of ethnic diversity are more worthy of consideration are less likely to support immigration is a telling finding. It seems that the White Australia ideal, long ago abandoned as official policy, remains entrenched in the Australian psyche.

4.3.8 Perceptions of equality

Respondents were asked to choose the single answer from the following list which best represents their perception of their “fair share” of the world’s resources:

- (1) . . . whatever I can afford
- (2) . . . Australia’s total resources divided by Australia’s total population
- (3) . . . the world’s total resources divided by the world population
- (4) . . . less than the world’s total resources divided by the current world population

Figure 46: Perceptions of a 'fair share' of resources



As shown by the figure above, respondents were quite evenly distributed between the response options. The coding (1 to 4) is interpreted in an ordinal fashion in terms of increasing sense of equality: where (1) discounts notions of equality except as dictated by market forces; (2) implies equality should extend to all Australians; (3) relates to an equal

share of resources for all people on Earth; and (4) implies that the notion of equality should be extended to include other species or future generations. Some respondents took the opportunity to offer alternative interpretations of “fair share” as: dependent on the individual’s ‘needs’, but disregarding their ‘wants’ (11 respondents); related to the productivity of the individual (5 respondents); and nothing (2 respondents).

Perceptions of equality are important to discussions of population size as they determine whether policy decisions should consider, for example, only the domestic situation or also the international community. This link is confirmed by the highly significant ($p < 0.01$) and moderate to strong correlations (0.2 to 0.3) between the equality variable and perceptions of the need to consider other species, future generations and global population levels in determining an optimal population for Australia (Appendix C).

A further regression analysis tested the utility of demographic characteristics (age, income and education) as predictors of attitudes towards equality. Both the global model and each of the independent variables were found to be significant ($p < 0.05$). Greater education attainment levels were found to be associated with a broader notion of equality, while both higher income and higher age were found to be associated with a more restrained approach to equality.

Table 10: Regression: demographics as predictors of equity perceptions

Coefficients ^a					
Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
	B	Std. Error			
(Constant)	2.987	.352		8.489	.000
income	-.120	.059	-.123	-2.033	.043
education	.124	.052	.146	2.402	.017
age	-.103	.051	-.118	-2.020	.044

a. Dependent Variable: “fair share”

An optimistic interpretation of the inverse correlation with age is that Australian attitudes are shifting towards a broader conceptualisation of equality as the younger generations displace the older. Unfortunately, this interpretation is not explicit in the data as it is also possible that people tend to change their opinions of the topic as they age and accumulate material possessions. Indeed, it seems likely that the inverse correlation between income and perceptions of equity is related to the fact that some people have more to lose than others from a redistribution of wealth. Nevertheless, the more egalitarian attitudes prevailing among the younger elements of Australian society do provide opportunities for

the future and should be nurtured by proponents of a sustainable population. A continual focus on education is clearly one way to achieve this goal.

4.4 Conclusions

The sample group is not demographically representative of the Australian population, but some useful findings have nevertheless resulted from the study. The sample group is split between advocates of a larger and smaller population, despite the consensus that an increase in Australia's population would have a negative impact on quality of life, social wellbeing and the environment. Accordingly, the attribution of importance to social and environmental issues was shown to be negatively correlated with attitudes about the optimal population size. Conversely, the group did find that an increase in Australia's population would be economically beneficial, although only slightly, and the attribution of importance to this consideration was shown to be associated with a desire for a larger national population. Both groups agreed that any future increase in Australia's population should result from domestic fertility in preference to immigration, despite the logical inconsistencies this stance presents to their responses to other questions.

With regards the global population size, a clear consensus emerged that it should be stable or smaller than the present level. This finding resulted from the attribution of environmental concerns as the most important determinant, followed by social considerations and then economic issues. Interestingly, the respondents differed in the way they attached importance to the consideration of different factors in determining optimal population sizes at the national and global scales. In particular, greater emphasis was placed on the consideration of environmental issues in determining the global population size than the Australian population size; thereby setting the scene for a tragedy of the commons scenario at the international level. Similarly, the finding that prospective parents primarily consider self-centred motivations in deciding to have children, while philanthropic motivations relating to the interests of the environment or society as a whole are disregarded, sets the scene for a tragedy of the commons scenario at the national level. These failures of the respective systems to operate in their own long-term best interests may be regarded by some as justification for regulatory intervention.

Procreation decisions were found to be strongly influenced by the expectation of happiness and the views of other people. Both of these factors were shown to currently promote

parenthood through the systematic biasing of information in circulation regarding the parenting experience and the widespread social perception that those wishing to remain child-free are somehow unusual.

Advocates of a stable or smaller population were found to be more interested in media reporting of population issues and more in favour of public discussion on the topic and the setting of targets than their 'Big Australia' counterparts. It seems that the discussion of population issues is not taboo in general and that advocacy of population increase is socially acceptable, while dissenting opinions are not welcomed by society. Higher age and income brackets are more likely to find the discussion of population stability as socially unacceptable; possibly due to their vested short term interests in the economic benefits resulting from population growth. Only minimal support was detected for the idea that population policies were religiously or racially offensive, with the majority rejecting the notion. Respondents favoured the use of education, the continued legalisation of abortion and contraception, restrictions on immigration and the legalisation of euthanasia. The group was opposed to the use of any financial incentives the implementation of a system of birth licences. The most surprising of these findings is that the current Baby Bonus is unwelcome even to advocates of a larger population, and that there is strong support for the legalisation of euthanasia.

The implications of these findings for policy makers and especially for the work of proponents of population stability will be discussed in the next section.

5 Conclusion

5.1 Introduction

The objective of this study was to reveal the beliefs and attitudes of Australian residents which underpin the ways in which population issues are conceptualised and discussed in public forums. In doing so, the study has sought to contribute knowledge to the scientific community which may find application in enlightening policy debates as well as informing the work of NGOs and other organisations which seek to further the agenda of population stabilisation. Such knowledge has been conspicuously absent from governmental policy discussions due to a lack of public consultation, and only minimally available to NGOs due to the sensitivities associated with the topic which have conspired to limit freedom of expression through the emergence of a cultural taboo.

Based on the research findings, specific recommendations for the various stakeholder groups are presented in this section. Finally, the methodological weaknesses which have arisen and the knowledge gaps identified during the current study are discussed in terms of their implications for further research.

5.2 Implications for relevant stakeholders

5.2.1 Policy makers

The findings of this research have revealed that public attitudes towards population are: diverse in terms of their preferred outcomes; based on varying ethical approaches, particularly with respect to notions of equality and the level of concern for other species; sometimes under-informed and logically inconsistent and; supportive of a range of different governmental policies which cannot be pursued simultaneously. These varied attitudes have been found to exist in a context where discussions of population size are biased toward pro-growth arguments through social convention, and in which powerful economic forces conspire to negate the expression of dissenting voices or the balanced consideration of physical limits to growth. Nevertheless, the high levels of interest expressed by respondents and the willingness for public discussion of the issues indicate that the stage is set for the restrictive population taboo to be broken, although the lesser

support for open dialogue among Big Australia advocates is likely to generate some resistance.

Meanwhile, the literature review has shown Australian Government policies to: be fluctuating significantly in their stated objectives in recent decades; nevertheless have the effect of continuously and proactively increasing population size; be in contravention of signed international declarations; place emphasis on domestic implications while neglecting international effects; place emphasis on socio-economic concerns while neglecting physical environmental realities and; be lacking in clarity and devoid of specific targets. While the lack of representativeness in the sample group means that the prevalence of support for a stable or smaller population among respondents cannot be generalised to the wider Australian population, it certainly indicates the existence of substantial opposition to prevailing government objectives and policies.

Echoing the calls by the National Population Council and the 1994 governmental inquiry into Australia's carrying capacity (Cocks, 1998), the current research indicates a need to reconcile the conflicting viewpoints into a cohesive national strategy through extensive community consultation about the pros and cons of different population sizes, compositions and distributions. The current non-offensive Sustainable Population Strategy fails even to address the fundamental question of whether, given the contradictory economic, social and environmental considerations, the optimum population is bigger or smaller than the current level. Accordingly, and following the structure used by the current research instrument, public discussions should initially establish the aims of any population policy. It is considered likely that such discussions would attach greatest value to the achievement of high levels of per person wellbeing both now and into the future- in line with the Average Utilitarian and weak anthropocentric approaches. Secondly, discussion should seek to determine what level of population will be most likely to achieve the stated objectives; this will involve a process of identifying the various considerations and weighting them according to their perceived importance before considering the impact of population change on each (as has been attempted by the current study). The setting of specific targets, a move so far resisted by governments, is necessary in order to enable a holistic view of the way population change affects the accomplishment of the overall objectives, as well as to inform the next stage; the selection of appropriate policies for achieving the population targets.

The effective functioning of such a process of public consultation is likely to encounter considerable challenges, yet the current findings indicate that resistance is expected to be based on economic arguments rather than the religious and racial contentions which are frequently cited. Success will be dependent on two factors: the inclusion of a wide range of stakeholders in order to generate public legitimacy; and the need for information which is as complete as possible and widely dissipated. The latter, which can be enhanced through education, leads to the discussion of several current governmental policies which are questioned by the current findings.

Increasing education was found to be the most favoured population policy by the sample group as a whole, as well as by the independent groups of larger and smaller population proponents; the question is what should be taught. Over the past decade, the Government has taken considerable steps in reforming the neoclassical economic paradigm which has traditionally guided the development of school curricula; most notably through the release of 'Global Perspectives: A framework for global education in Australian schools' (Australian Government, 2008) which codifies a range of documents relating to education about values, the environment, and citizenry among others. The non-governmental Australian Reproductive Health Alliance (ARHA, 2004) also produces a 'Population and Development Curriculum Kit' designed to further issues related to sustainable development, population and the environment by enhancing the status of women and reproductive health rights. Formal implementation of these messages is promoted by the Federal Government led Australian Sustainable Schools Initiative (AuSSI) which, in association with state governments and other stakeholders, had restructured both curriculums and operational practices in 30% of Australian schools by 2010 (Australian Government, 2012c) yielding positive economic, social and environmental impacts according to evaluation across the measurable indicators for success specified by the program (Australian Government, 2010). These encouraging developments that future decision makers will be better informed and more prepared to discuss relevant issues than the current generation were suspended in 2011 however, when the Federal Government discontinued the meagre funding of \$3 million per year (or \$3 per pupil reached) (Sydney Morning Herald, 2012b). Reinstatement of this program and a budget increase to the \$10 million p.a. required to reach all Australian school children would clearly be welcomed by the sample group and, it is believed, by the majority of Australians. With regards to education there is always more that can be done; for information, unlike most things, is not constrained by physical limits to growth.

The current pro-natalist policy of increasing fertility rates through the Baby Bonus can be criticized on the grounds that it is not embedded into a wider population strategy and that it disregards Australia's international commitments (Graham-Smith, 1994). Even accepting the goal of promoting natural population increase, the findings from the current study reveal further problems with this policy. Firstly, respondents revealed that government policies generally are unimportant in influencing the decision of couples to reproduce, and only minimal support was revealed for the proposition that the decision is influenced by the level of financial support offered to parents. This finding is at odds with a 2009 study which attributed 37,000 extra babies to the policy between 2005 and 2006 at a cost of \$1.7 billion, or \$45,000 for each additional baby (Lain et al., 2009). Secondly, the provision of financial incentives for having children was rated by respondents as the least desirable of all the population policies examined and proved to be objectionable even to advocates of population increase. This may be due to the high cost of the program or undesirable result that the greatest increase in birth rates has been observed among teenagers (Lain et al., 2009). Based on these findings, it is recommended that the government measure the prevailing attitudes in Australia and eliminate the policy if it is found to be contrary to the majority interest. More careful analysis of the aging population phenomenon is also recommended in the designing of future solutions, including a redefinition of the dependency ratio to better reflect the high financial burden imposed by the youth segment well beyond the age of 15.

In an update which occurred after the time of writing yet before the submission of this paper, the Federal Government has indeed revealed their plan to scrap the Baby Bonus. The announcement came as part of the Federal Budget released on 14 May 2013 and included plans to discontinue maternity payments from March 2014 (The Australian, 2013). This is a positive move in terms of responsible population policies and the effective functioning of the democratic process. Furthermore, it indicates that while the current sample group may not be methodologically representative of the wider population, the views expressed by respondents may still provide a good indication of the prevailing attitudes within the society.

Finally, the legalisation of euthanasia was overwhelmingly supported by respondents to the current study. This result supports the findings of Sikora & Lewins (2007) that Australians are generally in favour of voluntary euthanasia. While this should only be done for human welfare concerns and with majority support, the positive externalities of such a shift in

government social policy would include a small reduction in the dependency ratio which would dramatically understate the resultant economic benefits of removing the most medically dependent and financially reliant individuals from society. Given the sensitivity of the issue, it is recommended that a carefully worded proposition be put to referendum in order to accurately gauge societal attitudes and that the result should be used to inform official policy.

5.2.2 Stable population advocates

A primary motivation of this study is to assist the efforts of organisations committed to resolving the population problem through the promotion and advocacy of, at least, population stability in Australia. According to Lyon & Maxwell (2004), NGOs can have a significant bearing on the path and speed at which important issues progress through the stages of the Public Policy Life Cycle, eventually leading to legislation and implementation of socially desirable policies. As the primary function of these organisations is to build awareness within the community through the dissipation of information, the recommendations based on the study findings and provided here are structured according to what messages should be communicated and who should be targeted. It is hoped that these recommendations will find application in informing the design of effective educational campaigns and the efficient segmentation of the community respectively.

First of all, the overall preference for a smaller or stable population expressed by respondents, while not necessarily representative of the wider community, nevertheless signals that there is considerable support for the work of population stability NGOs. In the same light, respondents expressed a high level of interest in the topic which, although it may indicate a selection bias in those who voluntarily participated in the study, nevertheless suggests that significant awareness and interest exists within the community. Deeper analysis of respondents' willingness to openly discuss population issues reveals that claims of a 'population taboo' operating in society are supported by the results, but only in the sense that it is considered socially unacceptable to advocate a decrease in population. While this is exactly the definition referenced by academics who claim that the taboo prevents the explicit linking of population size and environmental harms (Hardin, 1993), the term is clearly open to misinterpretation by the lesser informed who may take a wider definition and subsequently deny that the general discussion of population size is culturally off-limits. Indeed, public statements about the existence of a 'population taboo' may be

seen as providing evidence which contradicts the intended message. Based on this finding, it is recommended that organisations either rename the taboo as something more descriptive or desist from using the term altogether in order to circumvent opposition.

While interest levels are generally high, of concern is the fact that advocates of a larger population were found to be less interested in media reporting on the subject and less inclined to welcome the idea of specifying population targets than the average. This presents the challenge of how to access and influence those who oppose population policy reform. Unfortunately, the study was unable to conclusively classify either supporters or opponents of population stability according to demographic characteristics which would have been a valuable finding. Repetition of the study to engage a larger and more representative sample is recommended in order to seek such patterns, while enabling the extrapolation of attitudinal findings to the entire study population. Differences were detected with regards to the taboo however, which was found to be most strongly perceived by higher income and higher age brackets, but to decrease with higher education levels. This finding identifies a significant problem in that both of these groups perceive a vested interest in population growth, yet simultaneously suggests that the remedy lies in the distribution of appropriate information.

Despite the fact that older minds are more difficult to change, it is recommended that the mechanics and weaknesses of the dependency ratio are communicated in order to challenge the perceptions of this group. Particular attention should be paid to the generally ignored fact that domestic fertility adds to the dependency ratio, rather than lowering it, and thereby increases the economic burden on society. If it were presented that immigration is the only feasible way to rectify the dependency ratio it is believed, again based on the current findings, that support for population increase would diminish. Further, current methods of calculating the dependency ratio both underestimate the level of dependency among the youth segment and ignore the potential for economic benefits through reducing unemployment. Indeed, the addition of 16 year old school students or unemployed adults to the population would lower the dependency ratio despite clearly adding to the economic burden on society. These methodological weaknesses may be exploited in criticising the logic of current policies. The attitudes of higher income brackets are even more problematic, especially considering the economic power they wield. An appeal to values is recommended in dealing with this group, both directly by promoting social and environmental objectives in preference to economic goals, and indirectly by

influencing the views of other people with regards to values of equality; both of which are discussed below.

With regards to overall strategy, it is recommended that organisations concentrate their efforts on influencing community attitudes and stimulating debate aimed at reaching a consensus as to perceptions of an optimal Australian population size. At the same time, it is recommended that the policies and mechanisms used to achieve these goals are excluded, at least initially, from the discussion. These suggestions are based on specific findings from the current study. The sample group was almost unanimous in their assessment of the negative impacts of an increase in Australia's population, regardless of attitudes about desired population size. It was found that personal quality of life, levels of societal wellbeing and the state of the environment are all predicted to decline significantly as the population rises. Meanwhile, the more varied expectations of the effect of population growth on the economy showed a positive yet weak impact. Similarly, greater consideration of social and environmental issues was shown to correlate to preferences for a smaller population, while consideration of political and economic issues was associated with preferences for a larger population. Communications should therefore be based on an appeal to community values in order to highlight the relevance of social and environmental objectives and marginalise the importance of other factors. In a more direct disparagement of the economic argument, it could be asked what exactly the role of the economy is if not to further social and environmental objectives.

In appealing to community values, it is recommended that organisations resist the urge to advocate change for the protection of the environment itself, thereby implying the existence of intrinsic value, and instead apply a weak anthropocentric approach by referring to population impacts on humankind and future generations. This advice is based on the finding that the two most important considerations in determining the optimal population, future generations and demands on infrastructure, are inherently human centred concerns. Arguments about the protection of other species will be dismissed outright by some and regarded as less important than human concerns by others. The preferred approach would be to present, perhaps visually, contrasting pictures depicting positive images of the human experience in a low to moderate population density, juxtaposed by negative images of the same setting with a high population density. As the message should force the public to consider the impacts on their own lives, the scenes

should depict everyday experiences and may include the supermarket, public transport and traffic congestion, or parks and beaches.

Much the same situation applies with regards to the decision by Australians to have children. Given the highly egocentric considerations regarded as influencing procreation decisions and the lack of altruistic concern for the environment or the wider society, appeals to the conscience of prospective parents are unlikely to be productive; at least not unless such calls are made by a large proportion of the community and specifically by significant other people, whose opinions are regarded as influencing the decision process. It seems that communications to influence individual decisions also need to be made on an anthropocentric and, more specifically, egocentric basis. Fortunately, there is a lot of potential for progress in this respect. The findings have shown that information about parenting is systematically biased towards the presentation of positive images through a further cultural taboo restricting the expression of negative feeling about the parenting experience. The decision to reproduce is therefore taken in the absence of full information and organisations could work to rectify the imbalance. As suggested in the previous recommendation, images could be used to depict the lifestyle of a couple on a given income living the high life as DINKs (Double Income No Kids) which are contrasted with the same couple on the same income merely 'getting-by' with two young children in tow. Furthermore, reproductive decisions may be influenced by the stigma of 'strangeness' attached to child-free women which was acknowledged by 35% of respondents. It is recommended that attempts be made to eliminate such perceptions- potentially through the use of child-free role models who are encouraged to speak publicly about their decision.

As previously mentioned, it is recommended that the discussion of specific policies is initially left out of the debate. This advice is based on the logic of deciding on desirable outcomes before selecting a course of action to reach them, but also on the controversial nature of various policies as revealed by the current findings which often provide grounds for dissent; it is thought that support for population stability should be easier to muster by encouraging a 'visioning' of possible outcomes in the absence of such contentions. While the study has revealed only minor support for the idea that restrictive population control inflames religious and racial sentiments, the limits imposed on personal freedoms are considered unacceptable by many. This situation is unlikely to improve in the future given the reference in governmental school curriculum guidance that students should test their opinions and views against the positions and values that are embodied in the Universal

Declaration of Human Rights (Australian Government, 2008). Furthermore, despite the fact that immigration more effectively solves economic concerns while minimising global environmental impacts, the strong preference for domestic fertility over immigration revealed by the survey poses another problem of referring to specific policies. Later however, once targets have been established and natural increase has declined, this same racial prejudice may prove to be a useful ally in the case for smaller populations.

Two current policies are worthy of attention in the short term. The study has revealed general opposition to maternity payments and general support for the legalisation of euthanasia; both of which may influence the overall size of the population. Given the recent decision by the Federal government to scrap the Baby Bonus, this policy no longer requires attention. It is recommended that moves to reform the current policies forbidding euthanasia should be pursued by subsidiary organisations rather than advocates of population stability in order to distance them from negative reactions from minority groups. Actions should be based on the premise of reflecting community preferences however, rather than reducing population growth, in order to avoid accusations of seeking to kill-off the current population.

Finally, encouraging the development of notions of equality is essential to make the population problem relevant to Australians. As an affluent country, perceptions will persist that economic superiority will enable the country to acquire the resources it needs for its own people. Even the threat of climate change refugees arriving on a mass scale may be interpreted as necessitating a militarisation of the country's extensive borders and thereby justify significant population increase. Furthering the extent to which a broad perspective of equality is extended to include the global community is a key to negating these arguments. The current deficiency in perspectives of global equality is evidenced by the way that respondents viewed environmental considerations as determinants of optimal population size at the global and domestic levels; where respondents revealed that environmental considerations should be given more weight internationally than domestically. Work should be done to reconcile these conflicting assessments, potentially by asking Australians why they believe that other countries shouldn't apply the same considerations as Australia in designing their policies and questioning what the outcome of such an approach would be. As discussed, older age brackets and higher income brackets are the most problematic in this respect. It is considered unlikely that entrenched attitudes among the elderly, which may consider other nation as enemies rather than allies, can be

converted. The view point of higher income brackets, on the other hand, which invariably have more to lose from the adoption of egalitarian perspectives may be influenced by widespread community attitudes that it is socially unacceptable for some to thrive while others suffer. Distributive reforms in the shape of draconian progressive tax rates and wealth taxes designed to reduce domestic inequality would also be useful in achieving this goal.

It is hoped that these recommendations are useful in informing the valuable work of organisations committed to reforming Australia's problematic population growth.

5.3 Implications for future research

The importance of population size as a determinant of environmental impacts makes it a relevant topic for further research. As discussed numerous times, the major failing of this study is the lack of methodological representativeness which prevents the extrapolation of the findings to the intended study population. Repetition of the study with a larger sample is therefore recommended in order to remedy these flaws.

Specific knowledge gaps identified in the course of the study include an incomplete understanding of the factors influencing individual's decisions to reproduce and the prevalence of racist attitudes within the community which lead people to favour domestic fertility over immigration despite contradicting their stated objectives. Both of these areas are considered as deserving of more thorough scientific scrutiny.

At a more general level, inconsistencies between stated objectives and support for specific courses of action are evident both at the individual level and national policy level. These inconsistencies can only be explained with reference to the conflict between physical science realities and the economic growth paradigm which still dominates contemporary thinking. Any efforts to reconcile these two elements through interdisciplinary research leading to a more holistic framework will surely be beneficial in addressing the myriad challenges of the current century.

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Appendices

Appendix A: Copy of online survey

from SurveyMonkey; www.surveymonkey.com/s/australia_population

Welcome

This ANONYMOUS survey for all Australian citizens seeks to collect YOUR OPINION of the size and growth of the Australian population.

The survey has 7 pages of questions and takes around 10 MINUTES to complete.

The results will be used for my Masters Thesis (available on request in July, 2013).

Please contact me with any questions or suggestions:

David Leonard
tourguidedave@gmail.com

***1. Tick one box on each row to indicate your level of agreement with each of the following statements**

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
I have previously thought about issues of population size	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am interested in media reports about population size	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Optimal population size should be publicly debated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is desirable to set specific targets for population size	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The optimal GLOBAL population is larger than the current level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The optimal GLOBAL population is smaller than the current level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The optimal AUSTRALIAN population is larger than the current level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The optimal AUSTRALIAN population is smaller than the current level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is pointless to discuss optimal population size	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If you think discussion of population size is pointless please indicate why. . .

***2. In thinking about the optimal size for the GLOBAL population, it is important to consider:**

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
Economic issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental impacts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other consideration (please specify)

***3. In thinking about the optimal size for AUSTRALIA'S population, it is important to consider:**

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
National defense capabilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Greenhouse gas emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Australia's international political power	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Demands on infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Future generations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Level of ethnic diversity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Current technology levels	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The global population level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other species	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
House prices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
International poverty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our desired consumption levels	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other consideration (please specify)	<input type="text"/>				

***4. Tick one box on each row to indicate your level of agreement with each of the following statements**

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
The Earth's human population could grow indefinitely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Earth's population will naturally stabilise itself at a desirable level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Women who don't want children are considered strange	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Men who don't want children are considered strange	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is socially acceptable for a parent to express regret at having children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is socially acceptable to discuss population size	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is socially acceptable to advocate increasing Australia's population	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is socially acceptable to advocate decreasing Australia's population	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

***5. Tick one box on each row to indicate your level of agreement with each statement beginning:**

In Australia, government policies to influence population size . . .

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
. . . are currently used	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . are desirable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . infringe on individual freedoms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . should include restrictions on immigration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . should include financial incentives for having children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . should include financial incentives for remaining child free	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . should include legalized contraception	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . should include legalized abortion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . should include legalized euthanasia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . should include increasing education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . should include a system of birth licenses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . should include subsidies for child related expenses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . offend people on racial grounds	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . offend people on religious grounds	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . offend people for other reasons	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Why are people offended by Government policies for population control?

*6. Tick one box on each row to indicate your level of agreement with each statement beginning:

An increase in Australia's population . . .

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
. . . is necessary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . would improve my quality of life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . would reduce my quality of life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . would improve wellbeing within society	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . would reduce wellbeing within society	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . would be beneficial for the environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . would be detrimental for the environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . would be beneficial for the economy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . would be detrimental for the economy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . , if it must occur, should result mainly from domestic fertility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . , if it must occur, should result mainly from immigration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
. . . , if it must occur, should result mainly from lower mortality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. Tick one box on each row to indicate your level of agreement with each statement beginning:

For most people, the decision to have a child (or another child) is influenced by . . .

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
government policies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
their expectation of greater happiness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
their financial means	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
the impact it will have on society	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
the impacts it will have on the environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
the impact it will have on the economy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
the level of financial support offered by government	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
the happiness of the unborn child	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
religious beliefs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
the expectations of other people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
anticipated effects on their relationship with their partner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other influence on the decision to have children

*8. Choose the (single) answer which best completes the statement:

My "fair share" of the world's resources is . . .

- . . . whatever I can afford
- . . . Australia's total resources divided by Australia's total population
- . . . the world's total resources divided by the world population
- . . . less than the world's total resources divided by the current world population

Other (please specify)

*9. Choose the best option from each of the drop-down menus

My gross annual income is . . . My religion is . . . My highest educational qualification is . . . My age (in years) is . . . My political persuasion is . . . My gender is . . .

*

*10. Choose the best option from each of the drop-down menus

I found the link to this survey . . . I own some real estate . . . My state/territory of residence is . . . I am an Australian resident . . . I was born . . . My ethnic background is . . .

*

Demographic questions with expansion of the single choice drop-down menus

My gross annual income is . . .

- < \$6,000
- \$6,001 to \$18,000
- \$18,001 to \$37,000
- \$37,001 to \$80,000
- \$80,001 to \$180,000
- > \$180,001
- I'd rather not say

My age (in years) is . . .

- 19 to 30
- 31 to 42
- 43 to 54
- 55 to 66
- 67 to 78
- 79 to 90
- > 90

My religion is . . .

- I'd rather not say
- No religion
- Roman Catholic
- Anglican
- Other Christian denomination
- Buddhist
- Hindu
- Jewish
- Islam
- Indigenous beliefs
- Other religion

My political persuasion is . . .

- Labour
- Liberal
- National
- Green
- Democrat
- Independent
- Other
- I'd rather not say

My gender is . . .

- Male
- Female
- Other

My highest educational qualification is . .

- Less than high school graduation
- High school graduation
- Certificate I-IV
- Diploma (Advanced/Graduate)
- Undergraduate degree
- Postgraduate degree

I found the link to this survey . . .

- From family or friends
- In an internet forum
- On a facebook page
- On the SPA website

I own some real estate

- Yes
- No

My state/territory of residence is . . .

- ACT
- NSW
- NT
- QLD
- SA
- TAS
- VIC
- WA

I am an Australian resident

- Yes
- No

I was born . . .

- In Australia
- Overseas

My ethnic background is . . .

- American
- Armenian
- Australian

Australian Aboriginal

ChineseCroatian

Dutch

English

Filipino

French

German

Greek

Hungarian

Indian

Indonesian

Irish

Italian

Lebanese

Macedonian

Maltese

New Zealand

Russian

Scottish

Serbian

Sinhalese

South African

Spanish

Turkish

Welsh

Other

Appendix B: Demographic Data

B.1 Age

Table 11: Sample group age distribution

age		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	19 to 30	51	17.5	17.5	17.5
	31 to 42	117	40.2	40.2	57.7
	43 to 54	42	14.4	14.4	72.2
	55 to 66	51	17.5	17.5	89.7
	67 to 78	21	7.2	7.2	96.9
	79 to 90	3	1.0	1.0	97.9
	over 90	3	1.0	1.0	99.0
	not provided	3	1.0	1.0	100.0
	Total	291	100.0	100.0	

Table 12: Cross-tabulation of age and survey access point

age * found link Cross-tabulation		found link				Total	
		1	2	3	4		
age	19 to 30	Count	24	0	24	3	51
		Expected	22.1	5.8	20.5	2.6	51.0
	31 to 42	Count	51	15	48	3	117
		Expected	50.7	13.3	47.0	6.0	117.0
	43 to 54	Count	9	6	21	6	42
		Expected	18.2	4.8	16.9	2.2	42.0
	55 to 66	Count	18	9	21	3	51
		Expected	22.1	5.8	20.5	2.6	51.0
	67 to 78	Count	15	3	3	0	21
		Expected	9.1	2.4	8.4	1.1	21.0
	79 to 90	Count	3	0	0	0	3
		Expected	1.3	.3	1.2	.2	3.0
	over 90	Count	3	0	0	0	3
		Expected	1.3	.3	1.2	.2	3.0
	not provided	Count	3	0	0	0	3
		Expected	1.3	.3	1.2	.2	3.0
Total		Count	126	33	117	15	291
		Expected	126.0	33.0	117.0	15.0	291.0
		Count					

B.2 Gender

Table 13: Sample group gender frequencies

gender		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	153	52.6	52.6	52.6
	Female	138	47.4	47.4	100.0
	Total	291	100.0	100.0	

B.3 Income

Table 14: Sample group income distribution

income		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< \$6,000	15	5.2	5.2	5.2
	\$6,001 to \$18,000	18	6.2	6.2	11.3
	\$18,001 to \$37,000	30	10.3	10.3	21.6
	\$37,001 to \$80,000	120	41.2	41.2	62.9
	\$80,001 to \$180,000	78	26.8	26.8	89.7
	> \$180,001	24	8.2	8.2	97.9
	not provided	6	2.1	2.1	100.0
Total	291	100.0	100.0		

Table 15: Correlation between education and income

Correlations between education and income			education	income
Kendall's tau_b	education	Correlation Coefficient	1.000	.212**
		Sig. (2-tailed)	.	.000
		N	291	291
	income	Correlation Coefficient	.212**	1.000
		Sig. (2-tailed)	.000	.
		N	291	291

** . Correlation is significant at the 0.01 level (2-tailed).

B.4 Educational attainment

Table 16: Sample group educational attainment

education		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than high school graduation	12	4.1	4.1	4.1
	high school graduation	27	9.3	9.3	13.4
	Certificate I to IV	33	11.3	11.3	24.7
	Diploma	36	12.4	12.4	37.1
	Undergraduate degree	102	35.1	35.1	72.2
	Postgraduate degree	81	27.8	27.8	100.0
	Total	291	100.0	100.0	

B.5 Political persuasion

Table 17: Sample group political persuasion

political persuasion		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Labour	36	12.4	12.4	12.4
	Liberal	63	21.6	21.6	34.0
	National	6	2.1	2.1	36.1
	Green	84	28.9	28.9	64.9
	Democrat	3	1.0	1.0	66.0
	Independent	24	8.2	8.2	74.2
	Other	45	15.5	15.5	89.7
	not provided	30	10.3	10.3	100.0
	Total	291	100.0	100.0	

B.6 State of residence

Table 18: Sample group state of residence

state		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ACT	6	2.1	2.1	2.1
	NSW	39	13.4	13.4	15.5
	NT	6	2.1	2.1	17.5
	QLD	51	17.5	17.5	35.1
	SA	27	9.3	9.3	44.3
	TAS	15	5.2	5.2	49.5
	VIC	51	17.5	17.5	67.0
	WA	96	33.0	33.0	100.0
	Total	291	100.0	100.0	

Table 19: Cross-tabulation between state of residence and survey access point

state * found link Crosstabulation							
		found link				Total	
		1	2	3	4		
state	ACT	Count	0	0	6	0	6
		Expected Count	2.6	.7	2.4	.3	6.0
NSW	Count	12	9	15	3	39	
		Expected Count	16.9	4.4	15.7	2.0	39.0
NT	Count	6	0	0	0	6	
		Expected Count	2.6	.7	2.4	.3	6.0
QLD	Count	9	9	27	6	51	
		Expected Count	22.1	5.8	20.5	2.6	51.0
SA	Count	18	3	6	0	27	
		Expected Count	11.7	3.1	10.9	1.4	27.0
TAS	Count	3	3	9	0	15	
		Expected Count	6.5	1.7	6.0	.8	15.0
VIC	Count	18	6	24	3	51	
		Expected Count	22.1	5.8	20.5	2.6	51.0
WA	Count	60	3	30	3	96	
		Expected Count	41.6	10.9	38.6	4.9	96.0
Total	Count	126	33	117	15	291	
		Expected Count	126.0	33.0	117.0	15.0	291.0

B.7 Access of survey

Table 20: Frequency table of survey access points

found link		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	126	43.3	43.3	43.3
	2	33	11.3	11.3	54.6
	3	117	40.2	40.2	94.8
	4	15	5.2	5.2	100.0
	Total	291	100.0	100.0	

Appendix C: Attitudinal Data

C.1 Optimal Australian population size

Table 21: Attitudes towards larger Australian population

optimal AUSTRALIA larger than current					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	72	24.7	24.7	24.7
	2	45	15.5	15.5	40.2
	3	60	20.6	20.6	60.8
	4	72	24.7	24.7	85.6
	5	42	14.4	14.4	100.0
	Total	291	100.0	100.0	

Table 22: Attitudes towards smaller Australian population

optimal AUSTRALIA smaller than current					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	51	17.5	17.5	17.5
	2	66	22.7	22.7	40.2
	3	81	27.8	27.8	68.0
	4	30	10.3	10.3	78.4
	5	63	21.6	21.6	100.0
	Total	291	100.0	100.0	

C.2 Anticipated impacts of an increase in Australia's population

Table 23: Impacts of population increase on quality of life

Increase quality of life					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	-4.00	72	24.7	24.7	24.7
	-3.00	18	6.2	6.2	30.9
	-2.00	42	14.4	14.4	45.4
	-1.00	45	15.5	15.5	60.8
	.00	93	32.0	32.0	92.8
	1.00	3	1.0	1.0	93.8
	2.00	18	6.2	6.2	100.0
	Total	291	100.0	100.0	

Table 24: Impacts of population increase on societal wellbeing

Increase wellbeing					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	-4.00	69	23.7	23.7	23.7
	-3.00	12	4.1	4.1	27.8
	-2.00	51	17.5	17.5	45.4
	-1.00	24	8.2	8.2	53.6
	.00	108	37.1	37.1	90.7
	1.00	3	1.0	1.0	91.8
	2.00	18	6.2	6.2	97.9
	3.00	3	1.0	1.0	99.0
	4.00	3	1.0	1.0	100.0
	Total	291	100.0	100.0	

Table 25: Impacts of population increase on the environment

Increase environment					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	-4.00	132	45.4	45.4	45.4
	-3.00	24	8.2	8.2	53.6
	-2.00	66	22.7	22.7	76.3
	-1.00	18	6.2	6.2	82.5
	.00	33	11.3	11.3	93.8
	1.00	3	1.0	1.0	94.8
	2.00	3	1.0	1.0	95.9
	4.00	12	4.1	4.1	100.0
	Total	291	100.0	100.0	

Table 26: Impacts of population increase on the economy

Increase economy					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	-4.00	24	8.2	8.2	8.2
	-3.00	9	3.1	3.1	11.3
	-2.00	24	8.2	8.2	19.6
	-1.00	15	5.2	5.2	24.7
	.00	93	32.0	32.0	56.7
	1.00	24	8.2	8.2	64.9
	2.00	60	20.6	20.6	85.6
	3.00	9	3.1	3.1	88.7
	4.00	33	11.3	11.3	100.0
	Total	291	100.0	100.0	

Table 27: Regression: Anticipated impacts of population increase as predictors of optimal population attitudes

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.554 ^a	.307	.298	2.25586

a. Predictors: (Constant), economy, environment, wellbeing, quality of life

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	646.060	4	161.515	31.739	.000 ^b
	Residual	1455.425	286	5.089		
	Total	2101.485	290			

a. Dependent Variable: AUSTRALIA total
b. Predictors: (Constant), economy, environment, wellbeing, quality of life

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.395	.243		1.628	.105
	Quality of life	.547	.106	.370	5.149	.000
	wellbeing	.042	.099	.030	.421	.674
	environment	-.113	.072	-.084	-1.577	.116
	economy	.320	.071	.261	4.487	.000

a. Dependent Variable: AUSTRALIA total

C.3 Determinants of an optimal Australian population size

Table 28: Determinants of optimal Australian population

	National defence	Greenhouse gas emissions	international political power	Demands on infrastructure	Future generations	ethnic diversity	technology levels	global population	Other species	House prices	International poverty	desired consumption
V	291	291	291	291	291	291	291	291	291	291	291	291
M	0	0	0	0	0	0	0	0	0	0	0	0
Mean	3.19	4.03	3.0	4.4	4.4	3.2	3.6	3.6	4.1	3.4	3.5	3.9
n		1	3	1	6	8	0	4	8	6	3	2

Table 29: Regression: consideration variables as predictors of opinions about optimal size of Australian population

Model Summary							
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate			
1	.493 ^a	.243	.210	2.39188			
a. Predictors: (Constant), desired consumption levels, ethnic diversity, National defence, Demands on infrastructure, Greenhouse gas emissions, House prices, technology levels, International poverty, global population , Other species, Future generations, international political power							

ANOVA^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	511.016	12	42.585	7.443	.000 ^b
	Residual	1590.469	278	5.721		
	Total	2101.485	290			

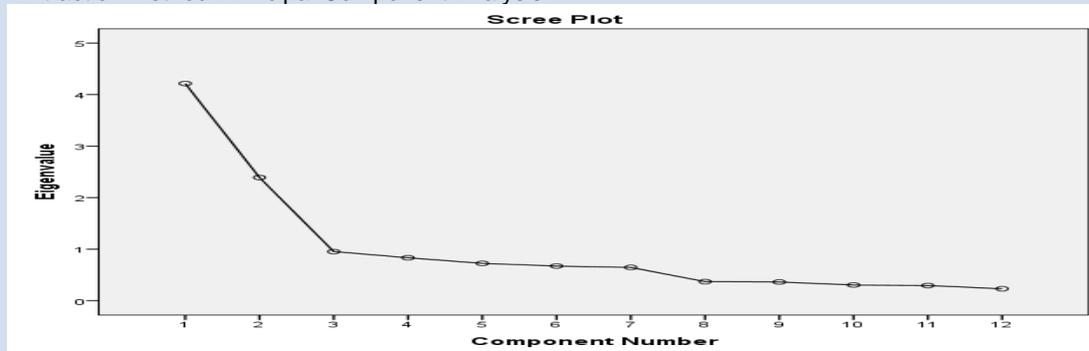
Coefficients^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.698	1.093		1.554	.121		
	National defence	-.080	.187	-.032	-.429	.669	.477	2.096
	GHG emission	.275	.187	.105	1.471	.142	.529	1.889
	International political power	.600	.205	.230	2.929	.004	.442	2.261
	Demands on infrastructure	.347	.260	.092	1.334	.183	.568	1.759
	Future gen.	-.369	.276	-.104	-1.34	.182	.447	2.237
	Ethnic diversity	.067	.156	.028	.430	.668	.656	1.523
	Tech.levels	-.171	.209	-.058	-.820	.413	.539	1.856
	Global pop.	-.211	.169	-.090	-1.24	.215	.517	1.934
	Other species	-1.10	.202	-.425	-5.45	.000	.448	2.233
	House prices	.050	.162	.020	.310	.757	.625	1.601
	International poverty	-.196	.161	-.084	-1.218	.224	.568	1.760
	Consumption levels	.500	.213	.197	2.343	.020	.384	2.607
	a. Dependent Variable: AUSTRALIAtotal							

Table 30: Factor analysis of consideration variables

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.780
Bartlett's Test of Sphericity	Approx. Chi-Square	1412.260
	df	66
	Sig.	.000

Total Variance Explained							
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	
1	4.214	35.119	35.119	4.214	35.119	35.119	
2	2.390	19.920	55.039	2.390	19.920	55.039	
3	.953	7.945	62.984				
4	.833	6.943	69.927				
5	.725	6.041	75.968				
6	.673	5.608	81.576				
7	.646	5.382	86.959				
8	.370	3.086	90.045				
9	.363	3.025	93.070				
10	.305	2.539	95.609				
11	.295	2.458	98.067				
12	.232	1.933	100.000				

Extraction Method: Principal Component Analysis.



Component Matrix^a

	Component	
	1	2
National defence	.069	.823
Greenhouse gas emissions	.679	-.027
International political power	.076	.840
Demands on infrastructure	.645	.089
Future generations	.752	-.088
Ethnic diversity	.069	.639
Technology levels	.714	.081
Global population	.724	.009
Other species	.728	-.292
House prices	.217	.680
International poverty	.683	.005
Desired consumption levels	.825	-.169

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

Table 31: Regression: consideration components as predictors of opinions about optimal Australian population

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.380 ^a	.144	.139	2.49851

a. Predictors: (Constant), REGR factor score 2 for analysis 1, REGR factor score 1 for analysis 1

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	303.625	2	151.813	24.319	.000 ^b
	Residual	1797.859	288	6.243		
	Total	2101.485	290			

a. Dependent Variable: AUSTRALIAtotal
b. Predictors: (Constant), REGR factor score 2 for analysis 1, REGR factor score 1 for analysis 1

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.072	.146		-.493	.623		
	REGR factor score 1 for analysis 1	-.638	.147	-.237	-4.347	.000	1.000	1.000
	REGR factor score 2 for analysis 1	.800	.147	.297	5.453	.000	1.000	1.000

a. Dependent Variable: AUSTRALIAtotal

Collinearity Diagnostics ^a						
Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	REGR factor score 1 for analysis 1	REGR factor score 2 for analysis 1
1	1	1.000	1.000	.50	.50	.00
	2	1.000	1.000	.00	.00	1.00
	3	1.000	1.000	.50	.50	.00

a. Dependent Variable: AUSTRALIAtotal

C.4 Optimal global population size

Table 32: Attitudes towards larger global population

optimal GLOBAL larger than current					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	132	45.4	45.4	45.4
	2	60	20.6	20.6	66.0
	3	54	18.6	18.6	84.5
	4	24	8.2	8.2	92.8
	5	21	7.2	7.2	100.0
	Total	291	100.0	100.0	

Table 33: Attitudes towards smaller global population

optimal GLOBAL smaller than current					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	27	9.3	9.3	9.3
	2	36	12.4	12.4	21.6
	3	57	19.6	19.6	41.2
	4	63	21.6	21.6	62.9
	5	108	37.1	37.1	100.0
	Total	291	100.0	100.0	

Table 34: Wilcoxon Signed Ranks Test comparing attitudes towards Australian and global population sizes

Ranks				
		N	Mean Rank	Sum of Ranks
AUSTRALIAtotal - GLOBALtotal	Negative Ranks	27 ^a	42.17	1138.50
	Positive Ranks	138 ^b	90.99	12556.50
	Ties	126 ^c		
	Total	291		
a. AUSTRALIAtotal < GLOBALtotal				
b. AUSTRALIAtotal > GLOBALtotal				
c. AUSTRALIAtotal = GLOBALtotal				

Test Statistics ^a	
	AUSTRALIAtotal - GLOBALtotal
Z	-9.341 ^b
Asymp. Sig. (2-tailed)	.000
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

C.5 Determinants of an optimal global population size

Table 35: Determinants of optimal global population size

		Economic	Environment	Social
N	Valid	291	291	291
	Missing	0	0	0
Mean		4.00	4.70	4.42

Table 36: Regression: consideration variables as predictors of opinions about optimal size of global population

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.207 ^a	.043	.033	2.47062

a. Predictors: (Constant), Social, Environment, Economic

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	78.536	3	26.179	4.289	.006 ^b
	Residual	1751.835	287	6.104		
	Total	1830.371	290			

a. Dependent Variable: GLOBALtotal
b. Predictors: (Constant), Social, Environment, Economic

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.214	1.176		1.033	.302
	Economic	.511	.206	.187	2.487	.013
	Environment	-.673	.315	-.160	-2.135	.034
	Social	-.368	.311	-.105	-1.183	.238

a. Dependent Variable: GLOBALtotal

C.6 Comparison of Australian and global population perceptions

Table 37: Wilcoxon Signed Ranks Test comparing Australian and global population perceptions

Ranks		N	Mean Rank	Sum of Ranks
Greenhouse gas emissions - Environment	Negative Ranks	132 ^a	68.51	9043.50
	Positive Ranks	3 ^b	45.50	136.50
	Ties	156 ^c		
	Total	291		

a. AUSTRALIA consider: Greenhouse gas emissions < GLOBAL consider:Environment
b. AUSTRALIA consider: Greenhouse gas emissions > GLOBAL consider:Environment
c. AUSTRALIA consider: Greenhouse gas emissions = GLOBAL consider:Environment

Test Statistics ^a		Greenhouse gas emissions - Environment
Z		-10.181 ^b
Asymp. Sig. (2-tailed)		.000

a. Wilcoxon Signed Ranks Test
b. Based on positive ranks.

C.7 Interest and views of population discussions

Table 38: Interest and views of population discussions

		previously thought about	interested in media reports	Optimal should be debated	desirable to set targets
N	Valid	291	291	291	291
	Missing	0	0	0	0
Mean		4.22	3.87	4.07	3.95

Table 39: Regression: interest level as predictor of attitudes towards the optimal population level

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.479 ^a	.230	.222	2.37482

a. Predictors: (Constant), desirable to set targets, interested in media reports, optimal should be debated

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	482.876	3	160.959	28.540	.000 ^b
	Residual	1618.608	287	5.640		
	Total	2101.485	290			

a. Dependent Variable: AUSTRALIAtotal
b. Predictors: (Constant), desirable to set targets , interested in media reports , Optimal should be debated

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
		B	Std. Error			
1	(Constant)	5.835	.657		8.878	.000
	interested in media reports	-.565	.183	-.200	-3.087	.002
	Optimal should be debated	-.519	.232	-.195	-2.241	.026
	desirable to set targets	-.407	.206	-.160	-1.978	.049

a. Dependent Variable: AUSTRALIAtotal

C.8 Population taboo

Table 40: Social acceptability of discussing population size

socially acceptable to discuss					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	33	11.3	11.3	11.3
	3	42	14.4	14.4	25.8
	4	144	49.5	49.5	75.3
	5	72	24.7	24.7	100.0
	Total	291	100.0	100.0	

Table 41: Social acceptability of advocating population increase

socially acceptable advocate increasing Australia					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	24	8.2	8.2	8.2
	2	42	14.4	14.4	22.7
	3	72	24.7	24.7	47.4
	4	132	45.4	45.4	92.8
	5	21	7.2	7.2	100.0
	Total	291	100.0	100.0	

Table 42: Social acceptability of advocating population decrease

socially acceptable advocate decreasing Australia					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	21	7.2	7.2	7.2
	2	105	36.1	36.1	43.3
	3	78	26.8	26.8	70.1
	4	63	21.6	21.6	91.8
	5	24	8.2	8.2	100.0
	Total	291	100.0	100.0	

Table 43: Wilcoxon Signed Ranks Test comparing social acceptability increase and decrease

Ranks					
			N	Mean Rank	Sum of Ranks
socially acceptable advocate decreasing Australia -	socially acceptable advocate increasing Australia	Negative Ranks	126 ^a	87.46	11020.50
		Positive Ranks	57 ^b	102.03	5815.50
		Ties	108 ^c		
		Total	291		

a. socially acceptable advocate decreasing Australia < socially acceptable advocate increasing Australia

b. socially acceptable advocate decreasing Australia > socially acceptable advocate increasing Australia

c. socially acceptable advocate decreasing Australia = socially acceptable advocate increasing Australia

Test Statistics^a

	socially acceptable advocate decreasing Australia - socially acceptable advocate increasing Australia
Z	-3.686 ^b
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test
b. Based on positive ranks.

Table 44: Regression: demographic factors as predictors of social acceptability

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	40.139	5	8.028	7.541	.000 ^b
	Residual	303.407	285	1.065		
	Total	343.546	290			

a. Dependent Variable: socially acceptable advocate decreasing Australia
b. Predictors: (Constant), own real estate, gender, education, age , income

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	5.143	.468		10.986	.000		
	income	-.205	.054	-.238	-3.781	.000	.783	1.278
	education	-.079	.044	-.105	-1.788	.075	.901	1.110
	age	-.169	.045	-.219	-3.777	.000	.925	1.081
	gender	-.108	.129	-.049	-.830	.407	.875	1.143
	own real estate	-.210	.131	-.093	-1.599	.111	.910	1.098

a. Dependent Variable: socially acceptable advocate decreasing Australia

C.9 Procreation decisions

Table 45: Influence of considerations on procreation decisions

Statistics

		government policies	expected happiness	financial means	social impact	environmental impact	economic impact	financial support	child happiness	religious beliefs	other people	relationship effects
N	V	291	291	291	291	291	291	291	288	291	291	291
	M	0	0	0	0	0	0	0	3	0	0	0
Mean		2.6	4.0	3.5	2.0	1.8	1.9	3.3	3.1	3.6	3.7	3.8
		0	2	5	7	2	0	4	0	4	4	1

C.10 Societal attitudes towards child bearing

Table 46: Attitudes towards child-free women

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	84	28.9	28.9	28.9
	2	48	16.5	16.5	45.4
	3	57	19.6	19.6	64.9
	4	78	26.8	26.8	91.8
	5	24	8.2	8.2	100.0
	Total	291	100.0	100.0	

Table 47: Attitudes towards child-free men

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	96	33.0	33.0	33.0
	2	90	30.9	30.9	63.9
	3	72	24.7	24.7	88.7
	4	33	11.3	11.3	100.0
	Total	291	100.0	100.0	

Table 48: Wilcoxon Signed Ranks Test comparing attitudes towards child-free women and men

		N	Mean Rank	Sum of Ranks
Men don't want children strange - Women don't want children strange	Negative Ranks	84 ^a	44.96	3777.00
	Positive Ranks	3 ^b	17.00	51.00
	Ties	204 ^c		
	Total	291		

a. Men don't want children strange < Women don't want children strange
b. Men don't want children strange > Women don't want children strange
c. Men don't want children strange = Women don't want children strange

Test Statistics ^a	
Z	Men don't want children strange - Women don't want children strange -8.002 ^b
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test
b. Based on positive ranks.

C.11 Information about parenting

Table 49: Social acceptability of expressing regret at having children

socially acceptable to express regret at having children					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	72	24.7	24.7	24.7
	2	120	41.2	41.2	66.0
	3	48	16.5	16.5	82.5
	4	42	14.4	14.4	96.9
	5	9	3.1	3.1	100.0
	Total	291	100.0	100.0	

C.12 Population policy tools

Table 50: Racial offensiveness of population policies

policies offend racial					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	63	21.6	21.6	21.6
	2	75	25.8	25.8	47.4
	3	84	28.9	28.9	76.3
	4	57	19.6	19.6	95.9
	5	12	4.1	4.1	100.0
	Total	291	100.0	100.0	

Table 51: Religious offensiveness of population policies

policies offend religious					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	54	18.6	18.6	18.6
	2	66	22.7	22.7	41.2
	3	93	32.0	32.0	73.2
	4	63	21.6	21.6	94.8
	5	15	5.2	5.2	100.0
	Total	291	100.0	100.0	

Table 52: Offence of population policies against personal freedoms

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	18	6.2	6.2	6.2
	2	72	24.7	24.7	30.9
	3	102	35.1	35.1	66.0
	4	75	25.8	25.8	91.8
	5	24	8.2	8.2	100.0
	Total	291	100.0	100.0	

Table 53: Desirability of various policy tools

Statistics		immigration restrictions	incentives for children	incentives for child free	legalized contraceptio	n	legalized abortion	legalized euthanasia	increasing education	birth licenses	subsidies child
N	Valid	291	291	291	291	291	291	291	291	291	291
	Missing	0	0	0	0	0	0	0	0	0	0
Mean		3.75	2.33	2.79	4.08		4.09	3.78	4.47	2.55	2.93

Table 54: Desirability of policy tools for different groups

Statistics			immigration restrictions	incentives for children	incentives for child free	legalized contraceptio	legalized abortion	legalized euthanasia	increasing education	birth licenses	subsidies child
groups (1 larger, 2 smaller)											
1	N	Valid	114	114	114	114	114	114	114	114	114
		Missing	0	0	0	0	0	0	0	0	0
		Mean	3.45	2.82	2.29	4.13	4.21	3.58	4.55	2.16	3.08
2	N	Valid	177	177	177	177	177	177	177	177	177
		Missing	0	0	0	0	0	0	0	0	0
		Mean	3.95	2.02	3.12	4.05	4.02	3.92	4.42	2.80	2.83

Table 55: Mann-Whitney Test comparing desirability of policy tools for different groups

Ranks			groups Australia (1 larger, 2 smaller)	N	Mean Rank	Sum of Ranks
policies should immigration restrictions			1	114	123.93	14128.50
			2	177	160.21	28357.50
			Total	291		
policies should incentives for children			1	114	173.79	19812.00
			2	177	128.10	22674.00
			Total	291		
policies should incentives for child free			1	114	111.86	12751.50
			2	177	167.99	29734.50
			Total	291		
policies should legalized contraception			1	114	154.05	17562.00
			2	177	140.81	24924.00
			Total	291		
policies should legalized abortion			1	114	154.88	17656.50
			2	177	140.28	24829.50
			Total	291		
policies should legalized euthanasia			1	114	134.00	15276.00
			2	177	153.73	27210.00
			Total	291		
policies should increasing education			1	114	150.93	17206.50
			2	177	142.82	25279.50
			Total	291		
policies should birth licenses			1	114	116.91	13327.50
			2	177	164.74	29158.50
			Total	291		
policies should subsidies child expenses			1	114	157.92	18003.00
			2	177	138.32	24483.00
			Total	291		

Test Statistics ^a										
	immigration restrictions	incentives for children	incentives for child free	legalized contraception	legalized abortion	legalized euthanasia	Increase education	birth licenses	subsidies child expenses	
M-	7573.	6921.	6196.	9171.	9076.	8721.	9526.	6772.	8730.	
W	500	000	500	000	500	000	500	500	000	
Wil	14128	22674	12751	24924	24829	15276	25279	13327	24483	
cox	.500	.000	.500	.000	.500	.000	.500	.500	.000	
Z	-3.749	-4.689	-5.740	-1.393	-1.541	-2.045	-.913	-4.954	-2.012	
Sig. (2-t)	.000	.000	.000	.164	.123	.041	.361	.000	.044	

a. Grouping Variable: groups Australia (1 larger, 2 smaller)

C.13 Immigration, domestic fertility or mortality rates?

Table 56: Preferred means of population increase

Statistics		domestic fertility	immigration	lower mortality
N	Valid	291	291	291
	Missing	0	0	0
Mean		3.28	2.52	2.98

Table 57: Regression: population determinants as predictors of attitudes about immigration

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.425 ^a	.181	.145	.903

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	49.986	12	4.165	5.108	.000 ^b
	Residual	226.694	278	.815		
	Total	276.680	290			

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.630	.413		8.800	.000
	National defence	.050	.070	.056	.708	.479
	Greenhouse gas emissions	.238	.071	.251	3.371	.001
	international political power	-.052	.077	-.055	-.669	.504
	Demands on infrastructure	-.308	.098	-.225	-3.130	.002
	Future generations	-.029	.104	-.023	-.278	.781
	ethnic diversity	-.019	.059	-.021	-.315	.753
	technology levels	-.144	.079	-.135	-1.827	.069
	global population	.183	.064	.216	2.861	.005
	Other species	-.215	.076	-.229	-2.818	.005
	House prices	-.128	.061	-.144	-2.095	.037
	International poverty	.063	.061	.075	1.046	.297
	desired consumption levels	.113	.081	.123	1.402	.162

a. Dependent Variable: increase should immigration

Table 58: Correlation between importance of ethnic diversity and attitude towards immigration

Correlations					
Kendall's tau_b	AUSTRALIA consider: ethnic diversity	increase should immigration	AUSTRALIA consider: ethnic diversity	1.000	increase should immigration
			Correlation Coefficient	.058	
			Sig. (2-tailed)	.291	
			N	291	
		increase should immigration	Correlation Coefficient	-.093	1.000
			Sig. (2-tailed)	.058	
			N	291	291

C.14 Perceptions of equality

Table 59: Interpretations of a 'fair share' of resources

"fair share"					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	81	27.8	27.8	27.8
	2	42	14.4	14.4	42.3
	3	60	20.6	20.6	62.9
	4	108	37.1	37.1	100.0
	Total	291	100.0	100.0	

Table 60: Correlation between concern for future generations and perceptions of equality

Symmetric Measures						
			Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Ordinal	by	Kendall's tau-b	.296	.050	5.800	.000
Ordinal		Spearman Correlation	.328	.055	5.907	.000 ^c
Interval	by	Pearson's R	.284	.068	5.038	.000 ^c
Interval						
N of Valid Cases			291			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

Table 61: Correlation between concern for the global population and perceptions of equality

Symmetric Measures			Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Ordinal	by	Kendall's tau-b	.207	.048	4.277	.000
Ordinal		Spearman Correlation	.243	.056	4.265	.000 ^c
Interval	by	Pearson's R	.243	.057	4.262	.000 ^c
Interval						
N of Valid Cases			291			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

Table 62: Correlation between concern for other species and perceptions of equality

Symmetric Measures			Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Ordinal	by	Kendall's tau-b	.206	.050	4.124	.000
Ordinal		Spearman Correlation	.238	.058	4.157	.000 ^c
Interval	by	Pearson's R	.215	.063	3.740	.000 ^c
Interval						
N of Valid Cases			291			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

Table 63: Regression: demographic characteristics as predictors of attitudes towards equality

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.214 ^a	.046	.036	1.213

a. Predictors: (Constant), age , income, education

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.233	3	6.744	4.586	.004 ^b
	Residual	422.097	287	1.471		
	Total	442.330	290			

a. Dependent Variable: "fair share"
b. Predictors: (Constant), age , income, education

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.987	.352		8.489	.000
	income	-.120	.059	-.123	-2.033	.043
	education	.124	.052	.146	2.402	.017
	age	-.103	.051	-.118	-2.020	.044

a. Dependent Variable: "fair share"