Weathering the future:
Climate change, children and young people, and decision making

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Acknowledgements

About ARACY

ARACY is a national non-profit organisation working to improve the wellbeing of children and young people by advancing collaboration and evidence-based action for all Australia's children and young people.

Despite Australia being a wealthy, developed country, crucial aspects of the health and wellbeing of our young people have been declining. ARACY was formed to progress evidence-based action to prevent the major problems affecting children and young people. ARACY tackles these complex issues through building collaborations with researchers, policy makers and practitioners from a broad range of disciplines.

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Executive summary

Along with drugs and alcohol, crime, and body image, one of the issues which most concerns Australian children and young people is the environment (Mission Australia, 2010). But while considerable research is being undertaken on the likely health consequences on the overall human population, little is known about the particular social, emotional and health impacts of climate change on children and young people. In addition, the views and interests of children and young people are not being adequately considered in crucial policy decisions that will ultimately shape their future.

To address these gaps, the Australian Research Alliance for Children and Youth (ARACY) in partnership with the National Centre for Epidemiology and Public Health (NCEPH) initiated a project called '*Climate change, children and young people, and decision-making*'. This project attempts to scope out the likely challenges, and the social, economic, health/wellbeing impacts posed by climate change on Australian children and young people. Twenty four well-known climate change and child and youth health and wellbeing experts, including several young people, were interviewed in two consecutive rounds by NCEPH using an adaption of the Delphi method. These experts shared their views on the importance, and the likely impacts of climate change on the health and wellbeing of children and young people. They were also asked to suggest ways to involve children and young people in policy discussions and decisions that will ultimately impact their future.

The majority of interviewees were well informed about climate change and its likely human impacts. They also agreed that children and young people today are being affected by climate change and cited extreme weather events, rural economic strain, and mental wellbeing as some of the main concerns. However, they struggled to predict the future impacts, due to knowledge gaps, lack of data and effective communication. They were also concerned about the lack of involvement of children and young people in crucial policy decisions and agreed that urgent measures need to be undertaken to address this. Most of the participants considered climate change as an intergenerational issue and unanimously supported an intergenerational dialogue to tackle the problems posed by climate change by breaking the silos and engaging in healthy conversations and discussions.

The following report includes a preliminary review of current research on the social, economic, health and wellbeing impacts of climate change in the Australian context and contributions from the experts that were interviewed.

Introduction

It is generally accepted that the predicted changes to our climate resulting from global warming will have far-reaching impacts on the lives of current and future generations.

To date there are good models of climate change induced impacts on human health via vector, thermal, water and food related diseases. However as yet there is only poor specification regarding socially determined impacts on health—that is the expected changes in social, cultural and economic capacities. There is some emerging evidence on the vulnerability of sub-populations, such as children, to expected health impacts.

It is the impacts on, and implications for, children and young people on which this paper focuses. How can their views and needs be best considered in the development of policy in this area?

Across all countries it is children who are at greater risk from environmental health hazards. Indeed, climate change has been called, by some, the 'greatest crisis for child health' (Waterston, 2006). This stems from children's potentially greater duration of exposure (linked to different behaviour patterns), their greater sensitivity to exposures (because of developing and immature organ systems as well as immature cognitive and emotion regulation systems) and because of their dependence on care givers for appropriate preparedness and response (Ebi and Paulson 2007). They will also have a lifelong exposure to risks (McMichael, Bunyavanich & Epstein, 2005).

More broadly, children's wellbeing will be affected by expected economic, social and cultural impacts of climate change. If, as forecast, climate change results in food and water scarcity then there will likely be an increase in the number of families living in poverty. In rural and remote areas, some families will lose their livelihood. This in turn may lead to forced internal migration: family separations where one parent moves to earn income, or family dislocation where the whole family moves, especially likely for rural families or families caught up in a climate change related natural disaster. Higher food and fuel prices will have further, compounding impacts on housing affordability and commute times, potentially adding to income and time stress for families with children. Fuel prices are linked to housing prices and there is already evidence of changes in the housing market.

Yet despite the evidence of climatic change and Australia's geographic vulnerability, and evidence that children and young people will be a particularly vulnerable group, research or policy targeting the impacts of climate change on children and young people is relatively scarce. Most modelling of the impacts of climate change does not include children. There is a scarcity of large multiple data sets that measure child wellbeing in depth, especially in developing countries. Very few climate and health models have incorporated child vulnerabilities in them with the exception of some global bodies, now developing policies specifically aimed at children. Policy responses to climate change in Australia have not been built with a child focus, or voice.

How, then do we ensure that their voices and needs are heard? Given the complex array of changes that we are facing, policy decisions regarding climate change will take place at every level, ranging from macro-economic decisions regarding taxes, to local decisions about recreational facilities. Children and young people, both in their current status and as future adults, will be affected by all of these decisions.

While children are certainly more vulnerable than adults to the impacts of climate change, they are also less visible. Where they are seen at all, children tend to be viewed as victims, or as passive recipients of assistance.

Fortunately, in many other areas of public policy, increasing attention is being paid to the needs of children, and methods for encouraging their participation have been developed and tested in recent years. While many of the models of participation have been heavily criticised, nevertheless, the agency of children and young people is also receiving greater recognition, and is enabling more effective participation of children. In developing countries, children are becoming more involved in disaster planning and recovery, for example.

However, climate change as a phenomenon presents unique challenges, which make it difficult for people to make sense of it and respond to it: one reason why it has been neglected by current child-focussed policy. Climate change will increasingly affect the coming generations, that is, its main impact is not visible now. It is therefore a problem for future generations, created by the current and preceding ones. This makes it a difficult concept for the current generation of adults to conceptualise as the consequences of actions now are not immediate or observable. However the costs of preventative action are immediate and highly visible, further entrenching the cognitive and behavioural barriers for policies and interventions to prioritise climate change in interventions to improve child wellbeing .

In order to explore how best to promote the voice and needs of children and young people in this difficult terrain, we interviewed a range of people with expertise in either climate change, or some aspect of children and young people. The interviews allowed us to understand the way in which children and young people are being considered with relation to climate change, and what the next steps forward might be.

Literature review

1. Climate change in Australia

Fluctuations in climate occur seasonally and across millennia, they are not new. But what is new is the rate and the time scale of the current warming. Current rises in temperature are faster than any since the beginning of agriculture, 10 000 years ago (McMichael, Bunyavanich & Epstein 2005).

What is the outlook for Australia with regard to climate change? Despite its affluence, as the most arid populated continent, Australia is particularly vulnerable to severe impacts resulting from relatively small changes in temperature and rainfall. Climate modelling indicates that the main impacts of climate change will be as a result of extreme weather events. These include cyclones, fires, flooding, higher temperatures, droughts and drying.

Changes will be far from uniform: southwards shifts in rainfall will affect farming regions along the eastern seaboard, and increase the risk of cyclones and storms in the populous areas of south-east Queensland and north-east New South Wales. Average temperatures in Australia have already increased by about 0.9^0C since 1910 (BOM, 2007) but there are expected to be much larger temperature increases in the interior and northern areas this century (Hennessy et al 2007).

Long term drying is predicted across southern Australia (CSIRO 2007). There may be up to 20 percent more droughts over most of Australia by 2030, and up to 80 percent more in south-western Australia by 2070. Along with ecosystems, farming and agricultural industries are likely to be affected. The Murray Darling River Basin supplies most of the water needed for Australia's irrigated crops and pastures. Already more than 95 percent of the river system is showing evidence of environmental degradation. Climate change is expected to further reduce annual stream flow by 16–48 percent by 2100 (Hennessey et al, 2007).

Sea levels will also be affected. Australia's coastal zone is under increasing pressure with approximately 80 percent of Australians now living within 50km of the coast. The coast also supports important activities and features such as infrastructure, agriculture, fisheries, tourism, coastal wetlands and estuaries, mangroves and other coastal vegetation, coral reefs, heritage areas and threatened species or habitats (Australian Government Department of Climate Change). Populations living up the Queensland coast to Cairns are at risk from sea level rise and storm surges.

Climate change economist Ross Garnaut has noted that over the last 2000 years, global output has increased 300 fold, with population increasing 22 times and per capita production 13 times. Most of these changes have occurred from 1820 onwards. This growth pattern is likely to continue for decades to come as economic development reaches into the most populous countries of Asia. This growth and the enormous benefits in health, longevity and living conditions it has created, has been enabled by fossil fuels. While there are limits on the economic viability of continuing to access fossil fuels, we will not reach those limits soon enough to mitigate dangerous climate change. Thus the solution to fossil fuel reduction will need to be political (Garnaut 2008).

For the first time, humans are exerting so much pressure on the earth's biophysical systems that there are now observable changes occurring at a global level. The scale of climate change is different to nearly all other environmental issues that will affect human health because it is global, and it affects multiple systems fundamental to health and survival. These changes are unprecedented, and so there is therefore uncertainty about how they will unfold at a local and regional level (McMichael, Bunyavanich & Epstein, 2005).

2. Children and young people: vulnerable populations

Although the likely specific impacts of climate change on children and young people are under researched, (Sly et al 2008) it is clear that they represent a particularly vulnerable group that is likely to disproportionately suffer from the direct and indirect impacts on health caused by climate change (Committee on Environment Health 2007). Compared with other groups, children have increased vulnerability to all expected physical health impacts from climate change—extreme weather, natural disasters, infectious diseases, air pollution impacts, nutritional deficits, water borne diseases, food borne diseases, and heat related health impacts.

For example, children are especially susceptible to diarrhoeal disease such as gastroenteritis, rotovirus and cholera. Diarrhoeal disease is one of the leading killers of children; 3–4 million children die each year, linked to their immature immune system and susceptibility. There is epidemiological evidence that for every degree Celsius increase in there is a 3–8 percent increase in incidence of diarrhoreal disease (McMichael, Bunyavanich & Epstein, 2005). In addition to the direct impacts of these diseases, Bartlett finds evidence for the effect of infectious and vector borne diseases and parasites on children's cognitive development (Oberhelman et al 1998, Niehas et al 2002, Boivin 2002, cited in Bartlett 2008).

Malnutrition is expected to increase in many regions as food production falls, due to lower rainfall and increased CO_2 absorption in many low latitude regions (including south-eastern Australia). Between 40 and 300 million people worldwide will probably become hungry as a result of climate change, and most of these will be children. Some of these children will die from starvation, but others will face long term health, cognitive and growth impairments that will affect their life chances, productivity and health into adulthood.

Children are uniquely susceptible to both the levels and timing of their exposure to chemical, biological and physical environmental threats. Children will also be affected disproportionately by environmental hazards because they will experience a longer period of exposure than adults alive today (Sly et al 2008, McMichael, Bunyavanich & Epstein, 2005). Additionally, children are more likely than adults to be exposed to environmental hazards (WHO quoted in Sly et al 2008). The same level and timing of exposure may affect children differently at various developmental stages. Additionally, their biology, behaviour, settings and activities may expose them to different threats than to the adults they live with. Therefore, it is "crucial to identify and understand the importance of the 'windows of susceptibility' in children and the relationships between exposures and developmental concerns" (Selevan et al 2005).

In addition to such direct impacts, Fritze et al (2008) identify mental health implications of climate change as being: the impact of extreme weather events; the effect of social, economic and environmental disruptions to vulnerable communities; and anxiety regarding the future.

It is also likely that children will experience increased threats to wellbeing more broadly following exposure to extreme weather events or natural disasters. For example, following Hurricane Floyd in North Carolina, it was found that families were vulnerable to higher child-abuse risk, increased parental stress and decreased social support. Rates of inflicted head injury in children under two increased five-fold after one hurricane in the US (Fritze et al 2008).

Some recent reviews indicate emerging interest in this topic area, and a recognition that children's health and wellbeing has been neglected in climate change impact research (Waterston 2006, Bartlett 2008, UNICEF 2008). Most of these reviews have taken a rather narrow view of wellbeing and of impacts. However, the potential impacts of climate change in Australia are likely to be much broader than increased incidence of vector, food or water borne diseases. Children's and young people's mental health is a crucial aspect of wellbeing that affects their later life chances and successes. Children's and young people's health and development is affected by their social environments and so any analysis of climate change impacts must move away from an individual focus to consider the wider social and economic systems that surround children and young people. For example, there are likely to be stresses placed on family relationships if whole families, or one of the parents move to avoid the loss of livelihood (Edwards, Gray & Hunter 2009). Indigenous, remote and rural families may be at particular risk, as will poorer families with fewer resources to cope with high food, energy and water costs (Green, King & Morrison 2009), Gracey & Cullinane 2003, Dean & Stain 2007).

The potential for climate change to affect multiple, interacting systems that drive Australian children's and young people's wellbeing is also unknown – eg crop failure, water scarcity and impurity, higher temperatures and heat stress, fires or droughts, family loss of livelihood and poverty, dislocation, parent mental health deterioration, relationship disruption or separation from parents. A disease by disease approach misses the likely multiple compounding and interacting elements at play (Akachi, Goodman & Parker, 2008). Compounding impacts that cross from parent to child (for example via parent depression) are another essential element of child and young people's wellbeing. Furthermore there is very little research on the way children and young people understand, act and make sense of climate change and its impacts. Some surveys of children's and young people's fears and concerns indicated that they are, already, aware of climate change and its likely impacts on them and their world (see for example, the Mission Australia report, 2010). What we don't know is how this may affect the relationship between generations.

3. Equity and the impacts of climate change on people

Climate change poses possibly the largest health inequity of our time (Patz 2007).

Principle 3 of the Rio Declaration Environment and Development states that 'the right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations'. Butler contends that this principle is now under threat, and is likely to be an unattainable goal (Butler 2002).

Because of the time lag between C02 emissions and resultant climate change, the positive impact of actions taken today to reduce carbon emissions will not be experienced by this generation. The costs of such actions, however, will be. Such mitigating actions will determine the extent and costs of climate change that future generations will have to bear.

Health inequities are predicted to increase as the impacts of climate change are felt. Poorer countries in low latitudes are expected to bear the greatest health impacts of climate change, despite the fact that they contributed least to its causes. Child mortality in these countries is already relatively high, and will increase with the expected rise in malaria, diarrhoea and malnutrition. Patz (2007) estimates that 99 percent of the health impacts of climate change are confined to the people in developing countries and that of these, 88 percent are children under five. Children therefore represent the major axis of inequity.

Climate change will not only increase direct health threats such as disease, malnutrition and heat exposure, it will also exacerbate the 'underlying social, economic and ecological determinants of global illness and premature death' (Costello et al 2009). Reduced availability of food, water and sanitation, disruption to education and social disruption through migration will all result from predicted climate change. Poor people are more vulnerable because of: exposure, sensitivity and adaptive capacity (Costello et al 2009). For this reason, they argue that addressing inequality is a basic strategy to address the likely health impacts of climate change. (Costello et al 2009). Conversely, McMichael et al argue that 'poverty cannot be eliminated while environmental degradation exacerbates malnutrition, disease and injury' (McMichael et al 2008).

Inequities will also be exacerbated by a greater degree of vulnerability and exposure to factors such as environmental pollution. Poverty is correlated with exposure to environmental hazards and pollution. This applies to developed countries such as the USA where it was found to be a disproportionate placement of waste sites and toxic waste sites in poor and Southern black areas (Brulle & Pellow 2006).

Patz et al (2007) argue that there are four key elements to health inequity: inter-generational, inter-national, and inter-species (based on Schneider and Lane 2005) to which they add intra-country, (vulnerable populations and compounding inequities). For example, Spurrier et al (2007) found that children from lower socio-economic backgrounds in Australia 'have a significantly more negative experience of health and wellness'. Likewise, Bradley and Corwyn (2002) cite evidence of the association between socio-economic status and child development, including cognitive development.

4. The psychology of climate change

Global warming from greenhouse gas emissions is one of the most certain concepts in natural science. Yet despite the lack of a coherent body of evidence to the contrary a significant proportion of the public express serious doubts about the science of global warming (Newell & Pitman 2010). Newell and Pitman argue that there are a number of characteristics in the psychology of how people perceive climate change which work against an understanding or acceptance of it.

One problem has to do with the information a person uses to draw an inference or conclusion (referred to as a 'sample'). For example *weather* versus *climate.* People often base their understanding of global warming on their everyday experience of the weather, which is variable. Experience of a cold day, for example, is viewed as evidence that global warming is not happening. Climate on the other hand has a different timescale to that of weather. Climate change refers to underlying trends discernible *beneath* the natural variability found in weather.

Also relevant is the process whereby recent events become more salient in memory and therefore disproportionately influence our judgments referred to as 'recency'. Thus recent cold events, even if very short, become more salient than longer term experience of warmer climate.

Media representations and science communication also affect people's judgment. If people hear opinions from climate change sceptics about half of the time, they may believe that there is another, equally plausible and accepted scientific viewpoint, even though sceptics represent a tiny minority of scientists.

A consideration of the concepts of anchoring and framing is useful here. *Anchoring* refers to the reference point people use to build a judgment. When people are uncertain about what values mean, such as the amount of CO_2 emissions in the atmosphere, then it is difficult for them to make judgments about the implication of relative levels or values.

Framing describes how information is presented. One of the problems with climate change is that carbon dioxide is a colourless, odourless gas so it is difficult to perceive directly. It is not a powerful toxin like cyanide for example. It occurs naturally, and it is essential to plant life. In addition, although human induced increases in carbon dioxide are the most important causes of global warming, they are not the only reason for carbon dioxide; there are other sources.

Furthermore the real impacts of climate change are deferred, and immediate changes in behaviour do not reward people with discernible improvement. This 'future events' feature results in information processing that is more general and non-specific. The essential impact of climate change is in the future. It is much harder in terms of cognitive information processing to think specifically about future impacts.

Mental models of climate change

The deferral of climate change impacts is also related to what is known as a 'discount function'. People apply discounts to the cost benefits of things that occur in the future; indeed this is built into economic modelling. However the costs of mitigating actions are incurred immediately and these costs are commonly held against uncertain non-specific and delayed benefits into the future acting as a further impediment to sustainable behaviour.

A mental model is a term used to describe the information, knowledge and belief that people build to understand or make sense of a problem or phenomena. There is a large body of psychological research showing that mental models are much richer, more concrete and more detailed if they are temporally close than those that are temporally distant (American Psychological Association 2010). This suggests that, for climate change, people are likely to build simplistic mental models which tend to be based on their immediate experience of weather, but struggle to understand future impacts in anything but a very essentialist and non-specific way. They will struggle to relate the cause of climate change (human activity and CO_2 emissions) to their actions.

Because climate change is complex and uncertain and involves long sequences of influences between variables, it is extremely difficult to establish a mental model for it. People rarely think probabilistically—rather they think in terms of supporting or refuting evidence. Thus one very cold winter can be seen as evidence that refutes climate change, without information to evaluate that event in the context of all other climate related events.

Thus misinformation, media focus on climate sceptics, and an occasional cold day all serve to reinforce normal cognitive processes to form a mental model of climate change as untrue or of no real significance.

5. Children and young people's views on climate change:

The views of children and young people can be considered under two broad headings: hopes and fears for the future; and the effects on wellbeing.

Hopes and fears for the future

Rapid social change and the emergence of global threats have led to increasing interest in young people's hopes and fears for the future, and the impacts these are having on their lives, including their health and wellbeing. It is a complex topic, confused by conflicting ideological and disciplinary perspectives.

There are at least three different portraits of young people and their relationship to their future (Eckersley 1997, 2005). Most young people are optimistic about their personal futures, and have conventional aspirations for education, travel, work, marriage and children. At a broader, generational level, they are also portrayed as adapted to a globalised, high-tech, 'postmodern' world. They are confident, optimistic, well-informed and educated, technologically sophisticated, self-reliant, enterprising and creative, fearless and flexible. The third portrait reveals a more disturbing side of their lives: concerns and anxieties about their lives, social trends and a world threatened by a number of immense global challenges—including climate change.

Several surveys by the Australian Childhood Foundation (Tucci, Mitchell & Goddard et al 2006, 2007, 2008) of children 10–14 or 10–17 present a picture of high levels of stress, worry and anxiety. For substantial minorities, increasing to majorities for some questions, their sense of confidence in themselves, their community and their place in the world is under threat (Tucci, Mitchell & Goddard 2007). Concerns range from how they look, not doing well enough, being bullied and not fitting in, being hurt by an adult, and feeling unsafe in public places and using public transport and the internet, through to climate change, water shortages, pollution and world affairs (Tucci, Mitchell & Goddard 2006). In one survey almost two thirds of children aged 10–17 either did not believe (18%), or were unsure (44%), that their generation would be better off than their parents; 27 percent were concerned the world would end before they got old.

Another Australian study indicated that while most young Australians are personally optimistic about their own lives, a growing proportion appears to believe quality of life in Australia is declining, despite a long period of sustained, strong economic growth, declining unemployment and rising incomes (Eckersley et al 2007). In 2005, 65 percent of those aged 18-25 said that of two statements—one optimistic, the other pessimistic—the pessimistic statement ('More people, environmental destruction, new diseases and ethnic and regional conflicts mean the world is heading for a bad time of crisis and trouble') most closely reflected their view of the world in the 21st century (Eckersley et al 2007). Ten years earlier 55 percent of those aged 15–24 made this choice.

Surveys generally show high levels of awareness and concern among young people about the environment, including climate change (Muir et al 2009). In a 2009 poll conducted by the ANU, environment/global warming ranked second after economy/jobs among young people (as it did among older people) as the most important problem facing Australia today (Reeder et al 2010).

The UK *E.On* report found that children were seven times more likely to say they are worried about climate change than about crime or violence and 70 percent believed that they would be left to clear up the mess of the previous generations (E.On 2007).

Impacts on wellbeing

Official reports on children and young people's health and wellbeing make little, if any, reference to climate change or other global threats, and the impacts of natural environmental conditions, such as contamination, are covered only briefly (eg AIHW 2007, 2008, 2009). ARACY's report card on the wellbeing of young Australians includes two environmental indicators—one on climate change, the other on biodiversity (ARACY 2008).

What might be called the 'existential' threat of climate change (and other global threats) emerged in the 1980s in psychological and futures research on children's and adolescents' fears for the future (Eckersley 1988). Many saw a world devastated by nuclear war and ravaged by pollution and environmental degradation, a society in which technology was out of control (or in control) and unemployment rampant.

A number of studies found a link between global fears and wellbeing (Newcombe 1986, Elkins and Sanson 1996, Twenge 2000) although these were based largely on informed conjecture and statistical correlations, not proven causal associations. When Eckersley (1988) canvassed experts about the health impacts of future fears, he encountered a wide range of opinion, from those who believed they could be significantly affecting child and adolescent development to those who were sceptical, even dismissive, of this possibility.

Nevertheless, this earlier research provides a useful conceptual framework for thinking about possible similar effects of climate change. The issue has taken on added significance and urgency because perceptions of the future are increasingly shaped by the images of global or distant threat and disaster to which people are exposed: earthquakes, storms, fires, floods, disease pandemics, terrorist attacks and war. It is not known the extent to which communication media and the internet have altered children's worries and fears (are children now, at an earlier age, more fearful of global issues, for example) (Gullone 2000).

While these hazards are mostly not new, previous fears were not as sustained or varied, or as powerfully reinforced by the frequency, immediacy and vividness of today's media images. The current situation is, in this sense, very different from the nuclear fears of the 1960s or 1980s. The distinctions between the personal and global (and real and virtual) are blurring as global events and developments increasingly become a part of people's personal frame of reference (Bradley 2003).

Researchers have identified 'solastalgia' as the psychological distress people feel when the natural environment in which they live is changed for the worse (Albrecht et al 2007). While it has been studied in the context of specific local environmental destruction, they say global environmental challenges such as climate change could also be significant sources of solastalgia. The American Psychological Association, in a report on psychology and climate change, states that, even in the absence of direct impacts, the perception and fear of climate change may threaten mental health (Swim et al 2009).

There are also less specific effects of this awareness. Psychological research suggests that adaptability, being able to set goals and progress towards them, having goals that do not conflict, and viewing the world as comprehensible, manageable and meaningful are all associated with wellbeing (Eckersley 2005). Biomedical research shows that people become more stressed and more vulnerable to stress-related illness if they feel they have little control over the causes of stress, don't know how long the source of stress will last or how intense it will be, interpret the stress as evidence that circumstances are worsening, and lack social support for the duress the stress causes (Sapolsky 2005). Negative expectations of the future of the world and humanity are likely to influence these qualities, most obviously by encouraging perceptions of the world as hostile and dangerous and that circumstances are deteriorating.

People's concerns about the future of the world and humanity also matter to social cohesion and capital. The erosion of faith in society and its future shapes the way people see their roles and responsibilities, and their relationships to social institutions, especially government. Positive images of the future allow individuals to identify with, and work for, social goals and national, even global, priorities; they embody an ideal that encourages people to channel their individual interests into a higher, social purpose and provides a broader sense of meaning in life. Pessimism about global futures, on the other hand, can reinforce the appeal of materialistic and individualistic values, which are also hostile to wellbeing (Eckersley 2005).

Furthermore, people's fears about climate change (and other global threats) also influence society's responses to these challenges in ways that can be maladaptive as well as adaptive (Eckersley 2008b, 2010). Thus global concerns may also impact on health and wellbeing through complex and pervasive feedbacks on social capital, cultural influences and political action.

There are many aspects of children and young people's fears and worries which are poorly understood, for example to what extent do the nature and number of fears and worries predict later outcomes, including mental health, school performance, physical activity, social engagement and participation. Are feared events which are viewed as global and uncontrollable, more predictive of poor outcomes and what factors might mitigate this?

Fear also has an important role in developing adaptive or avoidant coping mechanisms, but this relationship is poorly understood, especially with regard to fear of global, rather than personal, events (Gullone 2000).

6. Voice and participation

There has never been so much political and policy interest expressed in participation across so many fields (Beresford, quoted Prout et al 2006).

If children's voices and needs are to influence decisions related to climate change they are going to need effective mechanisms for participating in policy development. The last twenty years have seen a burgeoning of attempts to incorporate children and young people in many aspects of public decision making.

The 1989 United Nations Convention on the Rights of the Child (UNCRC), and in particular Article 12, which stipulates the right of children and young people to have a voice in 'all matters affecting them' has been the stimulus for much of this activity. (Kirby et al 2003). The UNCRC has coincided with the rise of service user and consumer advocacy, and the concern by governments to promote citizen engagement which have likewise contributed to the rise of children's participation (Tisdall et al 2008).

Internationally, a range of participatory models and activities have emerged. These have been applied across many different levels of decision making. They include highly structured, formalised and centralised models, such as 'youth parliaments' which operate in Scotland, Slovenia, Zimbabwe and elsewhere. By contrast, in Sweden the focus for many years was on youth participation in specific *local* government activities, as it was argued that this is where most services directly affecting young people are located, for example education and recreation (Swylander 2001).

Even less formal and more decentralised have been youth-led (bottom-up) participation models such as the Australian Youth Climate Coalition which has engaged very large numbers of young people around a specific issue, in this instance climate change.

The United Kingdom has adopted the approach of promoting a broad range of participatory models and embedding them at many different levels of governance. For example, the *UK Children Act 1989* incorporates the principles of UNCRC; all English central government departments are required to produce Action Plans 'detailing how they are to involve children and young people in the decision making of their department' (Tisdall 2010); and major policy initiatives addressing social exclusion require service providers to involve children and young people in the delivery of services (eg *Every Child Matters* and *Youth Matters*).

Some jurisdictions have framed participation largely in terms of protection, based on a view of children as vulnerable or as victims. For example, in South Africa the most celebrated child participation activity has been a participatory review of child protection laws (Moses 2008).

The focus on protection and viewing children primarily as vulnerable or as victims has been critiqued by analysts in the UK and Australia (Tanner 2010, Prout 2010). The emerging field of the sociology of childhood has focused the lived experience of children, and found that children exercise more agency than they have previously been credited with (Prout 2003, Hoffmann-Ekstein et al 2008, Morrow 2001). This has been used as the basis to promote participatory mechanisms which acknowledge the experience of children in the here and now, rather than characterising them as 'future' citizens, and respond to their participation with real changes.

Recent publications regarding children and climate change in an international context have shifted their focus and now address the potential for children to participate in planning and adaptation to climate change and natural disasters (Tanner 2010, IDS 2009). Tanner (2010b) cautions against the 'race to the bottom' of vulnerability with regard to climate change, and instead focuses on children as active agents of change.

Approaches to children's participation which have developed out of international experience with 'disaster risk reduction' are based on a dual approach of both rights and capacity. Children are considered well placed to drive necessary changes, as it is argued that they know most about their own situation, and have a greater capacity than adults to learn and adapt.

The range of participation efforts described above have had mixed results. Through extensive critiques of recent years, however, they offer important principles for informing approaches to the inclusion of children and young people in climate change policy development.

Principles drawn from these different approaches

Models to explain different approaches to participation have evolved from Arnstein's (and then Hart's) 'ladder' of participation. The ladder ranks participation activities on a hierarchy from least to most control by participants, the steps ranging from 'manipulation' on the bottom rung, to 'child initiated shared decisions with adults' on the top rung. Later refinements however, have replaced this hierarchy with a recognition that *different approaches are needed for different circumstances* (Kirby 2002, Treseder 1997) and that the *capacity of organisations* to listen to, and act on, the voices of young people was as important as how to engage young people (Shier 2001).

How effective is participation?

Despite the plethora of participation activities over the past two decades there are some cautionary tales. Many commentators are sceptical about the efficacy of much of the participation effort. For example, Cockburn concludes that 'there is little evidence of children and young people making an impact at a central government level…' (Cockburn 2010) and Kirby et al note the 'limited evidence of the impact of participation in terms of substantial changes' (Kirby et al 2003).

Specific criticisms of participatory approaches include:

- The limits of the 'top down' approach. For example, Vromen & Collin (2010) argue that in Australia 'top down' participation has tended to be formalised, and institutionally driven, and that this has had the effect of alienating and excluding many young people.

- That participation activities can be more concerned with process rather than product, and that once the participation activities conclude, nothing more is heard by the young people about the outcomes.

- That participatory approaches may replicate existing patterns of privilege and power within the adult community by creating structures which favour the already articulate and privileged, and exclude the already marginalised (Wyness 2009).

- That children are largely invisible or are characterised as either passive recipients or victims.

- That there can be a lack of genuine commitment on the part of organisations to act on the views of young people, or include them in decision making stages. In a detailed review of a major participation exercise under the Every Child Matters initiative, Kelley found that it 'made no difference to the policy outcome' (Kelley 2006). This supports the call for effort to be directed into developing the capacity of organisations to respond to the input of young people, as well as building the capacity of young people to participate (Vromen and Collin 2010).

- That tokenistic and/or poorly run participation can discourage young people from future political engagement. Adult initiated structures such as school councils and round tables are found to be especially prone to this (Bessant 2004, Tisdall 2010). This was certainly found to be the case in Australia, with regard to the National Youth Roundtable. Sorenson found that NYR participants were generally dissatisfied with the effectiveness, felt that the exercise was tokenistic and were as a result despondent about future civic participation (Sorenson 2007).

- That they are poorly executed. In particular, that they are not resourced properly.

Such criticisms give important principles for designing effective participation. Kirby et al (2003) in a review of 29 'best practice' organisations and their participatory activities, identify three broad principles of best practice participation. Participation should be:

- meaningful to young people

- effective in bringing about change

- sustained – it should be embedded rather than one off.

On an optimistic note, Kay Tisdall (2006) reports on the results of a recent survey, which suggests that all 'approaches could be effective - if undertaken properly'. She cautions, however, that to avoid children being left on the margins of political and policy decision making, the 'potential for children's [and young people's] participation to be political, to challenge and insist on change' must be retained.

Method

Climate change is predicted to pose the greatest challenges for children and young people now and into the future. Yet there is little evidence that the needs of Australian children and young people are being systematically addressed in either policy or research. The Australian Research Alliance on Children and Youth (ARACY) has been interested in environment as an indicator of the wellbeing of Australian children and young people. At the same time, the National Centre for Epidemiology and Population Health (NCEPH) has research strands in both child wellbeing and climate change. A collaboration was therefore proposed, to take the first steps in investigating the status of Australian children and young people in climate change research and policy, and to consider ways forward. It was decided to explore the views of both children's champions and climate change experts to determine to what extent the impact of climate change on children is being considered, and how to promote the interests and voices of children and young people.

This research began with four hypotheses:

1. Most child or young people's advocates and experts lack specific information about the likely impacts of climate change on Australian children/young people (including how climate change is viewed by children and young people).

2. *Child or young people's advocates and experts will consider that their peers lack information/are not well informed about the likely impacts of climate change on children.*

3. Climate change experts and advocates will be more informed about predicted impacts of climate change on Australian children, relative to those working in the area of child and youth wellbeing.

4. Those experts and advocates (in either climate change or child and young people's wellbeing) who are well informed about climate change and its likely effects, will rate it as a highly significant issue for Australian children and young people.

To investigate these, the study used an adaption of the Delphi method. This method was developed during the Cold War and was originally used as a technique for forecasting and planning for future risks. It garners the views of a group of experts, generally via interview, and feeds back these views to them in an iterative process. Although the aim is to achieve an informed consensus of views and strategies, not all applications of Delphi assume that a consensus is possible.

For this project two rounds of in-depth telephone interviews were conducted, each interview lasting approximately half an hour. Consent was obtained for each interview and the interviews were taped and transcribed. The views expressed during the first round of interviews were coded and synthesised, and a summary paper written and sent to participants. This paper identified several areas of agreement among our experts. However the results were not uniform and there were some key points of disagreement or dilemmas. The summary paper formed the basis of the second interviews, with a focus on the dilemmas identified, which were further investigated during the interviews.

Our participants

A total of 24 people participated in the study, of which 17 took part in both rounds of interviews, and seven took part only in the first round.

Expertise spanned a wide range of sectors and knowledge. These included advocates for children and young people's participation, climate change advocates, mental health and wellbeing experts, paediatricians, indigenous health experts, early childhood professionals, academics and climate scientists. A deliberative sampling method was used, identifying experts in:

5. Child and youth health and wellbeing

6. Social economic and environmental determinants of wellbeing

7. Climate change and its potential impacts

8. Involving children and young people in research, advocacy and decision-making.

Participants were asked to rate their own level of knowledge about climate change (Figure 1). By far the majority (17/24) reported that they felt informed or well informed, (7/24) said they had some or moderate knowledge, while none said that they had no knowledge.
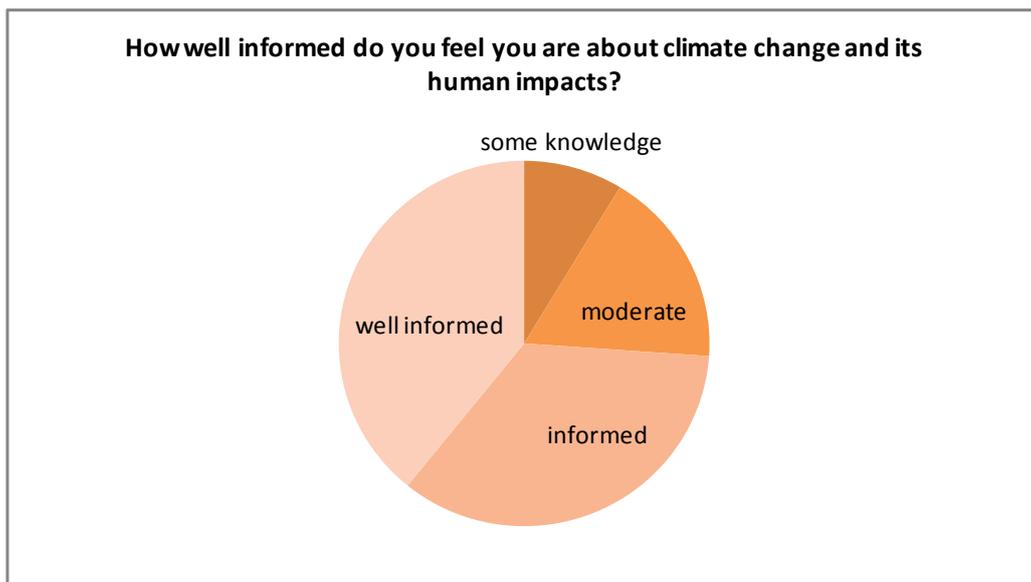
Figure 1: Self-assessed knowledge about climate change

Participants were also asked what their main sources of knowledge about climate change were, and a list of options was presented. Most participants reported a wide variety of sources such as the International Panel on Climate Change reports, and over a third (9/24) reported that they used all sources of information listed, up to and including scholarly journals. Only 3/24 relied on mainstream media or documentaries.

Source of information*	No. of participants
Scholarly journals	9
Reports (eg IPCC, the Garnaut report)	6
Professional bodies/conferences etc	3
Specialist media	3
Documentaries	1
Mainstream media	2

Table 1: Participants' sources of information about climate change

> * This list is hierarchical, for example it is assumed (and was confirmed by comments in the interviews) that if a participant's main source of information was 'scholarly journals', they were also obtaining information from all the other sources listed.

Participants were asked to rate the level of knowledge among their colleagues or others working in their field. Most (16/24) said that their colleagues had a 'mixed' level of knowledge, one said their colleagues had little knowledge and one said that their colleagues were well informed. Four participants reported that their colleagues had a professional interest in climate change (Figure 2).
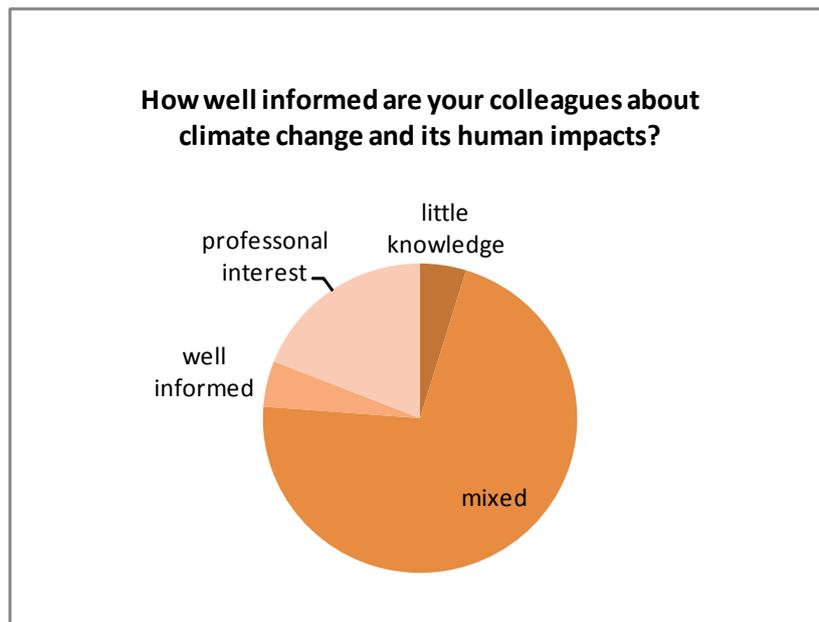
Figure 2: Knowledge of colleagues about climate change

In discussing this question, most participants who rated colleague knowledge as 'mixed' indicated that while there were some colleagues who had little or no interest in climate change, there were some who were very actively engaged:

> *'Well, I think it's pretty mixed. I mean there are deniers and there are very well informed...'*

'I think people are interested in varying degrees and I think within my work place say out of 30 people there's some people who really champion environmental education and champion climate change and promote that within their daily work in a whole range of ways and others who are aware of it but probably don't promote it in the same way.'

Results

1. To what extent is climate change viewed as a problem in your field of work?

> **Key themes:**
>
> - There are 'pockets' of interest in most participant's fields of work.
>
> - Climate change is viewed as a problem by at least some people in most fields of work.
>
> Most participants reported that for the majority of their colleagues, climate change had not '*even hit the radar'*.

Despite this, a third of participants reported that while climate change may not be a prominent issue, there were 'pockets' of climate change related activities within their field of work. '*There are papers about the health effects of climate change on children, and increase in particular diseases. So, if you start to look for it you can find a lot of work trying to educate people I suppose, make them aware of what a serious problem it is'.*

This reflects the assessment that participants made of the level of knowledge of their colleagues regarding climate change. Figure 2 shows that most people reported a 'mixed' level of knowledge among their colleagues.

Only one participant, working in family services, reported a very low level of knowledge overall in their field of work: 'In the sweep of our work I have to say that climate change has not featured prominently at all as one of the risk factors for children and young people's wellbeing'.

Three participants working in early childhood reported a growing level of interest in climate change within their sector. This was chiefly manifested as increasing interest and activity in educating children about environmental issues. '*For early childhood educators it's very central and it has increasingly become a central part of the curriculum that is developed and offered.'* There was little reported activity regarding the impacts of climate change on children and families who are their client base.

Those participants working specifically in climate change related sectors/disciplines reported a high level of interest among their colleagues, although one participant drew a distinction between climate science, where it was reported that climate change '*only figures as the motivator for asking particular types of questions, but doesn't figure in the work itself'* in contrast to the climate policy area, where '*it's essential'*.

One person reported a growing interest in their sector with climate change '*increasingly …. on people's radar'* while another said interest was shrinking and attributed this to a general decline in focus on climate change in the media and broader community.

Several comments suggest that most of the interest in climate change was not to do with child and youth wellbeing, but rather in literature about '*global futures and how young people see the future.'*

2. How concerned are children and young people about climate change?

Key themes:

- There is a lack of data.

- Levels of concern fluctuate.

- Children are possibly experiencing a feeling of a 'lack of future'.

In answering this question, many participants identified that they were aware of very little specific research about the state of mind of children and young people regarding climate change. This was particularly so for younger children. '*I haven't seen, I must say, much very reliable research at all on the views of very young children but that's probably a gap I think.*'

Despite this, most experts felt that climate change is one of many issues of concern to children and young people, although they considered that it fluctuates in its relative level of importance to them. '*Climate change is one of those things that is always bubbling just below the surface, but if in the absence... it really comes to the top in the absence of other major stresses in children's lives.*'

Such fluctuations were attributed to a number of factors including:

- Children's age: 'In my experience it varies with age, and I find that younger children, to the extent they know about it are very concerned ... teenagers more mixed...young adults do seem to be very concerned.'

- The prominence of other issues such as terrorism: 'So, it's, sort of, like, the go-to issue when terrorism's not happening, or when their local circumstances are pretty... are under control or OK'.

- The extent to which children can relate climate change to their daily lives (for example if they experienced floods, fires, drought directly) 'when you get the drought combined with the threat of bushfire and how hot and dry, and that is quite terrifying.'

- Concern about climate change is displaced by more immediate concerns such as body-image. 'When we're looking at what concerns them right now in their community, in their life, they're aware of climate change but they've got more pressing issues such as things like bullying, violence, other environmental issues that are directly relevant to them such as littering'.

- The temperament of individual children: 'I think it's more the future-oriented and anxious children who will demonstrate a preoccupation.'

For many Indigenous children, climate change and environmental concerns 'may cause additional stress, but not in comparison to the level of trauma that they're experiencing in other areas of their life'. Lack of control over their environment is a source of particular stress for many Indigenous children, given their obligations to land, leading to a sense of 'existential despair'.

Despite the lack of data, there was woven throughout different parts of the interviews a concern that children and young people are experiencing a sense of despair, a 'lack of future' associated with their perception of climate change. 'I imagine but I don't know that climate change is becoming an increasingly substantial part of that and not just as a bio-physical event but I think as a symbol of civilisational threat and decline.'

Associated with this was a perception that children experience a lack of control over decisions to do with climate change. 'The great challenge is to maintain optimism rather than just generate fear.' This sense of powerlessness over decisions which are perceived to be critical to their future was in itself a potential source of harm to children who 'have a sense of despair at the inaction of the adult community'.

A number of participants alluded to a reversal of roles whereby some adults abrogate responsibility for change to children '…there was a lot of discussion there about how it's hard for the adults to change what they do and it's all about that the solution lies with the people who are young now—the children now who can be better educated about these issues and will grow up to solve the problems.'

3. Are children and young people currently affected by climate change?

Key themes:
Key themes: • Most participants thought children and young people are being affected. • Most effects are associated with mental wellbeing. • Extreme weather events and rural economic strain were the most common other effects identified.

Notwithstanding the comments regarding the lack of data, most participants (20/24) said that children and young people *are* currently affected by climate change. By far the most commonly cited (18/24) concern was mostly with regard to their mental wellbeing.

> *'But there's also, and again I think under-researched the psychological impacts of sense of future or poor sense of future. So there's more I think anecdotal than hard evidence, but there is important anecdotal evidence for GPs and others about the anxiety of children and young people about the future.'*

> *'For youth and adolescents I think because of this growing awareness around climate change it potentially is causing stress for them in terms of what the planet is going to be like for them and future generations.'*

Of the current physical effects, almost all those identified were associated with rural children and the impact of climate change on '*the economic viability of their families'* or their exposure to extreme weather events such as bushfires and very hot days. Such comments were generally qualified by questioning the degree to which extreme weather events can be attributed to climate change.

> *'Those superhot days you know, more people died in the two or three days leading up to the Black Saturday bushfires than died in the bushfires and they died from heat exhaustion and of course, that particularly affects children as well as the elderly.'*

4. Future impacts of climate change on the wellbeing of children and young people

Key themes:

- Most 'impacts' identified were environmental changes.

- Effects on wellbeing were harder to identify.

The question posed to participants was: 'What do you think the likely effects might be on the wellbeing of Australia's children and youth?' However, of all the future effects of climate change which were cited, the most commonly mentioned can be grouped not as impacts on humans, but on the environment. For example extreme weather and climate events such as drought, fire and sea level rise were mentioned by 21/24 participants.

There was less consensus regarding how these environmental changes would specifically impact on the wellbeing of children and young people. Mental wellbeing, trauma and agricultural viability were raised either as a current or future effect by 18/24 participants. Disease, economic downturn and changes to migration patterns (including both internal migration and international refugees) were identified by about half of participants, and a range of other impacts were mentioned by small numbers of participants.

> *'It's almost unimaginable the sort of consequences like you can go through the science and it will tell you that there could be storm surges that inundate like the Sydney Opera house.'*

> *'Well I think this is really complex and there's a whole range of areas including global warming, peak oil resources, energy usage and different sources of energy, the degradation of the natural environment.'*

Thirteen participants predicted a widening of social and health inequalities, and/or identified those already disadvantaged as likely to be disproportionately affected by climate change. '*I think that most of these far reaching changes in society tend to hit on the poor and less well educated...the rich can buy their house a bit further away from the water... have the capacity to buy more expensive food.*'

> *'There will be an increasing divide between those who can afford to protect themselves and those who can't.'* A type of triple jeopardy was identified: '*...some of the rural coastal communities which already have quite disadvantaged clusters of children.*'

Indigenous children were seen to be at particular risk from the effects of climate change, although this was for a range of different reasons. Relationship to land, and custodial obligations were mentioned by a number of participants: *'you can imagine what the destruction of land would have, what impact that would have on indigenous health and wellbeing'.*

> *'I think there sometimes is a sense of existential despair, because people have no ability to control what's going to happen in the future. And if they can't fulfil their obligation, and then pass that on as their inheritance to their children, then there's the sense that you're floating in an unknown space, and you really don't know what's going to happen...'*

Likewise, the exacerbation of current disadvantage and the vulnerability of land to sea level rise was raised several times. One participant also discussed the impact on some Aboriginal communities of potential increases in the value of remote land if carbon trading is introduced.

It is interesting to note that very few participants identified future impacts of climate change which would directly impact on the client base of the participants (eg lead to an increased need for family services to address mental health problems, financial hardship or dislocation).

5. How important is climate change compared to other issues facing children and young people?

Key themes:

- Most thought it extremely important.

- Climate change is difficult to compare.

- Climate change is an 'umbrella' issue like a 'shadow'.

Over half the participants (15/24) considered climate change to be either very important now '*I think it is the most important issue'*, or that it would become extremely important, if not the most important issue in the future. *'I would be comfortable in saying it will simply be the most critical issue affecting their lives, well the implications of climate change.'*

For some participants, while climate change is extremely important, other issues are also priorities, 'I would say it is probably not the most important one right now ... a deteriorating public education system is actually more important for young people than the climate change issue'.

However, there was also a sense that it is difficult to compare climate change to other issues: '*It's an apples and oranges comparison'*. Rather than rank climate change against other issues affecting the wellbeing of children, some participants described it as a future issue, *like a shadow* or *an umbrella,* so all-encompassing it is difficult to compare.

Five participants answered this question from the point of view of children or young people rather than from their own.

6. Participation of children and young people

Key themes:

- Concern that participatory activities are often 'tokenistic'.

- The most effective examples of children and youth participation were in child-related areas of policy.

- Many mechanisms for listening, few effective ways of acting on the information.

- Participation needs to 'generate optimism'.

We asked participants to identify any examples where the interests and views of young people are already reflected in Australian decision and policy making, both generally and with regard to climate change. They were also asked what would help to better represent such interests and views.

'I think that most of the consultation with young people is very tokenistic'. This view was echoed by approximately half of the participants. Most participants could cite examples of consultation mechanisms with children and young people, including a few which had resulted in policy changes. On the whole, however, the response in the interviews was pessimistic about the efficacy of most consultation with children and young people. '*Yes, we listened to you and something came of it'*, as opposed to '*we listened to you and that was great'*.

The examples given where the views of young people were influential in policy development centred largely on single issue policy areas which were directly child or youth-related, such as children in care, adoption by gay couples, alcohol-related violence and curfews, rather than the more diffuse problems connected to climate change. There was particular mention of successful participation in the development of new youth-centred initiatives such as 'Headspace'. There was also more optimism about the possibility of the voices of children and young people effecting change at the more local level. This included local government, schools, child care centres, up to state level. Several participants saw climate change as too big an issue for the voice of young people to effect much change. '*Climate change and the solutions that are required…require a major transformation to societal systems.*'

Another source of difficulty flowed from the struggle for clear and constructive science and policy communication on climate change: '*The great challenge is to maintain optimism rather than just generate fear'*.

> *'It seems to me that the whole climate change issue thing is so complex, when it goes into carbon credits and everything else and I think if you look at other campaigns, you have to keep the message simple. When you've got scientists arguing with one another you just need to understand that there is going to be an impact that this is what it's likely to do and this is what we could do about it, in simple terms. I think this has all got so complicated and not explained well that you don't feel you have an informed view about it in some ways.'*

Most interviewees supported the idea that Australia has well developed mechanisms for hearing the voices of young people, at least for teenagers and older. Many consultation mechanisms examples were cited, including summits, forums, surveys, conferences and direct access to government ministers. What appeared to be lacking in Australia were the mechanisms for transforming *listening* into *action*.

There was a range of views as to whether a 'top down' approach (for example, the former Minister for Youth's Australian Youth Forum) or a 'bottom up' self-advocacy approach is more effective in translating consultation into action.

While there was a general sense of pessimism about turning children's and young people's views into action, a number of specific ideas for improvement were identified. These included:

- 'A well funded body that can consistently be out there representing the interests of young people in all debates…not a government arm.' Suggestions included a national children's commissioner, children's 'wellbeing' (as opposed to 'rights') commissioner, a children's ombudsman, a children's commissioner for future generations and an independent children's office.

- Strengthening consultation strategies by: developing mechanisms for consulting with young children, including those under school-age; ensuring a broader representation of children and youth; and making it more appealing to youth to contribute their views.

- Skilling children and young people in democratic processes; 'student parliaments and things like that.'

- Greater emphasis on ensuring the voices of young people are included in mainstream consultation and advocacy: 'challenging the environment movement a lot more than we do about why they're not seeking views of children and young people'.

- Better feedback to young people: 'really really publicising back to the young people what happens to their opinion.'

- 'A reasonably high profile and national workshop' to get it onto the political agenda.

- For young people to exercise their power as consumers as well as lobbying: 'what will really change things is if we suddenly are only buying green products from companies that have major green credentials.'

7. Dilemmas identified from the first round of interviews

The second round of interviews provided an opportunity to test and extend the analysis from the initial round. A summary of the initial interviews was sent to the participants, and they were asked to comment on three dilemmas that had been identified. They were also asked to suggest critical next steps, both to foreground the link between climate change and children, and to better incorporate the views and interests of children and young people.

8. The role of children and education – are we abrogating responsibility?

Most, but not all, participants concurred with the dilemma that emerged from the first round of interviews: that there is a tendency for adults to abrogate responsibility for dealing with climate change to children. However there was a range of views about whether we should therefore be focussing on educating children about climate change, and what focus such education should take.

> *'I think we have to do it. We do need to be giving them the best preparation we can. I think that there is that line between helping them to be familiar enough with the issues that they can make appropriate decisions for their lives and us feeling that we can't change and that the bequest we're leaving them is this problem.'*

A number of participants pointed to the critical need for schools to educate children to become active and competent citizens able to meet, among other things, the challenges that climate change will pose.

> *'Understanding what a price of carbon means, understanding the interests that are aligned against that and why, understanding the basic economics of why do we still drive cars with internal combustion engines, why do we still power our houses from coal fired power plants…those are economic questions and so I think that's where the education really needs to lie because that's where the leverage is and that's where your voice can have an impact.'*

> *'I don't think you teach them about climate change without teaching them also about tackling difficult issues, and intractable issues. So if you want to deal with climate change, you've got to deal with science, you've got to deal with relationships…they've got to deal with analytical thinkers, they've got to be negotiators, they've got to be empathic, they've got to be able to see big picture and minute details, they've got to be able to plan and execute.'*

Whereas other participants saw that the main need was for education and information to encourage behaviour change.

Putting parents back into the picture

Many of the participants pointed to the need to educate parents in parallel to educating children. This provides a way of:

a) reinforcing the messages that schools might be giving to children

b) countering the disjuncture that can occur between what children are learning at school and the behaviour of their families

c) engaging adults in the issue (and hence avoiding the abrogation of responsibility).

> *'There needs to be a similar thing given to parents as well to try and help consolidate it.'*

'I think that education for both parents and children is critical ... there is still this big hole where the parents sit. I think that parents need to be educated as well because kids need models and just as most people vote the way their parents do you can apply that same rule to taking care about climate change.'

'You need to make the point salient to parents that this is their children's future and that they will take their cue from their parents.'

The point was made that educating children in isolation from adults, particularly their families, 'exacerbates the risk of them becoming more fearful because they perceive inactivity, threat without action, threat with inactivity around them.'

Although many participants emphasised the need to educate 'the whole community, one participant made the point that *parents,* rather than adults in general, are far more likely to be receptive to messages about climate change, particularly when they are aimed at behaviour change.

Intergenerational dialogue

Education also provides a mechanism for intergenerational dialogue, which a number of participants considered to be at the heart of the challenge to ensure that each generation is able to take its fair share of responsibility and not abrogate responsibility.

'We need to pass the baton from an older generation to a younger generation in a way that each generation and age grouping understands what its roles and responsibilities are, and what they're trying to achieve.'

Intergenerational conversations are as important as education, are in fact part of education.

'I'm talking about a targeted conversation of the dialogue really between generations, across generations about: this is a shared responsibility. We all have different roles to play. You'll be around much longer than we will be on this. And this is high on our list of priorities, we'd like to think that you would regard this high on your priorities too. '

'I think young people both need and want to work with adults on these sorts of issues, and get some guidance from older people with their greater experience on how you deal with these sorts of things.'

9. The diffuse and future nature of climate change— does it get in the way?

Participants were asked to comment on our analysis that there are characteristics of climate change that make it difficult to develop realistic and constructive responses to it; the effects of climate change lie mainly in the future, they are diffuse and broad reaching.

Most agreed that the implications of climate change are indeed difficult for people to grasp, and that this makes it a difficult policy issue to tackle. *'One of the features of climate change is that the impacts are sort of two generations away, or one generation away'*.

'People get that it's huge, but they have to relate to it to do anything about it.'

A number of people commented that the perceived uncertainty around both the environmental effects and their human impacts also make climate change difficult to respond to.

'Yes, it is [in the] future and [there are] also lack of certain outcomes.'

This observation that the science is portrayed as uncertain was linked to the effect of the 'sceptics' debates discussed in the following section. However, participants drew a distinction between the debates around the veracity of the science, and the uncertainty of effects such as the degree of temperature rise that is likely.

'We need to get away from exactly what it's going to be like in the future in terms of quantifiable data. We just need a sense of agreement that this is a significant issue and we don't really know how it's going to play out.'

Several participants contended that in this, climate change invites comparisons with other policy issues. For example, 'prevention' strategies are always difficult to promote and implement as they are future-based.

'I just think there is a real commonality here with anything that's about prevention ... anything based on prevention is difficult as a rule around the world, not just Australia. We tend to not put our funds into prevention measures and part of the reason for that is that they're not obvious or quick returns.'

Likewise, any issue where individual actions might 'have a really big impact on another group that you never know about either because you're too removed from them, or because the impacts aren't felt for ten years'.

'So that I can blithely continue to consume, because really the impact's not going to be on me. But you know that sort of stuff happens with healthcare, so the ageing population sits there and goes 'we need health care, we need health care' and they don't understand that their demands...that extra three months of poor quality life means that children or infants get 20 years of poor quality life because the dollars go to the squeaky wheel that votes, rather than children, where the foundations of health are laid down.'

Many participants suggested that an important way to make climate change and its impacts easier for people to conceptualise (and potentially improve policy 'buy in') was to develop and deliver information about the likely effects of climate change that people can relate to their own lives and sector.

10. Why is it hard to articulate the impacts of climate change on children?

In the first round of interviews, it was striking that while participants could identify a range of possible environmental effects of climate change, and some general human impacts, they had difficulty in identifying specific impacts that climate change might have on children. We put this to them in the second round of interviews, and questioned why this might be. A range of reasons emerged.

Knowledge gaps

There were different opinions as to whether a knowledge gap, or a failure to communicate knowledge was the reason participants were not clear about the future effects of climate change on children. A small number of participants thought it likely that a body of research exists regarding the potential impacts of climate change on children. A larger number thought that such research is yet to be done.

> 'I don't think we've done the work so that we can speak with any real knowledge ... for example the impacts of people moving…what does that mean for children's experience of their lives? Disrupted education might be one.'

Science communication

There was a general sense that messages about climate change are confusing—the debate about the veracity of the underlying science, the lack of certainty about human impacts, the very diffuse nature of global environmental changes have all made it difficult for people to comprehend what specific changes will actually happen. Concerns about the science communication were as follows:

1. Science communication: information available is too general and broadscale

There is a lack of communication about the likely/possible *human impacts* of climate change in an Australian context. It was suggested that communication should focus on:

- Bringing climate change closer to people in concrete terms—anchor the information to changes that people can relate to in their own lives.
  Personal stories can be a powerful way to communicate. People, including politicians, respond to stories.

2. Science communication: distracted by sceptics debates

The ongoing debate about the existence of human induced climate change was identified by many participants as a barrier to deeper understanding.

3. Science communication: too negative

Many participants identified a need for more positive/hopeful messages about climate change. For example when talking to children, it was suggested to include a focus on the capacity for human beings to cope and adapt; humans have always adapted and will adapt to climate change.

> *'I have a lot of belief in how people get through tough times and get through these things. The innovation and creativity people often bring to it, sometimes our ideas and our anxieties about making it work hinders the things that might spontaneously happen.'*

Climate change provides a chance to make changes that will be broadly positive.

> *'We can create a more healthful environment, a socially more convivial environment … this can be a part of the same transition … this can be an exciting time of actually creating a better world, particularly for our children, that narrative isn't out there yet.'*

This focus on more positive messages was seen as a way of addressing the *overwhelming* nature of climate change, helping to protect against deleterious mental health impacts such as anxiety, and promoting optimism that is more likely to result in useful action.

> *'We can all handle things bit by bit but it's like the grim reaper, if it gets too overwhelming we shut it out. If we can make something positive, we need to learn from the advertisers.'*

> *'Make it much more aspirational and less a horror story.'*

> *'Encouraging a positive self image and a positive view of the future, getting over this feeling of helplessness.'*

4. Science communication: lack of an 'umbrella' group or lead agency that is considered to speak with authority

It was suggested by a number of people that there is a lack of a centralised authoritative voice for climate change information for the public to look to and trust.

> *'There is a lack of coherence and agreement among scientists which is really key.'*

The place of children

It was suggested by a number of participants that difficulty in identifying future effects of climate on children and young people was reflective of the invisibility of children in our society as a whole.

> *'It's about how we regard children in our society as a whole…children are like 'appendages within families'. One of the problems is…about regarding children in the first place…It's seeing children as much more visible in our society fundamentally, and seeing them actually as the key stakeholders for this climate change issue in particular.'*

11. Critical next steps suggested by participants

Participants were asked what they would identify as the critical next steps to:

a) foreground the connection between children/young people and climate change

b) integrate the views and interests of children and young people in climate change and related policy.

These suggestions are summarised below.

Participation of children and young people

A number of participants advocated for an event or process that might start nationally, and develop into an 'action plan':

- *'You need a summit – representative national forum to identify what young people see as the main issues. Two good examples are the peak body for children in care 'CREATE', and the work of the NSW Children's Commissioner.'*
- *'Create an agenda – practical doable steps.'*
- *' A high level round table or conference to include young people which would identify the nature of the problem and then chart 'practical doable steps'.*
- *'Young people's advisory body to the National Government.'*

Others suggested a bottom up approach where children would be supported to talk to each other at a local level after which representatives would meet regionally, at a state level and culminate in a national meeting of representatives.

- *'Develop a model of local forums to give young children a voice.'*
- *'Give young children and their families a voice – forums at a local level – through schools which then feed into a national level – start locally to get more voices, and to make sure it is not just a few token kids and to make sure young children can participate.'*
- *'Reach out to children where they are – at schools.'*

There were a number of suggestions for improving participatory mechanisms:

- Ensure that children and young people are meaningfully involved in any future research or action. Consider children's participation becoming a condition on relevant research grants.

- Ensure that participatory mechanisms are inclusive, as they tend to have a narrow constituency. To this end, make far better use of communication that young people actually use eg social networking.

- Find mechanisms to include children who don't participate.

- Keep the consultation cycle going: 'we've heard the message, we've changed the policy or our action, this is what we're thinking now, What do you think?'

- Encourage participation by ensuring it has a benefit to the participants eg something they can put on their curriculum vitae. Likewise, ensure that the results of participation are fed back.

- Support young leaders.

- Use innovative methods for participation eg story writing, competitions etc.

Science communication

Suggestions for improving science communication included:

- Promote an umbrella organisation for science communication on climate change issues.

- Engage more effectively with the media eg in order to get 'cut through' in the media, sometimes messages need to be tied to specific newsworthy events.

- Engage the advertising industry to change behaviours.

- Public education campaign along the lines of 'life, be in it' and 'slip slop slap'.

- Better education about children's rights and economic arguments regarding measures such as a carbon tax and emissions trading scheme.

- Broader education about the solution side of the story or potential actions that would help them.

- Education of children should be broader than schools. To engage children, use what they are attracted to eg games, electronics, online etc.

- Include it on the mainstream education for undergraduates (eg medical students).

Addressing the knowledge gaps

The participants suggested knowledge gaps could be addressed as follows:

- Develop a dialogue between people who *understand the science of climate change and people who understand children's lives.* This can identify and address real knowledge gaps (eg a reference group).

- Promote research about the current impacts of climate change on children and young people's wellbeing to understand more about the specific and contextual vulnerability of children and young people to climate change. (We are feeling the effects now and people don't necessarily know how to respond).

- A systematic serial survey over the course of the next three or four years—a group of sentinel schools—continue to collect systemic information that in five years might be important for evidence in change of awareness and concern.

Discussion

This research began with four hypotheses:

1. Most child or young people's advocates and experts lack specific information about the likely impacts of climate change on Australian children/young people (including how climate change is viewed by children and young people).

2. Child or young people's advocates and experts will consider that their peers lack information/are not well informed about the likely impacts of climate change on children.

3. Climate change experts and advocates will be more informed about predicted impacts of climate change on Australian children, relative to those working in the area of child and youth wellbeing.

4. Those experts and advocates (in either climate change or child and young people's wellbeing) who are well informed about climate change and its likely effects, will rate it as a highly significant issue for Australian children and young people.

It was somewhat surprising to us that by far the majority of professionals we interviewed who were working in the area of child and youth wellbeing were 'informed or well informed' about climate change and its likely human impacts on a self rating scale (see Figure 1). While some of this might be explained by the tendency for people who are very well informed to rate their knowledge at the same level as those who are not ('the more you know the more you realise you don't know') it should also be noted that even amongst participants who were working in the area of child and youth wellbeing, there were many who reported that their information came from a wide range of sources, including conferences and government reports, and so were presumably well informed. There was therefore a more informed spread of knowledge than we had anticipated.

While we did not ask directly how informed participants considered themselves to be about the likely impacts on *children*, from the interviews it would be fair to infer that none of the participants—whether they be climate change experts or children's champions— felt that they were well informed in this area.

Our second hypothesis, that 'Child or young people's advocates and experts will consider that their peers lack information/are not well informed about the likely impacts of climate change on children' has been largely borne out. Most participants reported that their colleagues' level of knowledge about climate change was 'mixed'. Closer investigation of the comments made by participants showed that 'mixed' most often meant that most of their colleagues had little or no knowledge about the likely impacts of climate change on children, but that there were individuals or groups who were interested and informed about climate change and its human impacts. No-one however reported that colleagues were well informed about the impacts on *children*. In some cases, colleagues were actively working on climate change issues within their professions. This raises interesting possibilities regarding the role that professional bodies might take in encouraging deeper understanding about the impacts of climate change on children in their constituency. Indeed, some participants reported that their professional bodies were starting to take an interest already. In the light of the many comments about the ineffectiveness of the media in communicating about climate change (beyond the 'sceptics debate'), alternative channels of communication, such as professional bodies, might be important.

Our third hypothesis, that 'climate change experts and advocates will be more informed about predicted impacts of climate change on Australian children, relative to those working in the area of child and youth wellbeing' presents some difficulties because, as the findings show, the interviews did not identify many specific predicted impacts of climate change on the wellbeing of Australian children.

Our fourth hypothesis, that 'those experts and advocates (in either climate change or child and young people's wellbeing) who are well informed about climate change and its likely effects, will rate it as a highly significant issue for Australian children and young people' was difficult to test as nearly all of our participants considered they were well informed. It was also the case that most participants, children's experts and climate change experts alike, considered climate change to be a highly significant issue for children and young people.

Yet, despite the high level of self-rated knowledge regarding climate change, it was difficult for participants to speculate about the future impacts of climate change on children beyond the broadest of changes. Lack of data was cited as a reason by some, and lack of communication about the predicted human impacts of climate change by others. Whether or not the data is available, it seems that it is not being effectively communicated to people who have a professional interest in the changes that climate change might bring to the lives of children. Most participants were convinced that there are significant knowledge gaps that need to be addressed, and conversations between the climate change sector and the children's sector which need to be started.

Cognitive science may help explain the difficulty in identifying the likely impact of climate change on children. All people use a variety of cognitive processes to make sense of information. Climate change poses real challenges because it is future oriented, complex and the evidence for climate change lies in trends rather than immediate experience. For example Newall and Pitman (2010) note the following confluences between the nature of climate change and perceptions of risk. First, *most people* base their understanding of global warming on the everyday experience of the weather, which is variable. Experience of a cold day is viewed as evidence that global warming is not happening. Climate on the other hand has a different timescale and refers to underlying trends discernible beneath the natural variability found in weather. Underlying trends are not directly experienced, nor is it easy to 'experience' carbon dioxide, (the driver of climate change) because it is a colourless, odourless gas.

Second, climate change is not a hazard itself, its impacts lie in the way it affects other hazards or risks and many of these are location specific as well as group specific. Psychological research in risk communication points to the importance of personal experience of possible outcomes in the perception of risk. Risk is also harder to grasp if impacts are deferred, and changes in behaviour do not reward people with discernible improvement. This 'future events' feature of climate change also means that information processing is much more general and non-specific: it is much harder in terms of cognitive information processing to think specifically about future impacts. Even if relatively well informed, these features of climate change may make it much more difficult for experts and advocates to articulate and prioritise it as an issue of real and immediate concern to children and young people.

Perhaps also, the difficulty in seeing children as relevant to climate change is part of the difficulty in seeing children at all. *'One of the problems is … about regarding children in the first place'.* If children are paid such little regard generally, it is unlikely that they will be visible in an arena as difficult to conceptualise as the future human impacts of climate change.

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Participatory mechanisms are one approach to increasing children's visibility. Mechanisms to listen to the voices of children and young people, consider their interests, and promote their participation in decision making with regard to climate change related policy and practice should in theory raise their status as legitimate stakeholders. It was therefore discouraging that our participants displayed such a degree of pessimism about participatory mechanisms. This pessimism is reflective of a great deal of the literature reviewing the recent mushrooming of activity encouraging the participation of children and young people, particularly in the UK. While some successes have been celebrated, a number of concerns have been raised. Perhaps most fundamental is the notion that children are often treated as 'citizens in waiting' rather than citizens in their own right, so their participation is seen as 'training' for future engagement as full citizens, rather than as a valuable contribution now. (Tisdall 2010). It has also been argued that most participatory mechanisms tend to replicate existing patterns of privilege and disadvantage. This was a concern also conveyed by many participants who urged that any participation mechanisms should actively attempt to engage children who would otherwise not participate.

An important link was drawn by participants between education and participation. In order to effectively engage in debates about climate change, it was argued education needs to provide children and young people both with an understanding of the 'bigger picture' of the economics and politics around climate change, and with the negotiation, analytic and scientific skills to tackle this 'intractable issue'.

Despite the agreement from most of our participants that climate change would widen social inequalities in Australia, few participants framed the issue as one of intergenerational inequity. Previously, we have argued that viewing climate change as an *intergenerational* health inequality issue may also help direct policy attention towards adaption and mitigation strategies, which can be viewed as health and social interventions, as well as environmental interventions (Strazdins et al, 2010, see also Quiggin, 2008). However, it is noteworthy that among our participants there was a great deal of support for encouraging intergenerational dialogue. This is in spite of the general cynicism about the effectiveness of most participatory mechanisms. Forums—listening followed by action—are part of this intergenerational dialogue, with an implicit goal of current generations taking more responsibility for, and helping to tackle, the problem posed by climate change. Our participants also advocated diverse ways in which such dialogue could be encouraged. Schools obviously have a central role to play, but so do families, environmental advocacy groups, and others.

Recent activity internationally gives cause for optimism that children and their role in decision making are emerging as an area of interest in research and policy. A global coalition of development and research organisations, *Children in a changing climate* has recently been established to 'challenge the presentation of children as passive victims of disaster and climate change'. The coalition has been active in promoting the involvement of children in climate change adaptation and prevention, as well as related research.

However, in a major policy review paper, UNICEF found that the issue of children and climate change had not been taken up either by mechanisms championing children, or those focused on climate change (UNICEF 2008).

Our study has also found that Australian children risk falling between the research-policy-action cracks. Despite awareness of the importance of this issue, the diffuse and deferrable nature of climate change means it is rarely given priority when immediate risks to children need to be addressed. Although our experts as a group represent considerable expertise and interest in increasing child voices on this issue, the lack of formal fora and formal advocates, hampers progress. This report aims to provide some insights into steps that will promote and protect children's and young people's stake in a complex, climate change future.

References

AIHW. 2007. *Young Australians: Their health and wellbeing*. 2007. Cat No. PHE 87. Canberra: Australian Institute of Health and Welfare.

AIHW. 2008. Making progress: The health, development and wellbeing of Australia's children and young people. Cat No. PHE 104. Canberra: Australian Institute of Health and Welfare.

AIHW. 2009. *A picture of Australia's children 2009*. Cat No. PHE 112. Canberra: Australian Institute of Health and Welfare.

Akachi, Y., Goodman, D., & Parker, D. 2008. Global climate change and child health: draft background study for policy review on climate change and children. Florence, Italy: UNICEF Innocenti Research Centre.

Albrecht G., Sartore G-M, Connor L. et al 2007. Solastalgia: *The distress caused by environmental change*. Australasian Psychiatry, 15(1), pp. S95-S98.

American Psychological Association Taskforce on the Interface between Psychology and Global Climate change 2010. *Psychology and climate change: Addressing a multi-faceted phenomenon and set of challenges*. Washington, American Psychological Association.

ARACY. 2008. Report Card: *The wellbeing of young Australians*. Canberra: Australian Research Alliance for Children and Youth.

Australian Government Department of Climate Change, *http://www.greenhouse.gov.au/impacts/coasts.html*.

Bartlett, S. 2008. Climate Change and Urban Children Impacts and Implications for Adaptation in Low and Middle Income Countries. Human Settlements Discussion Paper – Climate Change 2.

Bessant, J. 2004. *Mixed Messages: youth participation and democratic practice*, Australian Journal of Political Science, 399(2) 387-404.

Boivin M.J. 2002. *Effects of early cerebral malaria on cognitive ability in Senegalese children*. Journal of Developmental and Behavioral Pediatrics 23:353–64.

Bradley P. 2003. A war on violence? How Western societies are reacting to terrorism. InPsych, 25 (1) February, pp.11-13.

Bradley R.H, & Corwyn, R.F. 2002. *Socioeconomic status and child development*. Annual Review of Psychology. 53:371-99.

Brulle, R.J. & Pellow, D.N. 2006. *Environmental justice: Human health and environmental inequalities*. Annual Review of Public Health,27:103-124.

Bureau of Meterology. 2006. *Annual Australia Climate Statement.* http://www.bom.gov.au/announcements/media_releases/climate/change/20070103.sht

Butler, C.D. 2002. *Inequality and Sustainability.* PhD thesis.

Cockburn, T. 2010. Children and deliberative democracy, in Percy-Smith, B. & Thomas, N. *A handbook of children and young people's participation perspective from theory and practice*, Oxford: Routledge.

Committee on Environmental Health 2007. *Global climate change and children's health*. Pediatrics, *120*(5): 1149-1152.

CSIRO. 2007. Climate change in Australia technical report. Melbourne: CSIRO.

Dean, J., & Stain, H. J. 2007. The impact of drought on the emotional well-being of children and adolescents in rural and remote Australia. The Journal of Rural Health, 23(4): 356-364.

E.ON. 2007. *The E.ON changing energy report*. Coventry, UK: E.ON UK.

Ebi, K.L. & Paulson, J.A. 2007. *Climate change and children*. Pediatric Clinics of North America, 54: 213-226.

Eckersley R., Cahill H., Wierenga A., Wyn J. 2007. *Generations in dialogue about the future: The hopes and fears of young Australians*. Canberra and Melbourne: Australia 21 Ltd, Australian Youth Research Centre.

Eckersley, R. 1988. *Casualties of change: The predicament of youth in Australia*. Melbourne: Australian Commission for the Future.

Eckersley, R. 1997. Portraits of youth – understanding young people's relationship with the future. Futures, 29(3):243-9.

Eckersley, R. 2005. *Well & good: Morality, meaning and happiness*. 2nd ed. Melbourne: Text Publishing.

Eckersley, R. 2008. Nihilism, fundamentalism, or activism: Three responses to fears of the Apocalypse. The Futurist, vol. 42, no. 1, Jan-Feb, pp. 35-39.

Eckersley, R. 2010. *Population health: A forgotten dimension of social resilience*. In S. Cork (ed) Resilience and Transformation – Preparing Australia for uncertain futures. Melbourne: CSIRO Publishing.

Edwards, B. & Gray M. 2009. Sunburnt country: The economic and financial impact of drought on rural and regional families in Australia in an era of climate change. Australian Journal of Labour Economics. Melbourne: Australian Institute of Family Studies.

Elkins, K. & Sanson, A. 1996. *Children's views of the future: Concerns expressed in letters and questionnaires in the post Cold War period*. In Hagglund S, Hakvoort I, Oppenheimer L. (eds.). Research on children and peace: International perspectives. Report no. 1996:04, Department of Education and Educational Research, Goteborg University.

Fritze, J., Blashki, G.A., Burke, S. and Wiseman, J. 2008. *Hope, despair and transformation: Climate change and the promotion of mental health and well-being*. International Journal of Mental Health Systems, 2:13. 17 September 2008.

Garnaut, R. 2008. *Measuring the immeasurable: The costs and benefits of climate change mitigation*. Paper presented at The Sixth H.W. Arndt Memorial Lecture, The Australian National University.

Gracey, M. & Cullinane J. 2001. Gastroenteritis and environmental health among Aboriginal infants and children in Western Australia. Journal of Paediatrics and Child Health, 39(6):427–431.

Green, D., King, U. & Morrison J. 2009. Disproportionate burdens: The multidimensional impacts of climate change on the health of Indigenous Australians, MJA 190(1) 5 January 2009.

Gullone, E. 2000. *The development of normal fear: A century of research*. Clinical Psychology Review, 20(4):429-451.

Hart, R. 1992. *Children's participation: From tokenism to citizenship.* **Innocenti Essay** 92/6, UNICEF Innocenti Research Centre.

Hart R. 1997. *Children's participation: The theory and practice of involving young citizens in community development and environmental care*. New York: UNICEF.

Hennessy, K., Fitzharris B., Bates, B.C., Harvey, N., Howden, S.M., Hughes, L., Salinger, J., and Warrick, R., 2007. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Parry, M.L., Canziani, O.F., Palutikof, J.P., van der Linden, P.J., and Hanson, C.E., (Eds.), Cambridge University Press, Cambridge, UK, 507-540.

Hinton, R. 2008. Children's participation and good governance: Limitations of the theoretical literature. The International Journal of Children's Rights,16(3):285-300.

Hoffmann-Ekstein, J., Michaux, A. Bessell, S', Mason, J., Watson E. & Fox, M. 2008. *Children's agency in communities: A review of literature and the policy and practice context.* Sydney: Benevolent Society.

Institute of Development Studies 2009. *Participation and protection: Children's involvement in climate change debates.* In focus policy briefing, Issue 13: Children in a changing climate: Lessons from research and practice. November 2009.

Institute of Development Studies 2010. *http://www.ids.ac.uk/go/news/putting-children-and-future-generations-at-the-heart-of-climate-change-and-human-security*

International Save the Children Alliance 2005. *Practice Standards in Children's Participation*. London: International Save the Children Alliance.

IPCC 2007. *Climate change 2007: Synthesis report*. Statement of the IPCC on the Fourth Assessment Report. Geneva, Intergovernmental Panel on Climate Change, World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP).

Kelley, N. 2006, *Children's involvement in policy formation*, Children's Geographies, 4 (1):37-44, April.

Kirby, P. & Bryson. S. 2002. *Measuring the magic? Evaluating young people's participation in public decision-making*. London: Carnegie Young People Initiative.

Kirby, P., Lanyon C., Cronin K. & Sinclair, R. 2003. Building a culture of participation: Involving children and young people in policy, service planning, delivery and evaluation. London: Department for Education and Skills, UK.

Lansdown, G. 2001. Promoting children's participation in democratic decision making. UNICEF Innocenti Research Centre.

Lyon, M. 2007. *Children's participation and the promotion of their rights*. Journal of Social Welfare and Family Law, 29(2), 99-115.

Mandel Butler, U. 2008b. *Children's participation in Brazil: A brief genealogy and recent innovations*. The International Journal of Children's Rights, 16(3):301-312.

Mayall, B. 2006. Values and assumptions underpinning policy for children and young people in England. Children's Geographies, 4(1):9-17.

McMichael, A. J., Bunyavanich, S., & Epstein, P. R. 2005. *Global environmental change and child health*. In J. Pronczuk-Garbino (Ed.), Children's health and the environment: a global perspective (pp. 202-216). Geneva: World Health Organization.

McMichael, AJ, Friel, S, Nyong, A, Corvalan, C. 2008. *Global environmental change and health: impacts, inequalities, and the health sector*, BMJ 336: 26 January 2008, pp 191-94.

Mission Australia, 2010. National survey of young Australians 2010.

Morrow, V. 2001. Networks and neighbourhoods: Children's and young people's perspectives. London: Health Development Agency.

Moses, S. 2008. *Children and participation in South Africa: An overview*. The International Journal of Children's Rights, 16(3):327-342.

Muir K., Mullan K., Powell A., Flaxman S., Thompson D., Griffiths, M. 2009. *State of Australia's young people. A report on the social, economic, health and family lives of young people*. Canberra: Office for Youth, Australian Government.

Newcomb M. 1986. Nuclear attitudes and reactions: Associations with depression, drug use, and quality of life. Journal of Personality and Social Psychology, 50(5):906-20.

Newell, B. & Pitman, A. J. 2010. *The psychology of global warming: Improving the fit between the science and the message*. Bulletin of the American Meteorological Society, 91(8):1003-1014.

Niehaus M.D., S.R. Moore, P.D. Patrick, L.L. Derr, B. Lorntz, A.A. Lima, et al 2002. Early childhood diarrhoea is associated with diminished cognitive function 4 to 7 years later in children in a northeast Brazilian shantytown, American Journal of Tropical Medicine and Hygiene 66: 590–93.

Oberhelman R.A., E.S. Guerrero, M.L. Fernandez, M. Silio, D. Mercado, N. Comiskey, G. Ihenacho, and R. Mera 1998. Correlations between intestinal parasitosis, physical growth, and psychomotor development among infants and children from rural Nicaragua, American Journal of Tropical Medicine and Hygiene 58: 470–75.

O'Donnell, D. 2009. The right of children to be heard: children's rights to have their views taken into account and to participate in legal and administrative proceedings. Innocenti Working Papers, 4.

Patz, J.A., Gibbs, H.K., Foley, J.A., Rogers, J.V., & Smith, K.R. 2007. *Climate change and global health: Quantifying a growing ethical crisis*. EcoHealth, 4:397-405.

Percy-Smith, B. & Thomas, N. 2010. A handbook of children and young people's participation perspectives from theory and practice. Oxon.,Routledge.

Print, M., 2007. *Citizenship education and youth participation in democracy*. British Journal of Educational Studies, 55(3):325-345.

Prout, A. & Hallett, C. (eds.). 2003. *Hearing the voices of children*. London: Routledge Falmer.

Prout, A., Simmons, R. & Birchall, J. 2006. *Reconnecting and extending the research agenda on children's participation.* in Tisdall, K., Davis, J., Hill, M., & Prout, A. 2006, Children, young people and social inclusion. Bristol: Policy Press.

Quiggin, J. 2008. Stern and his critics on discounting and climate change: an editorial essay. Climatic Change, 89:195-205.

Reeder L., Eckersley R. & Olsen A. 2010. *The Australian Youth Forum asks the next big question*. A report to the Minister for Early Childhood Education, Childcare and Youth. Canberra: Australia 21.

Sapolsky R. 2005. *Sick of poverty*. Scientific American, December.

Save the Children UK. 2007. Legacy of disasters: The impact of climate change on children. London: Save the Children UK.

Schneider, S.& Lane, J. 2005. Integrated assessment modelling of global climate change: Much has been learned—still a long *and* bumpy road ahead, Integrated Assessment, 5(1).

Selevan, S.G., Kimmel, C.A. and Mendola, P. 2005. *Windows of susceptibility to environmental exposures in children.* in Pronczuk-Garbino, J. (ed) Children's Health and the environment: A global perspective, Geneva: WHO.

Shier, H. 2001. Pathways to participation: Openings, opportunities and obligations. Children & Society 15:107-117.

Sly, P., Hanna, E., Giles-Corti, B., Immig, J., & McMichael, T. 2008. *Environmental threats to the health of children in Australia: The need for a national research agenda*. Perth: World Health Organization Collaborating Centre for Research on Children's Environmental Health.

Sorenson, J. 2007. *The secret life of the National youth Roundtable*, in conf proceedings Are we there yet? National Youth Affiars Conference 1-3 May.

Spurrier, N., Sawyer,M., Clark, J., and P. Baghurst, Australian and New Zealand Journal of Public Health, 27(1)**:**27–33.

Strazdins, L., Friel, S., McMichael, AJ, Woldenberg Butler, S & Hanna, E. (In press 2010) *Climate change: an Australian intergenerational health equity analysis.* International Public Health Journal (Special Issue Editor Erica Bell). (Accepted January 15 2010)

Swim J., Clayton S., Doherty T. et al 2009. *Psychology and global climate change: Addressing a multi-faceted phenomenon and set of challenges*. A report by the American Psychological Association's task force on the interface between psychology and global climate change.

Sylwander, L. 2001. Children as participants: Swedish experience of child participation in society's decision-making process. Sweden: Ministries of Health and Social Affairs and of Foreign Affairs.

Tanner, T. 2010. Shifting the narrative: Child-led responses to climate change and disasters in El Salvador and the Philippines, Children and Society 24: 339-351.

Tanner, T. 2010(b). *Youth, gender and climate: Moving from impacts to agency.* UNICEF_GPIA 5th Annual International Conference.

Taylor, M. & Barry, S. 2008. *Children's participation: Learning from and for community development*. The International Journal of Children's Rights, 16:379-394.

Tisdall, K. 2010. *Governance and participation*, in Percy-Smith, B. & Thomas, N. A handbook of children and young people's participation perspectives from theory and practice, Oxon.,Routledge.

Tisdall, K. 2008. Is the honeymoon over? Children and young people's participation in public decision-making. The International Journal of Children's Rights, 16(3): 419-429.

Tisdall, K., Davis, J. and M. Gallagher, 2008. *Reflecting on children and young people's participation in the UK*, International Journal of Children's Rights 16:343-354.

Treseder P. 1997. *Empowering children and young people: Training manual*. London: Save the Children and Children's Rights Office.

Tucci J., Mitchell J., Goddard C. 2006. *Every child needs a hero*. Melbourne: Australian Childhood Foundation, July.

Tucci J, Mitchell J, Goddard C. 2008. *Children's sense of safety*. Melbourne: Australian Childhood Foundation, May.

Tucci, J., Mitchell, J., & Goddard, C. 2007. *Children's fears, hopes and heroes*. Melbourne: Australian Childhood Foundation and the National Research Centre for the Prevention of Child Abuse, Monash University.

Twenge, J.M. 2000. The age of anxiety? Birth cohort change in anxiety and neuroticism, 1952-1993. Journal of Personality and Social Psychology, 79(6):1007-21.

UNICEF Innocenti Research Centre, Climate Change and Children: A Human Security Challenge, November 2008, www.unicef-irc-org

UNICEF, Climate Change and Children, December, 2007.

Vromen , A. & Collin, P. 2010. Everyday youth participation? Contrasting views from Australia policy makers and young people, Young 18(97).

Walden, D. & Hawrylyshyn, K. 2009. Global warning: Children's right to be heard in global climate change negotiations. London: Plan.

Waterston, T. 2006. Climate change - the greatest crisis for children? Journal of Tropical Pediatrics, 52(6):383-385.

Williams, A., 1997. Intergenerational equity: an exploration of the 'Fair Innings' argument, Health Economics, 6:117-132.

Wyness, M. 2009. Children representing children. Childhood, 16(4), 535-552.