Australian
Psychological
Society

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Dear Ms Goss

Inquiry into Australia's Biodiversity in a Changing Climate

The Australian Psychological Society (APS) welcomes the opportunity to make a submission to the Productivity Commission Inquiry into Barriers to Effective Climate Change Adaptation.

Australian psychologists are increasingly concerned about the impact of environmental threats and climate change on the natural environment and its ecosystems. Psychologists have an integral role to play in addressing linkages between people and environmental problems and finding achievable and effective solutions.

The APS has no interests or affiliations relating to the subject of the consultation and the representations submitted, other than our concern that the Australian Government be well-informed and effective in its strategies.

Yours sincerely,

Professor Lyn Littlefield OAM
Executive Director
Australian Psychological Society

Submission to the Inquiry into Regulatory and Policy Barriers to Effective Climate Change Adaptation

Productivity Commission

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1 Executive summary

The Australian Psychological Society (APS) recognises the importance of identifying the diverse barriers that prevent individuals, households, organisations, firms, and governments from engaging in effective adaptation to climate change impacts now and in the future. Psychologists along with other social and behavioural scientists have been seriously involved in identifying and addressing these barriers for the past three decades. Hence a considerable body of conceptual and empirical work and distilled best practice exists which can inform strategic and effective interventions and policies.

The issues raised in this submission are summarised in a series of key points.

Key points and recommendations

This submission highlights the crucial body of work by social scientists on psychological adaptation.

Alongside physical and structural adjustment to environmental changes, adaptation also includes a range of coping actions that individuals and communities may take, as well as psychological processes that both precede and follow behavioural responses.

Considerable psychological adaptation to climate change takes place within individuals. It includes people's psychological responses, changes, and adjustments to the threat and implications of climate change, as well as to the psychological consequences of unfolding physical environmental impacts of climate change. These convergent psychological processes and responses powerfully mediate behavioural adaptations and adjustments.

Psychological adaptation includes: how people perceive and understand the problems, how they react emotionally, how they decide what to do, and how they behave in response to the problems.

Much adaptation requires changes in behavior; hence understanding the barriers to individuals and groups engaging in behaviour change is very important, so that these barriers can be identified and addressed, and change facilitated.

Because barriers are often activity-specific, the particular barriers to any one adaptive behaviour mostly need to be identified after the desired adaptation action has been identified. Techniques for identifying barriers include literature reviews, qualitative research such as observational studies and focus groups, and surveying the population of interest to identify what barriers might be preventing them from changing their behaviour.

There are also many barriers to thinking about and coming to terms with the reality and implications of climate change. Some of these come about because of mental shortcuts we use to make sense of events, or protective motivation defences. These processes, however, can also get in the way of adaptive psychological responses such as acceptance, felt responsibility, motivational commitment, etc., a lack of which in turn may constitute further psychological barriers to behavioural adaptation.

The diversity of barriers that exist for any adaptation behaviour means that single-focused interventions will rarely bring about behaviour change. The most effective interventions, therefore, are those that are tailored to the individual or the specific behaviour, or which address all the significant barriers that matter in a target population by combining intervention strategies.

Useful adaptation interventions include:

- Policy initiatives that make healthful, adaptive behaviour (e.g., recycling grey water, purchasing renewable electricity) the default option, so that people have to opt out if they do not want it.
- Using models which combine different incentives, like financial incentives, attention to customer convenience, quality assurance, and social marketing
- Using information and education campaigns in conjunction with practical and effective intervention strategies
- Building in feedback mechanisms which provide frequent information about the financial consequences of energy use and behaviour immediately or daily, rather than monthly or even less frequently.
- Designing effective disaster communication that combines appropriate psychological advice and education, along with best practice communication of warning message content for dealing with the actual emergency situation.
- Ensuring emergency warnings have the following characteristics: specificity, consistency, certainty, accuracy, clarity.
- Using social influence models to maximise spread of adaptation behaviours through a community: modeling, social norms, peer messages, using social marketing techniques
- Building and refurbishing healthcare facilities and infrastructure for sustainability and to maximize convenient access and ensure it is fit for and resilient to future climate impacts.
- Expanding mental health servicing capacity.

All adaptation actions must take into consideration their impact on those most at risk. This involves attention to:

- the social safety net
- the need for targeted assistance and short term assistance to aid recovery from disasters.
- the need for psychological/trauma services

Analyse specific barriers at the behavioural level, observe and record, intervene, test the intervention, then evaluate the program.

Design interventions that combine different strategies for maximum effects.

Work closely with other disciplines, with government agencies and with technical experts.

2 The Australian Psychological Society

The Australian Psychological Society (APS) is the premier professional association for psychologists in Australia, representing more than 20,000 members. Psychology is a discipline that systematically addresses the many facets of human experience and functioning at individual, family and societal levels. Psychology covers many highly specialised areas, but all psychologists share foundational training in human development and the constructs of healthy functioning. In particular, a number of convergent areas of psychological work and practice have focused on the challenges of global environmental change and global climate change for the past few decades, with environmental psychology, social psychology, health psychology, clinical psychology, disaster psychology, community psychology, and organisational psychology have made key contributions in addressing the human dimensions of climate change (e.g., APA, 2009; Kazdin, 2009).

The APS welcomes the opportunity to provide input to the Productivity Commission Inquiry into barriers to adaptation. Australian psychologists, along with other members of the scientific and professional community, are increasingly concerned about the impact of environmental threats and climate change on the natural environment and its ecosystems. Climate change is in a large part caused by human behaviours and directly affects human health and wellbeing. Psychologists thus have an integral role to play in addressing linkages between people and environmental problems and finding achievable and effective solutions.

The APS is well placed to contribute to this consultation by identifying psychological research on adaptation processes, considerations, and impacts at multiple levels, including within-individual dynamics and responses, changes and impacts; with respect to individual level pro-environmental behavioural engagement; and with respect to community and societal responses, changes, impacts, and behavioural engagement. (e.g., Reser & Swim, 2011).

The APS has a Climate Change and Environmental Threats Reference Group (CCRG) comprised of psychological experts in environmental and social psychology. In addition to a thorough understanding of human behaviour, our members have expertise in adaptation, disaster preparedness, barriers to behaviour change, resilience, the built environment, conservation of wilderness heritage areas, waste and recycling, media representations of environmental threats, risk perception and communication, stress and coping, and ongoing environmental stress, amongst other interests.

While the APS is not in a position to comment on every aspect of the Inquiry, we draw the committee's attention to the APS *Position Statement on Psychology and the Natural Environment*, based on a comprehensive Literature Review, the APS *Position Statement on Climate Change*, and a number of related submissions made to government inquiries in recent years. These resources can be accessed at: http://www.psychology.org.au/community/public-interest/environment/.

3 Responding to the terms of the Inquiry

This aim of this Inquiry is to review regulations and policies that may be barriers to effectively adapting to the impacts of climate change, and to examine the costs and benefits of options to remove those barriers.

It is beyond the scope of the Australian Psychological Society to address all of the terms of reference. We limit our response to the evidence drawn from the psychological literature on known barriers to adaptation, the benefits of various adaptation options, and examples of non-market based ways to promote effective adaptation.

We will also address critical omissions in this Inquiry, and indeed in the wider climate change science, discourse, and policy considerations when addressing matters such as barriers for adaptation. These omissions include the crucial body of work by social scientists on *psychological adaptation*. Psychological adaptation encompasses intra-individual processes relating to psychological responses, changes, and adjustments to the threat and implications of climate change, as well as to those psychological consequences of unfolding physical environmental impacts of climate change. These processes in turn influence behavioural and lifestyle changes that are necessary for adaptation, and understanding these is therefore crucial to any inquiry into adaptation.

4 Adaptation mechanisms

Adaptation to climate change is an ongoing and ever-changing process that includes reactions to, and preparations for, both the physical and psychosocial impacts of climate change that are experienced or anticipated. As well as physical and structural adjustment to environmental changes, adaptation also includes a range of coping actions that individuals and communities may take, as well as psychological processes that both precede and follow behavioural responses (Reser & Swim, 2011). Considerable psychological adaptation to climate change takes place *within* individuals. It includes people's psychological responses, changes, and adjustments to the threat and implications of climate change, as well as to the psychological consequences of unfolding physical environmental impacts of climate change. These convergent psychological processes and responses powerfully mediate behavioural adaptations and adjustments. (Unfortunately, climate change science almost totally neglects psychological adaptation).

Climate change impacts

Climate-related physical changes include the effects of rising sea levels, droughts, unpredictable weather, shortages of food and clean water, other resource shortages, and extreme weather events.

The social and psychological impacts of climate change include the direct mental health impacts on people affected by natural disasters and a changing environment, as well as the psychosocial impact of disruptions to the social, economic and environmental determinants that promote health and wellbeing in individuals and communities (Fritze et al., 2008), conflicts over resources (Reuveny, 2008 – from APA), anxiety and despair (Kidner, 2007 – from APA), and heat related violence. The psychosocial impacts of threats of climate change are often mediated via the construction and representation of events and consequences by the media, and by contemporary information and communication technologies. Government

departments need to appreciate and genuinely understand that this matter of the psychological and social impacts *of the threat* of climate change is a current and highly significant but missing part of the larger picture.

Adaptation to *both* physical and psychosocial impacts of climate change is critical. So adaptation involves a wide range of responses, both physical and psychological.

Adaptation and coping responses

Adaptive responses encompass actions by individuals or groups which are *proactive*, in anticipation of predicted changes to the environment, or *reactive* to changes that are already here. Adaptation actions can be undertaken by individuals, households, social groups, communities, organisations, firms, or governments.

Adaptation can also include *coping* responses to both the threat and unfolding impacts of climate change. Coping responses include how people perceive and understand the problems, how they react emotionally, how they decide what to do, and how they behave in response to problems and threats.

Adaptation thus includes:

- Structural changes e.g., building water desalination plants to increase water resources; changing building practices to better weather-proof houses, migration to safer climates and housing opportunities; increasing home weatherization to reduce heating/cooling bills and make houses better able to withstand extreme temperatures
- Changes in policies and systems relating to households, communities, institutions, and regional, national, and global governance (Reser & Swim, 2011)
- Behaviour changes that people make to reduce their energy/resources consumption and hence rising costs of living (Note: many adaptation measures are also mitigation measures and can also, (for example), reduce greenhouse gas emissions)
- Preparing physically for disasters

Psychological adaptation:

- Appraising situations, making sense of risks, determining the significance of risks to oneself and one's community
- Coping psychologically with losses of biodiversity, a stable climate, familiar landscapes, or a certain future
- Coping psychologically with the distress of climate change (e.g., guilt, anxiety, depression)
- Coping with stress
- Coping with the psychological costs of adaptation (e.g., stress of moving away from familiar area to more benign climate)
- Evaluating the different ways of responding to the threats, like engaging in behaviour change, managing emotions, disengaging from the problems, problem solving
- Preparing psychologically for disasters; anticipatory coping
- Building resilience in communities
- Recovering after natural disasters

5 Barriers to adaptation

Whether adaptation involves structural changes, policy changes or psychological responses, it is important that we understand the barriers to adaptation that individuals and groups encounter. Then, they can be addressed, taken into account, minimised, or overcome.

Human behaviour is complex, and deeply embedded in social situations, institutional contexts and cultural norms. All of these factors need to be considered in understanding barriers to adaptation. All of these factors also need to be considered in understanding how to motivate adaptive behaviours.

Barriers to action encompass:

1. Physical and structural barriers
2. Psychological and socio-cultural barriers

Structural barriers

Certain key structural barriers stand in the way of behavioural changes that would help limit climate change. Structural barriers include things like lack of public transport in your area, absence of recycling receptacles in public areas, lack of mental health services, low income which severely limits one's ability to purchase energy efficient appliances/solar panels/electric cars etc; living in a climate with extreme temperatures that that restricts one's ability to reduce home heating/cooling energy use.

Structural barriers need to be removed and adaptive behaviour patterns supported by the use of legislation, policy, urban renewal, building codes etc.

Psychological and socio-cultural barriers

Many psychological and socio-cultural barriers remain for individuals that make it difficult for some people to adopt effective adaptation behaviours, even if they are not facing stiff structural barriers (e.g., Schultz et al., 2007; Gardener & Stern, 2002; Gifford, 2011).

First, there are many 'barriers' to even thinking about and coming to terms with the reality and implications of climate change. The adverse psychological impacts of the ongoing threat and profound implications of climate change themselves get in the way of taking action.

People can avoid, minimize, or deny the threats, distract themselves, find ways to justify their current lifestyles and behaviours, etc. People use mental shortcuts (heuristics) to judge risks, interpret information, and choose responses. These processes often get in the way of adaptive psychological responses such as acceptance, felt responsibility, motivational commitment, etc, a lack of which in turn may constitute further psychological barriers to behavioural adaptation.

Socio-cultural barriers are also evident. These include not just barriers that come from perceptions of social status, a cultural ethos of consumerism, and entrenched gender roles in a community, but also include the impact of social constructions of shared meanings of climate change. The public's understandings of climate change are actually rather different from climate change science accounts, as they reflect cultural assumptions and meaning systems, and the socially constructed and

represented risk domain of climate change. This itself becomes a substantial barrier in communicating with, engaging, and influencing public understandings, responses and behaviours.

Furthermore, whilst the reality is that the great majority of Australians are very concerned and distressed about climate change and are also very motivated to address this problem (Reser, 2011), current media representations of public views and sentiments are often inaccurate and misleading, and seriously disconfirm, contra-validate, and erode individual and community motivation, commitment, and felt confidence that local and national government is or will act responsibly with respect to this profound threat and challenge. This compounds the challenges of getting people to enact adaptive coping responses to perceived threats of climate change.

So, psychological obstacles to effective climate change adaptation begin with ignorance and progress through increasing awareness towards an intention to act. An extensive list of psychological barriers to change that have been identified by Gifford (2011) is summarized in Table 1.

Table 1: Psychological Barriers to Adequate Climate-Change Adaptation

Barrier	What psychologists know about people's reluctance to make changes in the face of climate change and other threats
Ignorance	Unawareness of the issue or lack of knowledge about what action to take
Uncertainty	Perceived or real uncertainty reduces the frequency of pro-environmental behaviours (de Kwaadsteniet, 2007; Hine & Gifford, 1996); acting in short term self-interest - tendency to interpret any sign of uncertainty as sufficient reason to act in self-interest over that of the environment. When people are ambivalent, they often seek information that agrees with their existing attitudes, but they avoid information with which they disagree (Blankenship & Wegener, 2008).
Optimism bias	Social scientists have noted a common tendency in humans of unrealistic optimism even when the stakes are high (e.g., people underestimate their personal risk of getting sick from smoking, even though the statistics show marked increase in risk of heart and lung disease). Most people see themselves and their world in a more positive light than objective data would tell us. In environment contexts, there is a tendency for people to think that environmental problems cannot really be that bad as the scientists predict. People also have a tendency to cling to a belief that they can control uncontrollable events. One example of this is the way many people hold to the hope that technology will provide a silver bullet solution to global warming.
Limited attention	People have limited attention and information-processing abilities.
Risk assessment	There is a general, though not universally operating, tendency for people to underestimate large probabilities and overestimate small ones (Lehman & Taylor, 1987). Lichtenstein et al. (1978) used the term primary bias to refer to an overall pattern of data in which subjects underestimate the frequencies of many common causes of death (like heart disease, stroke, and stomach cancer), but overestimate the frequency of rare causes of death (like botulism, floods, complications of pregnancy). They also found an additional secondary bias – subjects

	tended to exaggerate dramatic and sensational causes of death compared to causes that are prosaic or ordinary. (e.g., homicides versus diabetes).
Judgmental discounting	Undervaluing future or distant risks, such as discounting climate change in temporal and spatial terms (when people presume environmental problems are going to be worse in the future, and in other parts of the planet, and so are less likely to be motivated to take action now and to act locally) (Gifford et al., 2009; Uzzell, 2000).
Numbness	We can become desensitised to big problems which are not easily fixed, and seem to go on and on without resolution. We can tune out, thus minimising our stress, and continuing with business as usual.
Fear	Fear can lead to people becoming easily overwhelmed at the magnitude of the environmental problems facing the planet. When they become too fearful, there is a tendency for people to react by denying or minimising the problems (Oskamp, 2000). Fear and anxiety can often get in the way of clear thinking and necessary adaptive responding in the context of imminent natural disasters (Reser, 2004).
Lack of [illegible]	Because climate change is a global problem, many individuals feel they can do nothing about it – this is the well-known collective action problem. (Olson, 1965).
Social [illegible]	People routinely look to others' behaviour in choosing their own actions (Festinger, 1954). We have a tendency to compare ourselves, and to alter our behaviour to fit the norm (Heath & Gifford, 2002).
	These are the rules that a group uses for appropriate and inappropriate values, beliefs, attitudes and behaviors (Heath & Gifford, 2002). Norms are very powerful (Schultz, Nolan, Cialdini, Goldstein & Griskevicius, 2007). One of the best ways of changing behaviour is to change what is socially acceptable (Cialdini, 2003).
	If any sort of inequity or perceived inequity exists, cooperation declines (Aquino, Steisel, & Kay, 1992).
	A range of perceived risks resulting from changes in behaviour have been documented - such as functional risk, physical risk, financial risk, social risk, or time lost (Schiffman, Kanuk, & Das, 2006).
	If we don't trust that a program will be effective, we are reluctant to engage in it.
	Evidence suggests people distrust messages that come from certain sources, like government or industry, particularly where such advice threatens one's freedom (MacGregor, Slovic, Mason, Detweiler, 1994).
Reactance	People often react to policies, particularly if they are restrictive. These policies can engender resentment and actions to restore threatened freedoms, such as ditching the policies themselves or creative disobedience (Eilam & Suleiman, 2004).
Denial	Denial of existence of climate change and human contribution to it, or more specifically denial of the role of one's behaviour or group behaviours in harming others (Swim et al., 2009).

Belief in solutions outside human control	Our beliefs in particular ideologies like 'techno-salvation', or suprahuman powers like 'mother nature' or God, may convince us that we are protected from ultimate climate disaster, thus minimising the need to change our own behaviour. Science does not support these theories, but many people cling to these beliefs nonetheless.
Place attachment	People may be more likely to care for a place to which they feel attachment than for one they do not. The role of place attachment is likely to be complex but acts as an impediment to action in some populations (Clayton, 2003; Uzzell, Pol, & Badenas, 2002; Gifford et al., 2009).
Habit	Many habitual behaviours are extremely resistant to permanent change, and others are slowly changed (Maio et al., 2007). Changing attitudes does not always change behaviours. Habit may be one of the most important obstacles to the mitigation of climate change impacts (Hobson, 2003). It is more difficult to alter and maintain repetitive behaviour changes than it is to bring about one-time changes in behaviour (Kempton, Darley & Stern, 1992).
Conflicting goals and aspirations	The common goal of getting ahead often means engaging in actions that run counter to the goal of reducing climate change impacts. Everyone has multiple goals and values, and goals that involve more production of greenhouse gases can trump goals that support using less.
Tokenism	The tendency for people to favour behaviours which are easier to change (but have less impact) over those which are more difficult but have great effect (low-cost hypothesis) (Diekmann & Preisendorfer, 1992; Kempton et al., 1985). These efforts then become tokenistic, and create further problems if we think we've done our bit to adapt, and are now off the hook for any further action.
Rebound effect	After making some savings in emissions in one area, people often erase the gains by using the savings to treat themselves on an even higher carbon-emitting product or activity, or by justifying greater use of the item, like purchasing a fuel efficient car, then driving even more than before. (Called 'The Jevon's paradox' (Jevons, 1865), or the 'Khazzoom-Brookes postulate' (Brookes, 1990; Khazzoom, 1980).

(Refer to Gifford, 2011 for a comprehensive discussion of barriers to action).

6 Identifying barriers

Understanding and identifying barriers, then reducing, removing or helping people to overcome them, is essential if adaptation is to be successful. Barriers, however, can be multiple and may vary for different groups of people or individuals. Also, barriers that prevent one person from adapting to one sustainable behavior (like low-emission farming practices) might be different from the barriers that prevent the same person from adapting to a seasonal threat of bushfire.

Because barriers are often activity-specific, the particular barriers to any one adaptive behavior mostly need to be identified after the desired adaptation action has been identified. For example, if household water conservation is the desired goal, program designers need to identify the particular barriers to people adopting differing adaptation behaviours such as installing grey water systems, installing water tanks, designing water efficient gardens, and reducing household

consumption. For each adaptation action, therefore, specific barriers may need to be identified. McKenzie-Mohr and Smith (1999) provide a useful list of techniques for identifying barriers, including:

- undertaking literature reviews
- undertaking qualitative research like observational studies and focus groups
- surveying the population of interest.

These researchers warn that relying on theories or hunches as to likely barriers is an insufficient and inaccurate way to identify actual barriers, although it is tempting and common in practice. Whilst conducting preliminary research to identify barriers takes time, it is a critical step that cannot be overlooked.

7 Successful adaptation interventions

There is an extensive psychological and social science literature, including the coping and disaster preparedness literature, that explores ways of removing psychological and socio-cultural barriers in order to increase adoption of important adaptation behaviours (for detailed summary, see Swim et al., 2009).

In general, interventions to improve adaptation are more effective when they:

- Address people's perceptions of how climate change or more specific environmental threats will impact on them and their close others (as this influences how motivated people are to engage in adaptive actions)
- Attend to factors that assist proactive coping in general, like setting small, achievable and specific goals, and highlighting how alternative goals may unexpectedly interfere with adaptation goals (Thoolen, de Ridder, Bensing, Gorter & Rutten, 2008).
- Ensure that adaptation recommendations are salient, credible, readily understandable, achievable and likely to be acceptable to the target group (Mertens, 2009).

Barriers to people adopting adaptation behaviours vary with both the behaviour and with the individual. The diversity of barriers that exist for any adaptation behaviour means that single focused interventions will rarely bring about behaviour change (McKenzie-Mohr, 2000). The most effective interventions, therefore, are those that are tailored to the individual or the behaviour (see previous section), or address *all* the significant barriers that matter in a target population by combining intervention strategies (Gardner & Stern, 2002).

In the following sections we detail specific examples of models to maximize adoption of adaptation behaviours by overcoming barriers to inaction: policy initiatives, economic instruments, communication and diffusion techniques and methods (APA, 2010). A combination of these approaches will be maximally effective.

Policy initiatives – optimal defaults

Psychology provides a major source of insight into the ways people respond or fail to respond to various policy approaches, such as public acceptance of regulations, taxes etc. For example, research that has been done on householder support for sustainability policies and strategies (including regulation and pricing mechanisms) shows which policies are considered fair/unfair (Newton, 2011). This important research concludes that voluntary behaviour change will be no easy task – even for 'committed greens'. Governments will need to persist with regulation, pricing and incentives to bring about urgent adaptation and mitigation behavior.

A recent approach that has proved successful in the field of public health and holds promise for climate change adaptation has been the use of *optimal defaults* (Brownell & Frieden, 2009). This term opt describes conditions that set up beneficial or healthy choices as the behavioural default option. Rather than focusing on changing people's behaviour one person at a time, good public policy makes positive changes in the environments that support particular behaviour patterns. The desired, healthful behaviour is set as the default (e.g., people are automatically signed up for organ donation at the time of getting their driver's licence; customers are automatically signed up for green energy when signing with an electrical utilities provider; low-flow showers and water saving toilets become the default option for new buildings). If people do not want the default option, they can opt out. This model represents a compromise between a personal responsibility model of change versus a public policy model of change; public policies can determine what the optimal default positions are, yet the choice remains with the individual to opt out.

For large scale effectiveness, this sort of intervention is much more successful than voluntary 'opt-in' schemes. Practising more healthful (or in this case, adaptive) behaviour becomes the optimal default – that is, choosing a more healthful or adaptive behaviour becomes easier, if not automatic.

In countries where optimal defaults have been used for organ donation, for example, this has changed the sign-up for organ donation from 10 per cent to 98 per cent. In Australia, where we are encouraged to opt in, the rate is less than 15 per cent (Refer to Burke, 2011). No public education campaign can ever hope to achieve such a massive swing in collective behavior.

Economic instruments

Social scientists have studied the effects of interventions that change financial incentives in an attempt to increase uptake of a new behaviour (e.g., time-of-use electricity pricing, Staats, Harland & Wilke, 2004). Simple economic models that presume a constant response to price elasticity are less successful than models which combine different incentives, like financial incentives, attention to customer convenience, quality assurance, and social marketing. For example, a home weatherisation program which combined financial incentives with these non-financial incentives led to successful weatherization of 20% more of eligible homes in a community in the first year of a program – results far more powerful than the financial incentives would have achieved alone (Stern et al., 1986).

Communication techniques

Much psychological research on interventions has focused on communication techniques such as information provision and persuasive appeals. On their own, information campaigns and mass media persuasion appeals are rarely effective. Studies generally find that information techniques increase knowledge but have minimal effects on behaviour. Education works best when combined with other strategies of intervention – education and other action strategies can act in synergy: the effects of both together are greater than one would expect from their separate effects (Gardener & Stern, 2002).

Information in the form of feedback has been found to be more useful than general information in changing behaviour. Behaviour is most likely to be influenced by consequences that occur soon and with relative certainty. For example, immediate or frequent (e.g., daily) energy use feedback has yielded energy savings of 5-12%

in homes, often lasting six months or more (Fischer, Greitemeyer & Frey, 2008). Feedback research emphasises that efforts to make links between financial consequences of energy use and behaviour need to show the costs immediately or daily, rather than via delayed consequences in the form of a monthly bill.

Effective communication techniques are essential in disaster preparedness, which is a critical adaptation behavior that people and communities in disaster-vulnerable areas need to have available. Effective disaster communication needs to be designed to combine and integrate appropriate psychological advice along with best practice communication and warning message content for dealing with the actual emergency situation.

The warning message itself is one of the most important factors influencing the effectiveness of the warning system. To be successful, an effective warning needs to have the following characteristics: specificity, consistency, certainty, accuracy, clarity.

The warning message must contain information about the impending hazard with sufficient but simple detail so that the public can understand the characteristics of the threat from which they need to protect themselves. The message should be clear about the risk itself, guidance, location, time, and source. (For more detailed information about useful ways of increasing adaptation to disasters, refer to the APS submission to the Senate Inquiry into the capacity of communication networks and emergency warning systems to deal with emergencies and natural disasters (http://www.psychology.org.au/Assets/Files/Submission-to-Senate-Inquiry-into-the-capacity-of-communication-networks-and-emergency-warning-systems-to-deal-with-emergencies-and-natural-disasters.pdf).

Social diffusion

Social diffusion is the spread of new ideas or behaviours through a community, thereby increasing the adoption of new behaviours (Rogers, 2003). Psychologists have studied interventions that successfully employ social motives to increase behaviour change, e.g., by modelling energy-conserving behavior, using messages from friends, using social marketing techniques, or making appeals to prosocial goals or social norms (Cialdini, 2003).

One of the best ways of changing behaviour is to change what is socially acceptable. Campaigns like 'don't be a wally with water' have used these techniques to develop social norms about conserving water and to change people's behavior to help them adapt to limited water resources. Studies of social norms in energy conservation have found that, when it comes to persuading people to conserve energy, the message that 'everybody else is doing it' works better than trying to appeal to people's sense of responsibility, desire to save money, or even to their hope of safeguarding future generations . Peer pressure seems to be the best motivator. Furthermore, researchers have found that people are also particularly influenced by those who are perceived as similar to them - e.g. similar ethnicity, social status, social values (Cialdini & Goldstein, 2004). Decisions to conserve are most powerfully influenced by those people who are most similar to the decision makers.

Social norms have a particularly strong impact on recipients under conditions of uncertainty – they look outside, to others, for evidence of how to act. So when there's introduction of a new green product, new report on depletion of environment, or new law related to pro-environmental action, the unfamiliar conditions will make people especially attentive and responsive to information about

how others are dealing with it. This also means that leaders lose great persuasive leverage if they fail to marshal and employ such information in their communications precisely at these times.

Strategies for harnessing social norms provide an effective and low cost way to help reduce our impact on global warming (Griskevicius et al., 2008). Here are some research findings.

- Descriptive norm messages that say 'everybody's doing it' to promote conservation-minded actions may be most effective.
- Descriptive-proscriptive messages, which describe undesirable actions as the norm, have unintended consequences. If signs are going to describe the actions of others, they should present only positive behaviours as the norm ('do' rather than 'don't').
- On the other hand, in situations requiring people not to do something, injunctive-proscriptive messages ("Don't go off the trail" and "Don't light fires") seem to work. In fact, Winter & Koger (2004) found that an injunctive-proscriptive message was twice as effective in deterring off-trail hiking as a descriptive-prescriptive message ("Stay on the trail").

Increase mental health services

Another key adaptation behaviour is to manage psychologically with the stressors of climate change threats. Under climate change scenarios, both in the aftermath of immediate disasters and more generally, psychological impacts (e.g., loss, dislocation from familiar community, financial stressors) are forecast, and that means governments will need to expand mental health servicing capacity.

The health sector needs to increase its awareness of the health impacts facing the population, and prepare to respond to the inevitable increased demand. The mitigation and adaptation efforts that the health sector needs to make include:

- improved early warning of public health and poverty-related problems
- identification of risks and vulnerabilities
- developing capacity for emergency response to extreme events
- building and refurbishing healthcare facilities and infrastructure for sustainability, and to ensure it is fit for and resilient to future climate impacts.
- consideration and planning for specially vulnerable groups such as young children and old people

(The current immediate challenge, however, is with respect to the anticipated *threat* of climate change and the psychological responses to and impacts of this threat).

Using social learning theory for change

Social psychologist Albert Bandura applies psychological theories to the major environmental problems of overpopulation and over-consumption. Using the example of family planning as a necessary adaptation action, Bandura argues that unless people see family planning as improving their welfare, they have little incentive to adopt it (Bandura, 2007). He advocates for a psychosocial approach that fosters personal and social change by enlightenment and enablement rather than by coercion (Bandura, 1997). One highly successful example uses long running TV serials aimed at closing population growth, preventing unwanted pregnancies, promoting literacy, and empowering women. Positive actions and their consequences are subtly modelled.

Many worldwide applications of this approach in Asia, Africa, and Latin America are raising the status of women, enhancing people's beliefs in their efficacy to control their family size by planned childbearing, and increasing adoption of contraception (Bandura, 2002; 2006a, 2006b). These changes are achieved by improving diverse interrelated aspects of people's lives, not by just targeting contraception.

As applied to adaptation behaviour this might result in Wally's nemesis, Polly, appearing as a new character in *Packed to the Rafters* or *Neighbours* – or even *Master Chef*!

8 Costs of adaptation

All adaptation and change to environmental demands entails costs.

Because of the complexities of climate change problems and responses, it is likely that actions that are seen by one group as successful adaptation will be seen by others as unsuccessful. Adaptation efforts may be unsuccessful either because they didn't work (the focus of this inquiry), or because they have actually increased the vulnerability of other groups and sectors in the future. Such outcomes have been referred to as 'maladaptations' (Barnett & O'Neill, 2009). There are at least five distinct types or pathways through which maladaptation arises, namely actions that, relative to alternatives: increase emissions of greenhouse gases, disproportionately burden the most vulnerable, have high opportunity costs, reduce incentives to adapt, and/or set paths that limit the choices available to future generations (refer to Barnett & O'Neill to see examples of these in practice with reference to decisions to (mal)adapt to water stress in Melbourne).

But adaptation and change also have psychological costs which are an important concomitant of psychological adaptation and an inherent contributor to the psychological impacts of the threat of climate change. Whatever people do to adjust, adapt or cope with the threat of climate change (like changing where they are living, or altering their lifestyle, or having less contact with loved ones who live far away) will have an impact psychologically. People can become weary, even exhausted, coping with change and stress and anxiety. And climate change is a challenging threat, thus quite taxing on people's inner resources. So the adjustments that people make to prevent, minimize or adapt to threats have more than just economic costs. These psychological costs then become further barriers to adaptation. For this reason, it is essential that the psychological costs of adaptation be considered.

9 Conclusion

Whilst much has been written about structural barriers to adaptation and psychological barriers with a behaviour change focus, it is also important to consider intra-individual psychological processes and barriers that influence psychological adaptation and change processes and in turn mediate behavioural and lifestyle changes.

What psychology has to offer is not limited to our expertise with respect to effective behavioural change, risk communication and management. There is also a rich body of evidence and practice-based wisdom for assisting people in coping with, and adapting (psychologically and behaviourally) to both very worrying threats and challenging environmental and life circumstance changes.

10 References

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