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Part III

**Governance and policies
based upon psychological,
behavioural and social
mechanisms**

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14 Towards a new model for communicating climate change

Sander van der Linden

Introduction

It has been well documented that for most people, the media is a prominent and integral source for acquiring information about climate change (e.g. Boykoff and Rajan, 2007; Ungar, 2000). Moreover, the way that information about climate change is framed and communicated can significantly influence the public's knowledge, attitude and perception (e.g. Sampei and Aoyagi-Usui, 2009; Sharples, 2010; Stamm *et al.*, 2002; Weingart *et al.*, 2000). As a result, a popular strategy for inducing behavioural change has been the deployment of persuasion techniques embedded in communication strategies. To this extent, a major area of concern is the apparent disparity between public communication and the lack of actualised behavioural change observed in the general public (Whitmarsh *et al.*, 2008). While public polls often indicate that people express general awareness and concern (e.g. GlobeScan, 2000, 2006), individuals remain reluctant to take personal action. This has also been dubbed the “value-action” gap (e.g. Kollmuss and Agyeman, 2002), “attitude-behaviour” gap or “intention-behaviour” gap (e.g. Sheeran, 2002) depending on where the focus is applied. Traditionally, most communication campaigns have tried to address this gap by providing people with more information, a strategy that has become better known as the “information-deficit” model of human behaviour. In fact, a content analysis by Devine-Wright (2004) suggests that a deficit model of human behaviour has played a predominant role in past public behavioural change campaigns and continues to do so at present. Yet, on the whole, public interventional campaigns only seem to produce modest behavioural changes (Steg, 2008). For example, a 1999 mass public media campaign in the UK: “Are you doing your bit” only elicited small consequent changes in attitudes and behaviours (O’Neill and Hulme, 2009). Similar disappointing findings have been observed in The Netherlands (e.g. Staats *et al.*, 1996). While new communication strategies have been undertaken in recent years, more substantial analyses of such campaigns often remain elusive (i.e. those that go beyond media hits and broad-opinion brushes), making it hard to identify benefits and limitations (Moser, 2010; Steg and Vlek, 2009). Recent research is increasingly pointing out that communication interventions need to be made more locally relevant and designed in such a way that they meaningfully involve and engage the public with climate change

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(Moser 2006; O'Neill and Nicholson-Cole, 2009). Moser (2006, p. 3) defines effective communication as: “any form of public engagement that actually facilitates an intended behavioural, organizational, political or other social change consistent with identified mitigation and adaptation goals”. While there certainly has been no shortage in the number of publications that offer “practical” shortlists for effective climate change communication (CCCAG, 2010; CRED, 2009; Futerra, 2005; Moser, 2010), there is currently no systematic overview of the theoretical and empirical pathways that explain how to get from merely communicating information to actually changing people’s behaviour. Moreover, while behavioural change is of course, to a certain extent, a practical matter, a more theory-driven perspective is generally welcomed by behavioural researchers (Steg and Vlek, 2009). Attaining a more holistic understanding of the link between designing persuasive messages, the communication and processing of that information on one hand and eliciting behavioural change on the other inevitably begs for the integration of insights from all relevant disciplines that deal with the subject matter. Indeed, integrative theoretical research can help synthesise, connect and combine dispersed research findings from various disciplines to advance new insights and improve current knowledge and understanding. Yet, in order to validate the value of a new integrative communication model, it is pivotal to first discuss the theoretical and empirical evidence of past models as well as their limitations. In an attempt to provide a more systematic overview, the current chapter delineates the “evolution” of public climate change campaigns according to the following typology:

- 1 The “*cognitive-analytical*” type (consistent with the traditional knowledge-attitude-behaviour model);
- 2 The “*affective-experiential*” type (congruent with the “risk-as-feelings” framework and the use of negative emotional appeals such as fear and guilt messaging); and
- 3 The “*social-normative*” type (consistent with the “normative” paradigm – which seeks to leverage the persuasive potential of social and moral norms on behaviour).

In addition, three major shortcomings of past and current public communication interventions are identified:

- 1 Most public interventions ought to be, but are not designed in an integrative manner;
- 2 Current campaigns do not sufficiently target specific behaviours nor pay sufficient attention to the psychological determinants of the behaviours that they are trying to change; and
- 3 Public campaigns often fail to make the climate change context explicit.

In the first section of this chapter, the theoretical and empirical evidence for each of the three public communication strategies is critically discussed. In the following section, a more integrated understanding of human behaviour and





1 decision-making is advanced by looking at the combined influence of cognitive,
2 experiential and normative influences on behaviour. In addition, the importance
3 of understanding psychological determinants of environmental behaviour (e.g.
4 knowledge, social norms) is outlined for both, the communication process as
5 well as its integral role in eliciting behavioural change. Finally, a new integrative
6 conceptual framework is proposed in an attempt to advance current understand-
7 ing of how to transition from merely communicating information about climate
8 change to actually changing individual behaviour.

10 **The cognitive-analytical approach**

12 *The homo logicus?*

14 “I know that you believe you understand what you think I said, but I’m not
15 sure you realize that what you heard is not what I meant.”

16 (Robert McCloskey)

17
18 Until recently, the tradition has been to communicate information about climate
19 change in a relatively scientific and analytical format (CRED, 2009), operating
20 under the assumption that people process (uncertain) information predominantly
21 in an analytical manner (Marx *et al.*, 2007). As a result, technical terms such as
22 “stratospheric ozone depletion”, “anthropogenic climate change” and “signi-
23 ficant probability” have often been used in communicating information about the
24 long-term developments in the earth’s climate. Yet, whether or not cognitive rea-
25 soning abilities in humans are really that well developed is questioned by both
26 comparative neuroanatomical work as well as cognitive psychology. In par-
27 ticular, it has been argued that the “neocortex” (the rational, higher functioning)
28 part of the brain was developed last in the chain of human evolution and is in
29 fact the least developed part of the brain (MacLean, 1990). Similarly, in their
30 heuristics and biases approach, Kahneman *et al.* (1982) have highlighted that,
31 when forming judgements under uncertainty, people employ relatively simple
32 heuristics and cognitive short cuts that may lead to erroneous and biased
33 decision-making strategies. In short, recent research has questioned how profi-
34 cient individuals are in dealing with abstract, descriptive and analytical informa-
35 tion about climate change (Marx *et al.*, 2007).

36 Because climate change is such a complex and elusive global hazard, the
37 concept is difficult to communicate to various publics (Moser and Dilling, 2004).
38 This process is even further complicated by the fact that people tend to process
39 information so that it is congruent with their pre-existing beliefs. Selectively
40 attending to evidence that confirms pre-existing beliefs and the negligence, re-
41 interpretation as well as distortion of information to the contrary is generally
42 referred to as “confirmation bias” (Lewicka, 1998). In fact, most information that
43 is eventually retained in an individual’s memory tends to be information that
44 supports pre-existing thoughts and beliefs. For example, in one US study
45 increased levels of knowledge seemed to increase concern for some people (e.g.





Democrats) but not for those (e.g. Republicans) that were already sceptical about climate change from the outset (Malka *et al.*, 2009). Similarly, in a study where US farmers were asked to recall weather statistics, those who believed that their region was undergoing climate change recalled weather statistics consistent with those beliefs while farmers that believed that their region had a constant climate recalled weather statistics congruent with those beliefs (Weber and Sonka, 2004). In sum, the way in which people process information and structurally organise their knowledge can have significant impacts on their behaviour. Yet, how do people cognitively understand climate change? And to what extent does more knowledge of the climate change problem affect people's behaviour?

Information processing and the structural organisation of knowledge

Cognitive psychologists have often described the way in which individuals process and organise incoming information as an elaborate network of mental structures that represents an individual's understanding of the external world, perhaps better known as "schema theory" (Anderson, 1977). More recently, the study of "mental models" has gained increased attention. Essentially, a mental model is a person's internal, personalised, intuitive and contextual understanding of how something works (Kearney and Kaplan, 1997). What is important to take away from this is that mental models basically carry three important functions: (1) they serve as a framework into which people fit new information; (2) they define how individuals approach and solve problems; and, perhaps most important, (3) they help formulate actions and behaviour (Carey, 1986; Morgan *et al.*, 2002). The majority of research on mental models and individual knowledge has identified several fundamental gaps in the public's knowledge and understanding of climate change.

For example, the American Psychological Association concluded in a recent report that the understanding of climate change, both in its causes and in its likely effects by the average citizen around the world is limited (APA, 2010). Nationally representative surveys in the US point out that climate literacy seems to be low in general (e.g. Leiserowitz *et al.*, 2010). In particular, people do not seem to understand the human causes that contribute to climate change nor the scientific consensus on this matter (Leiserowitz, 2007). In some cases, people even perceive a few degrees increase in global mean temperature as something rather pleasant, not understanding the potentially large harmful geophysical consequences (Meijnders, 1998). Despite widespread media coverage of climate change and related issues, typical mental models of global climate change tend to suffer from several severe fundamental misconceptions (Bostrom *et al.*, 1994). For example, most explanations given of the physical mechanisms underlying global climate change are inconsistent and incomplete. Kempton *et al.* (1995) found that Americans assimilated information about global climate change into pre-existing mental models of ozone depletion. In particular, people mistakenly believe that ozone depletion is a cause of climate change (Meijnders, 1998). This is not just the case in the US: a survey performed by GlobeScan in 1999

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1 (covering 25 countries) found that people worldwide (mistakenly) identified
2 “depletion of the earth’s ozone layer” as a main cause. This development has led
3 to much confusion between the two issues. A likely explanation is that the hole
4 in the ozone layer has been scientifically well documented over the years and is
5 much easier to imagine and remember (Ungar, 2000). It is interesting to observe
6 that this was pointed out by Bostrom *et al.* (1994) and by Kempton *et al.* (1995)
7 and yet again some 11 years later by Lorenzoni *et al.* (2006), suggesting that
8 despite past communication efforts, this popular misconception still persists.

9 People also tend to have difficulty understanding the difference between
10 climate change and other environmental problems (Heskes, 1998; Read *et al.*,
11 1994). In particular, it is hard for people to differentiate between good
12 environmental conduct more generally and specific actions that help reduce
13 climate change. Often measures such as not buying aerosol spray cans, recy-
14 cling and reducing waste are mentioned as effective strategies for mitigating
15 climate change, possibly because such apposite behaviours are generally
16 known to be harmful to the environment (Bostrom *et al.*, 1994; Leiserowitz *et*
17 *al.*, 2010; Read *et al.*, 1994). In addition, misconceptions about the relative
18 importance of the various causes of climate change are also widespread. Par-
19 ticularly, people tend to overweigh the effects of deforestation and non-
20 recycling and underestimate the effects of fossil fuel consumption (Bostrom *et*
21 *al.*, 1994; Whitmarsh, 2009). This also becomes evident from the fact that the
22 general public remains mostly unaware of the link between air travel and
23 climate change (Becken, 2007; Cohen and Higham, 2011; Gössling and
24 Peeters, 2007; Gössling *et al.*, 2006) or meat consumption and climate change
25 (de Boer *et al.*, 2012).

26 Occasionally, some local studies find that people are relatively well informed
27 about basic concepts (e.g. Lorenzoni and Langford, 2001; Truelove, 2009).
28 Although, on net, improvement seems to be slow and while awareness of climate
29 change is relatively high a more sophisticated understanding still appears to be
30 random and inconsistent (Anable, Lane and Kelay, 2006). Furthermore, it would
31 be erroneous to suggest that a flawed understanding of climate change solely
32 exists among the “lay” or general public. In fact, Sterman and Booth Sweeney
33 (2002, 2007) and Sterman (2008) conducted a series of experiments that identi-
34 fied widespread incorrect beliefs about climate change among highly educated
35 MIT science and engineering majors. In particular, the students were unable to
36 correctly describe the process mechanisms that underlie climate change. Sterman
37 and Booth Sweeney (2007) hypothesised that these deep-seated misperceptions
38 arise as a limitation of people’s mental model with regard to the relationship
39 between concepts of stock and flow in phenomena of accumulation (Sterman and
40 Booth Sweeney, 2007).

41 In conclusion, public understanding of climate change still reveals great
42 diversity, confusion and often ignorance. Understanding the way that individuals
43 process, classify and organise new information is important because incorrect
44 mental representations of climate change are likely to contribute to a “wait and
45 see” attitude (Xiang, 2011).

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Does knowing make a difference? The relationship between knowledge and behaviour

Based on the evidence review above, it would not be unreasonable to conclude that there is still widespread misunderstanding about (1) the process mechanisms of climate change, (2) its underlying causes and (3) effective response behaviours. In the face of addressing these issues, there are varying theoretical assumptions concerning the role of knowledge in behaviour. Knowledge is often believed to be a background factor that influences a person's attitude toward a certain behaviour (Ajzen, 1991) and given the known association between attitude and behaviour (Armitage and Connor, 2001), knowledge is then assumed to influence behaviour through a mediating variable. The idea behind the attitude-behaviour relationship is that the more people know about and understand the connections between their own behaviour and a range of environmental threats, the more likely it is a person will adjust their behaviour accordingly. Such models essentially assume a linear progression from increased knowledge to a favourable change in attitude which in turn is thought to produce a change in behaviour – a framework that has become better known as the Knowledge-Attitude-Behaviour (KAB) model (Kollmuss and Agyeman, 2002).

While there is little doubt about the fact that environmental attitudes correlate significantly with environmental behaviour, the KAB model has received fierce criticism in recent years. For example, Bulkeley (2000, p. 314) states: “recent research challenges the assumption that public confusion and an apparent gap between stated beliefs and action, arises from a deficit in public knowledge and understanding of environment issues”. Similarly, Kollmuss and Agyeman (2002) and Moser (2006) criticise information-based campaigns for being too rationalist and outdated. While it is certainly true that knowledge is a necessary but not sufficient condition for behavioural change, it would be erroneous to suggest that the role of knowledge is outdated or not important. In fact, the role of knowledge in environmental behaviour is important but often underestimated (Kaiser and Fuhrer, 2003), particularly because researchers fail to make a distinction between three *converging* types of environmental knowledge, namely; *declarative* knowledge (i.e. factual knowledge), *procedural knowledge* (i.e. knowledge of appropriate courses of action) and *effectiveness* knowledge (i.e. knowledge of how effective each course of action is). To illustrate, information about the causes of climate change (e.g. CO₂ emissions) can help create a better understanding of appropriate response behaviours (e.g. reducing energy consumption) and vice versa. While Kollmuss and Agyeman (2002) state that only a small fraction of environmental behaviour can directly be explained by environmental knowledge, this argument neglects to consider that the effect of knowledge is often overlooked because it is mediated by other important psychological processes (Kaiser *et al.*, 1999).

For example, one of the first studies that systematically reviewed the psychological determinants of environmental behaviour (Hines *et al.*, 1986/87) reported positive and significant correlations between environmental knowledge and

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1 environmental behaviour ($r=0.30-0.37$, $p<0.001$). Building on their work, a
2 a more recent and extensive meta-review conducted by Bamberg and Moser
3 (2007) found these findings (largely) to be still accurate. Other studies have cor-
4 roborated these findings. For example, a study by Meinhold and Malkus (2005)
5 supports the theory that there exists a linear relationship between environmental
6 knowledge, attitude and behaviour. In particular, environmental knowledge was
7 found to moderate the attitude-behaviour relationship, where strong pro-
8 environmental attitudes and high environmental knowledge predicted signifi-
9 cantly more environmentally friendly behaviours. Other critics have argued that
10 if individual knowledge about climate change is generally limited then know-
11 ledge should not be able to explain much of the variance in response behaviours
12 (Maibach *et al.*, 2008).

13 It is worth noting here that predicting specific climate change mitigation
14 behaviours (e.g. air travel) based on general environmental knowledge and atti-
15 tudes may sometimes (unsurprisingly) cause distortion in measurements
16 (Bamberg, 2003; Kaiser *et al.*, 1999; Whitmarsh, 2009) – as someone can hold
17 general pro-environmental knowledge and beliefs but still maintain different atti-
18 tudes toward specific behaviours. For these reasons, it is perhaps more appropri-
19 ate to review to what extent knowledge about climate change is able to predict
20 specific climate change mitigation behaviours. To this extent, some evaluative
21 studies have found that general knowledge about climate change is only weakly
22 related to actual self-reported behaviours (e.g. Staats *et al.*, 1996). Yet, research
23 by Bord *et al.* (2000) and O'Connor *et al.* (1999) provides evidence that know-
24 ledge is in fact an important predictor. In both studies, knowledge about climate
25 change kept its statistical validity as an independent predictor of behavioural
26 intentions (even after controlling for general environmental attitudes). In fact,
27 knowledge was the strongest relative predictor of intentions, explaining 11 per
28 cent of the variance to take voluntary action and 20 per cent of the variance to
29 support new government policies (Bord *et al.*, 2000). Similarly, Ngo *et al.*
30 (2009) also found that knowledge successfully predicted a range of climate
31 change mitigation behaviours.

32 While knowledge of climate change impacts has also been implicated in elic-
33 iting behavioural change (e.g. Nillson and Kuller, 2000), Truelove (2009) found
34 that knowledge of appropriate response behaviours was the strongest predictor
35 of mitigating intentions. Similarly, research by Semenza *et al.* (2008) and
36 Hounsam (2006) found that the most popular self-reported barrier to behavioural
37 change was simply the fact that people did not know how to change their beha-
38 viour to reduce their own contribution to climate change.

39 In conclusion, knowledge can be considered as a necessary condition for
40 behavioural change, given that knowledge about the causes, consequences and
41 solutions to climate change have all been implicated as significant predictors of
42 behavioural outcomes. Yet, in order to maximise the effect of environmental
43 knowledge on behaviour, knowledge must converge (Kaiser and Fuhrer, 2003).
44 Thus, popular recommendations that public campaigns should prioritise one type
45 of knowledge (e.g. response strategies) over another (e.g. understanding process

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mechanisms) must be exercised with caution as they may neglect the interdependent relationship that exists among these knowledge structures in some cases.

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The affective-experiential approach

The homo expertus?

“A man who carries a cat by the tail learns something he can learn in no other way.”

(Mark Twain)

What Mark Twain jokingly points out is an important fact of life: knowledge and cognition can only do so much for human learning and understanding. Humans have inherited a well-equipped sensory system, and, through interaction with our natural and social environments we are able to learn and understand things in a way that abstract knowledge is unable to provide. While traditional cognitive-knowledge-based approaches assume that the public is not changing their behaviour because they fail to understand the issue (Lorenzoni *et al.*, 2007), scholars are increasingly pointing out that highlighting scientific narratives in the media is unlikely to elicit more engagement (Hargreaves *et al.*, 2003), particularly because of the “yawn factor” that science tends to have on non-experts (Abbasi, 2006). In addition, several recent studies have shown that climate change is a temporally and spatially distant phenomenon for most individuals (Maibach *et al.*, 2008; O’Neill and Nicholson-Cole, 2009; Spence *et al.*, 2012).

One reason for this is that individuals have difficulty visualising future periods (Tonn *et al.*, 2006). For example, a study by O’Neill and Nicholson-Cole (2009) indicated that respondents could not really articulate what climate change might mean for the United Kingdom. Individuals also tend to display an unrealistic sense of optimism (Weinstein, 1980), particularly to the extent that climate change is likely to affect others (e.g. the third world) but not the individual in question (O’Neill and Nicholson-Cole, 2009). Because climate change cannot be experienced directly, it is likely that individuals will continue to distance themselves psychologically (Lorenzoni and Pidgeon, 2005). Yet, a study covering 34 countries found that the majority of people in each country believed that climate change was a somewhat to very serious problem (GlobeScan, 2000). In 2006, GlobeScan repeated the study and found that the percentage of respondents that believed that climate change was a “very serious threat” increased significantly in most countries (GlobeScan, 2006). Similarly, a study performed in the UK also indicated that over 80 per cent of the respondents reported to be concerned about climate change (Poortinga *et al.*, 2006). Yet some researchers have argued that there is an issue with the way this apparent “concern” is conceptualised. Because there is no one coherent method of how an individual’s risk perception is assessed, measures vary greatly and the terms “concern”, “worry” and “perceived seriousness” are often used interchangeably. Yet, the literature often fails





1 to note that these terms mean slightly different things. To illustrate, it is possible
2 to have general concern for an issue without actively worrying about it. Worry is
3 then considered to be a much more active emotional state and a stronger predic-
4 tor of behaviour than either concern or perceived seriousness (Leiserowitz,
5 2007). For example, a survey by the Pew Global Attitudes Project (2006) found
6 that, while varying among countries, personal levels of worry about climate
7 change are generally lower than perceived seriousness or general stated concern.
8 Thus, while general concern about climate change seems to be well established
9 among the general public, the same cannot be said for personal worry.

10 It is also questionable whether stated concern is related to the perception that
11 the problem of climate change is urgent or of high priority. For example, while
12 many people are concerned about climate change, they rank it as less important
13 than many other social issues such as terrorism, health care and the economy
14 (Krosnick *et al.*, 2006). Similar evidence is provided by Poortinga and Pidgeon
15 (2003) – based on 1,547 face-to-face interviews the researchers found that
16 while there was some moderate concern for all environmental risks mentioned
17 in the study, climate change was ranked among the least important issues. This
18 evidence leads to the conclusion that although general concern is expressed,
19 there is also a dominant belief that climate change is a distant, non-urgent and
20 non-personal threat (Darnton, 2005), possibly hindering proactive behavioural
21 responses (Lorenzoni and Langford, 2001). These findings have lent support for
22 the hypothesis that if general concern can somehow be transformed into per-
23 sonal worry then perhaps people are more likely to change their behaviour
24 accordingly.

Risk as feeling

25
26
27 It has become increasingly apparent that individuals have a hard time relating to
28 technical, descriptive and abstract risk messages. In fact, the public may not act
29 upon simple information about probabilities unless this information is given
30 emotional meaning (Slovic *et al.*, 2004). Accordingly, converging evidence from
31 cognitive, social and clinical psychology has indicated that human perceptions
32 of risk (across domains) are very much influenced by affective and emotion-
33 driven processes (Chaiken and Trope, 1999; Epstein, 1994; Loewenstein *et al.*,
34 2001; Sloman, 1996; Slovic *et al.*, 2006; Weber, 2006).

35
36 At this point it is perhaps warranted to make a conceptual distinction between
37 “emotion” and “affect”. Perhaps a definition encompassing the most pivotal
38 characteristics of emotion states that: “emotion is a complex state of feeling that
39 results in psychophysiological changes that influence thought and behaviour”
40 (Myers, 2004, p. 500). Emotions can be regarded as relatively transient and tied
41 to a particular stimulus or event, manifesting in a specific state such as fear or
42 happiness. *Affect* is a more subtle form of emotion defined specifically as a posi-
43 tive (like) or negative (dislike) evaluative feeling towards an external stimulus
44 (Slovic, 1999). For example, affective images can be regarded as a broad con-
45 struct to which positive and negative feeling states have become attached





through learning and experience (Slovic *et al.*, 1998, p. 3). Thus, while emotions are more complex in-depth feelings that cause psycho-physiological changes, affect is a rather fast, specific and automatic evaluation of a stimulus object. In the context of climate change, Leiserowitz (2006) and Smith and Leiserowitz (2012) found that negative affect and imagery toward climate change were the strongest predictors of risk perception. More specifically, the research indicated that people tend to display a strong negative affective feeling towards the term “global warming”. Similar findings were reported in a study by O’Neill and Nicholson-Cole (2009): while respondents seemed to have a wide range of imaginations and mental visions related to the concept of global warming, most of them were negative and bleak.

Thus, negative affective imagery towards climate change seems to be widespread. Yet, to what extent do (negative) affect and emotions affect willingness to help reduce climate change? According to Böhm (2003), environmental behaviours are guided by so-called “prospective” and “retrospective” consequence-based emotions, such as fear and worry, which also happen to be the most intense emotions associated with environmental risks. In fact, Böhm and Pfister (2001) theorised that feelings of fear and worry over consequences should lead people to prevent and reduce environmental damage. In line with this train of thought, a large amount of research has been directed towards eliciting “fear” – with the underlying hope that fear will serve as a strong motivator for behavioural change.

The link between personal experience, risk perception and behavioural change

While it is well known that emotions are an important and significant predictor of environmental behaviour in general (Grob, 1995; Maloney *et al.*, 1975), less is known about the specific relationship between experience, emotion, risk perception and behaviour in the context of climate change. Direct experience is thought to influence risk perception and behaviour (Whitmarsh, 2008), in particular, because experiences can invoke strong memorable feelings, possibly making them more dominant in processing (Loewenstein *et al.*, 2001). Consider an individual that encounters an approaching tornado. Such a direct threat can elicit strong instinctive emotions such as fear and anxiety that subsequently guide immediate behaviour, the so-called *fear-flight response*. These instinctive emotions primarily arise in the brain’s limbic system, an evolutionary older part of the brain that guides behaviour through fast and automatic responses, especially in reaction to threats (MacLean, 1990).

Yet, it is unclear to what extent this model applies to the context of climate change. For example, a sensible response to flooding would be moving away from the danger zone or perhaps buying flooding insurance (i.e. adaptation measures). In fact, instinctively, the goal of the response behaviour is to mitigate immediate threats (not climate change as a broader concept in itself). It is not at all obvious that whenever a person’s house floods, that person is actively going

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1 to diminish his or her carbon footprint in response, unless that person explicitly
2 links the flooding event to climate change (Helgeson *et al.*, 2012) – which is not
3 always the case. For example, a study by Whitmarsh (2008) reported no differ-
4 ence in risk perceptions of climate change between respondents that had experi-
5 enced flooding before and those who had not.

6 Yet, people who live in low-lying coastal areas do tend to have a heightened
7 sense of personal risk (Brody *et al.*, 2008) and a recent study by Spence *et al.*
8 (2011) did find that past flooding experiences were significantly related to
9 increased preparedness to reduce energy use. In particular, past flooding experi-
10 ences mediated onto level of concern and perceived local vulnerability, which in
11 turn, increased individual preparedness. Moreover, a significant amount of
12 studies indicate that risk perception is an important predictor of individual will-
13 ingness to help reduce climate change (e.g. Heath and Gifford, 2006; Hidalgo
14 and Pisano, 2010; Leiserowitz, 2006; Ngo *et al.*, 2009; O'Connor *et al.*, 1999;
15 Semenza *et al.*, 2008). Yet, a second issue revolves around the idea that even if
16 direct experience does matter, there is a disassociation between the cognitive
17 information that informs individuals that there is in fact a risk to be worried
18 about and the inability for many people to observe or experience this risk in their
19 direct environment (Weber, 2006). This lack of personal experience with the
20 potentially negative consequences of climate change is causing a lower level of
21 individual concern than advisable (APA, 2010; Weber, 2006). Thus, although
22 “experience” may indeed raise level of concern to what is considered a more
23 appropriate level of personal “worry”, direct experience with the effects of
24 climate change is generally lacking.

25 A potential solution to this problem has been to try to inflate personal worry
26 among the general public through measures that do not require actual personal
27 experience. One such measure is the use of negative emotional appeals, where
28 the centre of focus revolves around “fear-appeals” (Stiff and Mongeau, 2003).
29 This approach has gained popularity in climate change communication (Moser
30 and Dilling 2004; O'Neill and Nicholson-Cole, 2009) as the advertisement of
31 extreme events is thought to do better than the idea of slow ongoing change
32 (Brönnimann, 2002). To understand why fear appeals are often believed to work
33 (at least in theory) it is helpful to briefly consider the development of various
34 theories in the field of persuasive communication.

35 To start with, the experience of “fear” is a negatively valenced emotion
36 accompanied by a high level of arousal and is elicited by a threat that is per-
37 ceived to be significant and personally relevant (Witte, 2000). In particular, fear
38 appeals are a method of communication that attempts to influence attitudes and
39 behaviours through the threat of some danger (Tanner *et al.*, 1989). A large
40 amount of research has been performed over the years concerning the role of
41 negative threat-related emotion in communication, yet is largely inconclusive
42 about its general effectiveness. One of the earliest theories on fear appraisal was
43 put forth by Janis (1967), who proposed that the relation between fear and atti-
44 tude change is curvilinear (U shaped). In effect, the theory suggests that
45 moderate levels of fear are more persuasive than lower or higher levels. More

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specifically, Janis's drive theory argues that fear arousal is needed to elicit a motivational drive state (i.e. tension) that individuals seek to resolve. From this point of view, for fear-appealing communication to be persuasive two requirements have to be met: (1) the level of fear induced by communication must be sufficiently high to function as a drive state and (2) recommendations have to be included in the communication as to how to reduce this drive state. Unpleasant emotional tension can be resolved by individuals through either "adaptive responses" (i.e. useful behavioural changes) or through "maladaptive responses". For example, Leventhal (1970) made a distinction between an internal "fear control" process and an external "danger control" process. Maladaptive behaviours are targeted at controlling the fear response (e.g. through denial) but they often leave the actual threat (e.g. climate change) intact.

Rogers' (1975, 1983) protection motivation model (PMM) has arguably been one of the most applied theories to understand fear appeals (Witte, 1992). The PMM basically states that a threat-related message will only be effective if (1) it convinces the reader that he or she is seriously threatened (threat appraisal) and (2) actually capable of averting the threat (coping response). In particular, Rogers (1983) postulated that people continue to engage in maladaptive behaviours (e.g. "binge flying") if the rewards (convenience) of that behaviour exceed both the perceived severity of the threat (e.g. climate change) and the individual's perceived susceptibility to that particular threat (low). The intention to protect one's self then depends on four factors: (1) a threat's malignancy; (2) its probability of occurrence; (3) the effectiveness of a coping response (i.e. response efficacy); and (4) an individual's ability to perform the response (i.e. self-efficacy).

Scaring people, does it work?

Empirical evidence supporting either Janis (1967) or McGuire's (1969) model has been lacking (Higbee, 1969; Sutton, 1982). Furthermore Leventhal's (1970) and Rogers' (1975) models have been criticised for being imprecise (e.g. Witte, 1992). In general, the empirical evidence for the fear approach is mixed. While some meta-reviews point out that a positive linear relationship is found between the level of fear and a change in behavioural measures (Boster and Mongeau, 1984; Sutton, 1982) this does not mean that a curvilinear relationship should be rejected (Meijnders, 1998). More generally, Boster and Mongeau (1984) found that fear appeals are modestly correlated with attitudes and to a lesser extent with intention and behaviour. Yet, overall, it is generally agreed upon that without efficacy messaging (i.e. an individual's perceived capability to avert the threat), fear appeals tend to be rather unsuccessful (O'Neill and Nicholson-Cole, 2009). Indeed, if anything can be learned from 50 years of theory development, it is that *strong fear appeals with high efficacy messaging* produce the highest level of behavioural change whereas *strong fear appeals with low efficacy messaging* produce the most maladaptive responses (Witte, 2000).





1 However, much of the research on fear appeals has been conducted on health
2 risks, which are both personal and direct (de Hoog *et al.*, 2005) – two important
3 conditions that are perceived to be absent in the context of climate change. Yet,
4 there is some evidence available on the use of fear appeals in the context of
5 climate change. For example, Meijnders *et al.* (2001a, 2001b) found that
6 moderate fear messages related to global warming induced more systematic
7 processing of the perceived risks as well as more favourable attitudes toward
8 energy conservation (when compared to the low-fear condition). Lowe *et al.*
9 (2006) carried out a pre/post-test study after individuals had watched the climate
10 change disaster movie *The Day After Tomorrow* (Emmerich, 2004). Although a
11 majority of the respondents (67 per cent) were in agreement that everyone needs
12 to do something about climate change, this sense of urgency quickly faded in a
13 focus group meeting a month after the screening. However, very different results
14 were presented by Leiserowitz (2004). In a similar study concerning the same
15 movie, the author found that movie-watchers versus non-watchers showed higher
16 levels of both concern and worry, estimated various impacts on the US more
17 likely and significantly increased their intentions (in all stated categories) to
18 engage in personal action to address climate change (Leiserowitz, 2004). Sim-
19 ilarly, Jacobson (2011) used a spatial-econometric analysis to measure increases
20 in the purchase of voluntary carbon offsets within a ten mile radius of US movie
21 theatres after the release of Al Gore’s *An Inconvenient Truth* (Guggenheim,
22 2006). Shortly after the release, the purchase of carbon offsets went up as far as
23 50 per cent, yet no renewals were recorded in subsequent years. O’Neill and
24 Nicholson-Cole (2009) conclude that dramatic, sensational, fearful and shocking
25 representations of climate change (both visual and iconic) can successfully
26 capture people’s attention and drive a general sense of urgency to the issue
27 (O’Neill and Nicholson-Cole, 2009). Yet, the same researchers also found that
28 while capturing attention and raising concern, fear messaging disengages people
29 from climate change and renders them feeling hopeless and overwhelmed. The
30 authors further mention that catastrophic and fearful representations of climate
31 change are unlikely to motivate a sense of personal engagement and can possibly
32 trigger psychological barriers such as anxiety, apathy, paralysis and denial
33 (Lorenzoni *et al.*, 2007; Moser and Dilling, 2007). Consistent with these claims,
34 other research has found that fear messaging can have different impacts on dif-
35 ferent audiences. For example, individuals with strong “just-world” beliefs tend
36 to resort to maladaptive responses (e.g. denial) when faced with fear-messages
37 about climate change, leading to a negative effect on intentions to curb carbon
38 footprints (Feinberg and Willer, 2011). The authors recommend that messages
39 should include sufficient information on potential solutions, which is consistent
40 with the idea that a message is more persuasive when negative emotions about
41 one’s vulnerability are coupled with positive thoughts about potential solutions
42 (Das *et al.*, 2003).

43 All in all, these findings point to one (of several) potential problem(s) that
44 characterise the “fear” approach. To start with, it is likely that fear appeals have
45 a rather short-term effect. In fact, Weber (1997) coined the term “single action





bias” to explain the tendency for individuals to only take a single action to reduce a perceived threat and subsequently neglect further steps that would provide incremental protection. For instance, a 2008 poll in the United States indicated that while 28 per cent of Americans thought the environment was getting better, after having elected President Barack Obama in 2009, this number rose to 49 per cent (Silver, 2009). A possible explanation for the single action bias is that the first measure people take often sufficiently reduces the active level of worry/vulnerability.

An additional shortcoming is that fear appeals offer diminishing returns (Hastings *et al.*, 2004). That is, communicators run the risk of desensitising or “emotionally numbing” people to the risks involved, as familiarity with a risk reduces its salience (Fischhoff *et al.*, 1978). Furthermore, the “finite pool of worry” hypothesis states that people can only worry about a limited number of problems at any given time. As a result, increased concern for one risk (e.g. economic crisis) might decrease concern for other risks such as climate change (Hansen *et al.*, 2004).

In conclusion, “fear as a motivator” should be used with caution (Futurra, 2005). While fear messaging definitely has its place in the communication strategy mix (capturing attention and breeding concern), it will be difficult to retain such level of interest and arousal as people need a reason to stay engaged and often quickly shift their attention. Furthermore, when using narratives of an impending “catastrophic” and “looming disaster” without promoting actions that can help reduce the threat, fear messages are likely to trigger maladaptive coping responses and leave people feeling disempowered and disengaged. In the words of O’Neill and Nicholson-Cole (2009, p. 376): “depicting a state of crisis does not sit comfortably with the suggestion of individual action”.

The social-normative approach

The homo sociologicus?

“No man is an island, entire of itself; every man is a piece of the continent, a part of the main.”

(John Donne)

In addition to cognitive and experiential processing, human behaviour is also shaped by a wide range of normative factors. In fact, social-psychological research that explores the effect of social influences on behaviour is pervasive – as it is through social comparison with referent others that people validate the correctness of their opinions and decisions (Festinger, 1954). People derive descriptive and prescriptive social norms from observing others (Heath and Gifford, 2002), apply a logic of appropriateness in unfamiliar situations (March, 1994) and unsurprisingly, tend to behave as their friends and peers (Cialdini *et al.*, 1999). There are many examples of how social factors influence environmental behaviour. For example, people’s energy use tends to decrease when they

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1 are told that their neighbours are conserving energy as well. People tend to alter
2 their use of energy more generally to conform to the group-norm (e.g. Schultz *et*
3 *al.*, 2007). Usually a distinction is made between descriptive and prescriptive
4 social norms. While prescriptive norms contain information about how others
5 think how someone ought to behave, descriptive norms merely describe how
6 others are behaving (Cialdini *et al.*, 1991). When communicating social informa-
7 tion it is important to understand the relation between these two concepts. For
8 example, merely describing that CO₂ emissions are increasing because a lot of
9 people are increasingly choosing to fly short distances instead of using altern-
10 ative modes of transportation (a descriptive norm) may have unintended effects
11 if it is not clearly mentioned that this behaviour is in fact undesirable (prescrip-
12 tive norm). In other words, it should be made clear that people *ought* to avoid
13 flying short distances, otherwise the message is easily misread as: “it’s okay
14 because everyone’s doing it”.

15 Another important question is how moral norms are theoretically distinct
16 from social norms. Moral norms refer to the idea that some behaviours are just
17 inherently right or wrong regardless of their personal or social consequences
18 (Manstead, 2000). While there certainly is a strong link between social and
19 moral norms, it is nevertheless possible that a person’s moral convictions do not
20 coincide with the expectations that exist in that person’s social environment. One
21 way to think of the relationship between these two concepts is that both cultural
22 and social learning play an important role in acquiring moral beliefs (Krebs and
23 Janicki, 2002), as social reference groups deliver standards for what is viewed as
24 right or wrong. It is over time, when people have internalised social norms that
25 they become a (personal) moral norm. Moral norms are then considered to be the
26 link between internalised (general) values and more specific opinions and expect-
27 ations about how to behave in a tangible situation (Schwartz, 1977). Thus, even
28 though moral norms may originate from social group norms, once they have
29 become internalised, they exercise influence over an individual’s behaviour inde-
30 pendently from any immediate social context (Manstead, 2000). Similarly, Bic-
31 chieri (2006) highlights that while social norms are followed conditionally upon
32 the satisfaction of expectations of others, moral norms are followed uncondition-
33 ally based on internal (emotional) processes.

34 Moral norms have always played a central role in explaining pro-
35 environmental behaviour. A particularly influential framework is Stern *et al.*’s
36 (1999) *Value-Belief-Norm* (VBN) theory. According to the VBN, people’s
37 motivation for caring about the environment can be traced back to a specific set
38 of personal values. For example, someone could be aware of the potentially
39 negative consequences of climate change because they wonder how it might
40 affect them personally (i.e. egoistic values), how it will affect other humans
41 (altruistic values) or how it will affect the earth more generally (biospheric
42 values). These values are then thought to influence more specific belief struc-
43 tures about human-environment interactions (a person’s ecological worldview)
44 which in turn determines the extent to which people are *aware of consequences*
45 (AC) and *ascribe responsibility to their own actions* (AR) – eventually leading





to an activation of an individual’s moral norm, which is thought to be the main driver of pro-environmental behaviour.

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Evidence for the role of normative influences on environmental behaviour

Empirical evidence for the persuasive power of normative influences on behaviour is growing. A frequently quoted study concerns a conservation experiment on hotel towel reuse. In the experiment, a simple “normative” prompt (i.e. “75 per cent of guests in this room reuse their towel when asked”) significantly increased the reuse of towels (Goldstein *et al.*, 2008) – illustrating the potential of behavioural change through the communication of social information. A range of other studies that have used social norm manipulations in the context of energy conservation have showed similar positive results (e.g. Dolan and Metcalfe, 2012; Schultz *et al.*, 2007). In addition to social pressure, moral norms are an equally (if not more) powerful tool for encouraging pro-environmental behaviour (Markowitz and Shariff, 2012). To this extent, a recent field experiment by Bolderdijk *et al.* (2013) set out to explore what message frame is most successful when asking drivers to pull over to get their tyre pressure checked. Results strongly indicated that a moral message frame was most effective. Similarly, other recent research found that both moral and social norms are significant predictors of consumer decisions to purchase carbon offsets (Blasch and Farsi, 2012).

Yet, there are a number of identifiable problems inherent to the normative approach. First, observed effect sizes are typically small and short-lived (John *et al.*, 2011). The latter is particularly true for social norms, since they are conditional upon the existence of steady exogenous social pressure (extrinsic motivation) while moral norms elicit motivation from internal processes (i.e. intrinsic motivation). A second problem concerns the use of “guilt appeals”. Guilt usually arises as a result of violating some moral or social norm (Baumeister, 1998). In theory, guilt is thought to be a motivator of pro-environmental behaviour because guilt often leads to a moral obligation to compensate for any caused damages (Bamberg and Moser, 2007). Studies show that under certain conditions guilt can be effective in changing behaviour (O’Keefe, 2002) and some support is found in the context of climate change, for example, Ferguson and Branscombe (2010) illustrate that feelings of guilt mediated beliefs about global warming and willingness to engage in mitigation behaviours. Truelove (2009) comments, however, that similar to the case of “fear appeals”, the associated drawbacks are significant. A particular drawback is the risk of eliciting negative emotions (such as anger toward the guilt-inducer) as this can potentially undermine the technique’s overall effectiveness.

It is also interesting to note that in survey studies, social norms are often identified as one of the weakest predictors of behaviour (e.g. Armitage and Connor, 2001). A potential explanation for this is that it may very well be the case that the effect of social norms on behaviour is systematically underdetected because people display a strong tendency to underestimate the extent to which they are





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1 subject to social influences (Griskevicius *et al.*, 2008). Yet, in a similar manner
2 it can be argued that the positive results found in many experimental studies are
3 simply the result of artificially inflated social pressure. In fact, it is crucial to
4 understand that in order for social norms to affect behaviour, they must first be
5 activated and made salient (Cialdini *et al.*, 1999). Unfortunately, strong social
6 norms are generally absent for most pro-social behaviours (van der Linden,
7 2011). In fact, negative social identities associated with performing environ-
8 mentally unfriendly behaviours are currently not very well articulated. Thus,
9 throwing a few numbers at people for social comparison purposes is not going to
10 have much effect when there is no negative social identity to leverage in the first
11 place (Corner, 2011). As a result, while social and moral norms may affect beha-
12 viour, in order to leverage their full potential, a strong pro-environmental norm
13 must first be established. Several governmental advisory bodies have recently
14 advised the UK government to use more “deep-frames” in their communication.
15 This entails a community-based approach where the discourse is shifted from
16 “you” to “we” and from “I” to “us”, encouraging the elicitation of moral values,
17 collectivism and social identity (CCCAG, 2010). For example, the UK govern-
18 ment is currently actively trying to harness the persuasive potential of social
19 norms in its design of large-scale behavioural change campaigns (Cabinet Office,
20 2011). Yet, empirical evaluations still remain elusive.

Towards a new framework for communicating climate change

Building a more integrated understanding: theories of dual-processing in the brain

“Information’s pretty thin stuff unless mixed with experience.”

(Clarence Day)

31 So far, all three major approaches to public climate change campaigns have been
32 considered in isolation. Yet, cognitive, experiential and normative influences do
33 not affect human behaviour independently of each other – on the contrary, most
34 behaviour is the result of carefully integrated neurological processes. The ancient
35 Greek philosophers Plato and Aristotle long debated the intricacies of the fine
36 line between passion and reason and, ever since, a substantial amount of research
37 in social, cognitive and neuropsychology has lent its support for a theory of
38 “dual-processing” in the brain. Either a distinction is made between cognitive
39 and affective processing (e.g. Damasio, 1994; Epstein, 1994; LeDoux, 1996;
40 Zajonc, 1998) or between controlled and automated processes (e.g. Kahneman,
41 2003; Sloman, 1996). It is important to realise that these processing systems do
42 not function independently from each other. Instead, they operate in parallel and
43 continuously interact with each other, where higher analytical reasoning may
44 evoke strong (basic) emotions and simple reflexes can be triggered by higher
45 functioning neocortical processes (Marx *et al.* 2007; Weber, 2006). In fact,

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rational decision-making cannot be effective unless it is guided by emotion and affect (Damasio, 1994, 1999), moreover, without emotions, humans are not able to learn effectively at all (Baumeister and Bushman, 2008). While dual-process theories aid conceptual understanding, they often provide an overly simplified understanding of neurological functioning. Camerer *et al.* (2003) present a more useful categorisation of human neural functioning (Table 14.1).

To illustrate how these four quadrants (Table 14.1) operate in relation to everyday consumer behaviour, consider the following example: let's assume that a customer walks into a travel agency and wants to book a well-deserved exotic vacation. Upon entering the store, the customer's attention is immediately drawn to a big fancy flyer displaying the ultimate vacation, including a sunny location, palm trees, white sandy beaches and a breath-taking turquoise sea. The brain's motor cortex will guide that person's arm to reach for the flyer drawing on two processes, namely the *cognitive and automatic* quadrant III (reaching) and the *affective and automatic* quadrant IV (pleasure and enjoyment). However, at the same time higher level processing might occur in the brain. For example, it could be that this particular person has recently been exposed to a documentary on sustainable tourism and anticipates that going on this holiday would perhaps disappoint important family members who recommended watching the documentary. These processes (explicit memory) and anticipation (planning) draw on two areas of the brain; the hippocampus and the prefrontal cortex, which are involved in controlled cognitive (quadrant I) and controlled affective (quadrant 2) processing.

To keep things relatively simple, no social context was made explicit. Yet, it should already become clear from this hypothetical example that in most realistic decision-environments, all four neurological quadrants can potentially be activated (and interact) in a matter of seconds. A clear implication of a more advanced understanding of human behaviour is that in order to make communication efforts more effective, substantial efforts should be directed towards integrating *cognitive, experiential* and *normative* aspects of climate change communication. Particularly, increased cognitive understanding can help make behavioural change more sustainable in the long-term while experiential approaches can help elicit affective associations and facilitate learning and understanding through visualisation of the information presented. For example, research by Marx *et al.* (2006) indicated that people retain more factual information about climate change when that information is presented in an experiential format. In addition, the overall message should be designed and framed in a context that

Table 14.1 Categorisation of human neural functioning (adopted from Camerer *et al.*, 2003)

	<i>Cognitive processes</i>	<i>Affective processes</i>
Controlled Processes (e.g. effortful, evoked deliberately, serial)	I	II
Automated Processes (e.g. effortless, reflexive, parallel)	III	IV





1 illustrates that other people are also acting sustainably and that a strong pro-
2 environmental norm is both expected, desired and rewarded. In conclusion,
3 knowing how information is processed and integrated in the brain and how this
4 subsequently affects behaviour should lead to the understanding that communi-
5 cation designs that take into account positive interactive feedback loops between,
6 cognitive, experiential and normative processes are likely to be more effective
7 than “either/or” type strategies.
8

The pivotal role of determinants of behaviour in communicating change

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11 While the previous section has established that cognitive, experiential and norm-
12 ative processes often operate simultaneously and affect environmental behaviour
13 in an integrative manner, the relative importance (or contribution) of each factor
14 is not always known. To this extent, it is useful to introduce a distinction
15 between theories of change and models of behaviour. While models of behaviour
16 aid in understanding specific behaviours by identifying the underlying psycho-
17 logical factors that influence them, theories of change show how behaviours can
18 be changed and/or change over time (Darnton, 2008). Thus, while theories of
19 change generally describe more generic processes, models of behaviour are diag-
20 nostic and help illuminate the psychological determinants that explain and
21 predict a given behaviour (van der Linden, 2012). Psychological determinants
22 refer to the behavioural factors and processes that explain and predict a certain
23 behaviour. For example, both the role and relative importance of cognitive
24 (knowledge), experiential (affect) and normative (moral norms) factors in
25 explaining mobility behaviours is currently an active area of research (see
26 Bamberg and Schmidt, 2001, 2003; Bamberg *et al.*, 2007; Steg, 2005).
27

28 It should be noted that while theories of change and models of behaviour have
29 distinct purposes, they are also highly complementary. In fact, it is argued here that
30 the ineffectiveness of climate change campaigns can, in part, be attributed to the
31 fact that most public climate change interventions pay little to no attention to the
32 psychological determinants of the behaviours that they are trying to change. For
33 example, public campaigns that promote sustainable lifestyles and “good environ-
34 mental conduct” across the board (e.g. Doyle, 2011) do not take into account the
35 different determinants of various environmental behaviours. When campaigns do
36 get specific, for example, in the case of meat consumption (Meat Free Monday,
37 2010; Peta2, 2008), little attention is paid to the social-psychological determinants
38 of the behaviour. In fact, a report by the Government Communication Network
39 (2009) points out that attaining a better understanding of how relevant behaviours
40 are determined and influenced should be considered a prerequisite for the design of
41 effective communication campaigns (GCN, 2009). It is important for evaluators to
42 not only look at behavioural outcomes, as it is from studying the psychological
43 determinants of behaviour that we gain understanding of why certain interventions
44 were successful or not (Steg and Vlek, 2009). In short, successfully trying to
45 change any given behaviour involves a thorough understanding of all the factors
that determine and influence the behaviour under investigation.





A new framework for communicating climate change

A conceptual framework to help guide the design of public climate change campaigns is presented in Figure 14.1. The central argument behind the framework is that persuasive communication is only persuasive (i.e. likely to elicit behavioural change) if it is based on an integrated understanding of the psychological processes that underlie and influence pro-environmental behaviour. In order to achieve this, three criteria need to be met: (1) interventions should design *integrative* communication messages that appeal to cognitive, experiential as well as normative dimensions of human behaviour; (2) the *context* and *relevance* of climate change needs to be made explicit; and (3) *specific* behaviours should be targeted, paying close attention to the psychological *determinants* of the behaviours that need to be changed.

To illustrate that few of these criteria are typically met in practice, consider the following three illustrative cases. One of the earlier large-scale information-based campaigns on climate change was conducted in The Netherlands in 1996 and evaluated by Staats *et al.* (1996). The campaign employed a wide range of media tools, including billboards, posters, television commercials and information pamphlets. The aim of the campaign was to raise knowledge and awareness about the causes, consequences and solutions to climate change. Two strong

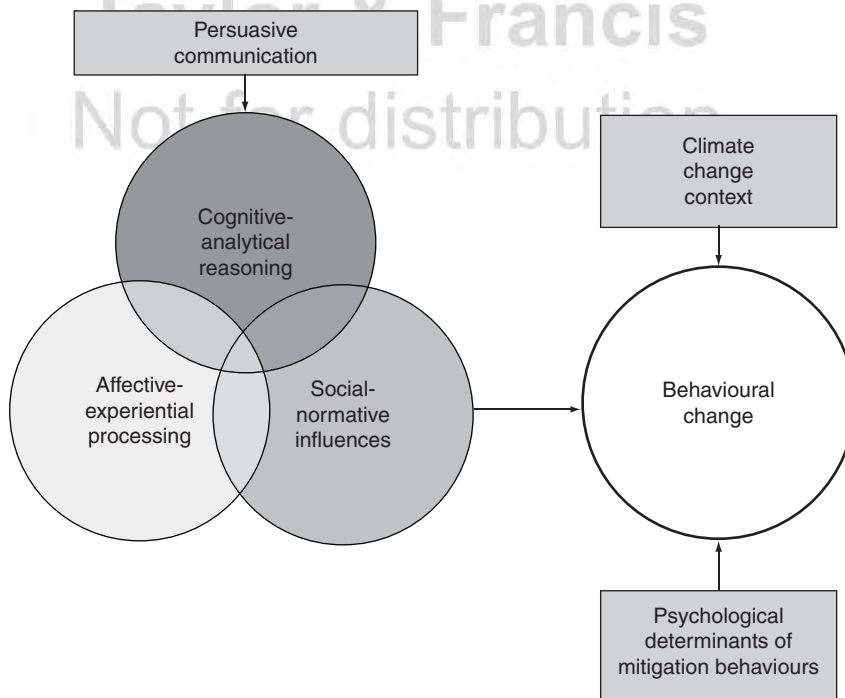


Figure 14.1 An integrated framework for public communication interventions.

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1 points of the campaign were the strong explicit focus on climate change and a
2 link was made between the greenhouse effect, climate change and relevant
3 behaviours. Nevertheless, being one of the earlier campaigns, the intervention
4 was nearly entirely focused on cognitive-information- and knowledge-based
5 factors (although some imagery was used to symbolically illustrate the green-
6 house effect). Yet, only marginal focus was applied to “affective and experiential”
7 processes and no attention was paid to “normative” influences. In fact, in
8 their evaluation, Staats *et al.* (1996) highlight that the disappointing results of
9 the campaign can be attributed to the fact that little attention was paid to social-
10 normative factors. In addition, no effort was made to research the psychological
11 determinants of the target behaviours.

12 More than ten years later, the “Act on CO₂” (2009) campaign in the UK fea-
13 tured an advertisement where a little girl is read a scary bedtime story by her
14 father about the potentially horrible consequences of climate change. While the
15 commercial did feature some knowledge/information, the content was predomi-
16 nantly controlled by a “fear frame” – focusing on the negative, scary and threat-
17 ening consequences of climate change in the form of a cartoon that depicted
18 “climate monsters” and drowning people. The cartoon implied that a “happy
19 ending” is uncertain (hinting that a happy ending is dependent on people chang-
20 ing their behaviour). Falling prey to all the common pitfalls associated with the
21 use of guilt and fear appeals, the advertisement was not well received by the
22 public as thousands of complaints were submitted to the UK Advertising Stand-
23 ards Authority (Sweney, 2010). The focus of the commercial was predominantly
24 geared towards the affective and experiential domain of human behaviour
25 neglecting both normative influences on behaviour as well as important informa-
26 tional aspects. While the link between climate change and energy consumption
27 was made explicit, no attention was paid to the psychological determinants of
28 the behaviours in question (car use).

29 Finally, more recently, the American “Wasting Water is Weird” (2011) video
30 campaign was released featuring a character called “Rip”. In the video, the Rip
31 character visits people who are clearly wasting water (e.g. brushing their teeth
32 with the tap running) and sarcastically illustrates that “they’re weird” for wasting
33 water. By trying to associate a negative social identity with wasting water, the
34 commercial fully relies on normative influences on behaviour. Therefore, while
35 zooming in on a particular behaviour (e.g. dishwashing), a major drawback of
36 the campaign is that no attention is paid to cognitive or experiential processes
37 and no contextual link is made to climate change. It is important to make the
38 climate change context explicit, primarily because if people engage in conserva-
39 tion behaviours for hedonic or cost reasons, they are likely to stop doing so once
40 the behaviour is no longer attractive or cost-effective environmental motives
41 have proven more robust against such changes (Steg, 2008). Finally, no effort
42 was made to research the psychological determinants of residential water usage.
43 If research had been conducted, it perhaps would have been more apparent that
44 providing information on alternative courses of action is an important aspect of
45 trying to change unsustainable behaviours that have a strong habitual component

Proof





(Gregory and Di Leo, 2003). In conclusion, climate change campaigns often adopt an either/or approach, appealing to only one aspect of human behaviour, thereby failing to consider other important psychological processes. Unsurprisingly, on the whole, evaluations of past public climate change campaigns have been disappointing at best (O’Neill and Hulme, 2009; Steg, 2008).

Figure 14.1 illustrates that in order for communication to be *persuasive*, it should take into account the interrelation between cognitive, experiential and normative influences on behaviour. Recent experimental evidence supports this notion. For example, Dolan and Metcalfe (2012) comment that little is known (empirically) about the interaction between social norms and basic information provision. Based on a large-scale energy conservation study, the authors conclude that, compared to only using a social norm prime, providing information *alongside* social norm messages is key to the success of behavioural change interventions – as it doubled the rate of energy conservation (Dolan and Metcalfe, 2012). Similarly, a recent field study by De Groot *et al.* (2013) showed that the combination of different normative appeals reduced the use of plastic bags in supermarkets significantly more compared to when the messages were administered individually. It is no surprise that integrating these theoretical dimensions can help guide the practical design of public climate change interventions. To illustrate, consider that it is well documented that human attitudes encompass both cognitive and affective dimensions (Albarracín *et al.*, 2005), especially in the context of climate change (Lorenzoni *et al.*, 2006). As a result, creating negative attitudes towards climate change draws on the interaction of both cognitive and affective processes. In addition, while knowledge about the potential consequences of climate change has been implicated in achieving behavioural change this effect is enhanced when knowledge about consequences interacts with a feeling of personal and moral responsibility for those consequences (Bamberg and Möser, 2007; Joireman *et al.*, 2004; Wall, 2005). Furthermore, it is important that individuals believe that engaging in the target behaviour is the right thing to do (i.e. moral norm activation) but this feeling is more easily elicited when people are under the impression that the target behaviour is also being executed by important referent individuals (i.e. social norm activation). Because individual beliefs are often a function of the social group to which the individual belongs, an informational message is expected to be more persuasive if the right in-group source and context is provided (Mackie *et al.*, 1990; Van Knippenberg *et al.*, 1994). In sum, recent research is increasingly starting to validate the importance of exploring interactions between cognitive, experiential and normative influences on behaviour.

Conclusions

The aim of this chapter has been twofold. First, to evaluate the theoretical and empirical evidence for three major approaches to public change communication (cognitive, experiential and normative) and second, to provide a new communication model that is more likely to effectively encourage the behavioural shifts

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1 that climate change necessitates. It is concluded that in isolation, cognitive,
2 experiential and normative approaches are unlikely to induce behavioural
3 change. Instead, a new framework for communicating information about climate
4 change is presented. It is argued that future interventions are more likely to
5 reduce the gap between public communication and behavioural change when
6 public campaigns: (1) effectively integrate cognitive, experiential and normative
7 aspects of human behaviour in their message design; (2) make the climate
8 change context explicit; and (3) foster a strong link between the behaviours that
9 need to be changed and their psychological determinants.

11 Acknowledgements

12 This research has been supported by the Grantham Foundation for the Protection
13 of the Environment, as well as the Centre for Climate Change Economics and
14 Policy, which is funded by the UK's Economic and Social Research Council
15 (ESRC) and by Munich Re.

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