MULTIPLE MODELS TO INFORM CLIMATE CHANGE POLICY: A PRAGMATIC RESPONSE TO THE 'BEYOND THE ABC' DEBATE.
Commentary for Environment and Planning A.

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We have followed with interest the debate in this journal between Shove (2010; 2011) and Whitmarsh & colleagues (2011) on contrasting theoretical approaches and representations of pro-environmental behaviour and social change, and of the potential, rationale and merit of interdisciplinarity or integration. In this commentary, we offer a pragmatic response to the issues being debated from the perspective of policymakers concerned with near-term reductions in greenhouse gas emissions. This response is informed by the recent experience of one of us (Chatterton) during a year-long Research Council UK (RCUK) Energy Programme Fellowship as a social scientist based in the Department of Energy & Climate Change (DECC).

The title of this Fellowship, "Individuals' and Communities' Energy Behaviour", reflects the dominant conceptualisation of behaviour among policymakers as elaborated by Shove (2010), as well as the prevailing interest within government in the potential for behaviour change to contribute towards policy goals. 'Behaviour change' policies are being promoted as an attractive alternative to the more established approaches of legislation, regulation, and taxation (p4, Dolan et al. 2010). The current UK government's coalition agreement argues for "*shunning the bureaucratic levers of the past and finding intelligent ways to encourage, support and enable people to make better choices for themselves*" (pp7-8, HMG 2010b). Supporting institutional developments include the creation of the Cabinet Office's Behavioural Insights Team in 2010, and the recent House of Lords Science & Technology Select Committee's inquiry into "*the use of behaviour change interventions to achieve policy goals*" (p88, House_of_Lords 2011). Here, we are primarily concerned with climate change mitigation as the policy goal, itself often framed within broader sustainability objectives.

Our commentary on the role of social science in informing behaviour change policy is founded on four propositions.

First, we use the term 'behaviours' to describe observable actions.

We are particularly interested in behaviours linked to greenhouse gas emissions, principally through the conversion of energy to provide useful services such as mobility or space conditioning. However, these 'emission-related behaviours' extend to any observable actions that result directly or indirectly in emissions of greenhouse gases, such as the purchase of consumer goods.

Equating behaviours descriptively with observable actions is consistent with government behaviour change efforts as well as the individualistic models of psychology or economics in which behaviour is an object of enquiry or outcome variable. Although behaviours are not germane to social theories of practice, constituted by materials, meanings and procedures among communities of practitioners, we draw on notions of "'*practice-as-performance' (that is, as enacted in specific moments and places)*" (p1279, Shove 2010) to consider

behaviours as physical manifestations of practices. Our proposition is that this is descriptively consistent with behaviours as observable actions. As to the actors of such actions, they may have volition, intention, and identifiable motivations, they may be performers and so re-constituters of social practices, or they may be statistical artefacts. These actors may also be individuals, groups, diffuse communities, or populations of some type. It is the behaviours or observable actions themselves, and more specifically, their link to emissions, which are most directly of concern to policymakers.

Second, emission-related behaviours vary widely in their characteristics and contexts.

Although conventionally grouped by economic sector of activity (e.g. Metz et al. 2007), by investment requirement (e.g. Black et al. 1985) or by a principal characteristic such as frequency or outcome (e.g. Dietz et al. 2009), it is self-evident that emission-related behaviours ranging from flying abroad on holiday and commuting by bus, to replacing light bulbs and eating meat are remarkably varied. This applies as much to their psycho-social antecedents as it does to their performance roles in different, albeit linked, social practices.

Third, policymakers will continue trying to change emission-related behaviours as an integral part of their climate change mitigation strategies.

We agree with Shove's argument that narrow behaviour change objectives are one element of a much wider interest among policymakers in the institutions and infrastructures with which emission-related behaviours are interdependent (p1278, Shove 2010). Others have also pointed to the growing awareness within government of the limitations of behaviour change objectives alone, evident in initiatives like the Big Society which shift agency away from the individual (Fudge & Peters 2011). Skirting these debates, we argue that emission-related behaviours, whether interpreted as physical manifestations of social practices or as the consequences of interacting personal and contextual influence on individuals, will remain salient to policymakers in the near-term given the imperative and stringency of emission reduction targets, and the capital cost and time delays of replacing energy supply infrastructure (UK_CCC 2008; Anderson & Bows 2011). This is clearly evident in the near-term expectations for behaviour change (particularly technology adoption) in the UK government's decarbonisation pathways (HMG 2010a).

Fourth, there are a multiplicity of theories and associated representations of emission-related behaviour which in turn generate a multiplicity of insights for behaviour change policymaking.

We focus here on the representations or 'models' of behaviour as they are more tractable, applicable, and immediately useful to policymakers (whose perspective this commentary adopts), and as such have been the subject of various recent comparative reviews (Jackson 2005; Wilson & Dowlatabadi 2007; Darnton 2008; Chatterton 2011). We recognise that this pragmatic emphasis on models is complicit with a narrowly instrumental demand for social science to meet the needs of policymakers concerned with efficiency, effectiveness, and evaluation rather than theoretical debates or paradigmatic ferment within the social sciences.

We return to this later after the substance of our commentary which is that the coexistence, competition, and contradiction of 'multiple models' of behaviour is perfectly possible precisely *because* these multiple models represent different things, define different problems, and answer different questions.

Each model is internally consistent (e.g. in terms of how it represents the relationships between elements of theory) and contextually meaningful (e.g. in representing a given behaviour in its real world context). As an example, social psychology models are useful for explaining kerbside recycling behaviour as a function of ease and convenience (availability/proximity to recycling infrastructure) and opportunities for social comparison (McKenzie-Mohr & Smith 1999; Schultz 1999). The same models are not as useful for examining the household consumption patterns which generate the disposable materials in the first place. Here, the scale of enquiry widens dramatically, and richer explanations are found (and have long been a concern) of sociological theories of consumption (Røpke 2009).

On the face of it, this is captured in the oft-invoked metaphor of blind men feeling different parts of an elephant[1]. But this falls short, as ultimately all the men are blind, all the men share a common objective, and all the men are confronted with the same elephant. Multiple models of emissions-related behaviour are more akin to blind, deaf and dumb men roaming all over a zoo, each with their own particular purpose in mind, with one feeling an elephant's leg, another happening on some tusk mounted on a microscope slide, and another studying the birds-eye view of an aerial photograph.

The pragmatic challenge for policymakers concerned with behaviour change is to identify which insights are offered by which models about which emissions-related behaviour in which context.

This will depend on behaviour change objectives, distinguishing ends from means (Keeney 1992; and for an example applied to climate policy, see Wilson & McDaniels 2007). The ends or ultimate objective will be to reduce greenhouse gas emissions, typically by reducing or decarbonising the use of energy. The means or proximate objectives towards these ends will vary widely according to how policymakers expect or envisage behaviours to change following implementation of the policy. As noted earlier, policies' means objectives are typically to support, encourage, incentivise, or otherwise facilitate behaviour change. The political vogue for 'nudges' which alter the context in which people make choices (p5, House_of_Lords 2011) clearly highlights the potential importance of means as well as ends objectives among behaviour change policymakers.

With this in mind, we suggest four key criteria to guide policymakers' selection and use of multiple models. These criteria relate to the actors, scopes, durabilities, and domains of emission-related behaviour relevant to, and so embodied in, the policy's means objectives.

The *actors* of the relevant behaviour (observable action) range from volitional individuals, to the interpersonal network, to communities of practitioners performing shared scripts, and so on, up to groups or populations defined by power, interests or societal roles. For example, do the means towards emission-reduction ends entail micro-generation deployment in households, among transition town networks, by newly emergent energy citizens, or within groups whose interests vested in a centralised energy system are swayed by a shifting profit landscape?

The *scopes* of relevant behaviour range from isolated behaviours, to behaviours which structure or circumscribe subsequent behaviours, to interrelated or co-dependent

[1] A parable that has found a place in many religious traditions, but (in the west at least) made most famous by the poet John Godfrey Saxe (1816-1887), see:
http://www.noogenesis.com/pineapple/blind_men_elephant.html

behaviours, and so on, up to lifestyles as regularised patterns of behaviour. Do the means towards emission-reduction ends entail meat-free Fridays, vegetarianism, low impact living, or complete self-sufficiency?

The *durabilities* of relevant behaviour range from one-off behaviours, to repeated behaviours sustained by policy intervention, to behaviours with successively less required reinforcement, and so on, up to enduring behaviours. Do the means towards emission-reduction ends entail one-off insulation retrofits, autumnal draft-proofing, insulation testing as part of annual boiler servicing, or the routine closing of windows when the heating comes on?

The *domains* of relevant behaviour range from the psychological, to the physical and technological, to the institutional, infrastructural, and so on, up to the scale of the social, national or global. Do the means towards emission-reduction ends entail positive attitude formation towards substitutes for air travel, improved infrastructure for long-distance trains, or collective renegotiation of perceived and actual needs for mobility?

Identifying the actors, scopes, durabilities and domains of emission-related behaviour relevant to behaviour change policy objectives provides a framework for guiding policymakers' use of the multiple models available to them. All four criteria correspond in some way to different dimensions of scale, from the social and relational, to the temporal, spatial and structural (Reid et al. 2010). Broader scale objectives may therefore mean behaviour change over larger geographies, longer time frames, more domains, and a wider set of relationships between those domains.

We illustrate the use of these four criteria of emission-related behaviour using the example of tea drinking. We choose this intentionally to avoid invoking existing debates around the relevant models for framing and understanding pro-environmental behaviour. We draw on various sources which explore tea drinking in depth, including (Ger & Kravets 2009), as well as more light-hearted but still insightful analyses in (p311-313, Fox 2004; Nicey & Wifey 2004).

Consider a policy whose ends objective is to reduce the use of energy (and resulting emissions) related to tea drinking.

Models representing tea drinking in an individualistic behavioural tradition might emphasise tea drinkers' choice of kettle and the energy form used to warm the water, the amount of water with which the kettle is filled, the social context and timing of tea drinking (the Queen's speech), the attributes of the imported tea, and so on. Taking one example, a model such as that derived from the theory of planned behaviour (Ajzen 1991) would draw policymakers' attention to tea drinkers' attitudes (organic tea?), subjective norms (colleagues' approval of workplace tea breaks?), and perceived behavioural control (who fills the kettle?).

Models representing tea drinking in a sociology of consumption tradition might emphasise the pervasive diffusion of the kettle into homes and offices as a co-evolving dynamic with the normalisation of tea drinking within daily life, cultural meanings of comfort and refreshment (mad dogs and Englishmen), our colonial heritage and the promotion of tea

drinking by the Victorian temperance movement (A History of the World in 100 Objects[2]), and so on. Taking one example, a model such as that derived from social practice theory (Reckwitz 2002) would draw policymakers' attention to tea drinking as a manifestation of a practice which is constituted by relationships between materials (kettles, teapots, cups, mugs, teabags), meanings (tea breaks, relaxation, revitalisation, work rhythms and other temporalities, cultural traditions, social class), and procedures (gathering, brewing, pouring, refilling, dunking).

In both approaches, different representations of behaviour (as an observable action) are brought to bear on the same behaviour change objective: reducing the use of energy related to tea drinking. But the different models characterise this problem differently in terms of its actors, scopes, durabilities, and domains, and consequently offer policymakers different insights corresponding to these different dimensions of scale.

In the case of the theory of planned behaviour (used as an example of an individual, behavioural framing of the problem), behaviour change objectives emphasise the filling and use of a kettle in the kitchen or workplace. The actors are individual, and networks consist of colleagues or household members; the scope is an isolated behaviour; the durabilities are repeated and reinforced; and the domains are psychological and technological. Policy approaches of a commensurate scale might include information supporting energy aware attitude formation (don't overfill your kettle), normative messaging (others find cold drinks more refreshing), product labelling (embodied carbon), technological substitution (low-energy tea urns), the organisation of groups (tea clubs) to share resources, dramatic hikes in tea taxes (Boston tea party), or outright bans on tea consumption.

In the case of social practice theory (used as an example of a sociological framing of the problem), behaviour change objectives emphasise the symbolic function of tea drinking and the competences of tea drinkers in social settings normalised through history and embedded in cultures. The actors are a community of practitioners; the scope is a set of interrelated behaviours; the durability is successively reproduced and enduring change; and the domain is social. Policy approaches of a commensurate scale might include forums for deliberative reflection (role and function of tea?), codified working times and workers' rights (frequency and timing of tea breaks), experimentation with alternative routines of comfort and cohesion (substituting 'a-nice-cup-of-tea?'), or public health campaigns (decaffeination, oesophageal cancer), or the regulation of commercial or political interests vested in tea sales and trade.

Very different models thus provide policymakers concerned with reducing the use of energy relating to tea drinking with very different insights. From a pragmatic perspective, therefore, 'multiple models' can and do co-exist. Perceived competition and contradiction between models can be an artefact of their emphasis on behaviour change at different scales.

This is neither integrative nor interdisciplinary (p262, Shove 2011; p259, Whitmarsh et al. 2011); we simply argue for appropriateness. In so doing, we clearly duck many of the epistemological and consequential issues considered in the debate between Shove, Whitmarsh and colleagues. In particular, we fail to challenge the ways in which policymakers define both the objectives of, and problems confronted by, behaviour change policies. This is identified as a critical issue by Shove, drawing on Kuhn, who argues that "*contrasting*

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[2] From Episode 2 on Mass Production, Mass Persuasion (1780-1914AD) of the BBC Radio 4 documentary, 'A History of the World in 100 Objects', available from http://www.bbc.co.uk/programmes/b00v71qr, and also in book form: (MacGregor 2010).

paradigms are valuable because they generate different definitions of the problem" and not because they provide "*a more colourful palette of responses to matters of urgent concern*" (p264, Shove 2011). Again, our response is pragmatic. In the third of the propositions on which this multiple models perspective rests, we uncritically accept the prevailing efforts of policymakers to influence emission-related behaviours according to the problems and potential solutions as currently framed. Our response to Shove's argument is therefore: we're not there yet. Much the same applies to other policy critiques, including the emphasis on reductionist evaluation metrics and methods which privilege policy outputs (e.g. number of lofts insulated) over policy outcomes (reductions in greenhouse gas emissions) (p83-84, HMG 2009).

But from a policy standpoint, there remains an urgent need to use social science to improve the design of behaviour change interventions, objectives and strategies. Ensuring wide participation in this endeavour requires a framework for selecting which models work best in which contexts, underpinned by a recognition of the validity and applicability of 'multiple models'. The framework we propose encourages policymakers to distinguish the scale of emission-related behaviours along dimensions related to actors, scopes, durabilities and domains. This should help guide an appropriate and expansive use of different models. For as Shove (2010) persuasively diagnoses, policymaking is currently dominated by behavioural framings of individuals (and communities) as agents of change. In particular, the promotion of behavioural economic insights by the Cabinet Office using the 'MINDSPACE' framework (Dolan et al. 2010) evidences a one-model-fits-all approach to the application of social science. This may be appropriate, and so relatively successful, for some behaviour change objectives. An example in the UK reported by The Independent is the official tax letter whose simple re-wording led to the collection of an extra £200m in income tax (Hickman 2011); many more examples are described at length in 'Nudge' (Thaler & Sunstein 2008). But the same framework is less suited to other behaviour change objectives. An example is a modal shift from cars to public transport, for which relevant issues include inadequate infrastructure, prevailing norms of mobility, powerful vested industrial interests, and the symbolic or social importance of privatised, personalised transportation (Urry 2008).

The House of Lord's inquiry into behaviour change clearly emphasized the need to move beyond single model approaches, finding that "*usually the most effective means of changing behaviour at a population level is to use a range of policy tools*" (p35, House_of_Lords 2011). This range of tools needs to draw on findings from "*a number of scientific disciplines, including neuroscience, psychology, sociology and behavioural economics [which] contribute to what is known about human behaviour*" (p9, House_of_Lords 2011).

We argue that the crucial next step is to move from single model approaches to a multiple model approach. This is an instrumental view, but one designed to open up an awareness on the part of policymakers to the potential contributions of social science research to emission-related behaviour.

Initial experiences of trialling a multiple model approach with government suggest this works well in practice. One of us (Chatterton) has built on his DECC/RCUK Fellowship by helping run workshops with civil servants using a multiple models approach to compare and contrast the insights from behavioural economics and social practice theory on a particular 'problem' (e.g. how to support flexible home working practices in government departments and so reduce the demands on London's transport infrastructure during the Olympic games). Introducing new theories and concepts as practical, *additional* ways of thinking through policy development is a direct and effective way of broadening awareness of the

substantive yet valuable differences between contrasting theories. For the theorists, this may seem like putting the cart before the horse. But we argue that the introduction into government of new approaches needs to be done at a practical level, alongside currently accepted models, as a necessary prerequisite to the contestation of the dominant theories of behavioural and social change. "*If awareness of anomaly plays a role in the emergence of phenomena, it should surprise no one that a similar but more profound awareness is prerequisite to all acceptable changes of theory*" (pp67-68, Kuhn 1962).

References

Ajzen, I. (1991). "The theory of planned behavior." <u>Organizational Behavior and Human Decision Processes</u> 50(2): 179-211.

Anderson, K. and A. Bows (2011). "Beyond 'dangerous' climate change: emission scenarios for a new world." <u>Philosophical Transactions of the Royal Society A</u> 369(1934): 20-44.

Black, J.S., P.C. Stern and J.T. Elworth (1985). "Personal and contextual influences on household energy adaptations." <u>Journal of Applied Psychology</u> 70: 3-21.

Chatterton, T. (2011). An Introduction to Thinking about 'Energy Behaviour': A Multi-Model Approach. DECC (UK Department for Energy and Climate Change), London, UK.

Darnton, A. (2008). GSR Behaviour Change Knowledge Review: An overview of behaviour change models and their uses. Government Social Research Unit, London, UK.

Dietz, T., G.T. Gardner, J. Gilligan, P.C. Stern and M.P. Vandenbergh (2009). "Household actions can provide a behavioral wedge to rapidly reduce US carbon emissions." <u>Proceedings of the National Academy of Sciences</u> 106(44): 18452-18456.

Dolan, P., M. Hallsworth, D. Halpern, D. King and I. Vlaev (2010). MINDSPACE: Influencing behaviour through public policy. Cabinet Office & Institute for Government, London, UK.

Fox, K. (2004). <u>Watching the English: The Hidden Rules of English Beahviour</u>. London, UK, Hodder.

Fudge, S. and M. Peters (2011). "Behaviour Change in the UK Climate Debate: An Assessment of Responsibility, Agency and Political Dimensions." <u>Sustainability</u> 3: 789-808.

Ger, G. and O. Kravets (2009). Special and Ordinary Times: Tea in Motion in Time. <u>Consumption and Everyday Life: Practice, Materiality and Culture</u>. E. Shove, F. Trentmann and R. Wilk. Oxford, UK, Berg: 189-202.

Hickman, M. (2011). Nudge, nudge, wink, wink … How the government wants to change the way we think. <u>The Independent</u>. London, UK.

HMG (2009). The UK Low Carbon Transition Plan: National strategy for climate and energy. HM Government, London, UK.

HMG (2010a). 2050 Pathways Analysis. HM Government, London, UK.

HMG (2010b). The Coalition: our programme for government. HM Government, London, UK.

House_of_Lords (2011). Behaviour Change. Great Britain. Parliament. House of Lords Select Committee on Science & Technology., London, UK.

Jackson T, 2005, "Motivating Sustainable Consumption: A Review of Evidence on Consumer Behaviour and Behavioural Change", A Report to the Sustainable Development Research Network, Centre for Environmental Strategy, University of Surrey, Guildford

Keeney, R.L. (1992). <u>Value-focused thinking : a path to creative decision-making</u>. Cambridge, MA, Harvard University Press.

Kuhn, T.S. (1962). <u>The Structure of Scientific Revolutions</u>. Chicago, IL, University of Chicago Press.

MacGregor, N. (2010). <u>A History of the World in 100 Objects</u>. London, UK, Allen Lane.

McKenzie-Mohr, D. and W. Smith (1999). <u>Fostering Sustainable Behavior: An Introduction to Community-Based Social Marketing</u>. Gabriola Island, New Society Publishers.

Metz, B., O.R. Davidson, P.R. Bosch, R. Dave and L.A. Meyer (2007). <u>Climate Change 2007: Mitigation of Climate Change. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007.</u> Cambridge, UK, Cambridge University Press.

Nicey and Wifey (2004). Nice Cup of Tea and a Sit Down. London, UK, Time Warner Books.

Reckwitz, A. (2002). "Toward a Theory of Social Practices: A Development in Culturalist Theorizing." European Journal of Social Theory 5(2): 243-263.

Reid, L., P. Sutton and C. Hunter (2010). "Theorizing the meso level: the household as a crucible of pro-environmental behaviour." Progress in Human Geography 34(3): 309-327.

Røpke, I. (2009). "Theories of practice -- New inspiration for ecological economic studies on consumption." Ecological Economics 68(10): 2490-2497.

Schultz, P.W. (1999). "Changing behavior with normative feedback interventions: A field experiment of curbside recycling." Basic and Applied Social Psychology 21: 25-36.

Shove, E. (2010). "Beyond the ABC: climate change policy and theories of social change." Environment and Planning A 42(6): 1273-1285.

Shove, E. (2011). "On the difference between chalk and cheese - a response to Whitmarsh et al's comments on "Beyond the ABC: climate change policy and theories of social change"." Environment and Planning A 43(2): 262-264.

Thaler, R. and C.R. Sunstein (2008). Nudge: Improving Decisions About Health, Wealth, and Happiness. New Haven, CT, Yale University Press.

UK_CCC (2008). Building a low carbon economy - the UK's contribution to tackling climate change. Committee on Climate Change, London, UK.

Urry, J. (2008). "Governance, flows, and the end of the car system?" Global Environmental Change 18(3): 343-349.

Whitmarsh, L., S. O'Neill and I. Lorenzoni (2011). "Climate change or social change? Debate within, amongst, and beyond disciplines." Environment and Planning A 43(2): 258-261.

Wilson, C. and H. Dowlatabadi (2007). "Models of Decision Making and Residential Energy Use." Annual Review of Environment and Resources 32: 169-203.

Wilson, C. and T. McDaniels (2007). "Structured decision making to link climate change and sustainable development." Climate Policy 7: 353-370.