





Combining behavioural and reflective policy tools for the environment: a scoping review of behavioural public policy literature

Farhad Mukhtarov


To cite this article: Farhad Mukhtarov (2022): Combining behavioural and reflective policy tools for the environment: a scoping review of behavioural public policy literature, Journal of Environmental Planning and Management, DOI: [10.1080/09640568.2022.2132475](https://doi.org/10.1080/09640568.2022.2132475)



To link to this article: <https://doi.org/10.1080/09640568.2022.2132475>

 View supplementary material 

 Published online: 02 Nov 2022.

 Submit your article to this journal 

 Article views: 66

 View related articles 

 View Crossmark data 



Combining behavioural and reflective policy tools for the environment: a scoping review of behavioural public policy literature

Farhad Mukhtarov*

International Institute of Social Studies, Erasmus University Rotterdam, Rotterdam, Netherlands

(Received 9 November 2020; final version received 20 September 2022)

Recent advances in behavioural and communication sciences generated enthusiasm in public policy for new ways of ‘framing’ messages and ‘nudging’ individual behaviour. Wide research and practice of behavioural interventions that have since ensued triggered the rise of a new sub-field called *Behavioural Public Policy* (BPP). At the same time, nudges – a part and parcel of BPP, have received criticism for being paternalistic, non-democratic and lacking evidence of long-term effectiveness. More recently, the whole project of BPP has come under criticism as construed too narrowly. Critics have argued for a new approach to BPP that is pluralistic, multi-disciplinary and multi-method. One key pillar of it is a ‘*policy mix*’ – a combined application of behavioural and non-behavioural policy tools. Little is known, however, about ‘policy mixes’ in practice. This paper conducts a scoping non-exhaustive review of the academic and policy literature published between 2008 and 2020 that discusses *policy mixes* of behavioural policy tools (defined in this paper as ‘nudges’ and ‘frames’) and reflective policy tools (defined in this paper as ‘deliberative’ events and incentives for individuals to ‘think’) employed within environmental policy. Two questions guide this review: (a) what are the characteristics of policy mixes in terms of their types, geography, sectors of application, and empirical detail of exposition?; (b) to what extent do existing policy mixes include broader governance aspects of politics, awareness of contextuality and flexibility? By taking stock of experiences of empirical place-based policy mixes of behavioural and reflective tools, we provide insights into a fast-developing body of scholarship and point to ways forward with policy mixes. The paper is also relevant to policy studies beyond the domain of the environment.

Keywords: nudge; frame; deliberation; policy mixes; review; environment

1. Introduction

Governments and non-state actors have increasingly relied on insights from behavioural economics, social psychology and neuroscience to design choice environments and messages to support behavioural change. ‘Behavioural public policy’ (BPP) represents a new growth area in the literature and practice of public policy, as seen in an identically titled academic volume edited by Oliver (2013), a recent Edward Elgar collection of 24 essays devoted to behavioural policies (Straßheim and Beck 2019), a number of influential monographs (e.g. John *et al.* 2009; Mont, Lehner, and Heiskanen 2014; John 2018; Whitehead *et al.* 2018) and a wide uptake of behavioural insights in

*Email: mukhtarov@iss.nl

national and international policies (e.g. OECD 2017; World Bank (WB) 2015; Halpern 2015; Dolan *et al.* 2012). A specially designated academic journal ‘*Behavioural Public Policy*’ describes itself as “an interdisciplinary and international peer-reviewed journal devoted to behavioural research and its relevance to public policy” (Cambridge University Press 2020).

Galizzi (2014, 27) referred to BPP as a sub-field that studies policy interventions that are “directly inspired by, and designed on, the principles of behavioural research.” BPP can be defined as the “analysis of public administration from the micro-level perspective of individual behaviour” (Grimmelikhuijsen *et al.* 2017, 45). Authors have approached BPP as a study of individual policy interventions based on behavioural insights, such as nudges (e.g. Straßheim and Beck 2019). Multiple heated debates emerged on defining the scope and nature of BPP, categorizing individual behavioural policy tools, and on the question whether ‘behavioural public policy’ is qualitatively new compared to behavioural political science research since the 1960s (e.g. Simon 1955; Leong and Howlett 2020). Behavioural policy interventions based on nudges have been criticised for being manipulative, paternalistic and threatening democratic citizenship (e.g. Brulle 2010; Niemeyer 2013; Menzel 2013). Commentators have described these debates as ‘heated’ (Marchiori, Adriaanse, and De Ridder 2017, 1) and ‘polarised’ (Feitsma 2018, 6, 18).

In the sea of disagreement there are also areas of consensus. Authors tend to agree that behavioural policy tools need to be integrated with non-behavioural or traditional policy tools in order to be effective (e.g. Ewert and Loer 2021). This argument was called the ‘holy grail’ of BPP by some experts (Ewert 2020, 344). Such integration is the major tenet of the broader approach to BPP advocated by Ewert (2020), Ewert and Loer (2021) and supported by Leong and Howlett (2020). However, despite many calls for integration, we know little about it in practice. Little is known about whether tools are combined for a single or multiple policy objectives, in what sectors and geographical locations such combinations are more common, and what characteristics of policy designs are more or less effective and legitimate. It is a paradox that the many calls for combined applications of policy tools are unmatched by studies that map such practices.

This paper seeks to address this gap by conducting a non-exhaustive scoping review of academic and grey literature on combined applications of behavioural and reflective policy tools in the field of environmental policy. These combinations are referred to as ‘policy mixes’. Our ambition is to map out various policy mixes described in the literature and make sense of their general characteristics, prevalence and governance considerations. Next to mapping and scoping policy mixes, we examine whether policy mixes found in the literature reflect the debates and insights from the governance literature.

This review is concerned with only one policy domain – environmental policy. The rise of ‘Behavioural Public Policy’ has seriously affected environmental policy; various scholars and practitioners have called for the application of behavioural insights to enhance pro-environmental behavioural change (e.g. John *et al.* 2009; Dolan *et al.* 2010; Mont, Lehner, and Heiskanen 2014; Lehner, Mont, and Heiskanen 2016; Lenzi 2019). These calls have been followed by practice. Ewert and Loer (2021) found energy and transportation fields to feature as the major domains wherein nudges and frames have been applied. Similarly, Leong and Howlett (2020) noted that seven out of eleven major journals that publish articles on BPP belong to the domains of

environment and sustainability. Van Deun *et al.* (2018) reported environmental policy as the second major empirical domain of BPP, with health policy being the first.

Environmental issues almost always impact communities, which is why democratic theory and deliberative approaches have been influential in this policy domain (e.g. Dryzek 1992; Bäckstrand *et al.* 2010). The polarised BPP debate on the one hand, and the sheer intensity with which nudges and frames have been applied in environmental policy beg for an inquiry into ways to ‘lower the temperature’ and explore combined applications that may lead out of the polarization. These are the reasons why this review investigates BPP in the domain of environmental policy.

Several well-documented reviews of behavioural public policy have been published in recent years, both in general and in environmental policy. Environmentally focused reviews include studies by Marchiori, Adriaanse, and De Ridder (2017), Feitsma (2018), Lehner, Mont, and Heiskanen (2016), and Hall (2016). Some examples of recent reviews of behavioural public policy are Ewert and Loer (2021), Leong and Howlett (2020), Szaszi *et al.* (2018), and Van Deun *et al.* (2018). These studies present invaluable information on the fast and dynamic development of the field. They discuss the geographical scope and the types of behavioural tools (e.g. Leong and Howlett 2020; Van Deun *et al.* 2018), as well as insights for a broader view on the role of the state and experts in behavioural public policy (e.g. Ewert and Loer 2021; John and Stoker 2019). However, none of these discuss ‘policy mixes’ with special attention to behavioural and reflective policy tools. This paper aspires to address this gap. To our knowledge, this review is the first to adopt a behavioural-reflective typology of policy tools in the context of policy mixes. Distinguishing between emotional frames and behavioural nudges on one hand, and collective deliberation and individual reflection on the other, is also novel. By discussing prominent behavioural policy tools applied together with reflective policy tools, we hope to offer a valuable contribution to the BPP literature.

The remainder of the article is structured as follows. [Section 2](#) introduces ‘nudges’, ‘frames’, ‘deliberation’, and ‘think’ as behavioural and reflective policy tools for pro-environmental behaviour. [Section 3](#) explains the methodology for this scoping literature review. [Section 4](#) presents the overview of the reviewed initiatives, and [Section 5](#) devotes space to the discussion of various types of policy mixes. [Section 6](#) discusses the governance aspects in designing policy mixes, and [Section 7](#) places the findings in the broader literature; [Section 8](#) concludes.

2. Behavioural and reflective policy tools

Any systematic review relies on clear definitions of key terms in order to categorise and code reviewed articles with consistency (e.g. Bilotta, Milner, and Boyd 2014). In a diverse and dynamically changing field such as BPP, there is no overall consensus on definitions of key terms and choices require careful consideration (e.g. Berthet and Ouvrard 2019).

We define behavioural policy tools as those that trigger automatic responses through engaging behavioural heuristics and emotional responses of individuals and push them toward desirable choices. They correspond to engaging System 1 functions of the brain, as discussed by Kahneman (2011). Reflective tools, in turn, are geared to provoke individual and collective reflection – the functions of the brain that are referred to as System 2 (Kahneman 2011). This distinction is based on the mechanism

by which policy tools work, not the end goal of an intervention such as changing behaviour or changing beliefs and attitudes (see Berthet and Ouvrard 2019). Nevertheless, our typology is imperfect in practice. For instance, providing social information may be aimed at stimulating reflection and deliberation by an individual (System 2), but may provide a heuristic rule for people to follow others' actions (a social compliance heuristic) (Berthet and Ouvrard 2019). Similarly, displaying warning signs on cigarette packaging may target a strong and automatic emotional response (System 1), but may also result in engaging reflection and attitudinal change as a result thereof (System 2). However imperfect, this typology is helpful in conducting the review. We discuss our choices in greater detail below.

2.1. Behavioural policy tools (System 1 tools)

There is much debate on how to categorise behavioural tools (e.g. Congiu and Moscati 2021; Cadario and Chandon 2020; Banerjee and John 2021; Blumenthal-Barby and Burroughs 2012; Dolan *et al.* 2012; Ölander and Thøgersen 2014). Some scholars advocate for the operational mechanism as a criterion for distinction (e.g. whether a tool triggers automatic or reflective reactions), others advocate for a technique type (e.g. whether a tool is a default setting or a message designed to trigger a heuristic) (Berthet and Ouvrard 2019; Sunstein 2015). Within behavioural tools, scholars have also distinguished between message-based nudges and environment-based nudges (e.g. Congiu and Moscati 2020, 2021).

We suggest two broad behavioural approaches: 'emotional framing', referred to as 'framing' hereafter, and 'nudging'. 'Framing' has long been practiced by governments and businesses and has been explicitly discussed in public policy at least since the 1970s (e.g. Schon 1983; Van Hulst and Yanow 2016). It can be defined as "the presentation of a given choice situation where particular attributes are made salient" (Michalek *et al.* 2015: 141). Messages, visuals, narratives and music communicate through framing (Schon and Rein 1994; Lakoff 2014; Hall 2016). This definition of 'framing' is not limited to an emotional response only. We, however, take a narrower approach to framing as linked to an emotional response and define it as structuring messages (verbal or non-verbal) in ways that explicitly target System 1 responses through arousing strong emotional reactions.

Our choice is based on an important debate in the field of environmental communication that has focused on the role of affect and emotions in supporting a public transition to environmental sustainability (e.g. Brulle 2010; Sleenhoff, Landeweerd, and Osseweijer 2015; Menzel 2013). This debate revolves around the question of whether triggering behavioural change through arousing emotional reactions is ethical and effective in the long-term. Scholars have distinguished between two types of frames in such debates: 'frames to persuade' – that work mindlessly through engaging System 1 and tend not to cause any long-term change in beliefs and attitudes, and 'frames to deliberate' – those that trigger reflection and facilitate a dialogue and, hence, tend to cause a change in attitudes over the long term (Friedman 2007; Brulle 2010; Hall 2016; Romsdahl, Blue, and Kirilenko 2018). Given the prominence of emotions in environmental communication debates – a literature strand that has not been much in dialogue with the literature on BPP, we have thought it appropriate to distinguish between messages that target emotional responses and messages that target behavioural heuristics.

We are aware that BPP refers to both functions of framing (arousing emotions and channeling attention) under the category of ‘nudges’ (see Sunstein 2015; Congiu and Moscati 2020). In this paper, we refer to the first as ‘frames’ and the second as ‘nudges’. For example, showing a video clip linking excessive energy consumption to the potential extinction of polar bears in ways that arouse emotions of compassion and guilt is an emotional ‘frame’. Framing energy conservation advice as a message “if you do not use energy conservation ... you will lose \$350 per year” is an example of a ‘nudge’ (Thaler and Sunstein 2008, 36).

Nudging is structuring messages (both verbal and non-verbal) and designing the environment in ways that trigger behavioural heuristics or make some elements of the situation more salient than others. The literature on nudging is much younger than that on framing; it developed first in the research on behavioural heuristics and biases in the 1970s and 1980s and then entered the mainstream of economics and public policy in the late 2000s, with the publication of ‘Nudge’ by Thaler and Sunstein (2008) and subsequently ‘Think Fast and Slow’ by Kahneman (2011). A lot of social science research on framing has been subsumed in the new literature on nudging as one form of behavioural intervention. A nudge can be defined as follows,

A nudge is a function of ... any attempt at influencing people’s judgment, choice or behaviour in a predictable way (1) that is made possible because of cognitive boundaries, biases, routines and habits in individual and social decision-making posing barriers for people to perform rationally in their own declared self-interests and which (2) works by making use of those boundaries, biases, routines, and habits as integral parts of such attempts. (Hansen 2016, 158)

Nudges may be verbal and non-verbal. Non-verbal nudges may be in the form of visuals, such as packaging or based on the “actual organisation of the choice settings with which the consumer is confronted” (e.g. Ölander and Thøgersen 2014, 2; Sunstein 2015). Verbal nudges, in turn, use messages or other signs to trigger a behavioural heuristic or channel information to make some aspects of information more salient than others. For example a notification on energy-use patterns may provide a comparison with average consumption levels in one’s community and trigger the social compliance heuristic (Whitehead *et al.* 2018; De Ridder 2014; Ölander and Thøgersen 2014). Examples of verbal nudges include display of warnings on products and drawing attention to social norms; examples of non-verbal nudges include the use of defaults in printer settings and design of shopping rooms (Lehner, Mont, and Heiskanen 2016). There is fast-growing research on the use of nudging for environmental behaviour and policy (e.g. Ölander and Thøgersen 2014; Schubert 2017; Lehner, Mont, and Heiskanen 2016). The typology in Table 1 serves the purposes of this paper and does not seek to resolve the debate on definitions and categories in BPP. Instead, it seeks to establish a working typology that can guide this review.

2.2. *Reflective policy tools (System 2 tools)*

The major challenge to policy application of ‘framing’ and ‘nudging’ comes from scholars and practitioners, who emphasise the importance of public deliberation and individual reflection in democratic societies. These scholars call for “an increased attention in environmental politics to procedural qualities such as participation,

Table 1. Typology of behavioural and reflective tools.

Type	Policy tool	Definition and key assumptions
Behavioural tools	Verbal and non-verbal nudge	The use of verbal messages and structuring the environment to target <i>cognitive heuristics</i> of individuals that would, in turn, facilitate a socially desirable action. Messages that channel attention and facilitate concept formation, but that do not rely on strong emotional responses.
	Emotional frame	The use of verbal or non-verbal messages to target an <i>emotional response</i> of individuals that would, in turn, facilitate a socially desirable action.
Reflective tools	Deliberation	Collective and transformative processes of exchange of views to help form reflective and informed preferences
	Individual reflection	Largely individual process of reflecting on one's values, goals, and behavioural patterns.

dialogue, transparency and accountability” (Bäckstrand *et al.* 2010, 3). Scholars in this tradition claim that democracy and critical reflection are essential for good governance (Bäckstrand *et al.* 2010; 5; Ingram, deLeon, and Schneider 2016, 176). For the purposes of this review, we distinguish two categories of reflective policy tools: collective deliberation and individual reflection. Deliberation envisages citizens who exchange views and form reflective and informed policy preferences (Lenzi 2019). Reflective preferences here are the “outcome of a conscious confrontation of one’s own point of view with an opposing point of view, or of the multiplicity of viewpoints that the citizen, upon reflection, is likely to discover within his or her own self” (Offe and Preuss 1991, 170). Individual reflection, also known in BPP as ‘think’, is based on individual reflection without transformative deliberation with others (e.g. John *et al.* 2009; John 2018; Feitsma 2018; Lenzi 2019; Lepenies and Małecka 2018). ‘Think’ may be triggered by making a behavioural pattern visible to an individual, reminding about one’s goals or values, or mindfulness practices that cause reflection and motivate effort to change behaviour (Whitehead *et al.* 2018; John 2018).

2.3 A typology of behavioural and reflective policy tools

Table 1 presents an overview of behavioural and reflective policy tools upon which we focus in this paper. Behavioural tools include ‘framing’ and ‘nudging’ and largely rely on automatic cognitive processes, behavioural heuristics and emotional reactions. By contrast, reflective tools rely on analytical and reflective functions of the brain that work to create informed attitudes, preferences and motivations.

This review focuses on combining tools from Table 1 in various constellations within policy mixes. In some policy mixes behavioural tools are used to foster public deliberation as an intermediate policy objective that would then help shape support for environmental regulation, for example. In others, public deliberation and individual

reflection (think) are used to design nudges and frames that are more democratic and legitimate for the end-goal of a better environmental policy.

Combined use of various policy tools to achieve a policy goal is anything but new. Harrison (1998) suggested a memorable typology of policy tools comparing governing to a conversation with a donkey: regulatory (sticks), economic (carrots) and information-based (sermons). Policy mixes as well as various guidelines on fitting policy tools (and their mixes) to policy objectives and 'policy targets' is a large body of literature (e.g. Schneider and Ingram 1993; Howlett and Rayner 2007, 2013; Howlett 2018). For Howlett and Rayner (2007, 2008), policy mixes are combinations of policy means and policy ends that may be intentional or circumstantial. This has to do with the dynamic nature of policy making and four processes by which policy mixes arise. These processes are 'layering', 'drift', 'conversion' and 'replacement' (Hacker 2005; Howlett and Rayner 2008). Layering signifies addition of new means and objectives to existing ones; drift is a process in which policy ends evolve while policy means remain the same; conversion is changing the policy mix in order to deal with newly emerged policy objectives; and replacement stands for re-structuring both ends and means in order to maintain their internal consistency (Howlett and Rayner 2008, 391). These dynamic changes can happen by design or by evolution. In this paper, a 'policy mix' is defined broadly to encompass both mixes of policy tools and mixes of policy objectives; this is a reductionist view of policy mixes, but a necessary simplification to conduct this review. We discuss various types of policy mixes in [Section 4](#).

3. Methodology

We conducted a scoping review following a methodology suggested by Arskey and O'Malley (2005) and Levac, Colquhoun, and O'Brien (2010) and applied by Ewert and Loer (2021). A scoping review is different from systematic reviews in two important ways. First, a scoping review aims to map the field and detect major concepts, geographical distribution and types of studies; it does not primarily seek answers to a specific question or set of questions asked by reviewers. Furthermore, it casts the net widely and allows various aspects of the topic to be reviewed or mapped. Second, whereas systematic reviews are explicit about evaluation and filtering of studies based on the quality of reviewed research, scoping reviews put more emphasis on what is reported rather than on the degree of reliability of such findings. Arskey and O'Malley (2005, 22) suggested five steps in conducting a scoping study, which are followed in this piece:

“Stage 1: identifying the research question
Stage 2: identifying relevant studies
Stage 3: study selection
Stage 4: charting the data
Stage 5: collating, summarising and reporting the results.”

At step 1, two research questions were formulated to guide the review as follows: (a) what are the types of combination between behavioural and reflective policy tools, geography and sectors of their application, and the empirical detail in discussing policy mixes? and (b) to what extent do policy mixes reflect governance aspects of politics, contextuality and flexibility? The first question is a standard question in scoping

Table 2. Search procedure and results.

Dataset	Identification	After duplicates eliminated	Final inclusion
Dataset 1 (<i>Web of Science</i>)	251	194	13
Dataset 2 (<i>Google Scholar</i>)	40	37	7
Dataset 3 (<i>Author's judgment, all domains</i>)	17	17	17
Dataset 4 (<i>Author's judgment, environment and sustainability domains</i>)	13	13	13
Total	321	261	50

reviews seeking to map out a new subject. The inclusion of questions on politics, contextuality and flexibility of policy mixes reflects our interest in governance aspects of BPP, given that the literature and practice in this area have been criticised for being ‘a-political’ (e.g. Lepenies and Matecka 2018; Feitsma 2019), ‘universalistic’ and applied with little attention to policy contexts (e.g. Whitehead *et al.* 2018; John 2018), and hence ‘inflexible’ (Feitsma 2018; Whitehead *et al.* 2018). This review seeks to find out whether case studies that report policy mixes reflect these key themes in governance.

At step 2, four distinct datasets of studies were generated: datasets 1 and 2 are based on multiple searches in *Web of Science* and *Google Scholar* respectively. Given the imperfect coverage of social science literature in these databases, highly cited and influential pieces on behavioural public policy were manually included based on the author’s prior knowledge of the field, which formed dataset 3. Dataset 4 included relevant empirical pieces in the field of environmental policy known to the author but not returned in the database searches.

The *Web of Science* is relatively restrictive and focuses on peer-reviewed journal articles with lesser inclusion of scholarly books, reports and conference proceedings (e.g. Mongeon and Paul-Hus 2016). *Google Scholar* is more inclusive, but returns many low-quality search results (Mongeon and Paul-Hus 2016); thus only ten most cited and relevant items for each search are included in the initial dataset. It was decided not to search *Scopus*, given its bias toward natural sciences (Mongeon and Paul-Hus 2016). The search was limited to items published between 2008, when the notion of ‘nudge’ became popularised by the same-titled book, and 2020 (Thaler and Sunstein 2008). Dataset 1 (*Web of Science*) generated 251 returns and 194 after elimination of duplicates, dataset 2 (*Google Scholar*) – 40 items and 37 after elimination of duplicates, dataset 3 included 17 items, and dataset 4 included 13 items. The preliminary datasets included, in total, 261 items. After close reading of the abstracts and full texts of these articles, a total of 50 articles were chosen for an in-depth review. Annex 2 presents the search terms and refining tools used to form datasets 1 and 2 as well as inclusion/exclusion guidelines; these were too numerous to include in the text. Table 2 presents the flow of the review procedure.

In step 3, the abstracts of all 261 items were reviewed in order to select items for the final dataset using the following *inclusion criteria*: (a) discussion of ‘nudging’, ‘framing’ or ‘behavioural’ interventions; (b) discussion of ‘deliberation’ and/or ‘think’; (c) application to the field of environmental policy and sustainability; and (d) discussion or reference to place-based empirical initiatives. The majority of discarded items did not fit the criteria of research on an environmental topic. However, many also did not have proper consideration of deliberative or reflective components.

Some exceptions were made to allow non-empirical work for further review; two publications in dataset 3 (Cairney and Kwiatkowski 2017; Lepenies and Małecka 2018) and one publication in dataset 4 (John and Stoker 2019) have no direct link to environmental policy. Nevertheless, these have been included because of important conceptual arguments they made about policy mixes. All other entries fit the inclusion criteria. As a result, a total of 50 items were chosen for an in-depth review (13 in dataset 1; 7 in dataset 2; 17 in dataset 3; and 13 in dataset 4). Some entries appeared across several datasets; an indication of saturation of the search (Lefebvre, Manheimer, and Glanville 2011) and, hence, a confidence degree that the search has been reasonably extensive, although not exhaustive.

The fourth step of the review included an in-depth analysis of studies using an analytical framework presented in Annex 1 (online [supplementary material](#)) – the coding scheme. We classified the contents of the 62 identified distinct empirical policy mixes with regard to pro-environmental policy.¹ The codes used to chart the initiatives in an Excel spreadsheet correspond to the research questions that guided this review. The first question seeks to map out various policy mixes and their distribution. The codes that relate to it include ‘type of combination between the tools’ with six possible options, the ‘geography of application’, the ‘sector of application’, and the ‘presence of other tools in the mix, such as regulatory or economic incentives’. Another important code is the ‘empirical detail of a case study’ and allows one to judge whether an argument is empirically grounded. The second question is about the governance aspects in the discussion of policy mixes; this is linked to codes on ‘politics in design and implementation of mixes’, ‘contextuality in design and implementation of mixes’, and ‘adaptive flexibility in design and implementation of mixes’. The coding scheme, including the procedure for decisions on coding, is included in Annex 1 (online [supplementary material](#)). The final dataset of studies (50) is presented in Annex 3 (online [supplementary material](#)). In the fifth and final step the data were presented through a narrative in Sections 4–6.

4. Overview of the initiatives in the dataset: sectors, geography, composition of mixes, and empirical detail of applications

From 62 initiatives, 45 offer place-based empirical case studies. It is remarkable that despite the effort to include as many empirical initiatives as possible, 17 entries still contain a hypothetical case, that is a conceptual suggestion for practice, a reflection that the literature is not yet well-grounded empirically. Some hypothetical cases come from dataset 3; others originate from datasets 1 and 2 – these are cases, which were initially considered to have an empirical character but were eventually coded as ‘hypothetical’.

The entries discuss various environmental issues (27), forest and nature conservation (10), climate change (7), urban planning (5) and other issues. Some (6) do not specify the area of application but seem relevant for environmental policy. The majority of initiatives did not include policy tools other than those in Table 1 (48), whereas some (14) also discussed economic instruments, regulation, public education campaigns and various combinations thereof. A total of 14 initiatives included ‘think’ in their design – an important observation given the often-pronounced criticism of behavioural tools for being non-reflective and overly manipulative. The vast majority of the policy mixes in the dataset come from the West. The results are as follows: European

Union wide initiatives (17), United Kingdom (14), North America (10), Asia (3), Australia (2), geographically non-specific (16). Pulled together, initiatives from Western countries account for 70% of all cases in the dataset and 94% if one does not consider initiatives without a specific geographical focus (coded as ‘global’).

5. Types of combinations of reflective and behavioural tools: insights from the literature

In the coding scheme in Annex 1 (online [supplementary material](#)), we distinguish between seven types of possible combinations of behavioural and reflective policy tools in policy mixes. Some types include causal links between ‘nudges/frames’ and ‘deliberation’ and ‘think’ (e.g. nudge/frame to deliberate or deliberate in order to design nudges/frames), whereas one type includes nudges/frames and deliberation that take place in parallel without obvious interaction. We structure this section according to the frequency of combination types in the dataset, in a descending order. [Table 3](#) details initiatives per type of combination, with most salient examples from the dataset. The database also includes studies (6) that explicitly argue against combination of policy tools for reasons of incompatibility or impracticality. These studies are not discussed in detail as they claim *a priori* that individual policy tools are better than a combination – a view that fades in comparison with the many calls for policy mixes, both in the literature on public policy in general and on BPP in particular. They are, however, reported in [Table 3](#) for further reference of readers.

5.1. Nudge and/or frame to deliberation

This is the most frequent type of combination (23), in which frames or nudges are used to facilitate deliberative events. Examples of this combination include participatory workshop designs, such as the use of clarified frames (Friedman 2007), decision-making models that generate scenarios based on inputs of participants, such as willingness to pay for climate mitigation (Al Sabbagh 2017), or scenario-building workshops to envision the future of a country based on various socio-economic choices (Whitehead *et al.* 2018).

Friedman (2007, 2) discussed how *partisan framing-to-persuade* (the usual use of the term ‘frame’ today) is different from *non-partisan framing-for-deliberation*. The first involves defining an issue to one’s advantage to sway the audience; the latter involves clarifying the range of positions surrounding an issue so that citizens can better decide what they want to do. This is referred to as ‘clarification’ of frames. For example, in the debate on abortion in the US, a facilitator may present various frames, as follows. Frame 1 ‘opposing abortion’ may carry the position that a human life is sacred and that the decision thereabout is not a matter of public policy. Frame 2 would then be ‘supporting abortion rights’ and carry the position that the right to abortion is based on individual freedom of choice to decide on one’s body and to be free from the government’s intervention in one’s private affairs. Frame 3 then, called ‘respecting differences’ would carry the position that the society is pluralistic and value systems change from community to community – and hence flexible policy solutions should be found that are not necessarily in the realm of law. Once these nuances are introduced to clarify policy positions and underlying values and beliefs, deliberation is more focused and positions may be debated in an informed fashion.

Table 3. Types of policy mixes with illustrations.

Type of combination	Selected examples from the database
Frame/Nudge to deliberate $n = 23$.	<ul style="list-style-type: none"> • Clarified linguistic frames to show various perspectives on abortion in order to encourage a meaningful debate in the context of USA (Friedman 2007, cited in Hall 2016); • Linguistic frames to present options of “rotation forest management” and “continuous cover forestry” to stakeholders involved in forestry with the goal to enhance trust and collaborative management in Finland (Isoaho <i>et al.</i> 2019); • Citizen science project in Belgium “CurieuzeNeuzen” that fostered social capital and collective engagement with issues around air quality (van Brussel and Huyse 2019)
Nudge/Frame to ‘think’ (reflect) $n = 11$.	<ul style="list-style-type: none"> • A ‘nudge plus’ approach, in which participants are encouraged to reflect on the patterns of their behaviour through notifications, nudges such as “boosts” (a notification that rewards and encourages continuation of good behaviour, such as pedometer notifications), or by expressing ‘commitments’ in order to initiate and sustain desirable behaviour (John and Stoker 2019; John 2018); • “Visualization” and “focalism” strategies of preparing customers for better choices with regard to big decisions such as house-purchasing (Bhattacharyya <i>et al.</i> 2019);
Nudge/Frame and deliberate $n = 8$.	<ul style="list-style-type: none"> • Forestry management nudges and frames implemented in various constellations, including nudges that were connected to voluntary agreements between the regional government in Bavaria and private forest owners in Germany (Aurenhammer 2020); • Forest management in the US where it is emphasised that a package of solutions is needed for conservation, including a local approach, regulation, pricing and public deliberation (Kreye <i>et al.</i> 2019);
Deliberate to design frames/ Nudges $n = 6$.	<ul style="list-style-type: none"> • The Irish mini-publics engaging in discussing climate change over 2 weekends and advising government on radical climate change action; could be used also for designing democratic nudges (Lenzi 2019); • The “Urban Nudging” project in Utrecht, The Netherlands, where choice architecture for cycle lanes and parking spaces have been discussed collectively and designs disseminated later to the public for awareness and consensus formation (Feitsma 2018);
No combination reported or endorsed $n = 6$.	<ul style="list-style-type: none"> • Niemeyer (2013) suggested that deliberation is essential and behavioural tools are not necessary at all; • Straßheim (2020) quoted John (2018, 122–34) that “an enhanced nudge is much more desirable than full-on deliberation, which takes up too much time, assumes too much capacity, and only selects a minority of the population”;
Nudge/Frame to lobby public officials and/or organisations $n = 6$.	<ul style="list-style-type: none"> • Nudging colleagues with the use of behavioural cues as a form of policy entrepreneurship, applied by the director of a school in Utrecht (Feitsma 2018); • Nudging policy-makers to consider multiple sides of the forestry debate in the policy circles of Finland (Isoaho <i>et al.</i> 2019);
Think to design nudge/Frame $n = 2$.	<ul style="list-style-type: none"> • The Sus Lub project included “hackathons”, in which “participants are not asked to rest new products and designs but invited to experiment creatively and adapt new technologies and systems” (Whitehead <i>et al.</i> 2018, 178). In such “hackathons” participants have the opportunity to understand better how products and systems work and can be adapted in the future (SuslabNWE 2014); • Asking park-goers in the US to think of motivations to engage in recreation and design nudges for themselves and others to keep this engagement (Dustin <i>et al.</i> 2019).

In some reviewed initiatives the linguistic aspect was more salient; for example Friedman's (2007) suggestion of frame-clarification in the abortion debate and Isoaho *et al.*'s (2019, 1) example of 'linguistic nudges' to discuss forestry matters rely on linguistic frames. In other cases, it was more about decision-making models, scenario-building tools and back-casting, visualisation and localisation techniques that encouraged more active and productive deliberations (e.g. Peltola *et al.* 2018; Romsdahl, Blue, and Kirilenko 2018; Bhattacharyya *et al.* 2019). We advise readers to consult individual studies to see the differences in the tools used in this type of interaction, including the difference in deployment of nudges and frames for deliberation.

5.2. *Nudge and/or frame to 'think'*

A somewhat surprising result is that the second most numerous type of combination (11) involves a 'think' strategy. 'Think' seems to have gathered speed since the criticism of nudges and frames for being manipulative. The reviewed initiatives include those called 'nudge plus' (John 2018; John and Stoker 2019) and 'meta-nudges' (Whitehead *et al.* 2018; De Ridder *et al.* 2013), and those that apply mindfulness to encourage reflection (Whitehead *et al.* 2018; Ericson, Gunaketu Kjonstad, and Barstad 2014). Smartphone applications that remind to practice mindfulness, for example, may trigger reflection and help fight anxiety and unhealthy eating as a result of it (Whitehead *et al.* 2018). Similarly, 'meta-nudges' help individuals receive information on their behavioural patterns in real time and may help them devise 'social appropriateness standards' around their behaviour in order to change their unhealthy or harmful habits (Whitehead *et al.* 2018; De Ridder *et al.* 2013).

John and Stoker (2019) cited a study of crime re-education policies in Chicago conducted by Heller *et al.* (2017). The programme 'Becoming a Man' has had a plethora of positive impacts on youth in areas with high prevalence of violent crime. One intervention encouraged participants to play simulation games that "work by helping youth slow down and reflect on whether their automatic thoughts and behaviour are well suited to the situation they are in, or whether the situation could be construed differently" (Heller *et al.* 2017, 2). This is an example of the use of a nudge (or a 'boost' as the authors referred to it) to trigger individual reflection. It is not a frame in our definition of the term, as there is no explicit appeal to affect. Authors emphasise that this strand of behavioural literature is 'new' and, hence, addresses the critique of democratic legitimacy of nudges (e.g. John and Stoker 2019). At the same time, one may argue how 'new' such approaches are, given that individual and group therapy have existed for decades.

5.3. *Nudge and/or frame and deliberate*

The third most popular type of combination is the parallel and complementary use of nudging, framing and deliberation (8). As presented in Sections 1 and 2, there are many calls for combined and parallel application of behavioural and deliberative tools (e.g. Lehner, Mont, and Heiskanen 2016; John and Stoker 2019; Lenzi 2019; Whitehead *et al.* 2018). However, it is somewhat surprising that this type returned only 10 initiatives, and some of these initiatives also include other tools, such as regulations, education campaigns, and economic incentives. Not all authors are in favour of such an eclectic approach; Lenzi (2019), for example, claims that 'strategic

communication' or framing as we refer to it in this review, is only permissible if it works toward deliberative ends and should not be employed otherwise. Aurenhammer (2020), Kreye, Rimsaite, and Adams (2019), Whitehead *et al.* (2018) and Galli *et al.* (2018) present the studies of policy mixes applied in practice.

A remarkable study is by Aurenhammer (2020), which presents detailed and diverse policy mixes of such tools as regulation, public participation, roundtables, financial incentives and nudges in order to encourage forest owners in Bavaria, Germany to adapt to climate change and reduce hunting, build and maintain road infrastructure, and plant climate resilience crops. One interesting 'nudge' was the use of voluntary agreements between forest owners and the provincial government, 'GFI contracts', which stand for government forest initiatives. These are contracts based on a "broad variety of instruments, both, traditional and new ones, to support and facilitate a range of activities in priority areas of forest landscapes" (1). GFIs include

... psychological incentives, i.e., nudging, (that) were applied in the context of the main new instrument, the GFI-contracts, being voluntary agreements, between individual private forest owners and the AELFs (government). Thereby the provision of higher than usual road construction or improvement related subsidies, well received by many private forest owners, were combined with the obligation to undertake certain measures or activities related to silviculture or hunting, which private forest owners, being sometimes simultaneously hunters, farmers and pasture keepers, usually did not perceive so well or which they have seen controversially (14).

The signing of contracts worked as a commitment device that created awareness among farmers/forest owners that, in exchange for subsidies, behavioural change was expected, even if no clear compliance mechanism by the provincial government was in place. Aurenhammer (2020) found that modern mixes of tools, including the use of nudging, led to an increase in short-term effectiveness, but failed to produce long-term results, especially regarding forest conversion as part of climate adaptation goals. To the contrary, nudging has led to increased conflicts and non-action in some cases. The author explains this failure by the relative inflexibility of the policy mixes. Nevertheless, the case illustrates how nudges can be used as a complement to more traditional tools, such as subsidies and regulation, in order to increase the readiness of forest owners to change forestry practices. This study also illustrates that complex policy mixes may not always be more effective than traditional tools or simple combinations of tools, an important counterargument to many calls for mixing approaches (Aurenhammer 2020, 17).

5.4. Deliberate to design nudges and/or frames

It is also surprising that this type occupied the fourth place with (6) initiatives, given how often the importance of deliberation and democratic control over nudging is emphasised in the literature. For example, Menzel (2013, 77) suggested using deliberation in order to "decide who and what will be allowed to manipulate citizens and consumers, and what form this manipulation² may take." Along similar lines, Hall (2016) suggested that communities should decide on ways in which they can nudge themselves or ask a local or central government to nudge them. Lenzi (2019) and Halpern (2015) discussed mini-publics discussing policy issues in the UK in the past, with success. Similarly, The UK and The Netherlands provide examples of nationwide

deliberation on the desirability of nudges before their large-scale implementation (Feitsma 2018; Whitehead *et al.* 2018). All these authors claim that proper discussion of nudges and target groups would improve their democratic legitimacy and may also help effectiveness.

Feitsma (2018) analyzed the efforts of the city of Utrecht in The Netherlands to organise a collective of artists, planners, designers and academics in order to discuss and democratically design nudges for cyclists to park their bicycles in correct places in the city centre. A key feature of this project was facilitation by SETUP, “a small enterprise that focuses on societal innovations” (Feitsma 2018, 9). Three different groups of participants designed different interventions: from playful ‘bicycle monsters’ out to eat improperly parked bicycles, to marking routes used by cars and pedestrians so that cyclists realise that the roads they use are shared with other users. This is how SETUP explains the idea behind the project:

In a series of playful nudges, we introduced the phenomenon in analogous forms to citizens of Utrecht. By stimulating them to make their own nudges, we have opened the debate about practices that are already influencing us on a daily basis, both offline and online. Urban Nudging is a democratisation of the nudge; we celebrate the phenomenon of nudging, make these tricks accessible to everybody and activate citizens to think about the consequences, possibilities, and lastly the desirability of these practices. (SETUP 2015, 7–8, cited in Feitsma 2018)

These are some vivid examples of how deliberation may be used to design behavioural tools.

5.5. Nudge and/or frame public officials or organisations

The next type of combination is the use of nudges and frames in order to influence policy-makers as part of policy entrepreneurship of citizens or public officials (6). Whitehead *et al.* (2018) and Cairney and Kwiatkowski (2017) describe how local councillors or elective officials can be nudged by citizens, who would send them letters with thoughtfully framed messages. There is also a suggestion to nudge other organisations, such as NGOs or funders, to join policy alliances for the environment (Crompton 2010). Similarly, Mitchel, O’Dowd, and Dimache (2020) discusses efforts to nudge small and medium enterprises (SMEs) to become more sustainable. Thus, nudging does not always, or only, apply to citizens and consumers, but may also work to influence organisations and policymakers. It is, however, important to note that such a form of advocacy requires skills, knowledge and resources and is likely to be employed by a more privileged part of the citizenry, those often referred to as ‘issue advocates’ (Cairney and Kwiatkowski 2017, 6) or ‘policy entrepreneurs’ (Cairney 2018, 199).

Cairney and Kwiatkowski (2017) discuss how issue advocates, such as citizen groups, may nudge policy-makers and recommend a three-step heuristic. First, citizen groups should take the cognitive biases of policymakers into account and “avoid overly complicated presentations of evidence with numerous subclauses, technical diagrams, caveats, nuances, and academically fashionable jargon” (Cairney and Kwiatkowski 2017, 4). This impedes engagement, causes memory overload and leads to disinterest. Instead, they should minimise cognitive load and use diverse types of data in communicating, such as words, pictures, music, and make ample use of

examples and stories. For example, citizen groups may advocate for climate action by a government by invoking narratives, images and arguments about recent disasters in the country or a neighbouring one. By invoking the proximity of a disaster and its salience due to recency, speakers command the attention of busy and distracted policymakers. The second step is to understand the motivations of policymakers in consciously filtering out information and making quick decisions. Understanding the ‘rules of thumb’ that policymakers use, or venues that are most effective in persuading them, is of value. For example, policymakers often experience pressure from the fossil fuel industry in stalling climate action. Communication by citizens groups may, hence, target litigation and judicial action instead of pursuing formal policy commitments. Finally, ‘framing’ a problem in order to steer attention to issues that policymakers care about would be more effective. Awareness about what drives policymakers is key in order to adapt messaging accordingly. For example, if the climate policy of a country is driven to a large extent by the unpopularity of climate mitigation policies, communicating the vote-winning potential of climate policies may work wonders. These are hypothetical examples to illustrate the ideas of the authors. Unfortunately, Cairney and Kwiatkowski (2017) did not employ any real-life examples in their work. More empirical studies of behavioural interventions that target organisations and public officials would be very welcome.

5.6 ‘Think’ to design nudges and/or frames

Finally, the least numerous type (2) of combination is individual thinking to produce a nudge for self-regulation, that may then diffuse to larger groups. There are two examples of this type in the dataset; one is based on the Sus Lab project and ‘hackathons’, in which designers work out nudges and choice architecture in labs with subsequent testing and rolling out (Whitehead *et al.* 2018, 172), and the practice of national parks in the US to encourage park-goers to think of ways in which they can motivate themselves and others to visit parks (Dustin *et al.* 2019). It is not clear what benefit this approach may have in comparison with the more consensual and effective process of collective puzzling over nudges with a further collective legitimisation.

6. Governance aspects of policy mixes: politics, contextuality and flexibility

This section is concerned with three issues frequently discussed in the literature on governance and public policy and their relevance to behavioural public policy, namely (a) politics and power in governance processes; (b) contextual dependence of policy tools; and (c) flexibility of policy designs (e.g. Ingram 2013; Mukhtarov *et al.* 2015). To what extent is the BPP literature on policy mixes in the environmental domain reflective of the issues debated in the broader public policy and governance literature? This question gained much salience since the criticism of BPP mentioned in Section 1 of this paper (e.g. Ewert 2020; Loer 2019; Ewert and Loer 2021; Ewert, Loer, and Thomann 2021).

Nudges and frames have been criticised for being presented as ‘a-political and technocratic’, ‘universalistic’, and/or ‘inflexible’. For example, a senior government policy strategist in Singapore noted that “there’s nothing inherently left-wing or liberal or conservative about Behavioural Economics” (cited in Whitehead *et al.* 2018, 106). This is a common sentiment that denies nudging and framing any ideological background and views them as mere tools – a sentiment that caused widespread criticism

of these as ‘technocratic’ (Lepeniec and Małecka 2018, 352; Feitsma 2018). In the meantime, orchestrated behavioural policies have spread around the world with 202 behavioural insight teams (BITs) all over the world as of November 2018 (Afif *et al.* 2019, 6). With such broad diffusion, the importance of adaptation of interventions to the local contexts is self-evident. Nevertheless, Whitehead *et al.* (2018, 16) noted with surprise that “(adaptation is) overlooked within meta-narratives of the spread of new systems of behavioural governments.” Finally, with the complex and often wicked nature of environmental problems, scholars have advocated for flexible, experimental and adaptive policy designs that could be tweaked along the way as social learning develops and circumstances change (e.g. Howlett 2018). This element of the design in behavioural tools seems underdeveloped (e.g. Feitsma 2018). We examine policy mixes in the dataset to establish whether the criticism applied to individual behavioural tools may also extend to policy mixes.

6.1. *How political are policy mixes?*

Practically all of the entries mention terms ‘politics’ and ‘political’, but many do so fleetingly and in reference to governments as political institutions. In over a half of initiatives (37), politics is explicitly acknowledged and discussed. The majority of the initiatives include politics in the context of enhancing deliberative democracy, civic participation and activism (e.g. Brulle 2010; Peltola *et al.* 2018; Romsdahl, Blue, and Kirilenko 2018). Other entries discuss political agendas of various actors (Whitehead *et al.* 2018; Feitsma 2018), and recognise that nudges and frames may be weaponised for a political struggle, as for example in lobbying politicians (Cairney and Kwiatkowski 2017; John *et al.* 2009) or recruiting like-minded allies (Crompton 2010). Very few items, however, refer to ‘political’ in the meaning of struggling for equity, inclusion, justice and structural causes of behaviour that are considered undesirable and, hence, liable for change through behavioural interventions.

A good example of political analysis is Feitsma’s (2018) ethnographic account of an intervention in Utrecht, The Netherlands, to encourage citizens to turn their private gardens into ‘green gardens’ covered with vegetation, a move beneficial for the well-being of residents as well as drainage, and biodiversity (Mukhtarov, Dieperink, and Driessen 2018). Feitsma claimed that decisions whether to garden or not are not solely in the realm of psychology, but have broader socio-economic and other explanations.

From broader research conducted by the behavioural insights team in Utrecht, it transpired that gender, age, socio-economic status, ethnic background and religion may have influenced citizens’ choices. In addition, it was evident that the financial dimension and availability of time in the contemporary society are important factors that impact decisions on whether to pave over gardens. These point to broader structural roots of behaviour and the need to address these in parallel and coordination with behavioural interventions. For example, through targeted subsidies or culturally appropriate communication campaigns, as well as deliberative events, working class and citizens with a migration background may be encouraged to engage in gardening, or even receive support in doing so. Thus, Feitsma (2018) called for the inclusion of broader structural issues that encourage residents to pave their gardens, and not focus exclusively on engineering the environments for their decision-making.

That said, most initiatives in the dataset limit themselves to mere acknowledgement of politics with no explicit and empirical focus on the broader structural issues of

equality, inclusion and justice. Whitehead *et al.* (2018, 15) have thus called for more studies that “help to expose the likely practical failings of such systems of government, as well as revealing their conformist inability to address engrained forms of uneven development and injustice.” Future studies should ask about the winners and losers of behavioural interventions, as well as the justice and equity aspects involved in such interventions.

6.2. How contextually sensitive are policy mixes?

Most initiatives reviewed have considered context in the design and implementation of policy tools. Over half of the initiatives (39) explicitly discuss the context and adaptation efforts. One example comes from the UK’s Behavioural Insights Team (BIT) interventions described by the World Bank (WB 2015). BIT uses a four-part methodology in designing tools: (1) define the desired outcome; (2) use ethnography to understand the specifics of the situation; (3) design new interventions; and (4) pilot the interventions with, where possible, randomised controlled trials (WB 2015). They applied this methodology to encourage timely tax payments by testing various messages in letters sent to taxpayers, a process that allows for the calibration of messages and tools to local contexts. Whitehead *et al.* (2018) devote a chapter to contextual adaptations (and the lack thereof) of policy tools in The Netherlands and Singapore (95–115). Romsdahl, Blue, and Kirilenko (2018, 280) also emphasise the local context in making deliberative engagement with climate change tangible and meaningful; they advocate a shift from from ‘think globally, act locally’ to ‘think locally to act globally’.

However, critics of such contextuality underline its focus on designing ‘micro-contexts’ (designing messages and the direct environment within which a subject functions) and ignorance of broader structural issues that define particular cultural and geographical spaces untouched. As a result, Feitsma (2018) and Feitsma and Whitehead (2019) call for more serious engagement with the ‘macro-contexts’ in behavioural designs that include culture, politics, geography and other socio-political features. These calls are consistent with the earlier emphasis in environmental social sciences on ‘social practices’ (e.g. Shove and Walker 2010; Lockton *et al.* 2014). The focus on social practices instead of pro-environmental behaviour calls attention to larger structures, values, meanings and processes within which human behaviour is embedded, such as material infrastructures, skill-sets and particular symbolic images and meanings shared within a cultural setting (e.g. Hargreaves 2011). Scholars who emphasise ‘social practices’ take a broader look at the project of behavioural change, one that cannot be achieved through individual nudges or frames in separation from material structures, values and practices that legitimate and facilitate particular practices in a society.

6.3. How flexible are policy mixes?

Flexibility of policy mixes received much less attention in the literature than the two other issues; only some (17) studies have an explicit discussion of flexible and adaptive policy designs. One example of flexibility comes from Feitsma’s (2018, 18) discussion of a ‘pragmatic’ version of behaviouralism practiced by a school principal who put “his own, adapted, experiential form of choice architecture: a form that was loosely informed by behavioural insights but beyond that underpinned by intuitive

judgment, creative thinking, and satisficed decision-making.” This entails the belief held by the principal that the results from the scientific work of running experiments of ‘what works’ is not always compatible with the everyday life of a school manager with limited time, personnel and various other challenges to solve. This example shows, as Feitsma claims, that policy practitioners do not follow the experimental science and advice in ways that are prescribed by scientists, and that practice remains pragmatic, eclectic and unfolding. Such flexibility of behavioural insights counter the criticism of behaviouralism as being too rigid and manipulative when put into practice.

Similarly, Howlett (2018) emphasised the need for policy experiments and learning-by-doing in behavioural approaches to sustainability. Furthermore, the 2015 World Bank’s World Development Report is another example of inclusion of adaptive governance in behavioural policy thinking. They devote chapter 11 to this with the title ‘Adaptive design, adaptive interventions’ (192–201). The report closes with the statement that “a more adaptive, empirically agile approach to the intervention cycle can help identify effective ways to improve development outcomes.”

7. Situating behavioural public policy in the debates on policy mixes and governance

7.1. On policy mixes

We have reviewed 62 initiatives presented in 50 published studies, most of which are place-based case studies in environmental policy. This section revisits two questions that guided this review and positions our findings in the broader literature on policy mixes and governance. The first question interrogated characteristics of combinations of reflective and behavioural policy tools for environmental behaviour. All seven types of policy mixes are commonly discussed in the dataset. However, the frequency of a particular combination type does not reflect its importance, efficacy or usefulness. Instead, it indicates the state-of-the-art of BPP in the field of environmental policy, which is nevertheless important to investigate.

There are many examples of framing and nudging to foster policy deliberation in the literature, but few initiatives depict efforts to deliberate in order to design frames and nudges. One may argue that the use of behavioural insights for workshops and deliberation is as old as democracy. Indeed, participatory workshops have always required some planning and design, as well as linguistic scoping (e.g. Chatham House rules for discussions or Robert’s Rules of Order). The well-established and long practiced design of deliberative events may explain the abundance of this type in the dataset.

However, it is surprising that, given the many calls for more democratic legitimacy of frames and nudges, few initiatives were found with collaborative designs of nudges and frames. Expert-driven technocratic views of behavioural tools do injustice to the complexities of policy problems, the embeddedness of individual behaviour in broader contexts, and the diversity of motivations of ‘addressees’ to react to interventions (e.g. Loer 2019; Howlett 2018). Deliberations and consultations may help designers understand the behavioural biases and motivations of their policy targets and thus better link specific policy tools with policy targets (Howlett 2018). One possible explanation for the few examples of such combinations (deliberate to nudge or frame) is cost; it is expensive to consult publics and appealing to rely on experts (e.g. Straßheim 2020; Lenzi 2019; WB 2015; John and Stoker 2019). As long as cutting costs is the major selling point of BPP, collaborative design and deliberation for design are unlikely to take place.

It is noteworthy that the second most popular combination type in the dataset involves the ‘think’ strategy – individual reflection on one’s behavioural patterns. It is an indication of a growing shift in the BPP literature away from a predominant focus on automatic processes, and toward embracing more reflective approaches that enhance the autonomy of individuals. However, this also raises pertinent questions of distinguishing BPP from the literature on behavioural therapy and mindfulness (Brent 1991; Ericson, Gunaketu Kjonstad, and Barstad 2014) and reflective and deliberative practice (e.g. Schon 1983; Forester 1998). Furthermore, whereas individual ‘think’ is extremely valuable, it is important not to push deliberation to the fringes of practice if governments are serious about the democratic legitimacy of their policies.

It was also surprising to find relatively few examples of combining nudging, framing and deliberation as policy tools (8), the policy mix type that proved successful in changing tobacco-related behaviour (e.g. Tenbensel 2006; Brandt 2007; Cairney 2007). Policy mixes are considered more effective for policy compliance than individual policy tools, which makes their relative scarcity a puzzle (Howlett 2018, 116). Ewert (2020, 349) also observed the failure to collect the ‘low hanging fruit’ of BPP by designing policy mixes – the ‘BPP’s unfinished business’ in his words. Ewert’s informants mentioned two possible reasons for the failure – an ideological divide between those who advocate behavioural and non-behavioural tools, and organisational fragmentation as “advocates of behavioural and structural policy interventions often work in different silos of government...” (Ewert 2020, 349). More research on organisational characteristics in successful and failed attempts to design policy mixes would throw better light on this issue.

In terms of geographical distribution, policy mixes seem to be a largely Western phenomenon. Richer authoritarian governments in Singapore, China, Qatar, Kuwait, Oman embrace nudges and frames without much evidence of deliberative processes or democratic safeguards, which puts under question the ‘libertarian’ character of nudging if it means promoting freedom (Whitehead *et al.* 2018; Hockley 2019). We think that deliberation or reflection is not a priority for the application of behavioural tools in the Global South and, hence, few policy mixes with both approaches are to be found there. For example, the World Bank’s 2015 World Development Report (WDR) ‘Mind, Society and Behaviour’ (WB 2015) discusses behavioural insights for development, but refers to the term ‘deliberation’ only a few times, as a tool to help own employees avoid confirmation bias (WB 2015, 183–184). Similarly, the OECD report (2017) includes many examples from the Global South, but does not mention ‘deliberation’ at all and refers to ‘participation’ mostly in the context of ‘enrolment’ in educational or other programmes. This conclusion is corroborated by the observation of Whitehead *et al.* (2014, 46) that “neoliberal styles of government have become a feature of policy making in more authoritarian states (particularly China and Singapore)” that would stifle reflective approaches. Furthermore, behavioural tools applied in the Global South come mostly from the fields of public health, poverty reduction, education and finances, and not environmental policy (WB 2015; Afif *et al.* 2019; Manning *et al.* 2020).

7.2. On governance aspects of policy mixes

In our second question, we asked about the governance aspects of designing and implementing policy mixes for environmental policy. The criticism of behavioural policy tools for their alleged failure to consider politics, contextuality and flexibility is

well-established (e.g. Whitehead *et al.* 2018; Feitsma 2018; Ewert, Loer, and Thomann 2021). The picture is more textured and nuanced when it comes to policy mixes in practice. Substantial attention is paid to these issues in the empirical literature. Politics is commonly discussed in empirical sources, but most such discussions are limited to mere acknowledgement that policies have a political component. Politics, including on social constructions of ‘target populations’ for policy interventions, needs more attention by scholars and practitioners alike (Schneider and Ingram 1993; Howlett 2018).

With regard to contextuality, most studies consider micro-contexts in designing and applying policy tools such as frames and nudges, but fail to consider so-called ‘macro-contexts’ that include structural issues such as inequalities, discrimination or socio-economic and cultural trends. A focus on ‘social practices’ instead of exclusively on behaviour may help to address this gap (Hargreaves 2011). Loer’s (2019) interesting proposal to add ‘behavioural spin’ to existing policy tools in order to make them more effective can take place only if there is enough knowledge about ‘addressees’ of nudges and how they are embedded in their own social context. At the same time, trust in government is an important factor in predicting the success of behavioural interventions – considerations in favor of more contextual (macro and micro) approaches to BPP. As Leong and Howlett (2020, 18) put it, the new policy science informed by behavioural insights must “understand the basis on which compliance is likely to occur. Three elements of the behavioural state – motivations, bases of compliance and legitimacy are all important considerations.” These considerations will vary from one case to another, making designing BPP interventions a highly embedded and contextualised endeavor. A long-established governance mantra ‘there are no panaceas’ also holds true for BPP.

Finally, there is much less attention given to the flexibility of policy designs in the reviewed cases compared to politics and contextuality, which is an interesting finding given the prominence of adaptive management literature that stresses flexibility, experimentation and learning in environmental policy (e.g. Mukhtarov, Dieperink, and Driessen 2018). Howlett’s (2018) advice to designers of nudges and frames to conduct policy pilots and experiments and to be reflective about their possible biases toward some ‘target populations’ to be nudged may help link BPP with the insights from experimental governance.

8. Summary and ways forward

8.1. Lessons learned

Five broad lessons and areas for future investigation emerge from this review. First of all, there is a paradox: legitimacy of behavioural interventions has been under attack and scholars called for behavioural units and individual nudges/frames to be subjected to review, public debate and scrutiny (Lenzi 2019; Lepenies and Małecka 2018). At the same time, there are very few examples of such practices. Causes of this dearth need to be better understood and dealt with.

Second, most of the reviewed policy mixes come from the West, or rich authoritarian countries in the Middle East and East Asia. We hypothesise that this uneven distribution has partly to do with the environmental domain in focus. If environmental protection is viewed as a ‘luxury problem’ that must be tackled mostly in the richer world, then it is not surprising that most examples come from the Global North. We expect more interesting policy mixes in the Global South in other policy domains.

Future researchers must actively seek out such studies and applications in order to help understand these in the context of the Global South.

Third, studies of behavioural tools need to engage more with the political component of BPP, especially with regard to such aspects as social justice, equity, power relations, and explicit discussion of winners and losers for particular interventions. Such studies would do well in engaging not only ‘micro-contexts’ of decision-making, as advocated by behavioural scientists, but also ‘macro-contexts’, such as broader societal and structural issues that shape and clothe behaviour with meaning. Relatedly, designing policy mixes that are flexible, context-sensitive and politically informed requires new mindsets and skill sets; and behavioural units around the world may benefit from exploring ways of fostering such skills among their experts. Reflective thinking fostered by ‘dog-fooding’ and ‘red-teaming’ in the World Bank is a move in the right direction (WB 2015). These techniques may help in resisting temptations to buy into some social constructions of target populations in nudging some target populations more than others (Schneider and Ingram 1993; Howlett 2018). More research is needed to understand such skill sets and mindsets and how to foster them (see Gasper 2022).

Fourth, more ethnographic accounts based on ‘thick description’ of applications of behavioural tools in practice may throw light on how deliberation may be intertwined with nudging and framing in ways that are contextual, flexible and political. Unfortunately, BPP literature remains dominated by experimental approaches expressed in randomised controlled trials (RCT) with little room for other methodologies. While very useful for some purposes, RCTs have important blindspots (e.g. Akram-Lodhi 2014, 2020; Ewert and Loer 2021). The work of Feitsma (2018) and Hargreaves (2011) are illustrations of fruitful alternatives and could lead to a more nuanced and empirically informed discussion of behavioural and reflective public policy away from the old clichés that have polarised the field.

Finally, a closer integration of behavioural public policy literature with the policy sciences literature on policy mixes and governance processes more generally will be productive for both camps (Bouma *et al.* 2019; Feitsma and Whitehead 2019). Such integrations would mean a more serious engagement with ‘policy targets’ or ‘addressees’ when designing interventions (e.g. Howlett 2018; Loer 2019), more experimentation and adaptive design in situations with little evidence on what nudges/frames work best for what groups (e.g. Feitsma 2018), and fine-tuning conventional policy tools based on behavioural insights (Loer 2019). An encouraging sign of progress in this direction is a recent special issue of *Policy and Politics* edited by Ewert, Loer, and Thomann (2021) that proposes a more comprehensive notion of behavioural public policy and administration.

8.2. Lessons for environmental policy

Most of the findings of this review are relevant for BPP at large. Some are specific to the domain of environmental policy, though. First of all, the issue of deliberative legitimacy is central to the discourse of environmental governance (e.g. Dryzek 1992; Bäckstrand *et al.* 2010). Special attention to the types of combinations found in this review may not be warranted in other policy domains. Second, calls for policy mixes have been very prominent in environmental policy in general (e.g. Gaddis *et al.* 2019) and in its BPP sub-field in particular. For example, Lehner, Mont, and Heiskanen

(2016, 176) suggested that while behavioural tools are “a possible strategy for changing behaviour of people with low engagement in sustainability discourse,” the best interventions include those that change minds alongside changing contexts, which is best achieved through a dialogue. Lenzi (2019, 1) argued that “combining deliberation with nudges promises to be a timelier and more effective response to climate change than deliberation alone.” The lack of such policy mixes in the literature is, hence, especially puzzling. A third observation is that the lack of initiatives from the Global South may be linked to the environmental domain of this review – there is much more attention given to interventions in healthcare, finances and education in poorer countries (e.g. WB 2015; Afif *et al.* 2019; Manning *et al.* 2020).

8.3. Limitations

There are a number of limitations of this review. This review focused only on the tools from Table 1 and, hence, missed other, more complex, policy mixes. We also limited the scope of this review to a general overview of policy mixes without evaluation of their designs and impact – a key feature of scoping reviews. Scholars are suggested to investigate policy mixes against criteria such as consistency, coherence, congruence (Howlett and Rayner 2007; 2013) and robustness (Capano and Woo 2017). Policy mixes were not evaluated in this paper, neither for design nor for impact. These are important tasks that fall beyond the scope of this paper; a systematic review may follow with more attention to the quality of studies and evaluation of policy mixes in action. The distinction between frames and nudges has been justified based on the prominence of emotions in debates on environmental communication and environmental psychology (see Section 2.1). However, we have not disentangled frames from nudges when discussing various types of policy mixes in Table 3 and Section 5 in order to reduce the number of types of interactions. Future research may report in greater detail on potential differences between framing and nudging interventions in the context of policy mixes.

The search in English prioritised publications in this language, and the use of Web of Knowledge and Google Scholar meant that some important and relevant studies remained beyond the reach of this review, due to those tools’ bias in favor of natural sciences (Mongeon and Paul-Hus 2016). We attempted to ameliorate this by adding to the sample some important studies not returned in the searches, but cannot guarantee that these give the full picture. Inevitably, it will have missed some important and relevant pieces in this review. Nevertheless, we hope to have produced useful new insights for scholars and practitioners of behavioural environmental policy and public policy more generally.

Notes

1. We define ‘environmental policy’ broadly and include adjacent fields of urban planning, sustainable housing, poverty reduction and development, and environmental benefits of health-motivated behaviour. Some of the 62 entries have thus an indirect environmental component. Most of the initiatives are explicitly environmental.
2. “Manipulation” here refers to emotional framing or nudging

Supplemental data

Supplemental data for this article can be accessed online at <https://doi.org/10.1080/09640568.2022.2132475>.

Funding

This work was supported by Research Support Grant from ADA University (2015–2016).

References

- Affif, Z., W. Wade Islan, O. Calvo-Gonzalez, and A. G. Dalton. 2019. *Behavioral Science Around the World: Profiles of 10 Countries (English)*. eMBED Brief. Washington, DC: World Bank Group.
- Akram-Lodhi, A. H. 2020. "Follow the Yellow Brick Road"?: Structural Shortcomings in Randomized Control Trials." *World Development* 127: 104803. doi:10.1016/j.worlddev.2019.104803.
- Akram-Lodhi, H. 2014. "Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty." *The Journal of Peasant Studies* 41 (3): 426–429. doi:10.1080/03066150.2014.912432.
- Al Sabbagh, M. 2017. "Social Learning and the Mitigation of Transport CO₂ Emissions." *Climate* 5 (1): 6. doi:10.3390/cli5010006.
- Arksey, H., and L. O'Malley. 2005. "Scoping Studies: Towards a Methodological Framework." *International Journal of Social Research Methodology* 8 (1): 19–32. doi:10.1080/1364557032000119616.
- Aurenhammer, P. K. 2020. "Nudging in the Forests: The Role and Effectiveness of NEPIs in Government Forest Initiatives of Bavaria." *Forests* 11 (2): 168. doi:10.3390/f11020168.
- Bäckstrand, K., J. Khan, A. Kronsell, and E. Lövbrand. 2010. "The Promise of New Modes of Environmental Governance." In *Environmental Politics and Deliberative Democracy: Examining the Promise of New Modes of Governance*, edited by Karin Bäckstrand, Jamil Kahn, Annica Kronsell, and Eva Lövbrand, 3–27. Cheltenham: Edward Elgar.
- Banerjee, S., and P. John. 2021. "Nudge Plus: Incorporating Reflection into Behavioral Public Policy." *Behavioural Public Policy* 5717 (332): 1–16.
- Berthet, V., and B. Ouyard. 2019. "Nudge: Towards a Consensus View?" *Psychology and Cognitive Sciences – Open Journal* 5 (1): 1–5. doi:10.17140/PCSOJ-5-143.
- Bhattacharyya, A., W. Jin, C. Le Floch, D. G. Chatman, and J. L. Walker. 2019. "Nudging People towards More Sustainable Residential Choice Decisions: An Intervention Based on Focalism and Visualization." *Transportation* 46 (2): 373–393. doi:10.1007/s11116-018-9936-x.
- Blumenthal-Barby, J. S., and H. Burroughs. 2012. "Seeking Better Health Care Outcomes: The Ethics of Using the 'Nudge.'" *The American Journal of Bioethics: AJOB* 12 (2): 1–10.
- Bouma, J., M. Verbraak, F. Dietz, and R. Brouwer. 2019. "Policy Mix: Mess or Merit?" *Journal of Environmental Economics and Policy* 8 (1): 32–47. doi:10.1080/21606544.2018.1494636.
- Brandt, A. M. 2007. *The Cigarette Century: The Rise, Fall, and Deadly Persistence of the Product That Defined America*. New York: Basic Books.
- Brent, D. 1991. "Young, Becker and Pike's 'Rogerian' Rhetoric: A Twenty-Year Reassessment." *College English* 53 (4): 452–466. doi:10.2307/378020.
- Bilotta, G. S., A. M. Milner, and I. Boyd. 2014. "On the Use of Scoping Reviews to Inform Environmental Policies." *Environmental Science and Policy* 42: 67–77. doi:10.1016/j.envsci.2014.05.010.
- Brulle, R. J. 2010. "From Environmental Campaigns to Advancing the Public Dialog: Environmental Communication for Civic Engagement." *Environmental Communication* 4 (1): 82–98.
- Cadario, R., and P. Chandon. 2020. "Which Healthy Eating Nudges Work Best? A Meta-Analysis of Field Experiments." *Marketing Science. Online* 39 (3): 465–486. doi:10.1287/mksc.2018.1128.
- Gaddis, E., J. Grellier, A. Grobicki, R. Hay, N. Mirumachi, F. Mukhtarov, and W. Rast. 2019. "Chapter 16: Freshwater Policy." In *Sixth Global Environmental Outlook, United Nations Environment*, 399–424. Nairobi: Cambridge University Press and UN Environment.
- Cambridge University Press. 2020. "Home Page of the Journal Behavioural Public Policy." <https://www.cambridge.org/core/journals/behavioural-public-policy>. Accessed 14 October 2021.

- Cairney, P. 2007. "A 'Multiple Lenses' Approach to Policy Change: The Case of Tobacco Policy in the UK." *British Politics* 2 (1): 45–68. doi:10.1057/palgrave.bp.4200039.
- Cairney, P. 2018. "Three Habits of Successful Policy Entrepreneurs." *Policy and Politics* 46 (2): 199–215. doi:10.1332/030557318X15230056771696.
- Cairney, P., and R. Kwiatkowski. 2017. "How to Communicate Effectively with Policymakers: Combine Insights from Psychology and Policy Studies." *Palgrave Communications* 3 (1): 37. doi:10.1057/s41599-017-0046-8.
- Capano, G., and J. J. Woo. 2017. "Resilience and Robustness in Policy Design: A Critical Appraisal." *Policy Sciences* 50 (3): 399–426. doi:10.1007/s11077-016-9273-x.
- Congiu, L., and I. Moscati. 2020. "Message and Environment: A Framework for Nudges and Choice Architecture." *Behavioural Public Policy* 4 (1): 71–87. doi:10.1017/bpp.2018.29.
- Congiu, L., and I. Moscati. 2021. "A Review of Nudges: Definitions, Justifications, Effectiveness." *Journal of Economic Surveys* 36 (1): 188–213. doi:10.1111/joes.12453.
- Crompton, T. 2010. "Common Cause: The Case for Working with Our Cultural Values." Common Cause Foundation. https://commoncausefoundation.org/_resources/common-cause-the-case-for-working-with-our-cultural-values/
- De Ridder, D. 2014. "Nudging for Beginners: A Shortlist of Issues in Urgent Need of Research." *European Health Psychologist* 16 (1): 2–6.
- De Ridder, D., E. De Vet, M. Stok, M. Adriaanse, and J. De Wit. 2013. "Obesity, Overconsumption and Self-Regulation Failure: The Unsung Role of Eating Appropriateness Standards." *Health Psychology Review* 7 (2): 146–165. doi:10.1080/17437199.2012.706987.
- Dolan, P., M. Hallsworth, D. Halpern, D. King, R. Metcalfe, and I. Vlaev. 2012. "Influencing Behaviour: The Mindspace Way." *Journal of Economic Psychology* 33 (1): 264–277. doi:10.1016/j.joep.2011.10.009.
- Dolan, Paul, Michael Hallsworth, David Halpern, Dominic King, and Ivo Vlaev. 2010. *MINDSPACE: Influencing Behaviour for Public Policy*. London: Institute for Government.
- Dryzek, J. S. 1992. "Ecology and Discursive Democracy: Beyond Liberal Capitalism and the Administrative State." *Capitalism Nature Socialism* 3 (2): 18–42. doi:10.1080/10455759209358485.
- Dustin, D., C. A. Zajchowski, N. Q. Lackey, D. Tysor, T. Bennett, K. Pagano, and M. Taylor. 2019. "Libertarian Paternalism and the Park, Recreation, and Tourism Profession." *Journal of Park and Recreation Administration* 37 (1): 95–104. doi:10.18666/JPra-2019-8801.
- Ericson, T., B. Gunaketu Kjonstad, and A. Barstad. 2014. "Mindfulness and Sustainability." *Ecological Economics* 104: 73–79. doi:10.1016/j.ecolecon.2014.04.007.
- Ewert, B. 2020. "Moving beyond the Obsession with Nudging Individual Behaviour: Towards a Broader Understanding of Behavioural Public Policy." *Public Policy and Administration* 35 (3): 337–360. doi:10.1177/0952076719889090.
- Ewert, B., and K. Loer. 2021. "Advancing Behavioural Public Policies: In Pursuit of a More Comprehensive Concept." *Policy and Politics* 49 (1): 25–47. doi:10.1332/030557320X15907721287475.
- Ewert, B., K. Loer, and E. Thomann. 2021. "Beyond Nudge: Advancing the State-of-the-Art of Behavioural Public Policy and Administration." *Policy and Politics* 49 (1): 3–23. doi:10.1332/030557320X15987279194319.
- Feitsma, J. 2018. "The Behavioural State: Critical Observations on Technocracy and Psychocracy." *Policy Sciences* 51 (3): 387–410. doi:10.1007/s11077-018-9325-5.
- Feitsma, J. 2019. "Brokering Behaviour Change: The Work of Behavioural Insights Experts in Government." *Policy and Politics* 47 (1): 37–56. doi:10.1332/030557318X15174915040678.
- Feitsma, J., and M. Whitehead. 2019. "Bounded Interdisciplinarity: Critical Interdisciplinary Perspectives on Context and Evidence in Behavioural Public Policies." *Behavioural Public Policy* 6 (3): 358–384.
- Friedman, W. 2007. "Reframing 'Framing'." Occasional Paper 1. Public Agenda Center for Advances in Public Engagement. Accessed 10 October 2021. https://apha.confex.com/recording/apha/138am/pdf/free/4db77adf5df9fff0d3caf5cafe28f496/paper227186_3.pdf.
- Forester, J. (1999). *The Deliberative Practitioner: Encouraging Participatory Planning Processes*. Cambridge, MS: MIT Press.
- Galizzi, M. M. 2014. "What is Really Behavioral in Behavioral Health Policy? And Does It Work?" *Applied Economic Perspectives and Policy* 36 (1): 25–60. doi:10.1093/aep/ppt036.
- Galli, F., E. Favilli, S. D'Amico, and G. Brunori. 2018. *A Transition towards Sustainable Food Systems in Europe. Food Policy Blue Print Scoping Study*. Pisa, Italy: Laboratorio di Studi Rurali Sismondi.

- Gasper, D. 2022. "'Making Strange': Discourse Analysis Tools for Teaching Critical Development Studies." *Progress in Development Studies* 22 (3): 288–304. doi:10.1177/14649934221080828.
- Grimmelikhuijsen, Stephan, Sebastian Jilke, Asmus Leth Olsen, and Lars Tummors. 2017. "Behavioral Public Administration: Combining Insights from Public Administration and Psychology." *Public Administration Review* 77 (1): 45–56. doi:10.1111/puar.12609.
- Hacker, J. S. 2005. "Policy Drift: The Hidden Politics of US Welfare State Retrenchment." In *Beyond Continuity: Institutional Change in Advanced Political Economies*, edited by W. Streek and K. Thelen, 40–82. Oxford: Oxford University Press.
- Hall, C. 2016. "Framing and Nudging for a Greener Future." In *The Oxford Handbook of Environmental Political Theory*. Oxford: Oxford University Press.
- Halpern, D. 2015. *Inside the Nudge Unit: How Small Changes Can Make a Big Difference*. WH Allen, London: Random House. <https://www.theguardian.com/politics/2018/nov/10/nudge-unit-pushed-way-private-sector-behavioural-insights-team>.
- Hansen, P. G. 2016. "The Definition of Nudge and Libertarian Paternalism: Does the Hand Fit the Glove?" *European Journal of Risk Regulation* 7 (1): 155–174. doi:10.1017/S1867299X00005468.
- Hargreaves, T. 2011. "Practice-ing Behaviour Change: Applying Social Practice Theory to Pro-Environmental Behaviour Change." *Journal of Consumer Culture* 11 (1): 79–99. doi:10.1177/1469540510390500.
- Harrison, K. 1998. "Talking with the Donkey: Cooperative Approaches to Environmental Protection." *Journal of Industrial Ecology* 2 (3): 51–72. doi:10.1162/jiec.1998.2.3.51.
- Heller, S.B., A. K. Shah, J. Guryan, J. Ludwig, S. Mullainathan, and H. A. Pollack. 2017. "Thinking, Fast and Slow? Some Field Experiments to Reduce Crime and Dropout in Chicago." *Quarterly Journal of Economics* 132 (1): 1–54. doi:10.1093/qje/qjw033.
- Hockley, T. 2019. *Making the Arab Region Safer, more Prosperous and Inclusive: One Experiment at a Time*. A Blog Post on Behavioural Public Policy Blog, Companion of Behavioural Public Policy, Cambridge University Press. <https://bppblog.com/2019/05/20/making-the-arab-region-safer-more-prosperous-and-inclusive-one-experiment-at-a-time>.
- Howlett, M. 2018. "Matching Policy Tools and Their Targets: Beyond Nudges and Utility Maximisation in Policy Design." *Policy and Politics* 46 (1): 101–124. doi:10.1332/030557317X15053060139376.
- Howlett, M., and J. Rayner. 2007. "Design Principles for Policy Mixes: Cohesion and Coherence in 'New Governance Arrangements'." *Policy and Society* 26 (4): 1–18. doi:10.1016/S1449-4035(07)70118-2.
- Howlett, M., and J. Rayner. 2008. "Third Generation Policy Diffusion Studies and the Analysis of Policy Mixes: Two Steps Forward and One Step Back?" *Journal of Comparative Policy Analysis: Research and Practice* 10 (4): 385–402. doi:10.1080/13876980802468816.
- Howlett, M., and J. Rayner. 2013. "Patching vs Packaging in Policy Formulation: Assessing Policy Portfolio Design." *Politics and Governance* 1 (2): 170–182. doi:10.17645/pag.v1i2.95.
- Ingram, H. 2013. "No Universal Remedies: Design for Contexts." *Water International* 38 (1): 6–11. doi:10.1080/02508060.2012.739076.
- Ingram, H., P. deLeon, and A. Schneider. 2016. "Conclusion: Public Policy Theory and Democracy: The Elephant in the Corner." In *Contemporary Approaches to Public Policy*, 175–200. London: Palgrave Macmillan.
- Isoaho, K., D. Burgas, N. Janasik, M. Mönkkönen, M. Peura, and J. I. Hukkinen. 2019. "Changing Forest Stakeholders' Perception of Ecosystem Services with Linguistic Nudging." *Ecosystem Services* 40: 101028. doi:10.1016/j.ecoser.2019.101028.
- John, P. 2018. *How Far to Nudge?: Assessing Behavioural Public Policy*. Cheltenham, UK: Edward Elgar Publishing.
- John, P., and G. Stoker. 2019. "Rethinking the Role of Experts and Expertise in Behavioural Public Policy." *Policy and Politics* 47 (2): 209–225. doi:10.1332/030557319X15526371698257.
- John, P., S. Cotterill, L. Richardson, A. Moseley, G. Smith, G. Stoker, ... H. Nomura. 2009. *Nudge, Nudge, Think, Think: Experimenting with Ways to Change Civic Behaviour*. London: Bloomsbury Academic.
- Kahneman, D. 2011. *Thinking, Fast and Slow*. Chicago: Macmillan.
- Kreye, M. M., R. Rimsaite, and D. C. Adams. 2019. "Public Attitudes about Private Forest Management and Government Involvement in the Southeastern United States." *Forests* 10 (9): 776. doi:10.3390/f10090776.

- Lakoff, G. 2014. *The All New: Don't Think of an Elephant!: Know Your Values and Frame the Debate*. London: Chelsea Green Publishing.
- Lefebvre, C., E. Manheimer, and J. Glanville. 2011. "Searching for Studies." Chap. 6 in *Cochrane Handbook for Scoping Reviews of Interventions. Version 5.1.0 (updated March 2011)*, edited by J. P. T. Higgins and S. Green. The Cochrane Collaboration.
- Lehner, M., O. Mont, and E. Heiskanen. 2016. "Nudging: A Promising Tool for Sustainable Consumption Behaviour?" *Journal of Cleaner Production* 134: 166–177. doi:10.1016/j.jclepro.2015.11.086.
- Lenzi, D. (2019). "Deliberating About Climate Change: The Case for 'Thinking and Nudging.'" *Moral Philosophy and Politics*, 6(2), 313–336. doi:10.1515/mopp-2018-0034.
- Leong, C., and M. Howlett. 2020. "Theorizing the Behavioral State: Resolving the Theory-Practice Paradox of Policy Sciences." *Public Policy and Administration* 37 (2): 203–225. doi:10.1177/0952076720977588.
- Lepeniec, R., and M. Małacka. 2018. "The Ethics of Behavioural Public Policy." In *The Routledge Handbook of Ethics and Public Policy*, 513–525. London: Routledge.
- Levac, D., H. Colquhoun, and K. K. O'Brien. 2010. "Scoping Studies: Advancing the Methodology." *Implementation Science* 5 (1): 1–9. doi:10.1186/1748-5908-5-69.
- Lockton, D., F. Bowden, C. Greene, C. Brass, and R. Gheerawo. 2014. "SusLabNWE: Integrating Qualitative and Quantitative Data to Understand People's Everyday Energy Behavior." http://suslab.rca.ac.uk/wp-content/uploads/2013/10/Lockton_Bowden_Greene_Brass_Gheerawo_2013_BECC.pdf
- Loer, K. 2019. "The Enzymatic Effect of Behavioural Sciences: What about Policy-Makers' Expectations?" Chap. 13 in *Handbook of Behavioural Change and Public Policy*. Cheltenham: Edward Elgar Publishing.
- Manning, L., G. Dalton, Z. Afif, R. Vakos, and F. Naru. 2020. *Behavioral Science around the World Volume II: Profiles of 17 International Organizations (English)*. eMBEd Report. Washington, DC: World Bank Group.
- Marchiori, D. R., M. A. Adriaanse, and D. T. De Ridder. 2017. "Unresolved Questions in Nudging Research: Putting the Psychology Back in Nudging." *Social and Personality Psychology Compass* 11 (1): e12297. doi:10.1111/spc3.12297.
- Menzel, S. 2013. "Are Emotions to Blame?: The Impact of Non-Analytical Information Processing on Decision-Making and Implications for Fostering Sustainability." *Ecological Economics* 96: 71–78. doi:10.1016/j.ecolecon.2013.10.001.
- Michalek, G., G. Meran, R. Schwarze, and Ö. Yildiz. 2015. "Nudging as a New 'Soft' Tool in Environmental Policy: An Analysis Based on Insights from Cognitive and Social Psychology." Discussion Paper Series RECAP15 21, RECAP15, European University Viadrina, Frankfurt (Oder). <https://ideas.repec.org/p/euv/dpaper/21.html>
- Mitchell, S., P. O'Dowd, and A. Dimache. 2020. "Manufacturing SMEs Doing it for Themselves: Developing, Testing and Piloting an Online Sustainability and Eco-innovation Toolkit for SMEs." *International Journal of Sustainable Engineering* 13 (3):159–170. doi: 10.1080/19397038.2019.1685609.
- Mongeon, P., and A. Paul-Hus. 2016. "The Journal Coverage of Web of Science and Scopus: A Comparative Analysis." *Scientometrics* 106 (1): 213–228. doi:10.1007/s11192-015-1765-5.
- Mont, O., M. Lehner, and E. Heiskanen. 2014. *Nudging a Tool for Sustainable Behaviour?* Stockholm: The Swedish Environmental Protection Agency.
- Mukhtarov, F., S. Fox, N. Mukhamedova, and K. Wegerich. 2015. "Interactive Institutional Design and Contextual Relevance: Water User Groups in Turkey, Azerbaijan and Uzbekistan." *Environmental Science and Policy* 53: 206–214. doi:10.1016/j.envsci.2014.10.006.
- Mukhtarov, F., C. Dieperink, and P. Driessen. 2018. "The Influence of Information and Communication Technologies on Public Participation in Urban Water Governance: A Review of Place-Based Research." *Environmental Science and Policy* 89: 430–438. doi:10.1016/j.envsci.2018.08.015.
- Niemeyer, S. 2013. "Democracy and Climate Change: What Can Deliberative Democracy Contribute?" *Australian Journal of Politics and History* 59 (3): 429–448. doi:10.1111/ajph.12025.
- Offe, C., and U. K. Preuss. 1991. "Democratic Institutions and Moral Resources." Chap. 6 in *Political Theory Today*, edited by D. Held. Cambridge: Polity Press.

- Ölander, F., and J. Thøgersen. 2014. "Informing versus Nudging in Environmental Policy." *Journal of Consumer Policy* 37 (3): 341–356. doi:10.1007/s10603-014-9256-2.
- Oliver, A., ed. 2013. *Behavioural Public Policy*. Cambridge: Cambridge University Press.
- Organisation for Economic Cooperation and Development. 2017. *Behavioural Insights and Public Policy*. Paris: OECD.
- Peltola, T., M. Åkerman, J. Bamberg, P. Lehtonen, and O. Ratamäki. 2018. "Emergent Publics and Affects in Environmental Governance." *Journal of Environmental Policy and Planning* 20 (2): 157–169. doi:10.1080/1523908X.2017.1343135.
- Romsdahl, R., G. Blue, and A. Kirilenko. 2018. "Action on Climate Change Requires Deliberative Framing at Local Governance Level." *Climatic Change* 149 (3–4): 277–287. doi:10.1007/s10584-018-2240-0.
- SETUP. 2015. "Urban Nudging." <http://docplayer.nl/25585019-Projectverslag-urban.html>.
- Schneider, A., and H. Ingram. 1993. "Social Construction of Target Populations: Implications for Politics and Policy." *American Political Science Review* 87 (2): 334–347. doi:10.2307/2939044.
- Schneider, A., and H. Ingram. 1993. "Social Construction of Target Populations: Implications for Politics and Policy." *American Political Science Review* 87 (2): 334–347. doi:10.2307/2939044.
- Schon, D. 1983. *The Reflective Practitioner: How Professionals Think in Action*. New York: Basic Books.
- Schon, D., and M. Rein. 1994. *Frame Reflection: Solving Intractable Policy Disputes*. New York: Basic Books.
- Schubert, C. 2017. "Green Nudges: Do They Work? Are They Ethical?" *Ecological Economics* 132: 329–342. doi:10.1016/j.ecolecon.2016.11.009.
- Shove, E., and G. Walker. 2010. "Governing Transitions in the Sustainability of Everyday Life." *Research Policy* 39 (4): 471–476. doi:10.1016/j.respol.2010.01.019.
- Simon, H. A. 1955. "A Behavioral Model of Rational Choice." *The Quarterly Journal of Economics* 69 (1): 99–118. doi:10.2307/1884852.
- Sleenhoff, S., L. Landeweerd, and P. Osseweijer. 2015. "Bio-Basing Society by Including Emotions." *Ecological Economics* 116: 78–83. doi:10.1016/j.ecolecon.2015.04.011.
- Straßheim, H. 2020. "The Rise and Spread of Behavioral Public Policy: An Opportunity for Critical Research and Self-Reflection." *International Review of Public Policy* 2 (1): 115–128. doi:10.4000/irpp.897.
- Straßheim, H., and S. Beck. 2019. *Handbook of Behavioural Change and Public Policy*. London: Edward Elgar Publishing.
- Sunstein, C. R. 2015. "The Ethics of Nudging." *Yale Journal on Regulation* 32: 413.
- SuslabNWE. 2014. *SuslabNWE: "Open Innovation Integration Co-Creation Living and Testing."* SuslabNWE. <https://docplayer.net/12473782-Open-innovation-integration-co-creation-living-and-testing-sustainable-labs-north-west-europe.html>.
- Szaszi, B., A. Palinkas, B. Palfi, A. Szollosi, and B. Aczel. 2018. "A Systematic Scoping Review of the Choice Architecture Movement: Toward Understanding When and Why Nudges Work." *Journal of Behavioral Decision Making* 31 (3): 355–366. doi:10.1002/bdm.2035.
- Tenbansel, T. 2006. "Policy Knowledge for Policy Work." In *The Work of Policy: An International Survey*, edited by H. K. Colebatch, 199–216. Lanham, MD: Lexington Books.
- Thaler, R. H., and C. R. Sunstein. 2008. *Nudge: Improving Decisions About Health, Wealth, and Happiness*. New York: Penguin.
- van Brussel, S., and H. Huyse. 2019. "Citizen Science on Speed? Realising the Triple Objective of Scientific Rigour, Policy Influence and Deep Citizen Engagement in a Large-Scale Citizen Science Project on Ambient Air Quality in Antwerp." *Journal of Environmental Planning and Management* 62 (3): 534–551. doi:10.1080/09640568.2018.1428183.
- Van Deun, H., W. Van Acker, E. Fobé, and M. Brans. 2018. "Nudging in Public Policy and Public Management: A Scoping Review of the Literature." Paper presented at the PSA 68th Annual International Conference. Cardiff, 26–28 March.
- Van Hulst, M., and D. Yanow. 2016. "From Policy 'Frames' to 'Framing' Theorizing a More Dynamic, Political Approach." *The American Review of Public Administration* 46 (1): 92–112. doi:10.1177/0275074014533142.

- Whitehead, M., R. Jones, R. Howell, R. Lilley, and J. Pykett. 2014. *Nudging All over the World: Assessing the Global Impact of the Behavioural Sciences on Public Policy*. Aberystwyth: ESRC.
- Whitehead, M., R. Jones, R. Lilley, J. Pykett, and R. Howell. 2018. *Neoliberalism: Behavioural Government in the Twenty-First Century*. London: Routledge.
- World Bank (WB). 2015. *World Development Report 2015: Mind, Society, and Behavior*. Washington, DC: World Bank.