Deliberately vague or vaguely deliberative: A review of motivation and design choices in Deliberative Monetary Valuation studies

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Highlights

- Designs of deliberative monetary valuation studies are highly heterogeneous
- Established categories of DMV approaches do not clearly show distinct study designs
- Social and ecological complexity motivates use of deliberation in most studies
- Tests of the design choice effects are necessary to improve DMV practice

Abstract

Deliberative Monetary Valuation (DMV) was developed in response to critique on traditional stated preference methods and combines elements of deliberative institutions with the elicitation of monetary values. In the theoretical DMV literature, two strands based on different motivations for employing deliberation were identified: preference economization studies, where the goal is to help participants form informed and stable individual preferences; and preference moralization studies, where deliberation is meant to help uncover preferences that transcend individual interests

and take into account a broader set of values. The common assumption is that these different motivations are reflected in distinct study design choices. However, this assumption has not been systematically verified. We present a review of the empirical DMV literature in which we systematically identify and assess the design choices made in DMV studies to verify whether the different motivations translate into different patterns. We find some trends, but also a large heterogeneity within each category. The study designs seem to mainly reflect the particular focus of each study. We argue that this is linked to the lack of agreed upon standards for DMV studies. Our review demonstrates the need for an empirically verified framework that associates motivations for deliberation with study design choices.

Keywords: deliberation, literature review, non-market valuation, stated preferences

1. Introduction

Deliberative Monetary Valuation (DMV) has been developed as a reaction to critique on conventional monetary valuation, especially stated preference (SP) methods (Bartkowski and Lienhoop, 2019; Bunse et al., 2015; Schaafsma et al., 2018).[1] Criticism on SP has come from different angles, both from within mainstream economics (e.g. Diamond and Hausman, 1994; Hausman, 2012; Sen, 1995) and from outside (e.g. Aldred, 2006; McCauley, 2006; Sagoff, 1988; Vatn and Bromley, 1994). DMV variants have been developed in response to various strands of critique. Accordingly, they differ in motivation, design and compatibility with mainstream economic theory (Schaafsma et al., 2018).

Many claims have been made regarding the advantages of DMV compared with conventional economic valuation methods, including its potential to facilitate preference formation, especially for complex and unfamiliar environmental public goods (Lienhoop et al., 2015); to improve decision making due to the inclusion of a wider set of knowledge systems (Pascual et al., 2017); to democratize and legitimize the process of valuation (Vatn, 2009); to capture plural, cultural and (shared) social values (Kenter, 2016a; Kenter et al., 2019); and to help resolve conflicts (Pascual et al., 2017).

In this context, Lo and Spash (2013) make the distinction between two main stated aims of DMV: "preference economization" and "preference moralization". In preference economization studies, deliberation has an informative focus: it is meant to help participants overcome cognitive difficulties associated with determining their preferences for complex and unfamiliar environmental changes. Deliberation is used for the discovery or construction of stable economic preferences based on individual utility maximization. In contrast, deliberation in preference moralization has a predominantly ethical or political focus: to facilitate the consideration of non-consequentialist, non-anthropocentric values, or to democratize the valuation process. Preference moralization studies aim to uncover preferences that take into account broader considerations such as social norms, rights and fairness (Vatn and Bromley, 1994). These preferences are usually referred to as citizen (as opposed to consumer) preferences or, alternatively, we-preferences, as opposed to the I-preferences (Vatn, 2009) that are addressed in preference economization studies. Other points of departure for deliberative studies motivated by preference moralization are increased democratic legitimacy of the stated values (Chilvers, 2009) or to accommodate preferences that do not conform to a single

[1] For an overview of the history of DMV, consult Bunse et al. (2015) and Bartkowski and Lienhoop (2019).

conception of value (Aldred, 1994; Spash, 2006). Those conceptions have been referred to as choice democratization (Lo and Spash, 2013) or deliberative democratic monetary valuation (Orchard-Webb et al., 2016). For the purpose of this review, we refer to all conceptions of deliberated values that go beyond individual utility or include the *possibility* that the expressed values go beyond individual utility, as preference moralization, because the declared objective of those studies is to elicit values that are – at least potentially – conceptually different from economic preferences based on individual utility maximization. Existing reviews of the DMV literature provide a general overview (Bartkowski and Lienhoop, 2019; Bunse et al., 2015; Kenter, 2017). In an attempt to introduce more transparency and structure into the literature, Schaafsma et al. (2018) developed a set of guidelines for DMV studies. These guidelines focus on what design choices can generally be made and should be communicated transparently, rather than prescribing any specific choices as is common in more established and consolidated fields (e.g. Johnston et al., 2017). Yet, there are no agreed-upon standards for conducting DMV studies and the growing body of DMV applications is still largely exploratory. Nonetheless, the expectation would be that different motivations for using DMV (e.g. preference economization versus preference moralization) translate into different study design choices.[2] The underlying question is whether specific design choices are associated with the theoretical aims of DMV, be that well-informed choices, democratic choices or identification of plural values. We want to explore to what extent study designs are contingent upon different underlying conceptual frameworks.

Friess and Eilders (2015) propose an empirical framework for deliberation research in which they divide the factors relevant for deliberation into three groups. The first group of factors is the design, considered as independent, which includes for example available information, the modalities of communication and moderation. The second category is the communicative throughput, or the process, relating to factors that pertain to the mode and quality of deliberation. Those are influenced by both the design and independent factors related to individual characteristics of the participants. Finally, the results of deliberation are fully dependent on design and process. They include both effects on individual participants, such as knowledge gain and awareness about different reasons, and effects on the outcome of deliberation, such as the epistemic quality of deliberation or the legitimacy of the results.

[2] According to Walker (2010), a theoretical framework leads researchers to ask certain questions, while a method (here: design choice) provides a way of answering those questions.

We consider that this framework is useful to advance DMV research, as it makes explicit the links between design, process and results. DMV practitioners typically aim at a certain result, which we refer to in this article as the motivation for deliberation. The expectation may be for the values to be based on stable and well-informed individual economic preferences in the case of preference economization, or preferences that transcend the individual and take into account society or citizen considerations (preference moralization). Since results depend on a combination of factors related to the design and the process of deliberation, these different motivations should be reflected in different study design choices.

There have so far been no structured attempts to analyze how DMV design choices follow from different motivations for applying DMV. In this article, we aim to do so by reviewing 33 DMV studies published up to 2021. We classify their motivations for using DMV and relate these to the studies' design choices. We report on identifiable patterns (or lack thereof) and discuss the implications of our findings for the future of DMV research.

2. Methods

To identify relevant studies for this review, we combined two approaches. We conducted a literature search using the database Web of Science and the search term "deliberative valuation". From the results only empirical studies that included deliberation in the valuation process (i.e. not only in the study design phase) and a monetary valuation of some type of environmental public goods were chosen. Secondly, we included all DMV studies identified in Bartkowski and Lienhoop (2019). The 33 selected studies are concerned with either i) monetary valuation tasks or ii) non-monetary valuation tasks that elicit alternative value measures such as ordinal preference measures. 24 studies were conducted in so-called developed economies and nine in developing economies.[3] Preference economization and moralization studies were similarly distributed across developed and developing economies. A list of all included studies can be found in Table 1. We will hereafter refer to the studies by the first (or main) associated publication, the one first cited in Table 1, respectively. In the electronic supplementary material (ESM), we refer to the studies by their codes.

[3] Based on WESP: https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/WESP2021_UPDATE.pdf.

Table 1: List of reviewed studies and their classification as preference economization or preference moralization (asterisks indicate studies for which we received additional information from authors)

Study code	**Associated publications (main publication listed first)**	**Year of study**	**Valuation object**
Preference economization			
M2002	MacMillan et al. (2002)	NA	Wild goose conservation
PM2005	Philip and MacMillan (2005), Philip and MacMillan (2003)	2002	Wildlife conservation
M2006	MacMillan et al. (2006)	2003	Rewilding red kites; wind power expansion
C2006	Christie et al. (2006), Christie et al. (2004)	NA	Biodiversity
UH2006	Urama and Hodge (2006)	2001	River basin restoration
LM2007*	Lienhoop and MacMillan (2007a, 2007b)	2002	Wilderness protection
S2008*	Shapansky et al. (2008)	NA	Bundle of ecosystem services
LF2009*	Lienhoop and Fischer (2009), Wätzold et al. (2008)	2006	Large Blue conservation
S2011*	Szabó (2011)	NA	Biodiversity
K2011	Kenter et al. (2011)	NA	Bundle of ecosystem services
B2013	Balderas Torres et al. (2013)	2010	Forest carbon services
A2015*	Aanesen et al. (2015), Sandorf et al. (2016)	2013	Cold water corals
LV2016*	Lienhoop and Völker (2016), Völker and Lienhoop (2016)	2014	Afforestation
G2018	Geleta et al. (2018)	NA	Conservation project
CD2019	Christantoni and Damigos (2019)	2016–2017	Aquifer recharge project

L2019*	Liski et al. (2019)	2015–2016	Coastal landscapes
GS2019	Grainger and Stoeckl (2019)	NA	Different environmental projects
W2019	Witt (2019)	2016	PES schemes
O2019	Owuor et al. (2019)	2016	Mangrove biodiversity and ecosystem services
L2020*	Lliso et al. (2020a, 2020b)	2018	PES schemes
SL2020	Shan and Li (2020)	2019	Marine ecosystem restoration
A2021*	Aanesen et al. (2021)	NA	Cold water corals
Preference moralization			
AH2006*	Álvarez-Farizo and Hanley (2006), Álvarez-Farizo et al. (2007)	2003	Water quality improvement
R2008	Robinson et al. (2008)	NA	Water quality improvement
A2009*	Álvarez-Farizo et al. (2009)	2003	Anti-pollution measures
D2009	Dietz et al. (2009)	1998	Carbon emission mitigation
I2009*	Ito et al. (2009)	2007	Wetland restoration
L2013*	Lo (2013)	2010	Carbon pricing
V2016*	Vargas et al. (2016), Vargas and Díaz (2016), Vargas et al. (2017)	2014	Forest conservation
K2016	Kenter (2016b), Kenter et al. (2014)	2013	Coastal landscapes
KEA2016	Kenter et al. (2016b), Kenter et al. (2014)	2013	Marine conservation
O2016	Orchard-Webb et al. (2016), Kenter et al. (2014)	2013	Coastal landscapes
B2020*	Balaine et al. (2020)	2015–2016	Compensation schemes

We categorized the identified studies based on the distinction between preference economization and preference moralization. Our classification is based solely on *motivations for deliberation*. Deliberation was used as a means to inform and construct preferences in all

of the studies, but the understanding of the resulting values differed: if there was no indication in the studies that the elicited values go beyond individual preferences based on utility maximization, we classified the study as a preference economization study. If, on the other hand, the study indicated that the underlying value conception potentially diverged from individual preferences, the study was included in the preference moralization group.

Our classification is different from a number of other theoretical papers on deliberative valuation (Bartkowski and Lienhoop, 2019; Lo and Spash, 2013; Niemeyer and Spash, 2001; Raymond et al., 2014), which make a conceptual distinction that combines motivations with design elements. For example, the division into "value juries" and "valuation workshops", as outlined by Bartkowski and Lienhoop (2019), is based on both the motivation for deliberation and the value aggregation method. A consequence of this different classification approach is that some studies that were described as belonging to the preference economization category by Lo and Spash (2013), are grouped as preference moralization studies here, for example Álvarez-Farizo et al. (2006, 2009): based on their declared objective to elicit "the responsible and committed value of a citizen", as contrasted with an "individual and self-interested value", the value conception underlying the study transcends individual utility.[4] We classified 22 studies as belonging in the preference economization and 11 in the preference moralization group. All but one study elicited monetary values (i.e. willingness-to-pay, WTP, or willingness-to-accept compensation, WTA). Owuor et al. (2019) elicited time spent doing volunteering work instead of WTP because of the study participants' particularly low incomes, but since time spent is a very close proxy for monetary values, we still consider it a DMV study relevant for this review[5].

We extracted from the studies information concerning the motivation (or justification) for deliberation, the non-(mainstream) economics concepts that authors explicitly referred to, a set of design elements, using the guidelines proposed by Schaafsma et al. (2018), as well as the political impact of the studies (see Table 2, and for more detail the ESM). To extract the relevant information, we consulted the published peer-reviewed articles including any available supplementary materials and background reports. Additionally, we contacted the authors by email over the period November 2021–January 2022 to obtain supplementary information that

[4] Studies that assessed both individual and self-interested values and citizen values were included in the preference moralization category.

[5] For a discussion on why labor can be a suitable substitute for money when valuing environmental goods and services in developing economies, see for example Kassahun et al. (2020)

was not included in the publications. After sending two reminders, we received responses for 13 studies, indicated in Table 1 by the asterisks. Through the questionnaire, we obtained information about (a) the type of complexity that the study was designed to address, (b) the original materials shared with participants about the valuation object, and (c) the political impact of the studies. For the studies for which we did not receive answers, we inferred this information from the available publications where possible.

Table 2: Study design elements extracted from publications and information/materials provided by authors

Study design element categories	**Description/examples of individual elements**
Motivation	Theoretical motivation (economization, moralization) underlying conception of elicited valued
Valuation object	Environmental change scenario, reasons for choosing this good, ecological and social/political complexity, participant familiarity with the good
Sampling	Recruitment and type of representation, number of participants, heterogeneity considerations
Timing	Number of sessions, session duration, reflection time
Facilitation	Facilitator characteristics and role
Information provision	Format and characteristics of information presented to study participants, inclusion of experts
Deliberative activities	Type, structure and characteristics of deliberative activities
Elicited values	Value indicators, comparisons of different types of values
Analysis of qualitative data	Recording and analysis of data on the deliberative processes

Hypotheses

We formulated hypotheses or expectations regarding each design choice and differences between preference economization and preference moralization studies, based on conceptual and theoretical contributions associated with these strands (e.g. Kenter et al., 2016; Lo and Spash, 2013) as well as empirical work using deliberative monetary and non-monetary valuation. We cannot offer hypotheses for all design choices – our analysis is mostly explorative.

Non-(mainstream) economic concepts

In addition to design choices, we extracted information on concepts from non-mainstream economics literature and disciplines outside of economics to be able to trace their potential direct influences on study design.

Ideally, design choices build on the theoretical motivation to employ deliberation (Schaafsma et al., 2018). Given their explicit distancing from mainstream economics, we expect preference moralization studies to engage more and more deeply with non-economic concepts and non-economics literature (Lo and Spash, 2013). To assess this, we first scanned the reference lists of the available publications, and then investigated where in the article non-economics references were cited and to what end. We specifically focused on references from philosophy, psychology or sociology; these were identified based on the presence of relevant terms in the reference's title as well as on the journals where they were published.

Valuation object

We distinguish two main "types" of complexity of the valuation object: ecological and social (Daniels and Walker, 1996). By ecological complexity, we mean the characteristics of the ecosystem(s) at the core of the study that can involve complex processes and interdependencies between species, ecosystem functions, habitats, etc. By social complexity we refer to discussions that are ongoing in the society, often including different stakeholders, operating at different levels of governance, in different sectors or locations, with opposing interests or incommensurable values. Some studies are designed to address one type of complexity, others both.

We expect that preference economization studies focus mainly on ecological complexity, and preference moralization studies mainly on social complexity. This is because preference

economization studies focus on preference construction, which corresponds to the challenge for valuation studies to improve respondents' knowledge about environmental entities and/or processes before eliciting their preferences (Lo and Spash, 2013). In contexts where the goal is to recognize a variety of perspectives on a socially complex issue, we expect to find more often approaches that specifically address alternative value conceptions in the deliberation activities, corresponding to preference moralization.

Sampling

Schaafsma et al. (2018) discuss three approaches to sampling and representation that are relevant in the context of DMV: statistical representation, political representation and stratified random sampling. As the distinction between statistical representation and stratified sampling can be difficult in practice, for this review, we considered any study mentioning quotas or strata (age, income, gender etc.) to be based on stratified sampling. A related design element is sample size. Larger samples are generally required for achieving strong statistical results, for example for hypothesis testing. Moreover, in the case of DMV specifically, group size is also an important design element, which determines the depth and also control over discussions.

We expect preference economization studies to aim at statistical representation, and preference moralization studies to aim at political representation (Niemeyer and Spash, 2001; Spash, 2008). Accordingly, we expect larger sample sizes in preference economization studies than in preference moralization studies. With respect to group size, we expect preference moralization studies to aim for smaller groups than preference economization studies.

Timing

For "timing", we consider the number and length of sessions that each group participates in. These design elements influence the breadth of different issues that can be tackled in a DMV study, as well as the depth of discussions and reflection, and associated preference or value formation processes.

We expect preference economization studies to consist of a single session each, and preference moralization studies to have multiple discussion sessions to allow for reflection and preference adaptation (Kenter et al., 2016c). For the same reasons, we expect preference moralization studies to employ longer sessions.

Facilitation

The importance of good moderation or facilitation of the group discussion is strongly underlined in the theoretical literature on deliberative valuation as well as in other discussion-based methods. Schaafsma et al. (2018) observe that in most cases, facilitation is done by the researchers rather than by external facilitators. Based on research in deliberative decision making which highlights the importance of unbiased (Spada and Vreeland, 2013) and well-trained (Quick and Sandford, 2014) facilitators, the recommendation is to hire an experienced facilitator whenever it is feasible and especially when the researchers do not have the necessary experience (Schaafsma et al., 2018).

We expect professional facilitators to be more common in preference moralization studies, as the need for moderation skills to navigate interactions between stakeholders with opposing values or interests is higher, compared to preference economization studies where information transmission requires communication skills for non-academic audiences (Isacs et al., 2022; Kenter et al., 2016). Furthermore, we expect facilitators in preference moralization studies to highlight opposing values and to navigate possible conflicts, while facilitators in economization studies are expected to focus on fostering the uptake of ecological evidence.

Information provision

The information that is presented to participants to describe the valuation object is of crucial importance in all valuation studies (Johnston et al., 2017). DMV practitioners typically employ one or more modes of information transmission. Furthermore, participants sometimes have the opportunity to interact with external experts, i.e. persons not involved in the study conceptualization, who are knowledgeable on the topic at stake, to enrich their informational basis.

We expect preference moralization studies to provide more detail about the stakeholders (e.g. identifying winners and losers) of the valuation object, whereas for economization studies the expectation is to provide more information about the ecology of the object (Bartkowski and Lienhoop, 2018). We do not have an expectation regarding the format of information provision or the involvement of experts, which should be more related to the valuation object, rather than factors pertaining to the economization-moralization distinction.

Deliberative activities

Deliberation can be structured more or less rigidly, following a pre-defined structure or "free-flowing", depending on the context. Some DMV studies draw upon the Deliberative Value Formation (DVF) model (Kenter et al., 2016c), which assumes that overarching transcendental values (general principles and life goals; see Schwartz, 1992) are translated into contextual values specific to the valuation object. This social-psychological model is based on the assumption that deliberative settings allow the "activation" and explicit consideration of a plurality of values.

We do not have an expectation regarding the overall degree of structure. We expect more deliberative activities focused on making diverse values salient in preference moralization studies in comparison with preference economization studies (Kenter et al., 2016c). Furthermore, we expect the studies that are based on the DVF model to employ deliberative activities that explicitly activate transcendental values and that allow for plural values to be expressed and discussed (ibid.).

Values

The values that are elicited and the level at which they are aggregated have been identified in theoretical DMV literature as the main element of distinction between different methodological approaches (e.g. Bartkowski and Lienhoop, 2019; Spash, 2007). Values elicited on the individual level have been linked to preference economization and values elicited jointly ("social values") have been associated with preference moralization.

Accordingly, we expect social value elicitation only in preference moralization studies (Lo and Spash, 2013). Individual values are expected to be elicited in preference economization studies. Some preference moralization studies may elicit both, because of conceptual reservations about the desirability of the consensus required for social value elicitation (see Bartkowski and Lienhoop, 2018), and to compare individual and social value estimates. Similarly, some studies may collect non-deliberated values (elicited either pre-deliberation or in a separately conducted, traditional SP study).

Qualitative data

The opportunity to collect qualitative data, i.e. information about the content of the discussions, is a clear advantage of DMV studies as compared to standard SP studies.

We expect preference moralization studies to analyze and report qualitative data more often and in more depth, because this DMV strand is more oriented towards deeper understanding of underlying positions and values of stakeholders, and the deliberative process itself, compared to preference economisation studies (Isacs et al., 2022; Kelemen et al., 2013; Mavrommati et al., 2021).

Political impact

We are interested in the (perceived) political impact of the DMV studies in addition to study designs, however we do not expect a marked difference between preference economization and moralization studies. Instead, we expect the political impact of the valuation studies to depend most strongly on their context – i.e. on who commissioned them, whether they were purely academic or embedded in an ongoing political process, etc.

3. Results

Motivations for deliberation

Early DMV studies most often stated preference economization as their motivation. They highlighted the potential of deliberation to overcome difficulties associated with limited time and information (Christie et al., 2006; MacMillan et al., 2002; Philip and MacMillan, 2005) and to construct stable individual preferences (Lienhoop and Fischer, 2009; Lienhoop and MacMillan, 2007; MacMillan et al., 2006; Urama and Hodge, 2006) that can be aggregated to derive social preferences.

MacMillan et al. (2006) introduced the idea that preferences for familiar environmental goods may be pre-existing, but for unfamiliar ones, SP studies actually work as a "preference engine". Subsequent studies adopted this proposition to underline the importance of deliberation in the context of complex or unfamiliar goods (Lienhoop and Fischer, 2009; Owuor et al., 2019; Shan and Li, 2020; Szabó, 2011). What is meant by "complex" and "unfamiliar", however, is often not defined (see section on valuation objects below).

In more recent DMV studies, preference economization remained an important motivation (Aanesen et al., 2021; Geleta et al., 2018; Lliso et al., 2020; Vargas et al., 2016), and preference moralization made its way into empirical applications. In addition to the time and information benefits of deliberative methods, Álvarez-Farizo and Hanley (2006) and Robinson et al. (2008)

argued that the citizen juries they examined expressed citizen rather than consumer preferences. Similarly, Álvarez-Farizo et al. (2009) highlighted that they expected conceptually different values as a result of the group deliberation as compared to those elicited individually:

> "In a traditional approach, we obtain just the individual and self-interested value, but when the valuation exercise is implemented during a citizens' workshop, we assume it is possible to get the responsible and committed value of a citizen." (Álvarez-Farizo et al., 2009, p. 790)

The studies based on the DVF model (Balaine et al., 2020; Kenter, 2016; Kenter et al., 2016b; Orchard-Webb et al., 2016) are preference moralization studies, as the "deliberative values" that are elicited are explicitly taken to exceed the notion of individual values.

Non-(mainstream) economic concepts

We could identify references to DMV-relevant non-economics literature (especially deliberative democracy, but also psychology and political science) in only 15 studies (seven on preference moralization, eight on preference economization), and the majority of these studies only referred to this literature in general terms, usually in the introductory or conceptual sections. Most common were references to Jürgen Habermas (six studies, of which five were preference moralization studies). The only three studies that can be said to explicitly build upon the cited non-economics literature in their study design are preference moralization studies, namely Lo (2013), who looked for signs of a "workable agreement" (a concept by John Dryzek); Kenter et al. (2016b) who used constructs from multiple psychological theories (Theory of Planned Behaviour, Value-Belief-Norm theory and Schwartz' value compass); and Orchard-Webb et al. (2016) who cited Habermas at length to justify their decision to adopt a design fostering an "open and inclusive process". Furthermore, Witt (2019) used insights from Dryzek's theory of deliberative democracy to justify their unusual approach to group size and structure (see below).

Valuation object: familiarity and complexity

Complexity of, and/or unfamiliarity with the valuation object were named in virtually all reviewed studies as major reasons to include deliberation in the valuation process. If and how these notions were defined, however, varied across studies and depended on their main focus. No clear patterns are discernible with respect to the economization–moralization distinction.

The degree of (un)familiarity with an environmental good was assumed in some studies (e.g. Robinson et al., 2008) and measured in others: MacMillan et al. (2006) conducted focus groups prior to their valuation study, which revealed that the reintroduction of red kites was considered an unfamiliar good, while wind power generation was considered a familiar good. Similarly, Christie et al. (2006) established through focus groups conducted prior to the DMV study that people exhibited low awareness and poor understanding of the term biodiversity, and tried to account for this in the experimental design by explaining the relevant notions in non-scientific terms.

Other studies assessed familiarity through questionnaires to elicit objective or subjective knowledge or learnings. Shapansky et al. (2008) had participants self-evaluate their knowledge about forest ecosystem services prior to deliberation and found that participants were largely unaware of these services. Similarly, Witt (2019) asked participants if they were familiar with PES at the beginning of the study and only 16% said yes. Learning outcomes may also indicate low initial familiarity with the subject: in a comparison between deliberation participants and survey-only participants, Aanesen et al. (2015) reported that the former performed much better in a post-experiment knowledge quiz about cold-water corals, although pre-experiment knowledge was not assessed. Kenter (2016b) reported that the majority of the respondents indicated considerable learning effects through post-experiment self-evaluations of learnings regarding community–economy, economy–environment and environment–community interactions related to coastal landscape realignment.

In terms of the type of complexity that was addressed, 13 of the 22 preference economization studies focused on ecological complexity (nine of those exclusively, while four also focused on social complexity). Ecological complexity was also the focus of six of the 11 preference moralization studies (two with an exclusive, the other four with a double focus). Christie et al. (2006) tried to account for the ecological complexity that underlies the term biodiversity by defining, with the help of focus groups, choice experiment attributes that addressed different aspects of biodiversity. Lienhoop and Fischer (2009) also focused on the ecological complexity concerning the protection of Large Blue butterflies who live in complex relationships with plants and other animals and are highly dependent on agri-environmental schemes for their survival. Information material concentrated on ecological conditions for Large Blue conservation and its interdependencies with other species.

Political or social complexity was a main consideration in 12 preference economization (six exclusive) and 10 preference moralization (six exclusive) studies. As an example, Lo (2013) was concerned with preferences for different carbon pricing strategies in Australia to mitigate climate change, a highly debated issue at the time. Four preference economization and four preference moralization studies aimed to address both ecological and social complexity. For example, Lienhoop and MacMillan (2007) dealt with preferences for hydropower generation in a wilderness area in Iceland, where ecological considerations played an important role. At the same time, according to Lienhoop (personal communication), the Icelandic society was very polarized regarding the planned hydro scheme. During the recruitment of participants, respondents were asked whether they were opponents or advocates of the scheme.

More detail about the treatment of ecological and social complexity can be found further below, in the section about the content of information provided to participants.

Sampling

Recruitment

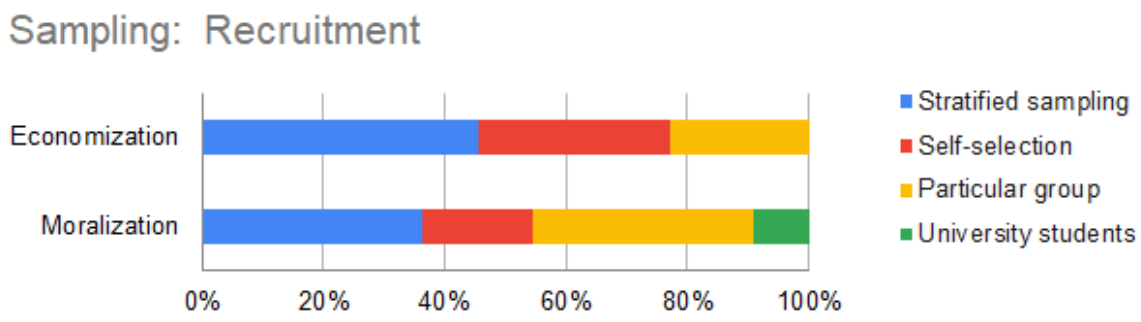

Figure 1 Recruitment strategies in preference economization and preference moralization studies

There are no clear differences observable in sampling strategies between preference economization and preference moralization studies, contrary to our expectations. We did not find a single study aiming for political representation of a broad spectrum of stakeholder groups, but some studies included particular groups.

Many studies used stratified sampling approaches, based on gender, age or income, for instance MacMillan et al. (2002), Álvarez-Farizo and Hanley (2006) and Aanesen et al. (2015). Others circulated calls for participation or contacted people in public places and thus relied on self-selection: Robinson et al. (2008) posted a newspaper ad, Shapansky et al. (2008) approached

potential participants at different public events and Liski et al. (2019) on the high street. In yet another group of studies, participants were recruited among a very particular target group: Kenter et al. (2016b) circulated a call for participation via angler and diver mailing lists in England and Scotland; Balaine et al. (2020) approached a group of indigenous people and a group of people of the Mestizo ethnicity in the Northeast Amazon region in Ecuador through contact persons in the communities.

Sample and group size

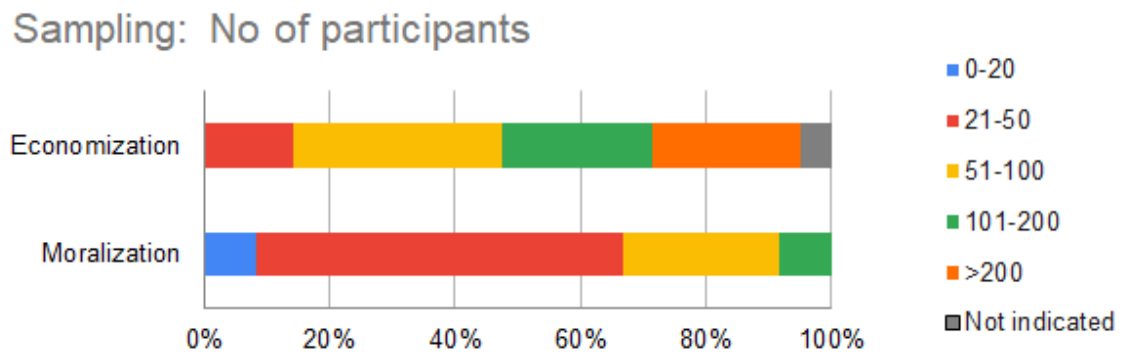

Figure 2 Participant numbers in preference economization and preference moralization studies

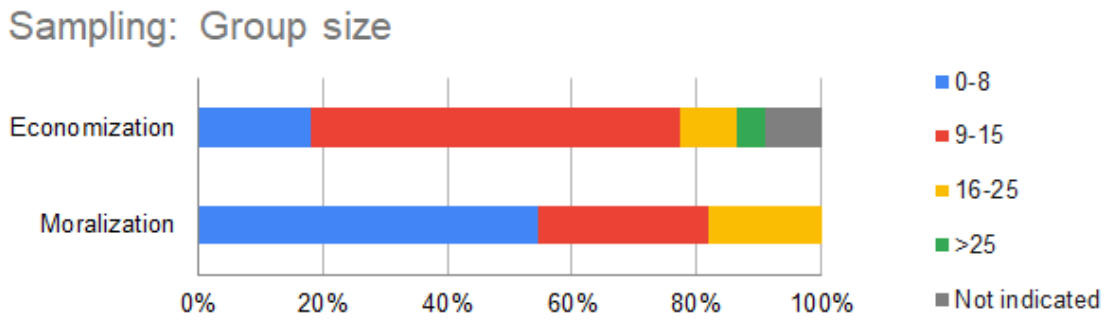

Figure 3 Group sizes in preference economization and preference moralization studies

We detect differences in sample and group sizes between preference economization and preference moralization studies. As we expected, preference moralization studies tend to have fewer participants: more than half of the reviewed studies had 50 or fewer participants. A majority of preference economization studies had over 100 participants. The five reviewed studies that had more than 200 participants were all preference economization studies. Most of them recruited their participants in geographically very confined areas such as rural villages,

in which residents helped to recruit others (Balderas Torres et al., 2013; Kenter et al., 2011; Lliso et al., 2020; Owuor et al., 2019). An exception is the study by Aanesen et al. (2015), where participants were recruited all over Norway with the help of a survey firm.

With respect to group size, we also find evidence supporting our hypothesis. Preference moralization studies used smaller groups, with more than half of the studies having groups of 8 or fewer people. In preference economization studies, group sizes between 9 and 15 people were most common.

An innovative approach to group size management was taken by Witt (2019), who had very large groups (62–68 participants), split up into small subgroups of four to six for focused discussions. These smaller subgroups presented the conclusions of their discussions to the other subgroups, aided by the facilitator. They then actively developed contributions to the other subgroups, which were again publicly shared. This method was intended to allow for larger sample sizes at lower costs, and referred to as a "minimalist deliberative framework".

Timing

Number of sessions and session duration

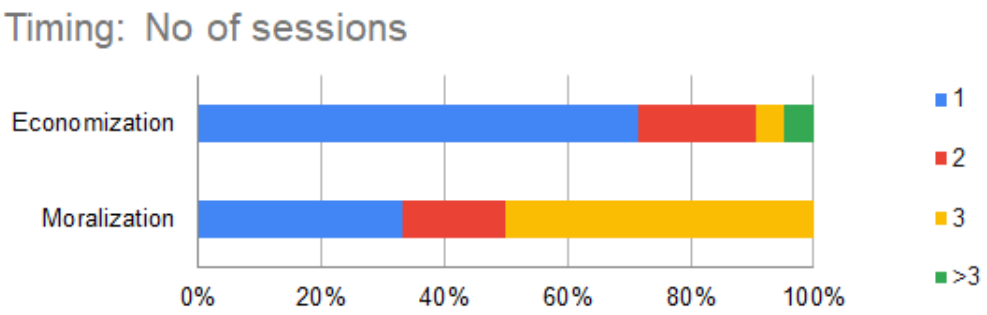

Figure 4 Number of sessions in preference economization and preference moralization studies

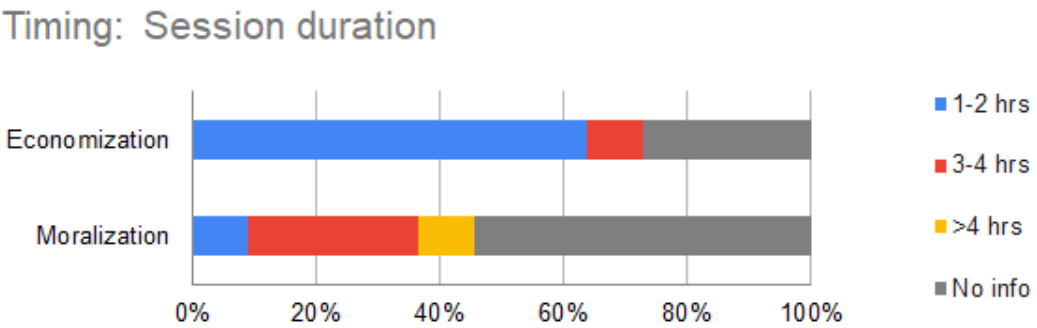

Figure 5 Session durations in preference economization and preference moralization studies

More than two thirds of the reviewed preference economization studies employed a single-session design, in line with our expectations. Contrastingly, two thirds of preference moralization studies were based on two or more sessions. This may explain why preference moralization studies have smaller sample sizes: organizing multiple sessions becomes more difficult as the number of participants increases. Conversely, the five studies with more than 200 participants were all based on only one deliberative session (Aanesen et al., 2015; Balderas Torres et al., 2013; Kenter et al., 2011; Lliso et al., 2020; Owuor et al., 2019).

Some studies consisted of one session in which participants were informed about the issue, participated in one or more deliberative activities and performed one or more valuation rounds. Others were based on several distinct sessions, where participants gathered on several occasions. The reasons for breaking up the process into different sessions varied. For instance, MacMillan et al. (2006) presented information about the valuation object and the contingent valuation method in the first session and then elicited pre-deliberation values. Some days later, the second session included a group discussion and elicitation of deliberative values. Urama and Hodge (2006), who conducted five deliberative sessions, made a thematic distinction: each session was organized around a different aspect of the valued good. Vargas et al. (2016) also made a session breakdown based on the issues that were discussed: the first session focused on general considerations about tropical dry forest protection, the second session on details about the concrete proposed intervention – payments for ecosystem services – and the third session served as the valuation session. Finally, participants were given "reflection time" of several days or weeks to revise and restate their preferences in multiple studies that employed the so-called market stall approach (Lienhoop and Fischer, 2009; Lienhoop and Völker, 2016; MacMillan et al., 2006; MacMillan et al., 2002; Philip and MacMillan, 2005; Urama and Hodge, 2006).

Due to the large share of missing information (ca. half of all studies), we are not really able to say anything reliable about session durations. Among the studies that provided this information, preference moralization studies seem to employ longer sessions.

Facilitation

Who facilitates

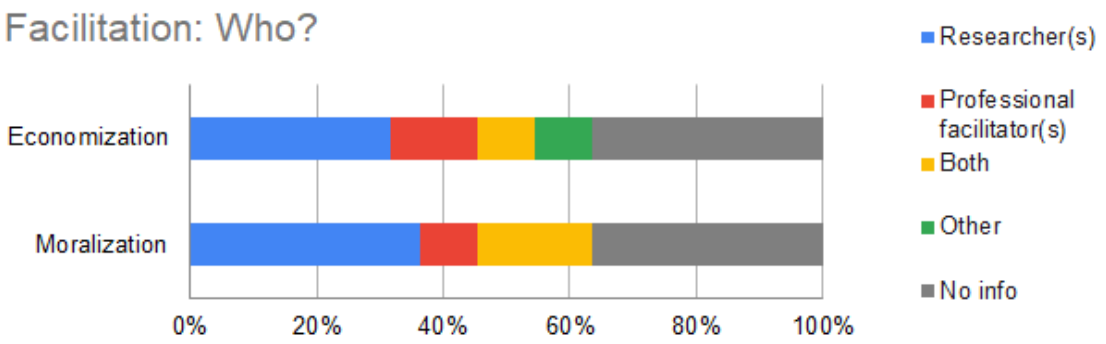

Figure 6 Facilitators in preference economization and preference moralization studies

Detailed information on the facilitators and the process of facilitation was rather scarce. We did not find information about the facilitator in 12 out of 33 studies. In line with our expectations, professional facilitators were employed more often in preference moralization studies, while preference economization studies relied often on the researchers to act as facilitators.

In two preference economization and four preference moralization studies, both the researchers and professionals acted as moderators. The moderation in Kenter et al. (2016b), for example, was by a researcher and a professional facilitator. Liski et al. (2019) hired a group of facilitators who were specifically trained to moderate the sessions together with the researchers.

Finally, two preference economization studies relied on facilitation by other agents who were especially familiar with the local context. Kenter et al. (2011) hired members of a local association that was well accepted by the population to facilitate sessions after having received special training. In a similar manner, Balderas Torres et al. (2013) trained sociology consultants and undergraduate environmental engineering students as well as members of local associations to help with session organization.

Role of the facilitator

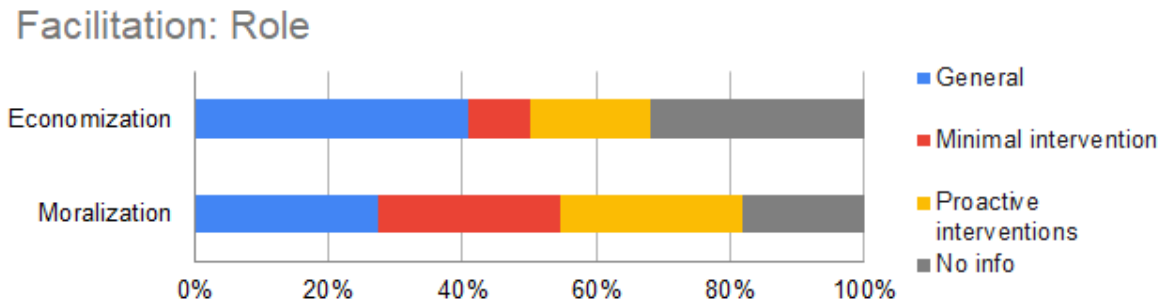

Figure 7 Role of facilitators in preference economization and preference moralization studies

For the 24 studies that provided information about the role of the facilitator, no obvious differences between preference economization and preference moralization studies can be identified. However, information about facilitation was unavailable for many studies, even when the importance of good facilitation was recognized (e.g. MacMillan et al., 2002). In some articles the role of the facilitator is described in rather broad terms, such as "ensuring neutrality" during discussions (Szabó, 2011, p. 39) or "control[ling] the room without biasing the natural flow of ideas" (Álvarez-Farizo et al., 2009, p. 789). Elsewhere, it was specifically pointed out that the facilitator only intervened minimally in the discussion (Balaine et al., 2020; Ito et al., 2009). More details were given in Lienhoop and Fischer (2009): the role of the facilitator was to guide through the process, give verbal inputs, answer questions and avoid power asymmetries by encouraging quiet participants to speak and discouraging others from dominating the discussion. Lliso et al. (2020) describe the facilitation process in their study in a similar fashion. Ensuring equal participation between participants was further mentioned as a responsibility of the facilitator by Kenter et al. (2011). However, in none of the studies the role of the facilitator was reflected upon or analyzed explicitly ex post (e.g. how often interventions were required, possible biases imposed through facilitation).

Information

Format

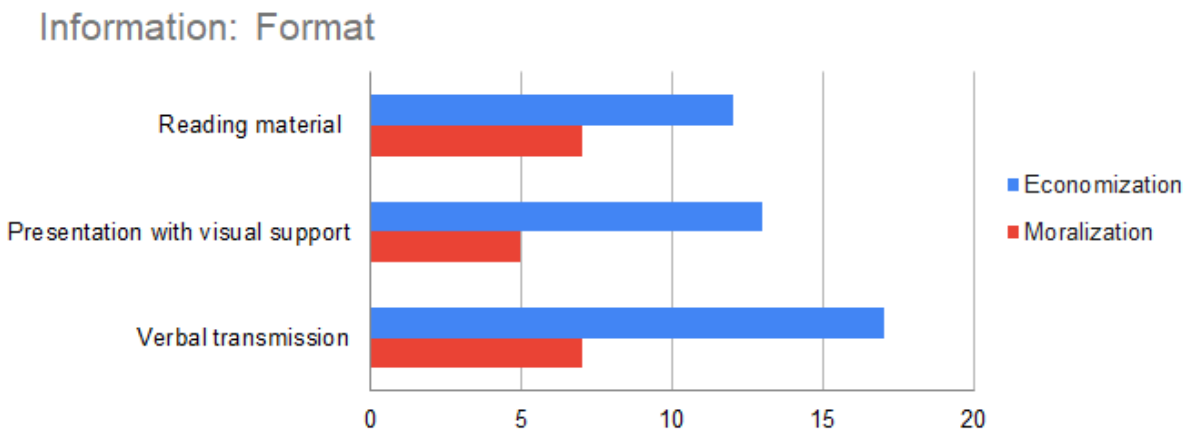

Figure 8 Information provision formats in preference economization and preference moralization studies

Overall, preference economization studies seem to have used a broader range of information provision formats.

Reading materials that remained at participants' disposal during the whole process were provided in seven of the 11 preference moralization studies and 12 of the 21 economization studies. They consisted of brief descriptions, similar to the information participants receive in traditional SP studies (e.g. Álvarez-Farizo and Hanley, 2006; Balaine et al., 2020; Dietz et al., 2009), more extensive information folders (e.g. Lienhoop and Völker, 2016; MacMillan et al., 2002) or slideshow presentations that were printed and handed out after having been presented by the facilitator (Balderas Torres et al., 2013).

Information was also transmitted verbally to participants (e.g. Kenter et al., 2011). About three quarters of both preference economization and preference moralization studies included structured verbal information transmission. Live presentations with visual support, such as slideshows, were given in more than half of the preference economization and in five of the 11 preference moralization studies reviewed.

Content

The content of the information used in the studies reflected their focus on either ecological complexity, social/political complexity or both. For example, Aanesen et al. (2015) and Aanesen et al. (2021) studied the very little-known cold water corals and the "hidden"

ecosystem services these corals provide. The main objective of the information provided in these studies was to educate people about the ecological characteristics of the corals. In MacMillan et al. (2002) and Shapansky et al. (2008), participants received information on opposing interests from wild geese conservationists and farmers, and from aboriginal land users and industrial forest operations, respectively. The purpose of the information provided was to summarize the interests involved, rather than to explain the ecosystems in detail. Lo, 2013 provided information focusing on the different carbon mitigation policies and their larger implications. Orchard-Webb et al. (2016) had participants develop their own "future visions" of inshore fisheries and marine conservation which included socioeconomic scenarios as a way to deal with social complexity. Some studies gave participants information that prioritized both ecological and political/social complexity.

Some studies varied the amount and type of information provided to participants to measure the effect of information on elicited values. For instance, MacMillan et al. (2006) provided a subgroup with more details, including perspectives from different stakeholder groups, in addition to the basic information about the studied wind power project that was provided to all participants. Additionally, a short anti-wind power report was given to all participants in a subsequent round of information provision.

Experts

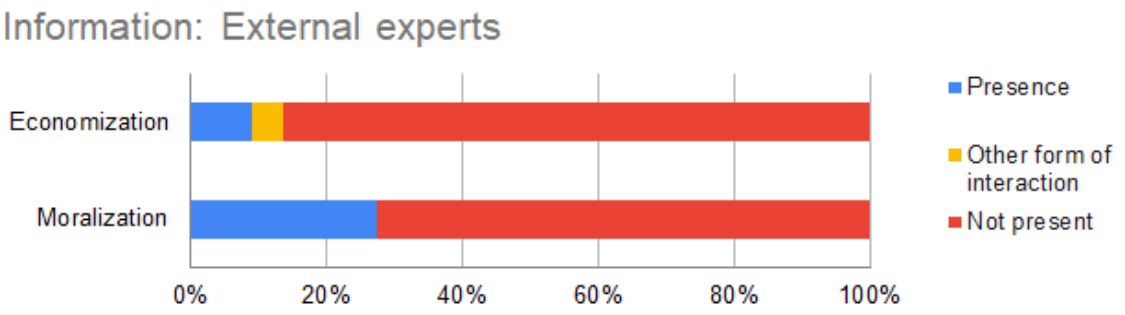

Figure 9 Presence of external experts in preference economization and preference moralization studies

Interaction with external experts was part of the study design in two of the 22 preference economization studies and in three of the 11 preference moralization studies. In three studies (Álvarez-Farizo et al., 2009; Robinson et al., 2008 and Urama and Hodge, 2006), external experts were present during discussions, and participants could engage with them and ask questions. In other studies, experts engaged differently. Lo (2013) included several on-site

expert presentations. Geleta et al. (2018) pre-recorded interviews with experts that were played to participants, who had the possibility to electronically transmit questions to the experts which were answered shortly before preference elicitation. Furthermore, moderators were reported to act as experts in seven preference economization studies (e.g. Aanesen et al., 2015; Shapansky et al., 2008) and one preference moralization study (Orchard-Webb et al., 2016), which is not reflected in the figure above.

Deliberative activities

Structure of discussions

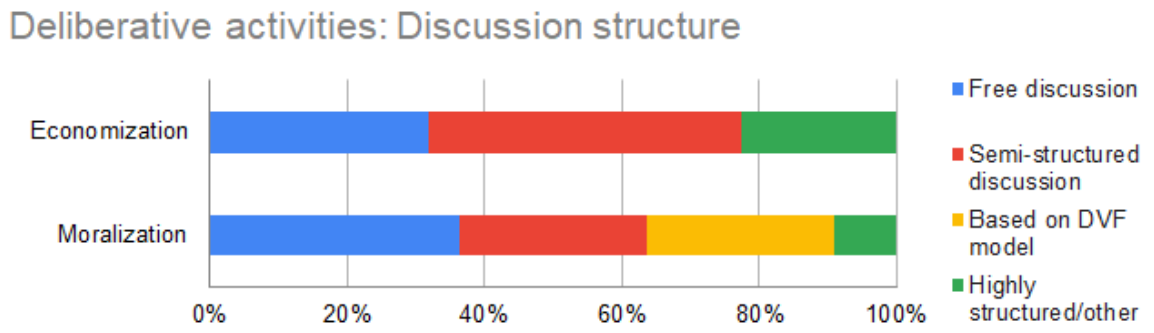

Figure 10 Discussion structure in preference economization and preference moralization studies

All of the studies we reviewed included at least one activity where participants were confronted with other participants' views or opinions, and were given the possibility to react to those. In eight preference economization studies and four preference moralization studies, this was realized through a free group discussion, i.e. one that centred on the topic investigated in the study and is guided by a facilitator, but in which participants were free to discuss aspects of that topic that seem important to them rather than having specific aspects chosen for them by the researchers.[6]

About one third of both preference economization and moralization studies employed a semi-structured discussion design. For instance, Urama and Hodge (2006) conducted five deliberative sessions, each of which was centred around a different attribute of the valuation object. In Shan and Li (2020), topics were suggested throughout the discussion: advantages

[6] Since the level of detail on the structure of the discussions varied between the articles that we reviewed, we assumed that when authors describe simply a discussion without much elaboration on the thematic orientation, it was a free group discussion in that sense.

and drawbacks of land reclamation and specific doubts that people had with ecological restoration projects.

Most of the studies based on the DVF model (Kenter, 2016; Kenter et al., 2016b and Orchard-Webb et al., 2016) designed a structured deliberative process that explicitly targeted the elicitation and integration of transcendental values and their translation into contextual values. Kenter (2016b), for instance, asked participants to first discuss which transcendental values were the most important to them. Subsequently, they developed a conceptual system of the coastal region that constituted the area of interest for the study. The final discussion round focused on how the transcendental values interact within the system. Kenter (2016b), Kenter et al. (2016b) and Orchard-Webb et al. (2016) used the Value Compass to "activate" the consideration of transcendental values. Balaine et al. (2020) was an exception, as it was based on DVF but did not involve any such activities. Vargas et al. (2016), while not explicitly based on the DVF model, also oriented the discussion towards transcendental values by asking participants in the first deliberative session to talk about their views about the tropical dry forest's importance for livelihoods, wellbeing and relationship conservation.

Lastly, one preference moralization study and about one fourth of the 22 preference economization studies employed a highly structured design, limiting the exchanges between participants to specific formats. Grainger and Stoeckl (2019) employed a design that did not involve an actual discussion, but rather a public display of other participants' votes for potential projects that could be implemented. The intuition was a model of a social learning process that allows for convergence towards a logically consistent social preference consensus. In Dietz et al., 2009, the Nominal Group Technique based on Delbecq et al. (1975) was applied: participants listed individually the arguments they thought should be taken into account for the valuation of forest carbon sequestration and then they read them out loud one by one. This was intended to function as a minimal surrogate for public discourse.

Other deliberative activities

A number of studies included other forms of deliberative activities, such as involving citizens directly in the design of the valuation exercise (beyond the use of focus groups to determine relevant topics). Shapansky et al. (2008), for example, divided participants into groups with different levels of involvement and access to information, of which one was actively involved in the choice of attributes and levels of the choice experiment. Similarly, Orchard-Webb et al. (2016) had participants develop their own policy ideas around inshore fisheries and marine

conservation, which they later budgeted hypothetically. In Kenter (2016b), the choice experiment was directly based on a stakeholder workshop with 28 representatives from different community groups, NGOs and businesses. The participants that performed the valuation in the subsequent DMV workshop were different from the ones of the stakeholder workshop.

Christantoni and Damigos (2019), Kenter et al. (2016b) and Orchard-Webb et al. (2016) integrated "storytelling" as an activity in the study design in order to discover narratives related to the respective ecosystem, where participants are asked to describe their personal experiences with the environmental good or service under valuation. The assumption is that these values subsequently enter the decision-making process in which monetary values are expressed.

Elicited values

Individual deliberated values were elicited in 20 preference economization studies and nine preference moralization studies. Two preference economization (Kenter et al., 2011; Geleta et al., 2018) and nine preference moralization studies elicited group-level deliberated values. This is largely in line with our expectation, although we did not expect any preference economization studies to elicit group-level values.

Individual non-deliberated values were elicited in 17 preference economization studies and nine preference moralization studies. Only one of the reviewed studies measured group-level non-deliberated values (Kenter et al., 2011).

Analysis of values

21 of the 22 reviewed preference economization studies and 10 of the 11 preference moralization studies included comparisons of different types of values. Similar to Bartkowski and Lienhoop's (2019) overview of WTP comparisons, we did not find any clear patterns regarding the results of value comparisons, irrespective of their particular design.

Within-subject comparisons were performed in 16 preference economization studies. For example, Urama and Hodge (2006) recorded individual pre- and post-deliberation WTP with the same CVM survey. Lienhoop and Fischer (2009), attempting to capture value adjustments in the time after the study implementation, elicited individual post-deliberation WTP at the end of their workshop, and again via a phone call after one week of reflection time. 10 preference moralization studies included within-subject value comparisons. Between-subject comparisons

were part of about half of the studies in both of our motivational categories. Two studies featured both within and between sample comparisons (Witt, 2019; Ito et al., 2009). Witt (2019) divided study participants into three groups: one answered a survey without deliberation, one stated both pre- and post-deliberation values, and the last group only provided deliberated values. Ito et al. (2009) recorded pre- and post-deliberation individual WTP as well as deliberated group WTP. For obtaining the latter, half of the deliberative groups were assigned the consensus rule, and half the majority vote.

Analysis of qualitative data

Contrary to expectations, reporting on qualitative data is far from universal in deliberative valuation studies. 13 of the 22 reviewed preference economization studies indicated that qualitative data were *recorded*, through video and/or audiotapes or note-taking by facilitators or assistants, compared to eight out of 11 preference moralization studies. Only half of the preference economization studies also *analyzed* and *reported* them, compared to two thirds of the preference moralization studies.

Methods for analyzing qualitative data varied. For instance, in Orchard-Webb et al. (2016), a rich body of qualitative data on the numerous deliberative activities was collected via audio recordings. The study then counted how many of the personal stories that were told during the storytelling exercise related to the marine well-being benefits that were identified earlier.

Several studies analyzed written motivations for stated preferences by coding them into categories (Dietz et al., 2009; Kenter et al., 2011; Shapansky et al., 2008). Dietz et al. (2009) subsequently compared the number of times an argument from each category was listed as having influenced a participant's stated preference between survey-only and group deliberation participants. Based on their observation that group deliberation increased the number of considered arguments and also the likelihood of considering issues of policy implementation, the authors suggested that in deliberative processes, people act as policy analysts. Kenter et al. (2011) observed slight differences in categories of learning outcomes that were stated among different groups of participants (gender, location, level of comprehension). Lo (2013) used a factor analysis to try and identify prevailing opinions on climate change and related institutions, as collected through a questionnaire. Some of the studies provide quotes from discussions (e.g. Christantoni and Damigos, 2019; Liski et al., 2019; Lliso et al., 2020).

In a noteworthy and innovative approach to the analysis of qualitative data, Lienhoop and MacMillan, 2007 used the behaviour coding approach (Bakeman, 2000), based on observations by the researcher, in order to investigate the level of focus and engagement of participants in DMV as compared with a standard SP study.

Political impact

Out of the 15 studies for which authors responded to our inquiry, the majority either did not know if their study had had political impact or they perceived it as being inexistent. The authors of four studies provided us with concrete examples of their studies' impacts. Two of them reported an influence or potential influence on political processes: Lienhoop and MacMillan (2007) informed us that the green party of Iceland took the study to a parliament discussion on the hydro scheme decision. Aanesen et al. (2015) reported tangible political outcomes of their study: since its publication, when activities are planned to take place in the deep sea in Norway, cold-water coral is one of the organisms that are now explicitly asked to consider when it comes to possible (detrimental) effects. Lliso et al. (2020) observed no political impact on the design of PES schemes in Colombia, but indicated that through their study, participants were introduced to and some of them got involved with community-led environmental activist groups.

Furthermore, Kenter et al. (2016b) was cited in the impact assessment for the designation of new Marine Conservation Zones in England, Wales and Northern Ireland commissioned by the UK Department for Environment, Food & Rural Affairs. For other studies whose authors did not provide further information, we are unaware of their policy impact.

4. Discussion

Different reasons for deliberation have been invoked in both theoretical and empirical DMV literature. In this review, we aimed to assess how these different motivations for deliberation are reflected in study design choices. The main results of our review are that (i) the empirical DMV literature is much more heterogeneous than the economization–moralization distinction inspired by Lo and Spash (2013), (ii) there are few clearly discernible patterns linking motivations and design choices. Moreover, the scarcity of information regarding design choices and lack of tests of design effects make it difficult to ascertain how DMV can realize its acclaimed advantages in practice. Despite a growing body of DMV studies, we observe no

convergence towards specific DMV practices but rather a wider set of deliberative activities that are used, including storytelling and participatory mapping.

We find that there is more variety in design among DMV applications than the two strands identified by Lo and Spash (2013) and adopted in subsequent publications (e.g. Bartkowski and Lienhoop, 2019; Bunse et al., 2015; Schaafsma et al., 2018). Our comparison of preference economization and preference moralization studies reveals few links between motivations and design choices. In line with our expectations, preference moralization studies use smaller groups with more time for deliberation; the discussions in these studies are more often structured in order to focus on specific topics; and group values are elicited more often. However, most of these patterns are weak and the heterogeneity within each group is often as large as, or even larger than, the difference between the two groups. This is partially reflected in the suprisingly weak adoption of non-economic concepts in preference moralization studies. Most references to non-economics literature are generic, and only very few studies explicitly use concepts e.g. from deliberative democratic theory or social psychology to enrich their theoretical basis. It may well be that individual study foci played an important role in determining the design choices alongside their conceptual bases, even though it is difficult to pinpoint which aspects were decisive here. For instance, some studies focused on the public appraisal of specific local projects (Álvarez-Farizo and Hanley, 2006; Christantoni and Damigos, 2019; Ito et al., 2009; Kenter, 2016; Liski et al., 2019), others on values for certain ecosystem functions (Aanesen et al., 2015; Balderas Torres et al., 2013; Dietz et al., 2009; Kenter et al., 2011; Shapansky et al., 2008; Owuor et al., 2019) or on the design of payments for ecosystem services schemes (Lliso et al., 2020; Vargas et al., 2016; Witt, 2019). Some studies tested specific design parameters such as the amount and kind of information given to participants (MacMillan et al., 2006; Shapansky et al., 2008) or homogeneity and heterogeneity of opinions in deliberative groups (Lienhoop and MacMillan, 2007; Lienhoop and Völker, 2016; Lo, 2013). Also, while some studies were embedded in large-scale ecosystem assessments, such as the UK NEA (Kenter, 2016; Kenter et al., 2016b; Orchard-Webb et al., 2016) or developed in cooperation with government representatives (Geleta et al., 2018; Ito et al., 2009; Robinson et al., 2008), others were individually conducted studies without discernible links to broader objectives or programs (Dietz et al., 2009; Szabó, 2011). Overall, it seems that the preference economization and preference moralization categories, although distinct in theory, are not clearly associated with different study design choices. Rather, the

DMV literature resembles a multidimensional spectrum of (sub-)motivations, goals, constraints and contextual factors whose interactions determine design choices.

Not only do we not find a clear link between study motivation and design, we also see no consistency in how motivation fulfilment is evaluated. The studies employed a diversity of criteria for ex-post evaluation of the achievement of the objective of deliberation. Some authors of preference economization studies cited an increase in subjectively stated value certainty associated with deliberated values, as compared to non-deliberated values (see for example Geleta et al., 2018; MacMillan et al., 2002; Urama and Hodge, 2006). Both preference economization and preference moralization studies referred to decreases in interpersonal preference heterogeneity as a demonstration of the success of their application of deliberation (Álvarez-Farizo et al., 2009; Shapansky et al., 2008). Additionally, authors referred to qualitative observations. Participants' comments and their behaviour were interpreted as being indicative of a broadening of their perspective (Christantoni and Damigos, 2019), a transcendence of individual values (Balaine et al., 2020), intersubjective understanding (Lo, 2013) and increased motivation while deliberating (Lienhoop and Fischer, 2009).

It would be helpful to develop more rigorous assessment methods to establish whether study design and process lead to the desired outcomes of deliberation (Friess and Eilders 2015). More generally, we see a need for more systematic research on the effects of design choices in DMV. Kenter et al. (2016a) formulated a list of questions for future DMV research, including the "relative impacts of different types of deliberation and deliberative exercises and interventions" and several specific questions pertaining to issues such as power dynamics, hypothetical bias, institutional factors etc. A better understanding of these effects would help to identify appropriate designs for different motivations to employ DMV. Learning from the long history of studies scrutinizing SP design factors, it is likely to require a considerable number of additional empirical applications of DMV before such design questions can be tentatively answered, but some DMV studies are relevant here. For example, Lienhoop and Völker (2016) constructed deliberative groups that were more homogeneous in terms of initial opinions and others that were more heterogeneous. The heterogeneous groups raised more and different arguments compared to homogeneous groups. Völker and Lienhoop (2016) found that heterogeneous groups provided participants with a more complete set of decision-relevant information. It may be useful to build on Mavrommati et al. (2021) for deliberative multi-criteria analysis, who proposed a method to investigate the influence of arguments on preference shifts in the deliberation process.

One important aspect that deserves further research in our view relates to the complexity of the environmental public goods under valuation, or respondents' unfamiliarity with those goods, as motivations for employing DMV. However, in existing DMV studies complexity is rarely measured, and unfamiliarity often assumed (though some studies investigated learning effects of deliberation). Consequently, it often remains unclear whether the deliberative design elements managed to address the complexity adequately, either by improving participants' understanding of the ecological complexity, or by providing guidance of the process to navigate social complexity and opposing preferences for environmental management options, including their implementation and outcomes. We argue that addressing complexity requires dedicated deliberative designs that deal adequately with the type of complexity in the valuation context. If not, DMV may not have strong advantages over other valuation methods.

There is no clear evidence arising from our study that DMV studies have had policy impact in any of the valuation contexts in which the studies were conducted. This is not unique to DMV; valuation studies, whether monetary or otherwise, tend to have limited policy impact (Laurans et al., 2013; Marre et al., 2016; Olander et al., 2017). However, whether DMV in practice will indeed enhance the democratic legitimacy of policy processes is therefore hard to tell.

A relevant limitation of our study relates to the potential bias in publication of DMV studies. It is possible that studies that collected qualitative data of the deliberation did not get to publish the analysis of such data if the primary publication targeted a more quantitative oriented outlet. Some studies solved this by publishing in multiple journals (e.g. Lienhoop and Fischer, 2009; Wätzold et al., 2008). We observed limited availability of information about the qualitative data in preference economization studies. A second potential issue lies in the selection of studies: we relied only on studies in English that used the term deliberation. There may be less difference between some studies included in our review and some participatory approaches to, for example, multi-criteria analysis (e.g. Liu et al., 2011; Zia et al., 2011), than among the DMV designs reviewed here. Future work may also compare deliberation in DMV studies and deliberation in non-valuation studies.

5. Conclusion

We reviewed 33 deliberative monetary valuation studies to assess whether the motivations for adopting this method translated into specific design choices. Our findings suggest that in the existing published studies, the study designs correspond to a multidimensional spectrum of

motivational and contextual factors that go far beyond broad classification into preference economization versus preference moralization studies. The term DMV still describes a diversity of motivations, approaches, contexts and design choices. The plurality and flexibility in DMV is also advantageous, as it allows for tailoring studies to the particular context and research question at hand. DMV studies share that the design contains some opportunity for participants to reflect on the given valuation object and context, whether privately (as in market stall studies) or in exchange with others. We argue that a set of minimum design requirements needs to be met for DMV to realize its acclaimed advantages of preference construction, learning and dealing with complexity, but such requirements have not been articulated so far in the literature, or in individual studies.

Acknowledgements

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