

The curatorial view of assessment and the ethics of scientific advice: Beyond decisional autonomy towards distributive epistemic justice

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Addressing the question: ‘How can history and philosophy of science, technology, and medicine help us to understand and evaluate the role of values in science?’

1. Introduction

Scientific advisors play a central role in shaping policy decisions in our world. From national policies to global interventions undertaken in response to planetary crises, scientists are routinely commissioned to carry out *assessments*: to engage in an ‘organized, interactive process of evaluating and communicating the state of knowledge on issues relevant to decision making’ (Mach and Field 2017, 570). Reflecting the ‘wickedness’ of the issues typically addressed in assessments (Rittel and Webber 1973), and the fact that no single advisor can plausibly assess and synthesise the relevant science, the locus of advisory authority has shifted in recent decades from individuals to groups and institutions (Oppenheimer et al. 2019, chaps. 1, 5). Contemporary assessments, as such, are social-epistemic projects, produced by massive groups of collaborating author teams, facilitated by an extended institutional bureaucracy with explicit institutional procedures, as well as ‘unwritten rules’ (Yohe and Oppenheimer 2011, 633) that transmit from one generation of assessors to the next, preserving the lessons of past assessments and giving stability to the institution’s epistemic outputs despite the change in its individual members (see Borie et al. 2021). Anthropogenic environmental crises have given rise to paradigm examples of such grand assessments, including international assessments of acid rain, ozone depletion, climate change, biodiversity and ecosystems services, soil degradation, environmental changes in the Mediterranean basin, and broader, global environmental outlooks that synthesise the results of other assessments to build a unified picture of planetary challenges in relation to human health and wellbeing (see Borie et al. 2021; for recent overviews Castree, Bellamy, and Osaka 2021). In turn, these complex environmental assessments have served as templates for assessments in other policy-relevant fields, e.g., in epidemiology and biomedicine, and calls are routinely made to launch new assessments in their image (Hulme and De Pryck 2022, 4).

The aim of this essay is to make two connected contributions to our understanding of contemporary scientific assessments for policy and their ethics. The first is descriptive: to offer a novel account of the *practices* of assessment that does justice to their diversity and complexity,

which I term, *the curatorial view of assessment*, drawing on museology to capture the results of historical and sociological studies of assessment (Section 2). The motivation behind the curatorial view, and the related notion of *curatorial risk*, is to expand our view of what scientists actually do in assessments, and better understand the ways in which ‘non-epistemic values’ (e.g., ethical and political values) impinge on expert judgement beyond those typically recognised in the literature on values in science.¹ The curatorial view, with its broader description of value-ladenness in assessment, leads to the second contribution of this essay: addressing the normative question of how value-laden choices should be managed in assessments. I argue that dominant proposals in the literature, despite their apparent differences, share a common commitment to the *principle of decisional autonomy*: advisors should resolve value-laden choices in a manner that preserves the decisional autonomy, or self-determination, of advisees (Section 3). I argue that the principle of decisional autonomy faces severe limits in guiding the choices of advisors, given the curatorial nature of complex assessment (Section 4). Instead, I propose an alternative principle to guide the resolution of value-laden choices in assessment, shifting away from decisional autonomy towards distributive epistemic justice (Section 5).

In summary, this essay looks at contemporary scientific advice through the lens of museum studies, history and philosophy of science, and political philosophy, with the aim of placing justice in the distribution of knowledge at the centre of advisory ethics.

2. The curatorial view of assessment

The aim of this section is to model the practices of assessment on curatorial labour in museums, characterising scientific advisors as *epistemic curators* whose responsibilities go far beyond the cognitive tasks of evidence appraisal and inference to the cultivation of audiences’ experiences of vast amounts of complex knowledge. At its core, *epistemic curation* is the task of turning an evidential flood into a guided stream:² through practices of discriminate selection and synthesis, placement, arrangement, ordering, juxtaposing and framing, etc., epistemic curators transform an otherwise impenetrable body of research into a set of accessible findings for policy.³

¹ For context, debates over the role of values in science typically draw on a distinction between so-called ‘epistemic’ and ‘non-epistemic’ values (see Steel 2010). The distinction is not uncontroversial (see Rooney 2017), but I will retain it in this essay: invoking the category of non-epistemic values is useful at least as a speech act in so far as it draws our attention to the ethics and politics of science, even if the conceptual distinction itself is ultimately untenable. For now, I will speak of value-laden choices to refer to epistemically underdetermined choices in assessment with non-epistemic risks associated, and further refine the category in subsequent sections.

² Adapting Davis’s phrase, ‘Through curation, one turns a sensory flood into a guided stream’ (Davis 2017, 771).

³ In principle, the concept of *epistemic curation* applies beyond scientific advice to any context in which an agent is involved in curating knowledge for another. Developing the concept in the direction of general social epistemology is an intriguing prospect that goes beyond this essay.

2.1. *What can museums teach us about the science-policy interface?*

On the face of it, the idea that museology holds insights for understanding scientific assessments may strike the reader as unpromising. After all, a distinctive feature of museums is that learning occurs ‘through movement in space’ (Wineman and Peponis 2010, 83), via the ‘agency of objects and immersive experiences’ (Cameron, Hodge, and Salazar 2014, 248), whereas the typical output of an assessment for policy is a written report, perhaps supplemented by a press release or a conference announcing its key findings. The two contexts appear, *prima facie*, to have little in common. However, a comparative look at the challenges of museum work and assessment work, particularly the scale of contemporary assessment reports, and how museologists actually understand notions such as ‘space’, will reveal deep connections between the two contexts of epistemic practice.

In a recent effort to conceptualise curation, Jansson and Hracs (2018) note that attempts to formally define curation run into one of two problems. On the one hand, common definitions that pick out one or two key practices – e.g., ‘the discriminate selection of materials for display’ (Davis 2017, 771); or ‘using acts of selection and arrangement to add value’ (Bhaskar 2016) – ultimately obscure more than they reveal. The fact that curation presumes expertise, for example, and is not purely a matter of taste, that it involves creating new knowledge, as well as care and conservation for items in the collection, is lost in such simple definitions.⁴ Conversely, attempting to capture such nuance in a definition ‘turns curation into a catch-all concept that is devoid of meaning’ (Jansson and Hracs 2018, 1610). For this reason, rather than constructing strict definitions, museologists tend to discuss curation in terms of a multi-dimensional *process* whose basic structure is shared across different museum contexts (e.g., Moser 2010; Wolff and Mulholland 2013). While research is of course central to the curatorial process, I will emphasise aspects of curation that raise concerns beyond the veracity of the factual claims made in museums (Atkins et al. 2009, 180–181), as an important aim of the curatorial view of assessment is to rethink scientific advice beyond issues of epistemic justification. In particular, I will focus on two aspects of museum curation with close analogues in assessment: namely, (a) rationing space in the museum, e.g., selecting from abundant collections a limited set of artifacts for display in exhibitions; and (b) distributing salience among the exhibited items.

A central task of the curatorial process is the rationing of a scarce resource, namely space in the museum. Rationing dilemmas cut across virtually every dimension of curation: from decisions about which items to collect and store at all, to which items to display in a given

⁴ For a popular discussion of this point, see Lucy Worsley’s comments in (*The Guardian* 2016).

exhibition, and how much floor/wall/shelf space to allocate to each exhibition, all the way down to the length of each individual label in the museum (Serrell 2015, chap. 7). At any given time, museums typically display only a fraction of their collections and the knowledge they possess about them. Although rationing challenges are particularly acute in major museums whose collections have ballooned in recent decades (Pogrebin 2019), they are common across all museum contexts. Studies of museum labels – staples of even the smallest museums – make this clear (Screven 1992; Ravelli 2006; Serrell 2015). E.g., in her seminar study of labelling, Beverly Serrell criticised, in her terms, the ‘Something-for-Every-Special-Audience’-approach to labelling (Serrell 2015, 156), which seeks to avoid rationing dilemmas by including in labels everything that may potentially be relevant to diverse audiences. Such an approach, in aspiring for completeness, commits the ‘age-old curators’ mistake’ of overloading their audience with content, engendering ‘museum fatigue’ (see Davey 2005), and producing an exhibition that is ‘overwhelming and underused’ (Serrell 2015, 157). In short, in order to produce a useful exhibition, curators must make judgements of *significance* – aesthetic, social, moral and political – to decide what to display and what to exclude at every stage of the curatorial process.⁵

Having selected a subset of items for display in an exhibition, curators must then decide how to distribute *saliency* across the exhibited items. Curators achieve this through managing the ‘space’ allocated to an exhibition. In museology, managing ‘space’ does not simply refer to managing the physical parameters of museum galleries, but extends crucially to ‘the way visitor movement is directed or guided within that space’ (Moser 2010, 24–25) via the layout of items: the order in which they are encountered, their arrangement and proximity to one another, the isolation of some items from the rest or their line-of-sight placement, lighting choices, etc (Davey 2005; Bitgood 2000; Wolff and Mulholland 2013). The distribution of saliency in an exhibition, via space management, shapes the experience and understanding of individuals (Wineman and Peponis 2010, 83) and interactions within groups (Atkins et al. 2009, 162), and comes with saliency risk: e.g., isolating an item from the rest of the exhibition draws attention to it, but increases the likelihood that less visible items in its path will be ignored as visitors make their way to the local ‘hot spot’ (Bitgood 2000, 35). As such, just as the initial selection of items for an exhibition presumes judgements of significance, so too does the distribution of saliency among displayed items (see Moser 2010).

These two aspects of museum curation – the rationing of space, and the management of space to distribute saliency – inform the curatorial view of assessment, which I now develop.

⁵ For classic discussions of display choices in museums as ‘displays of power’, see Bennett (1995, 2017).

2.2. *Curating assessments for policy*

The assessment body whose practices I will draw from in developing the curatorial view is the Intergovernmental Panel on Climate Change (IPCC). Perhaps more so than any other assessment body, the IPCC exemplifies the curatorial challenge of converting a body of abundant and complex knowledge into a set of actionable findings in a context where dependent social choices are significant and contested – a challenge the IPCC confronts amidst intense political scrutiny. Drawing on the IPCC's practices is particularly apt in the present context, given the extent to which its practices are appealed to in the values-in-science debate (e.g., Betz 2007, 2013, 2017; Steele 2012; Parker 2014; Intemann 2015; John 2015, 2017; Steel 2016; Jebeile 2020; Frisch 2020; Schroeder 2022).

Founded in 1988, the IPCC produces, every 5–7 years, assessment reports that aim at a comprehensive evaluation of (at least) the peer-reviewed literature across all disciplines relevant to addressing climate change. Each 'assessment cycle' produces a set of reports, one from each of the three 'working groups' (WGs) of the IPCC: focusing on the 'physical science basis' (WGI); 'impacts, adaptation, and vulnerability' (WGII); and 'mitigation of climate change' (WGIII).⁶ Even after significant restraint from authors in developing findings (more on this shortly), the reports produced by each working group typically run over a thousand pages – together, the reports from the previous assessment cycle (AR5) run to approximately 5000 pages. The point in highlighting the scale of these reports is to suggest that, beyond the justificatory challenges of adjudicating claims in light of evidence – the practices typically conjured by the word 'assessment' – advisors face broader curatorial challenges: how to make their complex reports usable beyond an expert community and ensure that key findings are made visible and salient.

Over many iterations, reflecting a long history of success and failure in delivering digestible reports to policymakers, the IPCC has developed sophisticated methods for managing vast amounts of complex knowledge, and reducing it into a subset of highly visible key or 'top-level' findings. The main process by which this is achieved is through assessment stratification: reports are divided along a synthesis hierarchy, with space being successively rationed at each stage and findings triaged and whittled down, combined and summarised. This process begins in underlying chapters, where authors work through consecutive drafts to cut their findings into the space allocated to their topic and continues under increasing rationing pressure and 'severe space constraints' (IPCC 2014b, response to rev. 28306) at each successive stage in the report's hierarchy. The end goal of this rationing process is to deliver accessible summary documents

⁶ See IPCC (n.d.) for further details regarding the structure of the organisation.

that admit only findings deemed to be of the ‘highest political importance’ (Livingston, Lövbrand, and Alkan Olsson 2018, 84). An example will help to illustrate the efficiency of this process.

Consider regional climate risks. Like all key findings of an IPCC assessment, the subset of key regional risks presented to policymakers is synthesised through six major stages: (1) A subset of ‘policy relevant’ findings are synthesised from the reviewed literature and included in the main chapters. (2) An ‘executive summary’ (ES) is produced for each of the main chapters, highlighting the key findings of the chapter. (3) A ‘technical summary’ (TS) for each working group report is produced, drawing heavily from the ESs of each chapter. (4) A ‘summary for policymakers’ (SPM) is produced for each working group on the basis of the TS and the ESs, presenting the key findings of the entire working group report. (5) The key findings of each working group report are further reduced and merged to produce a ‘synthesis report’ (SYR) for the whole assessment, drawing heavily on the SPMs of each working group. (6) The synthesis report is then condensed into a synthesis summary for policymakers (SYR SPM) – a ‘summary of a successive series of summaries’ (Livingston, Lövbrand, and Alkan Olsson 2018, 86) – which is the most visible and influential item in the IPCC’s communication structure (Poortvliet et al. 2020, 2). Figure 1 illustrates the severity of this rationing for regional climate risks in AR4: the figure shows how regional risks were distilled along the synthesis hierarchy from eight full chapters devoted to their discussion to a single table in the SYR SPM.

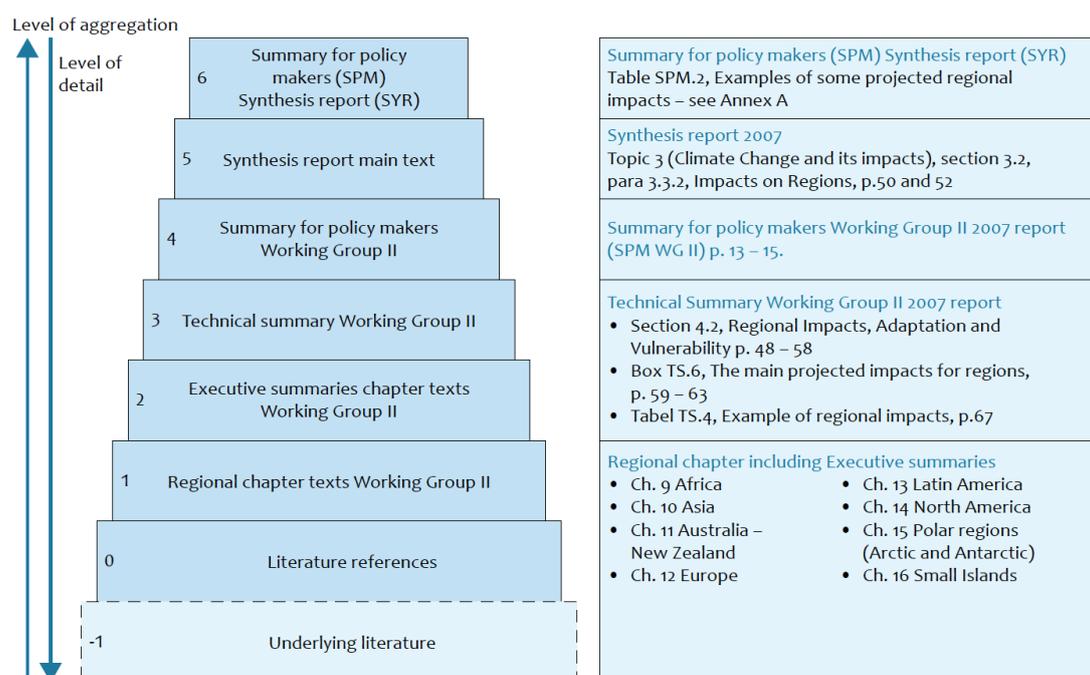


Figure 1: Source: the Netherlands Environmental Assessment Agency (PBL) (2007, 28).

Clearly, such radical rationing and synthesis raises important ethical questions concerning the conduct of assessments that go far beyond questions of epistemic justification. Decisions about which findings matter most, what climate impacts or policy options should be made salient, and which to withhold or marginalise under selection pressure, are ethically significant decisions. Through curatorial choices, assessments can perpetuate the marginalisation of stakeholders by overlooking their informational needs or prioritising those of others. Furthermore, by placing certain findings at the highest peaks of visibility in their reports, advisors can shape the agenda of climate politics towards certain social priorities. In addition to making a subset of findings highly visible through successive selection, there is more that assessments can do to distribute salience across their findings. To bring the full range of these choices into view, I develop a more systematic analysis of epistemic curation below, capturing both the familiar evidential practices typically associated with scientific assessment which have so far dominated the values-in-science literature, which I denote as practices of *evidence curation*, as well as practices of *salience curation* which remain understudied. In total, I distinguish six *dimensions* of curation that flesh out the labour of complex assessment, together with a tentative conception of *curatorial risk*.⁷

2.2.1. Evidence curation

Evidence curation denotes *practices that determine the scope of evidence considered in an assessment, epistemic standards for developing findings, and communicative standards for presenting findings in reports*. Broadly, practices of evidence curation determine the range of epistemic goods that enter IPCC reports at all (think, by analogy to museum curation, choices of what to ‘display’ at all). The definition picks out three dimensions of assessment that achieve this, which I will unpack.

1. *Scoping the evidence base*. Practices that fall under this dimension set standards for data and literature that may be reviewed in an assessment, placing restrictions on what enters the evidence base. Such practices are described in explicit IPCC procedures and guidance documents, as well as in first-hand accounts of unwritten rules that organically develop during assessments (Yohe and Oppenheimer 2011, 633). An example of an explicit procedure that constrains the IPCC’s evidence base concerns the use of non-peer reviewed literature, which is to be generally avoided in assessments (IPCC 2013, Annex 2). A less explicit restriction on the

⁷ In developing the curatorial view, I draw inspiration from what John (2019, 64) dubs the ‘communicative turn’ in the values debate, which ‘challenges this priority of the cognitive over the communicative’ (68) in thinking about values in science. The curatorial view speaks to both cognitive and communicative perspectives, as the concept of curation assumes both competencies.

evidence base results from the fact that authors cannot (at present) review the entire peer reviewed literature, due to a ‘literature explosion’ in climate science – in fact, roughly 80% of peer reviewed climate science that appeared during the AR5 assessment cycle could not be assessed (Minx et al. 2017, 253). Thus, authors are forced to rely on heuristics of quality and expert judgement to narrow down the evidence base. The details of how authors achieve this reduction remain largely black boxed (ibid). Additional restrictions on the evidence base apply within particular areas of assessment, such as the IPCC specific guidelines on evidence from detection and attribution studies (Hegerl et al. 2010), which restricts certain data sets according to contested standards of ‘good practice’ (see Shepherd and Sobel 2020).

2. *Synthesising evidence and developing findings.* Having scoped the evidence base, this second dimension covers the full range of practices for amalgamating the evidence, inferring findings from the evidence, and characterising the strength of evidential support for those findings. A small number of these practices are described in explicit procedures, e.g., the IPCC’s *Guidance Note* on uncertainty (Mastrandrea et al. 2010). The *Guidance Note* defines, for example, common uncertainty scales for characterising evidential support for hypotheses, and sets a minimum threshold of certainty for the assignment of numerical probabilities to outcomes. Beyond what is prescribed in guidance documents, additional standards for developing findings are negotiated among author teams in their meetings (e.g., Yohe 2019, 305; Broome 2019, 96), and yet others seep into the IPCC from the broader culture of climate science, and often find expression in expert review comments of chapters that challenge various findings (Edwards 2022). As such, in addition to explicit procedures, IPCC reports reliably follow additional epistemic norms for constructing findings, reflecting an ‘institutional epistemology’ (Borie et al. 2021) formed through the inheritance of past assessment cycles and a cultural embeddedness in a broader research community with dominant norms.

3. *Selecting findings for presentation.* Once authors have adopted an evidence base and developed findings, they must decide which findings to include at all in the report. A common discourse surrounding IPCC reports focuses on their size and length – e.g., when a senior figure in the IPCC boasts that their report weighs ‘almost five kilograms’ (IISD 2014, 24). This emphasis on length suggests, misleadingly, that space in the reports is abundant, and that authors can communicate all the findings they recognise and develop. However, even with a heavily constrained evidence base, an extraordinary number of findings are implicit in the reviewed evidence – more than can be typically reported in the space allocated to each author team. As such, *epistemic triage* must take place: authors must decide which findings are most urgent to communicate, under selection pressure. To give an example, consider that 12 out of 16 chapters

in WGIII's report in AR5 exceeded their page allocations in the first drafts (each chapter is allocated a 'page budget' at the start of an assessment cycle), resulting in multiple rounds of reduction, with some chapters having to cut more than half of their initial draft.⁸ For this reason, authors are directed to preserve only 'key' findings in their sections, and many norms have developed in the IPCC governing these selections. E.g., highly uncertain claims are typically excluded unless they pertain to 'areas of major concern' (Mastrandrea et al. 2010, 3). Similarly, in the communication of risks and vulnerabilities from climate change, authors are asked to include 'the issues most pressing' (Oppenheimer et al. 2014, 1069) to them 'from a vast array of possible' risks encountered in the literature (Schneider et al. 2007, 785).

2.2.2. *Saliency curation*

The three dimensions of evidence curation, together, determine the range of epistemic goods displayed in reports at all. Once findings make it into an assessment report, however, there are further questions of *saliency* to consider: namely the manner in which findings are organised, contextualised and displayed to an audience, which crucially affects the uptake of knowledge. I use the term *saliency curation* to denote the *practices by which a subset of presented findings are made uniquely visible, tangible and attractive with the aim of bringing them to the attention of an audience and prioritising their uptake*. I will unpack these practices along three dimensions.

4. *Placement and ordering*. Findings presented in underlying chapters of assessment reports are typically seen only by a 'self-selecting group of interested scholars and practitioners' (Yohe and Oppenheimer 2011, 636). As such, as sketched at the start of this section, a key method of saliency making involves elevating certain findings, deemed to be of particular policy relevance, from their locations in underlying chapters to places of prominence in the reports, e.g., to summary documents that ultimately 'count' politically (Broome 2019, 101). However, even within these highly prominent summaries, further visibility choices abound. E.g., *ordering* choices, determining the sequence in which findings appear in a summary, add another layer of saliency, as a reader glancing briefly over the SPM may only encounter the findings placed at the head of each section. Furthermore, ordering choices can be seen as subtle forms of policy prescription and are thus often contested – e.g., when the emissions of Asia were presented first, before other regions, in the draft of WGIII's SPM (see IPCC 2014b, rev. 28322). Ordering choices can also affect the chances of a finding surviving under the pressure of deliberation,

⁸ See the comments of the IPCC Technical Support Unit (TSU) on the allocated pages for each chapter of WGIII, available through the IPCC's online archive (<https://archive.ipcc.ch/report/ar5/wg3/>).

especially for the SPM, which is subject to line-by-line government approval. As Dubash, Fleurbaey, and Kartha (2014) point out, findings placed towards the end of the SPM run a higher chance of being cut during the approval session, as they are debated towards the end of many days of deliberation, with limited time and after a ‘spirit of contention’ (37) has developed among delegates over previous findings.

5. *Framing and contextualising.* Choices of framing affect the experiences of readers as they encounter findings, and connects those findings tangibly to their concerns and values (Nisbet and Mooney 2007). As such, framing choices in the IPCC are crucial – they determine how climate change is perceived by readers, and the policy implications they will likely draw from findings. E.g., using the term, ‘carbon budget’ to capture the link between the use of emission reserves and the chance of meeting certain temperature targets frames the challenge of climate mitigation in economic terms and lends credibility to certain policies over others (see Lahn 2021). Similarly, framing changes in the ocean and cryosphere – a topic that may initially seem detached and abstract – in terms of the ocean’s ‘support [for] unique habitats’, and the risks faced by ‘communities in close connection with coastal environments’ (IPCC 2019, 5), lends tangibility to the subsequent findings, and links them directly to moral concerns. In addition to framing, there are other ways of contextualising findings. These include the use of case studies to render concrete an important but abstract risk or response strategy (e.g., IPCC 2019, 156, Box 2.3), and using the format of an FAQ to anticipate and respond to common misconceptions lay audiences may bring with them to the findings of assessment.

6. *Amplifying and dramatising.* The final dimension of salience covers various practices of ‘amplification’ of findings via visual communication. A key example is the use of the so-called ‘burning embers diagram’, which colour codes climate risk from white (undetectable risk) to purple (very high risk), dramatising in a striking manner the risks to vulnerable systems (e.g., coral reefs) of crossing certain climate thresholds (Mahony and Hulme 2012; Mahony 2015). Beyond ‘burning embers’, other visual methods of amplifications are available to authors, including the use of prominent tables, schematic illustrations and ‘high-traction’ visual summaries (Mach et al. 2016, fig. 429), and design elements for graphs and projections. Choices of amplification and dramatization, through visual representation and graphic design, are among the most contested choices in the IPCC, given the persuasive power of ‘visual rhetoric’ (see O’Neill and Smith 2014; Walsh 2015).

2.2.3. Curatorial risk

To complete the curatorial view, let us introduce the concept of *curatorial risk* to denote ethical risks that arise in practices of epistemic curation, across both practices of evidence curation and salience curation. Curatorial risks arise when advisors confront *epistemically unforced choices* – choices whose justification is underdetermined by epistemic factors alone – and where significant ethical consequences are at stake in the choice.⁹ By highlighting practices of salience curation, the curatorial view reveals the full extent of these unforced choices in assessment, as choices of salience in an assessment for policy are, in general, epistemically unforced, contingent on judgements of non-epistemic significance (Schroeder 2022, 38; see also Anderson 1995). Before moving on to the ethics of managing curatorial risk, let me briefly relate the notion of curatorial risk to the dominant notion of ‘epistemic risk’ in the values-in-science literature, to highlight its contribution.

In recent years, one way in which scholars have uncovered the role of values in science is by proliferating concepts of risk to capture ethically significant moments in scientific inquiry. One of the earliest of such concepts is that of ‘inductive risk’, which refers, roughly, to the risk associated with error in inference: the risks of falsely accepting/rejecting a hypothesis (Rudner 1953; Douglas 2000).¹⁰ More recently, philosophers have shifted towards the broader notion of ‘epistemic risk’ to capture the variety of error risks in inquiry beyond those that occur at the moment of inferring from evidence to hypothesis, e.g., in determining what to count as evidence in the first place (Biddle 2016; Biddle and Kukla 2017). Even more recently, Harvard and Winsberg (2022) have persuasively argued that the category of epistemic risk should be extended beyond error to include judgements of adequacy/inadequacy for purpose, as these are the appropriate judgements for representational tools, which are not truth apt (e.g., climate models are not properly judged as true/false, but rather as adequate-/inadequate-for-purpose).

Yet, despite this important broadening of scientific risk concepts, a vast swathe of ethical risks in assessment are neglected by even the most expansive conceptions of epistemic risk in the literature. Consider, for example, a risk made visible in the curatorial view: the risk of rationing space in reports, and discriminately selecting findings for inclusion/exclusion – what we might call, *epistemic triage risk*. These risks escape the category of epistemic risk – they neither concern the veracity of truth-apt claims nor the adequacy-for-purpose of any given

⁹ For more on the epistemically forced/unforced distinction in the values debate, see Winsberg (2012, 130), Parker (2014, 26), and Brown (2020, 21). For the variety of ways in which a choice may be value-laden, see Ward (2020). My discussion combines two senses of value-ladenness distinguished by Ward: curatorial choices are ‘value-laden’ when values are required to *justify* a curatorial choice and where values are *affected* by the choice.

¹⁰ For generalised concepts of inductive risk, covering suspension of judgement as well as error, see Wilholt (2013, 2016) and Steel (2016).

representation. Rather, epistemic triage risks arise in deciding which truth-apt claims and representations to display in a given space at all, under rationing pressure. Beyond triage risks, think also of the host of ethical risks that arise in practices of salience curation: e.g., the risks of ordering a section, boldening a portion of a text, isolating a finding in a start-up box, etc. While such choices have long been a concern for historians and sociologists of assessment (e.g., Mahony and Hulme 2012; O’Neill and Smith 2014; Livingston, Lövbrand, and Alkan Olsson 2018; Oppenheimer et al. 2019), they fall outside the risk concepts familiar to philosophers of science and thus typically escape philosophical scrutiny.¹¹ The concept of curatorial risk is therefore useful in bridging disciplinary divides in the literature on values in science.

With the curatorial view in place, let us now turn to the ethics of assessment: the ethics of managing curatorial risk in light of the values at stake.

3. Normative models of assessment: the principle of decisional autonomy

This section summarises three dominant advisory models in the literature – *deferral*, *alignment* and *transparency* – which prescribe to advisors how to manage value-laden choice in assessment. I argue that, despite their apparent differences, underlying these normative models is a common commitment to the *principle of decisional autonomy*: *When confronting unforced choices, advisors should resolve those choices in a manner that preserves the decisional autonomy, or self-determination, of advisees.*

3.1. Deferral

At its core, the deferral model prescribes the avoidance of value-laden choices in assessment entirely. Of these deferral proposals, perhaps the most well-developed are defences of the ‘value-free ideal’ (VFI) that seek to defer values specifically in the justification of scientific claims – the gathering and appraisal of evidence, and inferences drawn from that evidence (e.g., Betz 2013; Henschen 2021). An important example of a deferral proposal defending the VFI is the ‘hedging defence’ (see Frisch 2020) against the argument from inductive risk. Recall that the thrust of the inductive risk argument is that when faced with uncertainty, responsible scientific advice requires that scientists vary their evidential thresholds for accepting/rejecting hypotheses depending on the ethical significance of erring. The hedging defence maintains, by contrast, that the responsibility of scientists is to make the uncertainty in scientific understanding sufficiently explicit so as to defer ethical judgements about when the evidence is

¹¹ There are exceptions, e.g., Lewens (2019), Murray and Schroeder (2020), Jebeile (2020).

sufficient for action to policymakers, rather than allowing such value judgements to affect thresholds of inference (Jeffrey 1956; Betz 2013, 2017; Parker 2014).

Beyond the context of justification, strategies of deferral have been proposed to block the intrusion of values in virtually every aspect of assessment, throughout the ‘collective reasoning process that leads to a scientific assessment report’ (Betz 2017, 97). E.g., when deciding which assessment findings to present to policymakers, some argue that advisors should ideally present all policy options that are technically feasible even-handedly (Pielke, Jr 2007), offering, ideally, a comprehensive and unprejudiced ‘menu’ of choices to policymakers (Oppenheimer et al. 2019, 181–184). In addition, when it comes to framing and contextualising findings, some have argued that words such as ‘degradation’, ‘improvement’, ‘good’ and ‘poor’ should be eliminated from science communication, as these convey normative judgements (see Lackey 2007; Holland et al. 2007). Instead, scientists should speak of ‘change’, ‘increase’, ‘decrease’, and other purportedly ‘neutral’ words that ‘convey no policy preference’ (Lackey 2007, 14). These broader restrictions on values in communication and salience making can be seen as defending an ideal that is even more demanding than the VFI. Following Kappel and Zahle (2019), call this broader ideal, the ‘neutral communication ideal’, requiring not only that the justification of findings be normatively neutral, but that scientific communication be so in general.

3.2. Alignment

Proponents of the alignment strategy favour a midway between licensing scientists to resolve value-laden choices in accordance with their own judgement, and the demand that scientists should defer all value-laden choices to others. Proponents of alignment worry that both routes are undesirable: the first threatens to undermine the trustworthiness of science (Schroeder 2020) and ‘usurp’ the role of policymakers (Schroeder 2019, 524); whereas the second typically comes up against pragmatic constraints – such as time, resources, and audiences’ epistemic limitations – that make complete deferral impossible, forcing value-laden choices on advisers (Parker and Lusk 2019, 1645).

The alignment model can be operationalised in different ways. Where scientific advice is being provided to assist particular users, and where non-epistemic risks are at stake, Parker and Lusk (2019) argue that users’ values should serve as ‘tiebreakers’ between unforced choices that affect the balance of these risks. Their proposal, although posed in the context of managing inductive risk, can again be readily generalised to other aspects of assessment: e.g., when deciding which subset of possible future scenarios to report, or which findings to make salient,

the values of stakeholders should guide the curation of information (see, eg., Edenhofer and Kowarsch 2015, 60). Call this first, more general operationalisation of alignment, *user alignment*.

A second way of operationalising the alignment model is in relation to ‘democratic values’: roughly ‘those of the public or its representatives’, as determined by an appropriate political philosophy of democratic representation and empirical research into those democratically held values (Schroeder 2020, 10–11). Call this approach, *democratic alignment*. There are interesting tensions between user alignment and democratic alignment (see Lusk 2020 for an attempt at reconciling them). These tensions will not concern us, however, as the aim is simply to point to a broad model that has as its central feature an appeal to *some* external audience’s values, be they individual user, small collectives of stakeholders, or ‘the public’ at large, to resolve value-laden choices.

3.3. *Transparency*

Transparency is a complex notion (Elliott 2020). The relevant notion of transparency here relates not to procedural transparency, the sharing of report drafts, or the opening up of an assessment to media scrutiny, etc., but rather to transparency with respect to the influence of specific values on the findings of an assessment. Proponents of value transparency generally accept that, one way or another, scientists will have to take normative decisions into their own hands at various points in assessment. What they insist on, however, is that scientists’ values should not become sedimented in an assessment; their value judgement should be provisional, made transparent enough such that audiences can ‘backtrack’ to arrive at alternative conclusions, informed by their own values (McKaughan and Elliott 2013; Elliott 2020). To actually achieve such value transparency, proponents of the model have proposed a variety of practices. These include placing transparency requirements on scientific advice that mirror standards for eliciting informed consent in healthcare settings (Elliott 2006, 2010). They also include techniques of framing that allow stakeholders to backtrack from thickly-framed results to less controversial facts – e.g., by leaving a trail of cues for the reader which acknowledge the value-orientation of the framed result, acknowledging alternative ways of framing the result, and directing readers to where they might find these alternatives (McKaughan and Elliott 2013), etc.

3.4. *The principle of decisional autonomy*

Despite the many differences between these three models, they all share a common commitment to the principle of decisional autonomy: When confronting unforced choices, advisors should resolve those choices in a manner that preserves the decisional autonomy, or self-determination, of advisees. The authors proposing these models worry that ‘value-ladenness threatens the ability of decision makers to formulate choices that accord with their own values’ (Elliott 2020, 3), and that personal and political autonomy would be jeopardized if the scientific findings guiding policy ‘were soaked with moral assumptions’ (Betz 2013, 207). Each model offers a way of preserving decisional autonomy in light of value-ladenness: Deferral promotes decisional autonomy by attempting to avoid value-laden choices entirely in assessment production; alignment does so by resolving unforced choices in a manner that aligns with an audience’s values; and transparency does so by ensuring that diverse audience have a chance to question the value choices made and backtrack, if they disagree, to alternative conclusions. Furthermore, note that although these models are often defended individually, there exist ‘hybrid models’ that direct advisors to shift from one basic norm to another, depending on the advisory context. Pielke’s (2007) ‘Honest Broker Model’ is an example. In essence, the model requires deferral of unforced choices where no value consensus exists among stakeholders, and an alignment of choice with the consensus view where it exists. As such, despite apparent differences in the positive proposals in the values-in-science debate, the literature is largely unified through its endorsement of a common ethical principle (Figure 2).

To understand the centrality of this principle in current normative models of assessment, it is useful to reflect briefly on the sources of inspiration behind these models. Many authors in the literature have looked to bioethical principles to inspire a general account of scientific advice. For these authors, the principle of autonomy in bioethics stands out as particularly relevant. More precisely, they have adopted the ‘decisional’ or ‘self-determination’ conception of autonomy, typically identified with the elicitation of patient consent (Mackenzie 2015). E.g., in arguing for the alignment model in scientific assessment, Schroeder states that alignment aims ‘to take the bioethical requirement on physicians to promote informed decision-making and apply it to scientists’, in order to ‘enhance the ability of the public to exercise its right of self-governance in a meaningful way’ and make ‘decisions that reflect the policy-makers’ (and the public’s) values’, which requires ‘taking the scientist’s values out of the equation’ (Schroeder 2022). Similarly, in arguing for transparency, Elliot’s explicit aim is to model scientific advice on ‘informed consent, which guides medical clinicians in preserving the self-determination of their patients’ (Elliott 2010, 637, see also 2006).

Ultimately, then, what is at stake in assessing these three models is the principle of decisional autonomy itself. In the next section, I will critically evaluate the three models, arguing that the principle of decisional autonomy faces severe limits in guiding the choices of advisors.

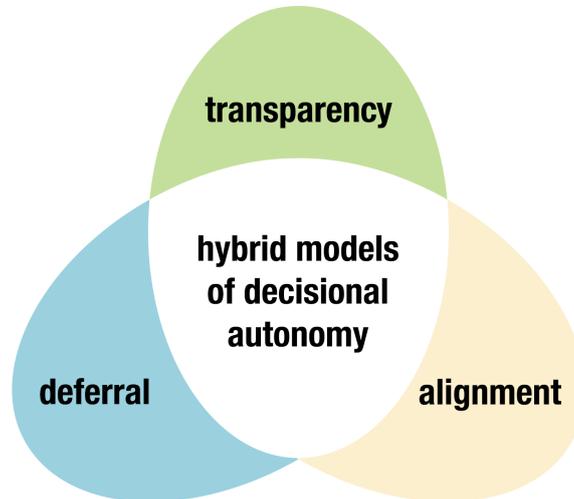


Figure 2: Normative models centring on the ideal of decisional autonomy. Source: Author.

4. Epistemic curation and the limits of decisional autonomy

4.1. *The limits of deferral*

Of the three basic models of decisional autonomy, deferral is the most widely challenged view in the philosophical literature. As Schroeder puts it, whatever its potential in other aspects of science, deferring value judgements ‘is a non-starter when it comes to scientific communication’ (Schroeder 2022, 38) – and we might add, in *curation*. Given the extensive critique of the model (e.g., Steele 2012; Havstad and Brown 2017; Frisch 2020), I will keep my own remarks relatively brief, and simply cash out the ready implications of the curatorial view for the deferral model. Put simply, deferral of values is antithetical to epistemic curation – if we want assessment reports that are usable at all, then advisors must engage in the suite of rationing and salience making practices outlined in Section 2, and these practices cannot be justified without appeal to values.

To appreciate the trouble with deferral from a curatorial view, consider a basic rationing decision, determining whether a given finding of potential relevance to policymakers will be presented in a report. The deferral model gives a straightforward answer: scientists should ‘not leave out relevant evidence’ (Betz 2017, 101) or fail to communicate any ‘possible future scenarios’ (Betz 2007, 8), or ‘policy options’, so as not to constrain the space of political action (Pielke, Jr 2007, 141). Although there are subtleties in the work of particular authors who share

the deferral intuition, and it is often unclear precisely what they require in terms of disclosure, let us take such claims at face value, and adopt comprehensive disclosure as the regulative ideal for assessment curation. While we might share these authors' specific concerns in the cases of withheld knowledge they cite, the norm of comprehensive disclosure is untenable. The sheer abundance of *relevant* knowledge available on issues such as climate change necessitates extensive epistemic triage and salience curation, on pain of committing the 'age-old curators' mistake' (Serrell 2015, 157) of producing an overwhelming and irrelevant data dump.

4.2. The limits of alignment

For advisors to align value-laden choices with the values of their audience, they must first determine *who* the relevant audience is. In the language of user alignment, advisors must determine the identity of the 'user' or 'client'; in the language of democratic alignment, advisors must determine the relevant public and their representatives. While in simple advisory contexts, the answer to these questions may be clear enough, they raise thorny problems in complex assessments. This is most obviously so for global assessments such as the IPCC's, where the democratic view is undertheorized (Schroeder 2020, Footnote 17) and shifting to user alignment does not help: the range of officially acknowledged 'users' is effectively the entire world (IPCC 2018, 4). To get an engagement with the alignment model off the ground, however, I will simply assume that we can resolve such conceptual problems in due course and highlight instead the basic epistemic challenge facing alignment in any context of complex assessment, whether domestic or global, i.e., even once the relevant audience has been fixed.

Assume in the IPCC's case that the only relevant users are the national governments who are signatories to the UNFCCC. The predictive task facing authors adopting the alignment model goes as follows: When faced with an unforced choice, authors must predict how governments would want the choice to be resolved. In some cases, this will mean predicting the values of one or a small coalition of governments for findings that are relevant exclusively to their needs. For choices of broader relevance, authors will need to track a much broader consensus position or compromise, or several dominant value orientations that cannot be reduced, and resolve the choice accordingly.

What are the prospects of this sort of alignment? Unfortunately, the prediction task at hand is daunting. To see this, consider that the vast majority of curatorial choices occur in assessment deep within the recesses of the production process over many years, before any material is even brought to the consideration of users for their input. Furthermore, it is implausible, given the

complexity of assessment production, to expect authors to be constantly ‘on the phone’, eliciting the values of users at every choice of rationing and salience – this problem cannot be idealised away, if our aim is to develop advisory models that speak to *plausible* assessment conditions. As such, authors preparing reports will have to resolve all sorts of unforced choices with scant evidence regarding the preferences of governments towards them.

To underscore this epistemic challenge, note that even when we consider choices that occur with plenty of guidance from governments, e.g., after drafts have been distributed and following extensive rounds of government review, authors are typically still left guessing as to their users’ values. To illustrate, consider the question of whether a given finding should be included/excluded from the SPM – a dimension of salience curation that receives extensive government feedback. Specifically, consider the question which arose in a recent report – whether a figure on long-term sea-level rise, i.e., beyond 2100, should be presented in the SPM (IPCC 2019, fig. 4.2). *Prima facie*, predicting whether this finding, if included in the SPM, would be approved by governments appears straightforward. The plausible, albeit uncertain, finding that emission pathways chosen in the next decades may commit future generations to five metres of additional sea-level rise certainly *seems* politically relevant. Nevertheless, when asked why this figure was initially withheld from the SPM, one of the SPM’s drafting authors reflected, after emphasising that authors were in fact keen to discuss long-term sea-level commitments: ‘How many policy makers care about anything beyond 2100 is rather uncertain and even 2100 is of limited interest to many of them’ (Michael Oppenheimer, private communication, cited with permission). That the finding was ultimately included does not change the point: the preference of users was not discernible with any confidence from the perspective of authors preparing the assessment.

To add a final twist to the epistemic challenge, note that, given epistemic inequalities among assessment users, the user engagement mechanisms that authors rely on to discern their users’ values will typically prove an unreliable gauge of the actual informational needs and preferences of users – the legitimate values that are worth aligning with. To appreciate this, consider Figure 3, which shows, for a recent IPCC report, the distribution of government reviews of the SPM. The results: 89% of government reviews are from developed nations vs. 11% from developing nations; three developed nations (United States, United Kingdom, Germany) account for roughly 40% of all reviews received from a total of 39 nations, 19 of which are European nations. Under such conditions of unequal participation, whatever joint preferences the authors predict for the collective of *actually engaged* governments will track the consensus (or compromise)

of the powerful, i.e., epistemically resourceful governments. Alignment, in short, may be action guiding in some contexts, but faces significant epistemic challenges in complex assessments.

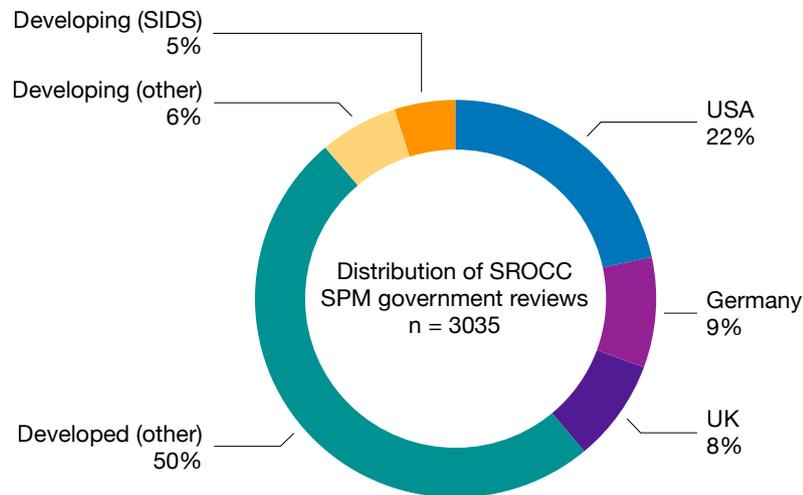


Figure 3: The distribution of government reviews for the SPM of the IPCC's SROCC report (IPCC 2019). Source: Author.

4.3. *The limits of transparency*

In many ways, transparency can be seen as a final safeguard for decisional autonomy, in light of the trouble with both deferral and alignment. I.e., if unforced choices must be resolved by advisors, given the limits of both deferral and alignment, then at least the justification for their choices should be made transparent enough for advisees who disagree with the assumed values to backtrack and return to a set of less controversial facts. How optimistic should we be about transparency as a safeguard for decisional autonomy?

To answer this question, I will summarise the results of a case study from AR5: the development of a controversial figure representing 'consumption-based emissions' that was presented to policymakers in the SPM of WGIII. Going down this curatorial journey will make it clear that the sort of transparency necessary to safeguard decisional autonomy is untenable in complex assessments, and pursuing it reproduces the failure of the deferral model – namely, that it transforms what is meant to be an accessible report into a data dump.

One of the central tasks of WGIII is to disaggregate the global emissions trend. The aim of disaggregation is to reveal the underlying drivers of emissions: the 'processes, mechanisms, and characteristics of society that influence emissions' (IPCC 2014a, 356), and explain why 'greenhouse gas emissions accelerate despite reduction efforts' (IPCC 2014c). As part of this

effort in AR5, authors drafted four figures (containing eleven panels) into the SPM, allocating emissions to different country groups (all of which were ultimately deleted by governments in the approval session of the SPM). Their aim was to pull apart the influence of variations in behavioural patterns, economic development, modes of agriculture and industry, resource availability, trade, etc., on the emissions of each country group – trends and drivers which can then be targeted via mitigation policies (see IPCC 2014a, chap. 5).

One of the four emission figures uses, for the first time in IPCC reports (Victor, Gerlagh, and Baiocchi 2014, 35), the method of *consumption-based accounting* for measuring emissions. In contrast to the official *territorial- or production-based accounting* used in the UNFCCC, where emissions are attributed to the places (i.e., countries) where goods and services are *produced*, the consumption-based method allocates emissions, regardless of their territorial origins, to the final *consumers* of goods and services (IPCC 2014a, 373–375). The figure relies on a division of countries into four income groups, defined by the World Bank: high-income (HIC), upper-middle (UMC), lower-middle (LMC) and low-income countries (LIC). It shows that consumption emissions of high-income countries are significantly higher than their territorial emissions, with the trend being reversed for all other income groups. This implies that rich countries are, generally, importing ‘embodied’ emissions in the form of products and services from poorer countries (Edenhofer and Minx 2014, 38), which implicates rich consumers in the growth of emissions outside their own countries (IPCC 2014a, 288). The significance of this pattern is lost from the perspective of territorial accounting, where, for example, production emissions in China are allocated to Chinese producers even though a portion of these emissions originate to satisfy consumption needs abroad (Sato 2014, 831). Conversely, territorial accounting allows rich consumers to ‘distance themselves’ from the consequences of their consumption (Rothman 1998, 177), as the emissions embodied in the products they consume are allocated to producers abroad.

Crucially, however, the political significance of comparing consumption/territorial emissions depends sensitively on how countries are grouped. The income grouping foregrounds a set of policy implications; different regional groupings would bring to the fore other political trends; and there are dozens of potential alternatives with their own epistemic strengths and political valences. In fact, authors, collaborating across four underlying chapters and the SPM, developed seven unique representations of consumption-based emissions (R1–R7), many of which were deleted along the way, with the World Bank income approach emerging as the representative of these distributed efforts under numerous constraints and challenges. I have

summarised the result of this complex authorship process, which unfolded across fourteen drafts over the course of two years, in response to approximately 300 reviews, in Figure 4.

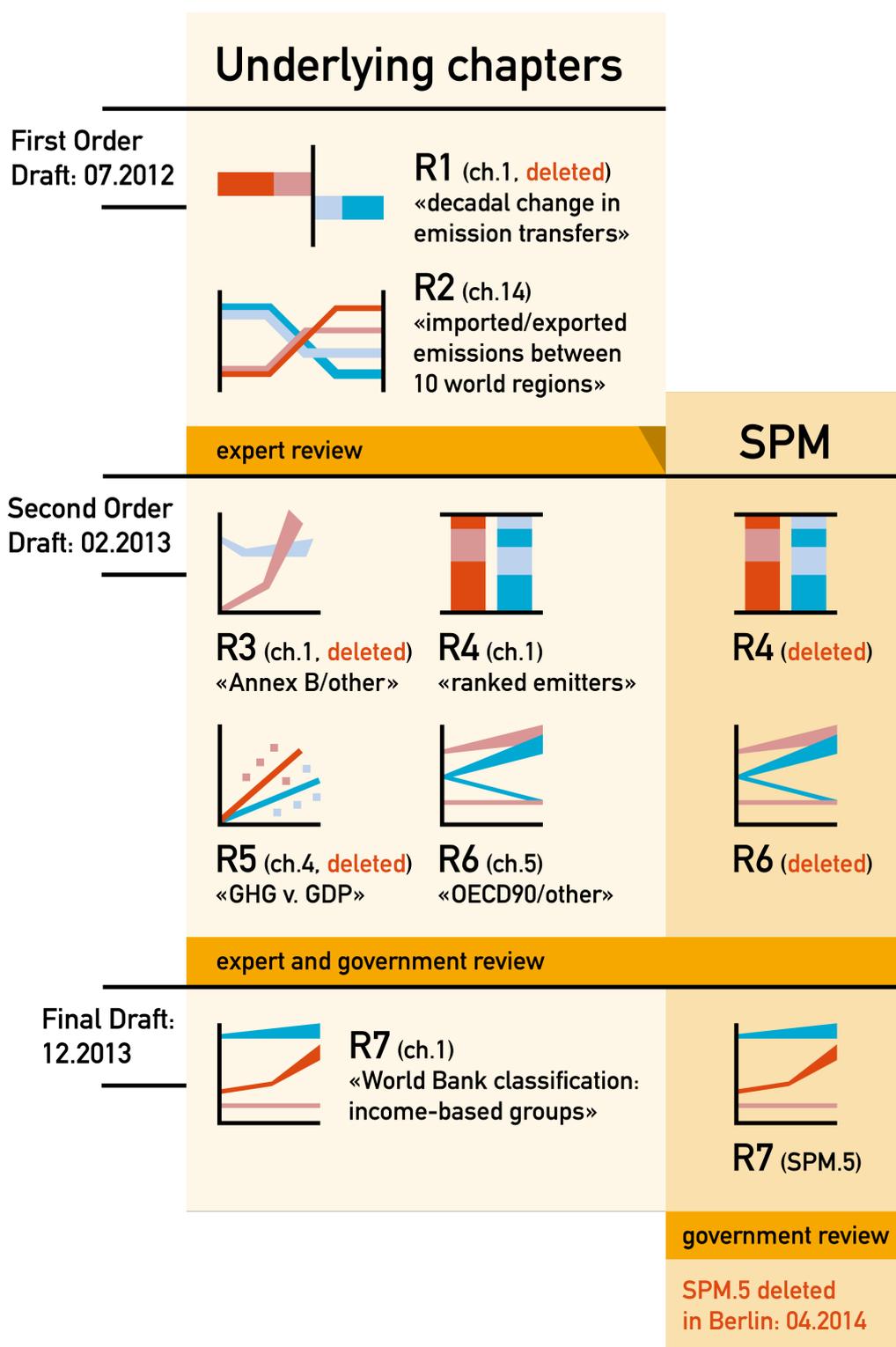


Figure 4: The figure shows, from top to bottom, the timeline of the drafting process. The wider column on the left corresponds to the location of graphs in underlying chapters, and the narrower column on the right shows the graphs that were selected for the SPM. Source: Author.

The key point to emphasise is that choices between these representations – which to develop, which to emphasise and place in the SPM, etc. – are value-laden: each representation has its own unique epistemic strengths and weaknesses; each offers a complementary analysis of consumption emissions (i.e., the choice between them is epistemically unforced and ‘in the hands of advisors’), yet their political valences differ, and prioritising one (or a subset) over others would lend support to particular policy implications. Recall, furthermore, that the figure on consumption emissions was one of four emission figures presented to policymakers, displaying eleven panels in total. The choice among the seven representations for the consumption figure was consequently coupled to representational choices made for other emission figures, with the aim of producing a consistent mitigation narrative in the SPM. I.e., authors were not choosing between the seven representations for consumption emissions in isolation; they had to negotiate that choice in connection with the work of other teams and the broader analysis of emissions they were presenting as a collective. The range of choices faced by authors simply in deciding how to represent and frame consumption emissions, therefore, offers a glimpse into a broader, entangled project of producing an accessible, overarching narrative of rising emissions to policymakers across multiple findings and figures.

Let us now draw the implications of this discussion for the transparency model. Assuming authors *can* be transparent about the role of values in justifying each significant choice they made in this complex story, it is doubtful that this transparency would be *empowering* – i.e., that policymakers would be able to backtrack and arrive at alternative findings, in line with their own values. The reason for this is straightforward. As is clear from the case study, developing emission figures presumes advanced knowledge of carbon accounting methods and various other forms of specialist expertise – and this is the case across virtually all climatic questions assessed in the IPCC. In cases where the effect of value choices on findings is subtle and complex, lay audiences will typically lack the capacity to cash out transparency in the form of genuine alternatives that accord with their values. In summary, I contend that transparency regarding values fails as a model for safeguarding the decisional autonomy of stakeholders in complex assessment.

This concludes the critique of the three normative models of assessment centring on the principle of decisional autonomy. Let us now consider how to rebuild from here.

5. Beyond decisional autonomy: towards justice in epistemic curation

This section sketches a first step towards an alternative account of ethical scientific advice, proposing a shift away from decisional autonomy towards distributive epistemic justice in assessment curation. As discussed in section 3, many authors in the literature have drawn parallels between scientific advice and the doctor-patient interaction, finding in the bioethics of decisional autonomy a foundation for a general advisory ethics. However, the doctor-patient model is a distorting descriptive model when we go beyond the provision of expertise in highly local settings, e.g., in a clinic – indeed, a key aim of this essay is to offer an alternative description that does justice to the complexity of contemporary assessments. In the IPCC, multiple advisors are speaking collectively and collaboratively, directing their advice at many audiences, often with non-overlapping or conflicting values. These audiences are heterogenous: shot through with radical social and epistemic inequalities. E.g., policymakers representing the Global South typically require knowledge from the IPCC to inform decision making under conditions of urgency and deprivation, to anticipate some of the most severe threats from climate change; others are intent on maintaining the status quo, which has hitherto played to their advantage. The nature of ethical scientific advice in such contexts appears to require philosophical resources beyond what can be gleaned from local advisory settings, where both the values of stakeholders and the decision context itself are relatively circumscribed.

To motivate a shift from decisional autonomy to epistemic justice in the ethics of scientific advice, I draw inspiration from a series of recent path-breaking papers on distributive epistemic justice by Gurol Irzik and Faik Kurtulmus (Kurtulmus and Irzik 2017; Kurtulmus 2020; Irzik and Kurtulmus, n.d.). To differentiate their contribution from a broad literature on epistemic in/justice, I will begin with a brief summary of the standard, ‘discriminatory’ notion of epistemic injustice, which, although relevant to a full account of justice in assessment, is not what I want to focus on in thinking about epistemic curation.

At the very start of her seminal discussion of epistemic injustice, Miranda Fricker (2007) recognised that ‘the idea of epistemic injustice might ... prompt thoughts about distributive unfairness in respect of epistemic goods such as information or education’ (1). She proceeded, however, to dismiss this distributive notion, as her aim in introducing the idea was to theorise a wrong done to a person ‘specifically in their capacity as a knower’ (1), and it appeared to her at the time that distributive epistemic injustice could be subsumed under generic accounts of distributive injustice, whereas her aim was to theorise an injustice that was ‘distinctively epistemic’ (1). Instead, she suggested that two types of ‘prejudicial’ (8) encounters between knowers raise distinctively epistemic injustices, and developed the influential concepts of testimonial and hermeneutic injustice (Fricker 2007, chaps. 1, 7). These two concepts (and

others, sharing a similar link to prejudice) have since become known as forms of ‘discriminatory epistemic injustice’ (Fricker 2017, 53; Coady 2010, 2017).

Since the introduction of these two forms of discriminatory epistemic injustice, philosophers have fruitfully applied various discriminatory notions of epistemic injustice to the context of science (see Grasswick 2017 for a review), as well as to the prejudice in the functioning of epistemic institutions as opposed to prejudicial interactions between individual epistemic agents (e.g., Anderson 2012). On the other hand, as Irzik and Kurtulmus note, *distributive* epistemic injustice has been left underdeveloped in this expanding literature, despite subsequent recognition by scholars that injustice in the distribution of knowledge (more precisely, the *opportunity* to access knowledge) cannot be reduced to other forms of distributive injustice (Coady 2010; Fricker 2017) – i.e., there is indeed something *distinctively* epistemic about distributive epistemic injustice. It is this gap in the literature that Irzik and Kurtulmus seek to fill.

Irizik and Kurtulmus take the following for granted: Firstly, there are certain kinds of knowledge in which we all have a ‘fundamental’ interest. Such knowledge concerns basic facts about the world, our social situation, our governments, which we require to pursue our individual ends and deliberate on the common good (Kurtulmus and Irzik 2017, 130). Secondly, certain kinds of knowledge are further required by public officials if they are to legislate justly (131). Based on these two assumptions, they propose a distinction between ‘primary’ and ‘secondary’ distributive epistemic injustice in science: ‘while the former occurs when science fails to provide citizens with an equal opportunity [to] obtain the knowledge they need, the latter arises when it fails to provide officials with the knowledge necessary for the pursuit of justice’ (Irizik and Kurtulmus, n.d.). Drawing on their insights, I propose the following principle as a guide to the curation of assessment: *When confronting unforced curatorial choices, advisors should resolve those choices in a manner that promotes a fair distribution of epistemic goods among stakeholders with an objective interest in them and provides policymakers with the knowledge necessary for the pursuit of justice.*

Let me close by saying something, in brief, in response to an immediate objection that questions whether a first-order ethical value, such as justice, can be action guiding (see Schroeder 2017). The worry in short, is that we have no common conception of justice; asking scientific advisors to pursue justice in epistemic curation is thus not action guiding. We are left no better than we are on the principle of decisional autonomy. In response, following methodological recommendations of non-ideal theorists of justice regarding the pursuit of contested ideals of justice (e.g., Sen 2006; Fricker 2013; Wiens 2012), we should construe the task of pursuing distributive epistemic justice in assessment as a negative one: a task of curating assessments with the aim of limiting clear *failures* of justice; eliminating cases where any

substantive account of justice would agree that such cases are failures of justice – and draw from these failures insights for institutional reform. As such, we should largely focus on ‘groups or weighty interests’ (Irzik and Kurtulmus, n.d.) that are systematically epistemically neglected in assessments. Assuming such a line of response is tenable, a second objection arises: namely, the objection that, even if justice were action guiding in assessment, scientific assessment bodies lack the political legitimacy to pursue justice. Here, I would respond by emphasising the connection, rather than the independence, of justice and legitimacy as political concepts. While most theorists of political legitimacy accept a ‘gap’ (Wellman 2021) between justice and legitimacy – i.e., that a just institution may nevertheless be illegitimate, whereas an unjust institution may be legitimate – most theorists of legitimacy also concede that severe forms of injustice can erode the legitimacy of an institution (Peter 2020; Adams 2018; Wellman 2021). If we think critical epistemic institutions, such as the IPCC, can be held to standards of political legitimacy because of the importance of the knowledge they distribute (see Adams 2018, 95), then we can also argue that the elimination of severe distributive epistemic injustice is necessary for the legitimacy of such institutions, and we need not see the pursuit of curatorial justice in their assessments – appropriately construed as mitigating curatorial *in*justice – as at odds with maintaining the institution’s legitimacy. I leave the elaboration of these thoughts, and the further development of curatorial justice in assessment, open for future work.

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