research article

Knowledge brokering inside the policy making process: an analysis of evidence use inside a UK government department

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Background: Knowledge brokering plays an important role in the evidence-to-policy system, but little is known about whether and how it occurs within government departments.

Aims and objectives: Using empirical evidence from one UK government department, this article analyses how knowledge brokering takes place inside the policy making process and what shapes brokering activities.

Methods: Between 2019 and 2021, 25 semi-structured interviews were conducted with current and former senior officials at the UK's Department for Environment, Food and Rural Affairs (Defra). We combined existing knowledge brokering frameworks to investigate the daily activities of a group of officials known internally as 'evidence specialists'.

Findings: Defra's evidence specialists routinely performed a range of activities to improve the uptake and use of evidence by their 'policy maker' colleagues. These conformed well to our knowledge brokering framework and included informing, relational, framing, institutional and some co-production activities. They could act as brokers because of the separation of roles of evidence specialists and policy makers; and their brokering work was shaped by organisational, structural and process factors.

Discussion and conclusion: Knowledge brokering can play a key role in improving evidence use inside government departments, though this may vary between jurisdictions because different administrations may vary the roles and functions of groups of civil servants. Understanding how different roles could contribute to a brokering approach to evidence use would help fill a gap in researchers' understanding about the evidence-to-policy process and help government departments formalise and strengthen the ways they acquire and interpret evidence to inform policy decisions.

Keywords knowledge brokering • civil servants • policy makers • evidence specialists

Introduction

The field of knowledge brokering has matured over the past few decades, since the early practical demonstrations that moving knowledge from producer to user could be done with strategic intent and could have demonstrable impacts on policy and practice (for example, Lomas, 2007). Knowledge brokers have worked between research and policy (MacKillop et al, 2020), between research and practice (Wright, 2013 in healthcare; Carton and Ungureanu, 2018 in management studies; Rycroft-Smith, 2022 in education), in analyses of local government (Armstrong et al, 2013) and in studies of other public and private organisations (Lightowler and Knight, 2013; Dobbins et al, 2019). Knowledge brokering between academia and policy is seen as central to improving the uptake and use of evidence, as evidenced by the UK government's initiative to encourage departments to detail their main research questions and strengthen relationships with researchers (Boaz and Oliver, 2023).

A recent systematic review notes that knowledge brokering requires performing multiple roles at the interface between different communities to improve the uptake and use of evidence. This distinguishes knowledge brokers from knowledge intermediaries who mainly work to disseminate evidence, and from boundary spanners whose focus is on building relationships (Watling Neal et al, 2022). Knowledge brokers use problem-oriented and interdisciplinary approaches to their work (Bandola-Gill and Lyall, 2017). Their roles include building relationships, fostering interactions to facilitate the flow of information, working as bridges between knowledge producers and decision makers, facilitating knowledge sharing, enhancing communication, mediating boundaries between different epistemic communities, building capacity and creating the institutional infrastructure for these intermediary activities to take place (Waring et al, 2021; Oliver et al, 2022).

Knowledge brokers are mostly defined in the research literature as individual people (Watling Neal et al, 2022), though teams and whole organisations can also act as knowledge brokers (Wye et al, 2020; MacKillop and Downe, 2023). But despite the maturity of the analysis, research on how knowledge brokering approaches can be institutionalised has been conducted predominantly from a perspective external to government departments (Oliver et al, 2022), analysing how evidence can be brokered from research or other organisations towards policy officials. In this article we look inside one UK government department to understand brokering relationships between policy officials. This adds another piece to the puzzle of evidence-informed policy making: how evidence is used after it has been received into the policy making process.

Background to this study

The literature on public administration recognises that policies are made in large bureaucracies composed of teams of civil servants with a range of specialisms. They operate at various degrees of distance from political appointees and are responsible for formulating the detail of policies put forward for political assent and for constructing the evidence base on which these policies rest (Head et al, 2014). One key role is structuring and presenting information about policy problems, possible solutions and risks so that decisions can be taken on what to do and how to proceed (Baekgaard et al, 2018). Research on this topic has focused on the different dimensions of policy capacity (Mukherjee et al, 2021), how public officials use academic research (Newman

et al, 2016) and the role of policy analysts (Howlett, 2015). A few ethnographic studies have highlighted how different groups of British civil servants use evidence for specific policy issues (Maybin, 2016; Marvulli, 2017; Monaghan and Ingold, 2019). But there is a relatively sparse evidence base on how the administrative features of policy bureaucracies shape their use of evidence (Christensen, 2021; Shaxson et al, 2024). This could be related to a lack of clarity in the research literatures on evidence-informed policy making and knowledge brokering about the range of different positions public officials occupy and the variety of roles they play in policy making processes (Stevenson, 2019). A more detailed understanding of specific roles could better highlight how the administrative aspects of work inside a government department shape how evidence is used.

This article begins to address these issues with empirical evidence from inside a government department. We structured our research questions as follows:

- How does the work of different groups of civil servants distinguish between 'evidence' and 'policy'?
- How could a framing of 'knowledge brokering' add to our understanding of their work?

To gain depth of analysis we focused on a small number of civil servants in one UK government department. Because brokering takes place at the interface between different communities, we wanted to understand whether there was an internal distinction between evidence communities and policy communities and whether any civil servants worked across the communities in ways that resembled knowledge brokering as described in the academic literature.

Research methods

Our approach was to draw on policy officials' own accounts of their daily 'mundane' work that supports evidence-informed policy making (Borst, 2023). This suggested an in-depth qualitative study of a single department, using semi-structured interviews with a purposive sample of participants.

Study site and sampling

The department selected for analysis was Defra, the UK's Department for Environment, Food and Rural Affairs. Defra leads the UK's policy making on environmental, rural, food and farming issues, advising other government departments and leading for the UK in international negotiations. As a ministerial department Defra is responsible for formulating and reviewing policies in its remit and for guiding legislation through parliament. It is led by a Secretary of State and junior ministers, and its staff work closely with a network of public sector organisations ('the Defra Group') which both provide evidence and advice to Defra under contract and are responsible for policy implementation (NAO, 2015).

Defra was selected for two reasons. First, in the mid-2000s it began a long-term initiative to better align its evidence base with its policy priorities and improve how it invested in evidence (Defra, 2006; 2010; 2014). Second, LS had worked as a consultant to Defra between 2004 and 2007, helping design the first project to improve how

the department managed its evidence base (Shaxson et al, 2009). This research was an opportunity to examine, over a decade later, Defra's approach to using its evidence base for policy making.

The history of how Defra developed its approach to evidence-informed policy making has been analysed elsewhere (Shaxson et al, 2024) so for this research we focused on analysing current practices around evidence use. To give us insights into a range of Defra's policy responsibilities and its central teams we selected three policy teams (marine and fisheries, air quality, and waste and resources), the office of the Chief Scientific Adviser and the office of the Chief Analyst. LS's professional network helped us reach a very senior official who granted permission for the research, gave an interview and enabled access to the five teams.

We used purposive sampling to ensure breadth of interviewees across teams and snowball sampling to ensure depth within them. Interviewing continued until no respondents could propose people beyond those who had already participated in or been approached for an interview. Of a total of 25, nine interviewees held positions at Grade 6 or in a Senior Civil Service (SCS) category, meaning they had significant and broad management or senior management responsibility. Three of these led policy teams, six were in a central team headed by the Chief Scientific Adviser (referred to by interviewees as the 'central evidence team') which also included the office of the Chief Analyst. Eleven interviewees occupied positions at Grade 7 or SEO/SSO (Senior Executive Officer or Senior Science Officer): six in policy teams, the other five in the central evidence team. At these levels civil servants have more focused policy responsibilities, and some management responsibility for junior staff. At one policy team's suggestion we interviewed two external experts because of their decade-long relationship with the team's advisory body. And to understand some of the history of Defra's work on evidence we interviewed three former officials who had held senior positions in Defra's central evidence team from the early 2000s: two in the senior civil service grades (SCS) and one Grade 6. Table 1 summarises the distribution of interviewees by grade and location.

The interviews

LS conducted all the interviews between 2019 and 2021. Seven took place face-to-face in Defra's London offices but the remainder were conducted during the COVID-19 pandemic over Zoom or telephone, depending on the interviewee's preferences. We

Table 1: Distribution of interviewees by type and grade of interviewee

	Location of interviewee		Total
	In the central science team	In a policy team	
Grade 6 or SCS	6	3	9
Grade 7 or SEO/SSO	5	6	11
Expert advisers	2	-	2
Ex-officials	3	-	3
Total	16	9	25

did not try to interview people who had been moved to working on pandemic-related issues, and none of our interviewees noted significant changes in their work because of the pandemic. Interviews varied between 30 and 90 minutes, with a median of 60. In-person and online interviews were recorded after obtaining the appropriate consent and subsequently transcribed verbatim. Typed notes were taken concurrently during phone interviews with the interviewee's consent. The audio recordings were anonymised at the point of transcription and the original recordings and interview key stored securely on a server at Kingston University. To preserve anonymity in a small sample, in the following analysis all quotes refer to the interviewee's team and the nature of their role but not their seniority.

Our questions differed depending on whether interviewees were from policy or central evidence teams (see Research Materials). Those in policy teams were asked about their roles, their daily work in relation to how they acquired and used evidence, who they worked with, how they related to them through routine and less formal interactions, and how they could be assured that the evidence was robust. Those in the central teams were asked who they worked with in policy teams to strengthen evidence and analysis, who else they worked with to manage Defra's evidence base, and what this work consisted of. Follow-up questions probed for specific issues they had raised. We were aware that prior structural changes in Defra had affected working relationships between civil servants in the policy and central teams, so we asked long-serving and former officials about the rationales for those changes. Because our focus was on the organisational aspects of evidence-informed policy making we did not ask about officials' interactions with political appointees as this would require a separate study or set of studies on evidence use within specific policy decisions.

Reflexivity

Reflexivity was an important consideration: LS needed to balance her sense of insiderness because of her prior work inside Defra with her sense of outsiderness because of the decade that had elapsed and her very limited contacts with a few Defra staff since then (Mercer, 2007). Insiderness can influence the interview process and how interviewees respond but can also lead to deeper questioning that picks up on shades of meaning in their answers, giving a more nuanced understanding (Boaz and Oliver, 2023) and helping tell credible stories about organisational life (Styhre, 2004). Taking field notes after each interview helped her reflexively analyse the interview process by observing and bracketing initial impressions that resonated with her previous experience in Defra (Tufford and Newman, 2012). For example, she remembered from 2004–7 a sense of frustration that much of the contemporaneous academic literature discussing evidence-informed policy making had been of limited use to the team devising Defra's first evidence strategy because it had an inadequate understanding of organisational structures, processes, relationships and incentives inside a government department. Writing field notes prompted the realisation that the organisational context for the interviews was less familiar than she thought and that her personal experience added little to how she understood interviewee responses and framed follow-up questions. This helped her maintain an open-minded approach to the questioning and analysis.

Analytical framework

We wanted to understand whether a framing of knowledge brokering (referred to hereafter as 'brokering') could add to our understanding of policy officials' work with evidence. But the work of brokering 'is complex, and it is not always clear where the brokering ends and other roles begin' (MacKillop et al, 2023: 2). We therefore focused on asking our interviewees about their daily work practices (Schatzki et al, 2001), seeking to uncover whether any of their everyday activities involved brokering and, if so, how brokering was made to 'work' in the everyday processes of a complex bureaucracy (Borst, 2023).

Following data familiarisation, we selected framework analysis as the analytical tool because it allows inductively- and deductively-derived themes to emerge from the data via processes of data description and abstraction (Goldsmith, 2021). This suited our approach of looking for activities the academic literature had already identified as knowledge brokering while acknowledging that other activities could emerge from the interviews.

To develop our own analytical framework we merged six frameworks focused on knowledge brokering activities (Lomas, 2007; Michaels, 2009; Fisher, 2010; Shaxson and Gwyn, 2010; Bandola-Gill and Lyall, 2017; Middleton and Whitmore, 2017) with a recent review of research-to-policy engagement activities (Oliver et al, 2022). From these we developed five main categories with associated sub-categories, allowing for fuzzy boundaries between them:

1. 'Informing' activities: for example, identifying knowledge needs, responding to evidence requests, facilitating access to evidence, presenting information accessibly, connecting to relevant experts, building capacity to interpret and use evidence, contextualising evidence within the policy environment.
2. 'Relational' activities: for example, translating evidence for non-specialists, connecting/matchmaking, building relationships, bridging different communities, engaging, collaborating, identifying and overcoming barriers to evidence use, mediating epistemological and practical differences in knowledge.
3. 'Framing' activities as the relational process of creating meaning (Chong and Druckman, 2007): working together to set the research agenda, formulating a shared understanding of evidence needs and co-producing questions to be answered with evidence.
4. 'Institutional' activities: for example, developing organisational structures or processes to enable knowledge brokering, reducing barriers to evidence use, implementing strategic and deliberate efforts to integrate informational and relational strategies.
5. 'Co-production' activities: for example, co-production, co-delivery and co-assessment of evidence with an emphasis on reciprocity, equality and mutuality and its active mitigation of unequal power relations (Bandola-Gill et al, 2023; Johnson et al, 2023). The terms co-creation and co-production are sometimes used interchangeably but following Brandsen and Honingh (2018) we associate co-creation with strategic design and planning; co-production with activities involving citizens in policy formulation or implementation.

LS conducted the coding, reflecting on the data with RH and AB. The analysis proceeded in three steps: indexing the data against the framework using MaxQDA software, charting the data using MaxQDA's code matrix browser function, and mapping and interpreting the patterns found within the charts.

Research materials

Research materials can be found at https://osf.io/sjpm4 (interview guide) and https://osf.io/rqzag (coding framework).

Findings

In the following analysis, quotes are coded P for policy maker, EA/ES for analysts/ scientists embedded in policy teams, CS for scientists working in the CSA's office, CA for analysts working in the Chief Analyst's office and F for former officials. The reasons for this differentiation are given further on in this article. Numbers were assigned randomly to each interviewee.

The nature of Defra's evidence base

The interviews revealed the complexity of Defra's evidence base. Evidence and analysis could be acquired from external organisations through research and consultancy projects commissioned by Defra teams, data and analyses generated by organisations elsewhere in the Defra Group, expert advisory committee reports and industry bodies.

Defra also generated a good deal of its own evidence and analysis: 'Defra is very data rich' (CA23: analyst, central analytical team). Interviewees mentioned regulated statistics that are generated and disseminated regularly, data from surveys such as the survey on Monitoring Engagement with the Natural Environment, cross-departmental initiatives to produce statistics on shared policy issues such as climate change and air quality, and data from Defra's network of earth observation facilities. They discussed how Defra staff produced quantitative models (such as Brexit's effects on implementation of different policies) and analysed the projected effects of different policy instruments. They noted that policy officials '(built) their cases on the back of quite extensive collections of information and insight' (CS10: scientist, central science team), mentioning systematic reviews and evidence syntheses done internally, with some external academic support, to support decision making.

This evidence was contained within a wide range of evidence products. Some were specific to individual policy areas, such as status reports on key environmental attributes, forward-looking policy strategy documents, position papers for policy negotiations or business cases for policy proposals. Others cut across policy areas. Some evidence remained internal, such as policy position papers, but there was a presumption that any evidence Defra commissioned from external sources should be published externally.

The functional separation between 'policy makers' and 'evidence specialists'

Interviewees distinguished between three groups of civil servants who contribute to evidence-informed policy making in Defra. The British Civil Service differentiates between 'professions' (Civil Service Professions, nd) with distinct job roles and responsibilities. Our interviewees were either in the 'scientist', 'analyst' or 'policy maker' professions. 'Scientists' had technical expertise in their specific policy areas that was not readily transferable: a fisheries scientist would find it difficult to switch to the science of waste and resources, for example. 'Analysts' such as social researchers, economists, statisticians and geographers had transferable skills and could move between policy areas: several analyst interviewees had moved between departments and policy areas in their careers. Interviewees used the term 'evidence specialists' to refer to scientists and analysts together. 'Policy makers' specialised in the legislative process: senior policy makers led direct interactions with political appointees such as Ministers and Special Advisers, calling in evidence specialists as necessary. The exception was the Chief Scientific Adviser (CSA), who, like other departmental CSAs, has a direct relationship with Ministers. The remainder of this article adopts the interviewees' terminology, using 'policy officials' when referring to all three groups together.

A small number of evidence specialists worked in central evidence teams under the direction of the CSA and Chief Analyst. However, most were embedded in policy teams, physically located (before the pandemic) with their policy maker colleagues in shared areas in Defra's main buildings and working towards their team's policy priorities: 'On the day-to-day [scientists and analysts] are embedded in their teams: they will be attending the policy team meetings, taking direction from policy Deputy Directors' (P14: policy maker, marine and fisheries). 'Taking direction' did not mean becoming de facto policy makers. Embedded evidence specialists worked closely with policy makers and shared each team's overall purpose for formulating evidence-informed policies, but they had their own functions and responsibilities; reporting upwards to the Chief Analyst and Chief Scientific Adviser who had overall responsibility for the quality and relevance of Defra's evidence base. One interviewee who had moved from working as an evidence specialist into a policy maker position emphasised that while their background helped them clarify their requests for evidence and understand it when it was presented to them, this was a complete change of role.

Because most evidence specialists were embedded in policy teams, the relationships of accountability for delivering evidence-informed policy making were complex. Embedded evidence specialists might be wholly responsible for the quality of the team's evidence base, but they and their policy colleagues were jointly accountable to Ministers for ensuring the evidence was used. This was complicated by the fact that the CSA was responsible for managing the part of Defra's overall budget that was allocated to evidence. Embedded evidence specialists worked with their policy colleagues to anticipate their evidence needs for the coming year and bid for their budget, but final allocations to each policy team were decided by the CSA (for more detail see Shaxson et al, 2024). One interviewee noted that one year they and their team bid for an evidence budget of £1 million but only received £150,000 which limited the extent to which their policy making would be informed by evidence.

So, within policy teams, embedded evidence specialists were accountable to the CSA for the quality of the evidence base and to Ministers for the quality of the resulting policies, but the amount of evidence they were able to procure was limited by Defra's overall budget for evidence and by the CSA's decisions on how that budget should be prioritised between teams. The next sections explore how they managed this complexity of distinct roles, a shared purpose and some shared accountability through a range of brokering functions.

'Informing' activities: making evidence available

Informing functions involve collecting relevant evidence and presenting it so that it is accessible to its users (Middleton and Whitmore, 2017). Embedded evidence specialists noted an almost constant demand for evidence from their policy maker colleagues: 'It does feel that there is always a request for evidence or there is a question of what does this mean for people or what would be the challenges for this or what's that based on' (EA07: analyst, marine and fisheries). To ensure that these demands were met, senior evidence specialists worked with policy maker colleagues to shape policy questions into ones that could be answered with evidence and analysis, delegating the commissioning process to be project managed by their junior evidence colleagues. Senior evidence specialists were responsible for quality assuring the evidence that emerged, either themselves where they possessed the requisite technical skills, from expert advisers or from peer reviewers in academia. The types of evidence commissioned and thus the make-up of each policy team's cadre of evidence specialists varied because different types of policy issue required different types of evidence. This had implications for how the informing function worked in different teams. In policy areas such as air quality where there was a risk of legal action against the government, evidence specialists would be very highly qualified and did much of the analytical work themselves. In other areas such as marine, they would tend to focus on summarising the evidence base generated by external organisations including academia.

This demand-pull aspect to 'informing' was complemented by one of supply-push. Evidence specialists also promoted Defra-generated evidence and analysis to other government departments to influence their policy making, such as the Defra-devised and Treasury-approved methodology for valuing the natural environment (Defra, 2023): '[We] send our sturdy economists and statisticians off into other government departments to help them … come to a similar place in in terms of value that we are coming from' (CS13: scientist, central science team).

Policy makers were not involved in the 'informing' function in any way: it was evidence specialists' responsibility to procure the best available evidence for the budget they had been allocated. We found no examples of evidence specialists trying to build their policy maker colleagues' capacity to understand and use evidence (Oliver et al, 2022). Although some policy makers already had considerable technical skills when they joined Defra, up to PhD level, the Policy Profession Standard 1.2 on Data, Analysis and Scientific Advice indicates that policy makers only require enough understanding of data collection techniques and statistical analysis so they know when to secure expert advice and how to build multidisciplinary teams (HM Government, 2021).

Relational activities: fostering evidence-informed policy debates

> Your success as a scientist … depends on your ability to work collaboratively with other parties and build bridges. (P22: policy maker, air quality)

Despite clear remits to strengthen policy making with robust evidence, building relationships was still an important part of the evidence specialists' work. How this was done depended on how relationships were structured, which depended partly on the size of the policy teams and partly on policy directors' preferences. One evidence specialist sitting in a policy division's central evidence team felt this gave them automatic influence: 'I'm sitting within the leadership team of a policy division which allows me to be very influential in how they think: we're working towards the same endeavour' (P20: policy maker, waste and resources). Where evidence specialists were more dispersed within policy teams, they worked individually with policy maker colleagues and met regularly as thematic groups to discuss their parts of the evidence base.

Many evidence specialist interviewees spent much of their time building relationships with evidence colleagues in other teams, other departments and internationally. This increased with increasing appreciation of the systemic links between policy issues, both within Defra and externally. One senior evidence specialist noted that this was becoming an important issue within Defra:

> [W]hen you're talking about very complicated systemic problems it's unsurprising if a policy maker will go for the route of least resistance and use policy instruments which are within their control to deliver what they are trying to deliver. [For them] this is a safer way of doing things than saying okay everyone, let's take a step back. (CS13: scientist, central science team)

Evidence specialists made significant contributions to building systemic understandings, often leading the process. The CSA had recently constituted a small central team of evidence specialists and seconded academics to apply systems approaches to understanding potential trade-offs and synergies between policy areas. This was welcomed by interviewees at all levels: 'The current systems researchers are encouraging the right debate across the department and across Whitehall' (P22: policy maker, air quality). This work on developing systemic understandings blurred the boundary between relational work and the framing work outlined next.

Framing activities: developing meaning in the policy process

Our interviews uncovered two distinct but complementary types of framing work through collaborative meaning-making. This located evidence specialists at the heart of policy development.

Framing as developing strategic purpose

The long-term nature of many of Defra's policy goals requires it to use evidence to anticipate a range of issues that could become future political priorities. The policy

strategy documents policy teams publish to set their forward priorities are developed in tandem with strategic evidence narratives. In 2016 Defra's CSA and the Government Chief Scientific Adviser drew together evidence on waste and resources to produce a report intended to change how Defra framed its waste and resources policy 'from a mindset of managing waste to one of increasing resource productivity' (Walport and Boyd, 2016: 5). The report was 'politically unpopular and difficult to publish' (CS11: scientist, central science team) because the evidence it contained challenged policy priorities, but soon after publication 'the politics just, pouf, changed completely, 180 degrees … it was the same time as *Blue Planet* … [the report was] about three years ahead of the policy curve and it was a great stimulus to the policy teams to get on with producing a strategy' (CS11: scientist, central science team).

While Walport and Boyd were able to work outside of the system because of their seniority, this would not have been possible for more junior officials. However, the resulting waste and resources policy strategy, produced by the policy team, contained a dedicated evidence annex (HM Government, 2018). This became a model for other teams to develop policy strategies containing an embedded narrative about their long-term evidence needs. This strategic framing work constructed shared meaning in two ways. First, creating high-level evidence narratives could help shape policy priorities by deepening Defra's understanding of purpose and scope for action. Second, evidence specialists could use these high-level narratives to construct more focused narratives around their shorter-term evidence needs which they used to support their annual budget bids.

Framing as meaning-making within policy formulation

A second type of meaning-making was done during the policy development process as evidence specialists 'ask(ed) provoking questions … sense-check(ed) the assumptions about the best way to achieve that particular thing' (CA24: analyst, central analytical team). Evidence could be used to, for example, challenge the logic of theories of change, scrutinise how beneficiary groups had been determined, or question how value for money criteria had been calculated. They would check how policy outcomes had been defined, encourage policy makers to consider systemic links between issues and confirm that policy evaluations had been well scoped and budgeted before policy business cases could be signed off. The bulk of this work was done by mid-level evidence specialists and their policy maker counterparts, supported by senior policy makers. 'I've found it … valuable to work at the (mid-level) SEO grade … that's where the day-to-day work is done but (you) ensure you maintain dialogue at the senior level' (CS1: scientist, central science team). Evidence specialists were clear that their role was to respond to policy priorities and needs, not to lead the process: 'You have to have that balance between this is what the evidence says, but you need to tell me what policy you're thinking about in order to make sure that the evidence I'm giving you is accurate and reasonable' (EA03: analyst, marine and fisheries).

Defra's evidence specialists therefore played important framing roles throughout the policy process, helping create meaning at different levels by contributing to setting policy's strategic direction and by challenging and clarifying policy purpose and design. But this was not necessarily a fully equitable process of co-creating shared meanings. As noted earlier, short policy timetables might mean that the evidence could not be fully explored, insufficient budgets could limit what evidence was accessible,

or the strength of political priorities might make it difficult to create space for the evidence to be collated and interpreted. Evidence specialists played a crucial role, yet the outcome of that role was shaped by policy priorities and timetables.

Institutional activities

Institutionalising brokering activities helps ensure their long-term impacts (Michaels, 2009; Shaxson and Gwyn, 2010). We found two linked types of institutional work to support relationships between evidence specialists and policy makers that had co-evolved: developing an appropriate organisational structure, and the process of planning and managing the evidence budget.

Defra's attempt to institutionalise an evidence-informed approach to its policy making began after it was created in the early 2000s. At that time, evidence specialists and policy makers were in separate teams with the CSA managing the evidence budget and overseeing the quality of the evidence base. A small team in the CSA's office attempted to reconfigure this structure, emphasising that the department's evidence base should be shaped by policy rather than by scientific priorities. After 2010, policy teams were given the authority to decide how they spent their budgets on procuring evidence and their staff budgets on evidence specialists, with the CSA's team meeting policy directors regularly to challenge and strengthen their decisions. But this system proved too weak to prevent policy makers cutting evidence budgets disproportionately during a period of austerity and after 2014 the CSA took back overall management of the evidence budget (Shaxson et al, 2024).

At the time of interviews this semi-embedded approach to structuring policy teams and managing the evidence budget was still in place. Policy makers and evidence specialists specified their annual needs for an evidence budget and submitted this to the CSA who decided final allocations. A team from the CSA's office monitored each policy team's monthly expenditure on evidence, reallocating underspends from one team to another as priorities shifted mid-year. Policy directors decided on staffing levels in their teams throughout the year, taking advice from the CSA and Chief Analyst based on which specialisms they were likely to need to manage their evidence base. This meant that discussions about the content of the evidence base were closely linked to discussions about what budget was available and to how many of which types of evidence specialist they would need in each policy team.

The semi-embedded institutional model and its budgeting process underpinned the other brokering functions we found. It facilitated relationships between policy makers and embedded evidence specialists but had two in-built checks and balances so that evidence specialists could not become policy makers by default. The first ensured that evidence specialists were accountable both to the CSA for the quality of the evidence base and to Ministers for ensuring that policies were evidence-informed. The second gave the CSA overall authority over the budget for procuring evidence, though policy makers controlled the budget for hiring the evidence specialists they needed to interpret and apply the evidence to their policy priorities. This ensured that Defra's evidence specialists retained the close relationships they needed to understand and contribute to policy priorities as well as the separation that knowledge brokers need to perform effectively (Bandola-Gill and Lyall, 2017; Watling Neal et al, 2022)

Co-production activities

Our analytical framework describes co-production as activities where evidence specialists and/or policy makers co-produce evidence with citizens, researchers and external organisations. Most formal processes of collecting evidence from citizens or organisations that interviewees mentioned were extractive rather than co-productive because evidence was given in response to predetermined questions. However, two senior interviewees mentioned Defra's use of citizens assemblies in developing the National Food Strategy, and public engagement exercises in which visual artists helped groups of citizens develop scenarios around future land use. One described involving policy maker colleagues and citizens in designing the research component for large-scale, long-term policy programmes such as the (now closed) Catchment Partnerships Fund. But, they noted, this type of co-production required long-term investment in building relationships. Significant cuts to Defra's overall budget in 2010 meant that programmes in which policy makers and evidence specialists directly engaged with citizens and researchers were now rare. Another echoed this point, noting that environmental policy making for the sustainability transition would increasingly require co-production approaches to developing Defra's evidence base (for example, Kass et al, 2022).

Interviewees' observations on knowledge brokering

In 2014 Defra noted that it would 'invest in knowledge exchange and brokering to ensure effective interaction between evidence providers and evidence users' (Defra, 2014: 29). But although both evidence specialists and policy makers described activities that our analysis suggests could be classed as brokering, most interviewees used phrases such as: 'insert evidence into the policy process', 'answer policy questions', 'help make policy decisions', 'ask provoking questions' or 'try to influence people'.

   The word 'brokering' was only used by three senior scientists in the central science team whose positions and experience in the department meant they had broad overviews of Defra's entire evidence base. They had not encountered other senior officials who understood brokering as a distinct set of activities, but they had been talking to each other for over a year about how formalising knowledge brokering could improve the flow of evidence into policy. They recognised that much of the evidence specialists' existing work could be described as brokering but there were no formal opportunities for learning about different approaches and their effectiveness. Recognising brokering as a distinct function would, they thought, emphasise a specific set of roles that would be complementary to the roles of evidence specialists and policy makers. Were this to happen, they felt it would require a significant change in the types of skills Defra sought, such as facilitating policy discussions, mapping key interactions within policy systems, synthesising fragmented evidence bases and increasing the amount of active work to co-produce evidence with citizens and other external actors. The systems research team was beginning to spearhead a broad debate about how an internal brokering function could be developed, though one observed that a prior conversation needed to happen across Defra about the different types of value evidence brings to policy making processes. This would lay the groundwork for discussing the value of a brokering approach

and developing a cadre of brokers (see Boswell, 2021, commissioned by Defra to provide this analysis).

Discussion

Our research aimed to answer two questions: how the work of Defra's civil servants distinguished between evidence and policy, and whether a framing of 'brokering' could help us understand more about evidence use in the policy process. In relation to the first, we found that there was a distinction between evidence roles and policy roles because of the way the British Civil Service codifies different types of expertise. This granted Defra's evidence specialists the autonomy that knowledge brokers need to perform effectively. But how Defra had organised those roles – embedding some of its evidence specialists within policy teams – fostered the close relationships with policy makers that knowledge brokers also require. There were sufficient checks and balances within the institutional structures, management lines and lines of accountability to ensure that evidence specialists saw evidence-informed policy making as central to their work but could not cross the line and become policy makers by default.

In relation to the second research question, many of the roles performed by Defra's evidence specialists aligned well with the way brokering is framed in the research literature, reflecting researchers' call for brokers to be accountable to both communities of science/evidence and policy making to ensure that evidence is relevant to policy making while maintaining its autonomy, authority, scientific credibility and independence (Michaels, 2009; Bandola-Gill and Lyall, 2017). They did not simply respond passively to policy priorities, but neither were they marketing particular policy solutions. Their work was a structured, collaborative, sometimes strategic, sometimes sharply focused process of 'collective puzzling' (after Heclo, 1974); non-linear in nature but shaped by the institutional structures and processes Defra had developed over the two decades since its establishment as a department. There were signs that senior officials were beginning to consider brokering as a specific and important evidence activity within the department; one that would complement existing roles by performing activities that aligned with new framings of policy making for the sustainability transition. This suggests that understanding the interactions between policy-oriented and evidence-oriented specialists in a government department as a form of knowledge brokering could give useful insights into relationships between evidence and policy.

Researchers have paid close attention to the institutional structures and processes that facilitate a brokering relationship between external organisations and government departments (MacKillop and Downe, 2023; MacKillop et al, 2023). Our findings show that to understand evidence use in the policy process it is also important to pay attention to whether brokering activities exist inside a government department and, if they do, how they are influenced by internal structures and processes for using evidence, how those developed, why any changes were necessary and how their history shaped current relationships between evidence and policy. We also highlight the importance of understanding how the budget for evidence is managed and how this shapes the institutional structures that facilitate a brokering approach. This adds to the list of mechanisms that need to be studied as we develop a fuller understanding of evidence-informed policy making processes (Oliver et al, 2014; Cairney, 2016; MacKillop et al, 2020).

However, being able to use the framework of brokering to analyse evidence–policy relationships inside government departments depends on there being a distinction between evidence roles and policy roles: unless we recognise which officials we are engaging with and the parts they play in the policy making process we can only have a limited understanding of how they might be using evidence (Cairney and Kwiatkowski, 2017). Our specific findings may be only relevant to the UK because of how the British Civil Service delineates evidence specialists from policy makers. Other administrations may merge evidence and policy responsibilities in the same person, relying more heavily on external sources of evidence and external knowledge brokers. But what we aim to show with this research is that seeking to understand brokering relationships from inside a government department is a useful exercise because it helps uncover this issue of role separation and the institutional factors that influence evidence use.

Conclusions

Researchers interested in how evidence is used to inform policy have long recognised the need to understand the detail of policy making processes. This article adds to the literature with empirical data indicating that knowledge brokering could be an important part of the 'complex choreography' of policy making (Gerblinger, 2023: 3), and that how it is performed is shaped by the organisational structures and processes which institutionalise different brokering functions.

To our knowledge this is the first study to provide a perspective on knowledge brokering from within a government department and it is unclear how transferable our findings are. A programme of comparative, empirical work would clarify whether what we found in Defra is echoed in other UK departments and in other parts of government in other countries. It would also help us understand the range of approaches to structuring evidence–policy relationships inside departments, how they do or do not facilitate a brokering approach, and the effects this has on evidence use. Building our evidence base of what evidence use looks like inside government departments would offer researchers opportunities to better understand the practicalities of policy work and improve how we theorise it (Christensen, 2021; Zacka, 2022). Detailed ethnographic research would help us gain a much deeper and more nuanced understanding of different brokering activities inside government departments, learning about the performative and substantive roles evidence plays in policy making (Stewart and Smith, 2015) and exploring how individual attitudes and behaviours towards evidence (for example, MacKillop and Downe, 2022) are shaped by organisational contexts. It could also extend our insights into the web of relationships between evidence specialists, policy makers and political operatives; understanding where and how the organisational aspects of policy making intersect with the political process and what this implies for evidence use.

A programme such as this will, however, require researchers to avoid using generic terms such as 'policy makers' to refer to all public officials. Doing so risks conflating roles and blurring our understanding of the detail of how evidence is used, which limits our understanding of officials' mandates and their discretion to act as they work with evidence in the policy process. In addition, researchers will be better able to communicate more effectively with public officials if we use terminology they are familiar with. In each jurisdiction we would need to clarify local terms.

Policy officials could gain from collaborating with such a research programme. Understanding more about brokering could help them think critically about their own roles in the policy process and provide a framework for sharing learning about how to improve relationships between evidence and policy. This is likely to become increasingly important as systemic links between policy issues become more visible and as new technology changes the ways evidence can be produced, synthesised and communicated.

Research ethics statement
Ethical review of the study was undertaken by Kingston University Research Ethics Committee which granted permission for it to proceed (Ref: 2019-04-003).

Contributor statement
LS conceptualised the study and designed it with advice from AB. LS conducted the investigation, data analysis and interpretation with contributions from RH and AB. LS wrote the first and subsequent drafts of the manuscript with comments from RH, AB and BH.

Data availability statement
The research materials are available at https://osf.io/sjpm4 (interview guide) and https://osf.io/rqzag (coding framework).

Conflict of interest
The authors declare there is no conflict of interest.

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