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Leadership and the hidden politics of co-produced research: a Q-methodology study

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Introduction

There has been encouragement from funders, universities and academics to co-produce research (Durose et al., 2018). Co-production of research can be considered a methodology in its own right, or an underpinning set of principles for other methods. Co-production aims to reshape relations between the researched and the researcher (Hemström et al., 2021). Yet, co-producing research rarely starts with a blank sheet, and is informed by antecedent power as well as prior experiences and expectations. Attention has been paid to practical barriers to co-production, such as time and resources, and there has been critical analysis of the claims made (Orr et al., 2009; Martin, 2010; Richardson, 2014). The ‘hidden politics’ of co-production as a research approach (Flinders et al., 2016) have also been identified.

This paper contributes to debates about such hidden politics of the co-production methodology in research. How leadership in research takes place matters, as it is a way of handling contestation over different aspects of methods, including the purpose and practices of research, and power differentials in co-production. Our study was motivated by our experiences of a co-produced research project on participatory urban governance. The project brought together citizens, activists, and practitioners from the public and voluntary, community and social enterprise sectors as co-researchers to conduct action research (Perry et al., 2019). Part-way through this process, participants started talking about the ‘elephants in the room’, referring to unsurfaced issues and concerns about the research, including issues of leadership. What became apparent was that people within the group held distinctly different preferences for what leadership in co-produced research should look like. For some, an initial period of relationship-building had led to frustration at the slow speed of delivery of the research, and they wanted more directive leadership to drive forward the project. For other co-researchers, leadership that facilitated openness and creativity was a welcome alternative to their usual professional practices. The aim of the subsequent Q-methodology study was to help us think through leadership in co-production, particularly in relation to negotiating difference, by setting our experiences in a wider context of the experiences of other co-produced research projects.

In the first section of this paper, we set out why we need to pay more attention to leadership in relation to the hidden politics of co-produced research. We elaborate three ways in which these hidden politics play out: divergent purposes, plural practices and power differentials. We then turn to the leadership literature to consider its alignment and limits in engaging with the politics of contested contexts such as co-producing research. In the second section, we set out the design of this study and offer a rationale for the use of Q-methodology as an appropriate way to study co-

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production as a research methodology. In the third section, we present the four distinct viewpoints on leadership in co-production that emerge from the survey. We elaborate upon the competing perspectives on the purpose, practice of leadership, and how power differentials should be addressed within co-produced research, with contrasting emphases on the purposes of creativity, outcomes, vision or equality. In discussing their divergence, as well as points of commonality, we demonstrate the value of centring questions of politics in debates on co-production and leadership. Our research demonstrates theoretical advance in understanding how leadership in co-production is contested, and practical utility in offering heuristics to help navigate the messy realities of co-producing research.

Situating co-produced research

In the field of knowledge production, there has been a history of experimentation, from participatory and community-based research (Goodson & Phillimore, 2012), to citizen science (Haklay, 2013). Co-production can be understood in the context of this ‘participatory turn’ (Facer & Enright, 2016), not as a prescribed or single method, but rather as a set of ideas for how to understand the world and do research (Banks et al., 2019). The number of co-produced research projects has increased, in part as a result of growing funder stipulations for ‘user’ engagement. Yet practice has out-paced the theorising of co-production, resulting in a range of normatively orientated studies, and fewer critical reflections on the distinctiveness or effectiveness of such knowledge production processes (cf Hemström et al., 2021). In some of the debates, normative considerations loom so large they pose a danger of crowding out important concerns of robustness and reliability of scientific methods (Richardson, 2014).

For example, co-produced research has been posed by some scholars as an alternative to a ‘traditional’ mode of knowledge production that is within disciplinary boundaries, university-centered, conducted in academic settings and led and controlled by academics using typical academic processes such as peer-review (Gibbons et al., 1994). In contrast, co-production has been argued to operate in a mode that is applied, transdisciplinary and change-oriented (Hart et al., 2013, 6). Advocates pose co-production as a means to address perceived limits of the traditional mode of knowledge production, e.g. that it is overly specialised and in part, detached from the field of study. Co-production has also been presented as a challenge to the academic monopoly on research expertise, by including applied expertise from beyond the academy (Nowotny et al., 2001). However, what has typically been less clear in such debates is how any potential tensions might be resolved within a piece of research, for example, between experiential ways of knowing, and established research methodologies (c.f. Richardson, 2013; 2014).

In this context, attention is being usefully paid to what has been called the ‘hidden politics’ (Flinders et al., 2016) of co-production. Such politics are ‘rarely referred to in the literature’, which instead tends to focus on the promises of inclusion (Oliver et al., 2019, p. 1). As such, co-production can present an ‘expectations gap’ for those involved when its ideals sharply contrast with the messier realities of practice (Flinders et al., 2016).

Hidden politics of co-production: purpose, practice and power

The hidden politics of co-production in research include a number of underlying tensions and debates about the purposes of scientific work, its practices, and how power is negotiated.

First, conducting research in non-traditional ways is likely to encounter substantive differences in values and incentives, aims and priorities, standards of knowledge and cultures of working, experiences, expectations of working within different kinds of institutional cultures, and timescales (Bovaird, 2007; Flinders et al., 2016; Martin, 2010). Co-production necessarily brings together people with not only different forms of expertise but who likely have different *purposes* for being involved in co-produced research, for instance, linked to achieving more effective policy outcomes,

reframing policy problems, delivering social justice or empowering those experiencing hardship or disadvantage (Bevir et al., 2019; Williams et al., 2020). Some have argued that the purpose and practice of co-production in research ought to be social justice and the democratisation of the academy (Ersoy, 2017), for example, through involving lay people in research, or the creation of 'utopian' spaces for creativity and remaking the world through imagination (Bell & Pahl, 2018). Research funders may also see co-production as a pathway to impact, whilst others centre the importance of 'societal problem solving' as the end goal of co-production, with research outputs a secondary benefit (Polk & Kain, 2015, p. 2).

However, for some scholars, these emphases unhelpfully devalue the primacy of scientific methods and the goals of publishing original and significant knowledge. Whilst academics may have multiple motivations for their work, they continue to be assessed according to traditional systems of peer review and institutional cultures, which value academic publications above other forms of output (Durose et al., 2018). Despite acknowledged issues with peer review (Walker, 2010), it remains a crucial core platform for quality assurance of scholarly work. Unpublished and unreliable results do not contribute to the body of knowledge in the world. This is not to create a false dichotomy between social science and relevance (Bastow et al., 2014), but to acknowledge that there may be trade-offs between them, for example, some studies have shown that academic performance is lower in research projects with non-academic involvement (Newig et al., 2019).

Second, co-production is commonly understood as a process that is non-linear, iterative and unfolding. In working collaboratively and seeking to integrate diverse forms of expertise, many accounts highlight the need for flexibility and openness in structures and processes (Garud et al., 2008), such that research can be 'palpably and directly affected' by wider participation (Fung, 2001, p. 79). Emergence, uncertainty and creativity are seen as hallmarks of co-productive research. Consequently, the design of appropriate *practices* to negotiate uncertainty and flexibility in research processes, and enable the integration of 'experiential expertise' is essential (Collins & Evans, 2002). However, tensions can be generated between the need for openness, and the pre-determined, well-established and tested requirements of robust methods, particularly deductive approaches, in social scientific research; and on a practical level, the need for academics to fulfil the research design and methods as set out in their promises to funders, and the standards required for publication.

Third, co-production in research values multiple forms of expertise, and advocates often have a normative orientation towards the rights of citizens to have a voice in research that affects them (Lister & Beresford, 2000; Williamson & de Souza, 2010). This raises questions about how differential power should be negotiated throughout the research process (Bell & Pahl, 2018). Whilst co-production is sometimes seen to be able to 'dissolve' prior conflicts and tensions (Voorberg et al., 2015), this perspective masks challenges (Oliver et al., 2019), for example, to the idea that academics define and legitimate knowledge (Hart et al., 2013; Pohl et al., 2010; Walker, 2010). Co-production opens up research to under-represented voices (Brock & McGee, 2002; Gaventa, 2005), and decentres traditional roles in research (Lister et al., 2000; Hemström et al., 2021; Williamson & de Souza, 2010), seeing expertise as distributed across the 'many not the few' (Bennett & Roberts, 2004, 7), without privileging one specific group (Pohl et al., 2010, p.217; Porter, 2010). For advocates of co-produced research, academics should not be assumed to be the sole knowledge producers. However, doing research demands specific skills and sets of expertise, for example, in methodologies, methods, a familiarity with a given field, and so on. Whilst lived experience or experiential expertise may be a complement to scientific expertise, it is not a substitute. Therefore, how can co-researchers contribute in a meaningful way to a research process, without simply defaulting to conventional hierarchies where academics dominate?

The question of who is leading in co-produced research is central to how these three sets of debates might be resolved or addressed. Who decides where the emphasis lies on the purpose, who and what shapes what methods are used in practice, how are differences in expertise and background handled? Before introducing the design of our study to address these leadership questions, we first examine the theories and assumptions about how leadership may align with the ideas of co-

produced research, and the limits of existing theory in negotiating the politics of leadership in contested contexts, such as the co-production of research.

Leadership in co-produced research

A recently commissioned study for Economic and Social Research Council (ESRC), the UK's largest public funder of social science research concluded that 'the existing evidence base on research leadership within higher education is incredibly limited' (Flinders & Anderson, 2019, p. 13). However, some scholars have begun to examine certain aspects of how leadership is being transformed within higher education (Van Ameijde et al., 2009; Youngs, 2017), including the challenges of undertaking interdisciplinary research (Edelenbos et al., 2017), and how leadership can support research impact (Jeong & Choi, 2015). There has been relatively less focus to date on research leadership in the context of changing modes of knowledge production (Jasanoff, 2006), and emerging new 'modes' that challenge traditional relationships between science and society (Gibbons et al., 1994; Maasen & Lieven, 2006). Some studies have centred on the contribution of particular leadership types or styles to co-production, such as relational leadership (Bussu & Galanti, 2018; Schlappa & Imani, 2018), others the modes of leadership that may be appropriate in different governance conditions (Tortzen, 2017).

Looking to the broader leadership literature, a pre-occupation with those who have formal authority within a given organisation or context may be noted. However, there is increasing recognition that it is insufficient to seek to understand leadership solely through attention to those in such positions (Hartley, 2018). Instead, more distributed conceptualisations that recognise the value of leadership that involves and mobilises actors from different backgrounds and positions (Bolden, 2011; Gronn, 2000); acknowledge different sources of authority, power and legitimacy (Hartley, 2018); and examine the processes and practices of leadership 'which shape the attention and resources of others' (Hartley, 2018, p. 203) are gaining prominence. For example, theories of 'systems leadership' (Ghate, 2013), emphasise mobilising collaboration across traditional sectoral or organisational boundaries. Similarly, theories of 'facilitative' (Bussu & Bartels, 2014) or 'adaptive' leadership (Heifetz, 1994) advocate wider mobilisation to help navigate unpredictable and uncertain contexts, and to produce innovation.

Such theories of facilitative and adaptive leadership may, at first glance, seem a natural fit with co-production, given the emphasis in both on empowering diverse networks of actors working collaboratively, and in recognising claims to authority based on different forms of expertise, such as applied or experiential knowledge. However, such alignment has neither been examined empirically, nor has engaged substantively with the politics that such leadership may involve.

Challenging established conventions on research leadership remains 'counterintuitive' within the academy (Bolden 2011, p. 254). The leadership authority of academic researchers, even within co-produced research, is reinforced in multiple ways. For example, funding conventions can mitigate against co-production, due to a reluctance to provide the longer-term or more distributed funding required to build different forms of collaboration (Durose et al., 2018). Also, standard ethical conventions of research may serve to 'protect institutional power at the expense of community empowerment' (Durham Community Research Team, 2012, p. 9), and are ill-suited to the ethical complexities of co-produced research (Thomas-Hughes, 2018). Other commentators have highlighted the broader risk that the distinctive ethical and political stance of co-production may be 'diluted' (Williams et al., 2020) through its 'capture' by the neoliberal university (Bell & Pahl, 2018), which may serve to reinforce academic authority within co-produced research.

Existing leadership theories – like the existing theorising of co-production – is limited in terms of engaging with the politics involved in mobilising those without formal authority to become leaders. As Hartley has observed, leadership theory has – until recently, at least – 'neglected the existence and treatment of both formal and informal politics', which has 'impoverished leadership in whatever sector or sphere' (2018, p. 207). This absence of politics has been based on a misplaced

assumption of shared goals and aspirations concerning leadership (Hartley, 2018), which is unlikely within co-production's plurality of interests, goals, aspirations and values. As Gordon (2010, pp. 282–283) notes, the literature on distributed leadership has often adopted 'a normative, apolitical approach to power', neglecting the political skills of leadership, particularly in contexts of contestation (Hartley, 2018).

In this article, we seek to interrogate the preferences for forms of leadership of those involved in the co-production of research, and what this means for understanding the power, purpose and practice of leadership in this context. In particular, we are interested in understanding not only different perspectives on how leadership can negotiate the inherent contestation within the co-production of research but what are the points of commonality and divergence between the viewpoints on leadership. What for example, are the trade-offs made between being directive and inclusive, innovative and accountable, open to what emerges and sharing power? With these questions in mind, we now turn to the research design of our study.

Methods

The remainder of this paper focuses on the results of a Q-methodology study that aimed to redress the dearth of empirical studies on leadership in co-produced research, and interrogated the alignment between the leadership preferences of respondents with experience of co-produced research. The methodology under discussion in this paper is that of co-produced research. We used a Q-survey as our specific method for primary research about leadership in co-produced research. However, Q-methodology is also a methodology in its own right, which involves technique (sorting), method (factor analysis), and associated ontology and epistemology. In this section, we discuss the choice of Q as our data collection and analysis method.

Motivated by the discussion on 'elephants', noted in the Introduction, we initially undertook 17 qualitative interviews with those involved in our co-produced research project to understand their views on research leadership (see [Appendix 2](#)). Analysis of these interviews revealed little consensus around what research leadership should look like, with participants differing on the leadership role of academics, and on the value of a more distributed approach. Rather than seek to settle these debates, we wanted to gather more data from a wider population, to further explore competing interpretations of the problem at hand, including points of contention and agreement. Therefore, we then conducted the Q-methodology study with 32 respondents involved in a range of research projects on urban governance that self-identified as co-producing research, drawn from three funding programmes – two in the UK and one in Sweden.

Q-methodology is particularly well suited to the challenges of exploring competing opinions, as it is designed to clarify alternative perspectives on complex and contested topics (Watts & Stenner, 2012). Q reveals and describes divergent views in a group as well as consensus. It involves a process called 'Q-sorting' – where participants rank order, using a pre-set grid (see [Appendix 1](#)), a large set of items (usually statements) about the topic under investigation (see [Appendix 2](#)). These Q-sorts are commonly conducted with 25 to 40 participants (Watts & Stenner, 2012), then analysed using principal component analysis (PCA) or factor analysis to find a set of shared viewpoints (Brown, 1980).

Our study consisted of a set of 42 statements that each provided a different ending to the sentence 'Good leadership in co-production . . .'. Respondents ranked these statements, based on the extent of their agreement with them, and the PCA of these Q-sorts produced a set of four shared viewpoints. We give a detailed account of how we developed and undertook the research, applying a well-established five-step process for conducting Q-methodology studies (McKeown & Thomas, 2013), in [Appendix 2](#). In this section, we focus on three key reasons why we selected the method as a means of understanding leadership within co-produced research.

First, Q-methodology surveys employ structured Q-samples provide a means to systematically interrogate the structuring theoretical propositions in a transparent and replicable form (Brown,

1980). A Q-methodology survey was a way to explore notions of research leadership by subjecting our theoretical presuppositions to examination by others involved in co-producing research. Through our interviews within the original co-produced research project, along with our review of relevant literature, we developed an incipient typology of four ideal types of leadership in co-production, which we termed, 'directive', 'distributed', 'shared', and 'adaptive'. These ideal types may be positioned along two axes, which run as continuums: one running between leadership aligned with formal authority, and leadership not aligned with formal authority; the other, from leadership aligned with particular individuals, and leadership not aligned with particular individuals. 'Directive' leadership was understood as leadership held by individuals in formal positions of authority; 'distributed' leadership as held by individuals informally, and not primarily based on any positions of authority; 'shared' leadership as held between individuals imbued with formal authority; 'adaptive' leadership as held between individuals informally and not primarily based on any positions of authority. We used these four ideal types, along with the distinction between purpose, power and practice within leadership, outlined earlier, to structure our Q-sample of 42 statements (see [Appendix 2](#)). Our findings demonstrate that our respondents' judgements did depart from and nuance our initial expectations in important ways.

Second, Q-sorting is an intensive forced-choice process that induces reflection in the respondents as they iteratively sort, prioritise and comment on the statements in order to arrive at their final rank order. This process of reflection was important in relation to the topic of leadership, which we already argued is a 'hidden' element of co-production, which may be primarily characterised by implicit assumptions. Moreover, the large number of statements allowed respondents to render a detailed and nuanced account of their perspective, while also producing data that can be subjected to systematic, transparent and replicable quantitative analysis.

Third, conducting an online Q-methodology study enabled us to extend beyond the original research project, with a scientifically robust method that allowed us to be more confident that the viewpoints we found were not determined by the specific features of one individual case of a co-productive research project. Q-methodology does not rely on large-N person samples to produce statistically meaningful results, with most Q-studies involving between 25 and 40 people (Watts & Stenner, 2012). Its rigour is partly based on the quality of the 'Q-sample', which represents and summarises the diversity of debate on the topic under consideration. The Q-sample, known as the 'concourse', was drawn from a review of relevant literature, and illustrated through statements typifying the debates collected from the initial qualitative interviews. The full set of statements in our structured Q-sample is shown in [Table 1](#) in [Appendix 2](#). Our purpose was to characterise the range of diversity of preferences on the questions of leadership in co-produced research.

In the next section, we outline the four shared viewpoints on good leadership that resulted from the PCA of the respondents' Q-sorts. We arrived at these by interpreting the 'PC arrays' (see [Appendix 3](#)) – composite Q-sorts created from the weighted average statement scores of all those Q-sorts with a statistically significant loading onto the PC (and without a similarly large loading on another PC). Each PC array thus represented the shared features of those with similar viewpoints in an aggregated position. Our interpretations focus on the full set of statements as 'gestalt', elaborating the relationships of the parts to the whole, whilst paying particular attention to 'characterising statements', namely those at the extremes of the distribution grid (most agree/most disagree), and 'distinguishing statements', those with a statistically unique placement for a single viewpoint, as is standard practice within Q-methodology (Brown, 1980; Watts & Stenner, 2012). The free-text comments of exemplar respondents – those with a statistically significant loading on a single viewpoint – were provided to explain why they chose their most agree/disagree statements were also drawn upon to enrich these interpretations.

Four viewpoints on good leadership in co-production of research

This section sets out the four viewpoints on what constitutes good leadership in co-production of research as identified through our analysis.

Viewpoint One: Creative Leadership

Creative Leadership was ‘marked by the presence of creativity, the ability of a group to move’ (s41, +4, 0, +2, +2)¹ and was premised on the ‘underlying relationships’ (s34, +4, +4, +1, +1) between those involved in co-production. For this viewpoint, such relationships were a pre-condition for creativity, allowed for unexpected outcomes, and also enabled the co-production process to adapt to changing circumstances, respond to group dynamics and preferences, and address inequalities in power within the group.

Flexibility was key for *Creative Leadership*, as evident from the characterising statement, ‘good leadership in co-production is not about one particular style that suits all purposes’ (s36, +4, +3, -1, 1). As one exemplar argued, ‘flexibility is important – even in the same process, different stages need different [...] styles’ (RES11²).

This interpretation was reinforced by the distinguishing statements for *Creative Leadership*. It was the only viewpoint that reacted negatively to the statement that ‘good leadership in co-production means knowing where you are, knowing what your role is, knowing what is expected of you and you getting on and doing it’ (s01, -2, +1, +3, 0)³; which one exemplar remarked was ‘too inflexible and undemocratic’ (RES26). It was distinguished by its relative neutrality about the statement that ‘good leadership in co-production needs a clear process for how decisions will be made’ (s22, -1, +4, -3, +3). As one exemplar commented, ‘Co-production is nearly always messy there are no clear process-oriented ways of doing it’ (RES01).

Challenging power inequalities was an important theme. That leadership in co-production ‘can mean telling someone what to do’ (s37, -4, -1, -2, -2) was strongly rejected, since this risked ‘undesirable hierarchies’ (RES07). Indeed, *Creative Leadership* was notable for its focus on ‘addressing real but invisible hierarchies and how that shapes decision-making or what people feel’ (s38, +3, 0, 0 + 2). A distinguishing view was that leadership in co-production is complicated by antecedent social position, ‘feeling that you can be a leader is about gender, class, experience’ (s25, +2, -2, -3, -1). In *Creative Leadership*, ‘you do not “give” people power, you stop preventing them from exercising power’ (RES23).

Viewpoint Two: Outcomes-focused Leadership

Outcomes-focused Leadership defined the purpose of leadership in co-production as ‘ensuring activity towards an outcome’ (s15, -2, +4, +1, -1). Without this focus, as one exemplar explained, ‘the exercise becomes meaningless process and everyone ends up disappointed’ (RES19). *Outcomes-focused Leadership* also valued relationships (s34, +4, +4, +1, +1), but took a more instrumental view than *Creative Leadership*, emphasising that relationships would help to take account of the ‘real strengths each party is bringing’ (RES19). For this viewpoint, leadership was about getting things done; rejecting notions of group decision-making and collective voice. Decisions were to be taken by whoever had the most appropriate skills and capacities. Relationships of trust, clear structures and transparent processes supported this priority. Lower priority was placed on addressing inequalities in power.

Lack of clarity about structures and processes, for example, ‘fudging moment-to-moment’ (s2, -2, -4, 3, -3), was most strongly rejected in *Outcomes-focused Leadership*. As one exemplar commented, ‘On rare occasions maybe ambiguity is useful, but making it a big part of a leadership model does not seem a positive trait’ (RES32). Instead, *Outcomes-focused Leadership* relied upon ‘a clear process for how decisions will be made’ (s22, -1, +4, -3, +3).

Outcomes-focused Leadership was also distinctive in its rejection of group decision-making. For example, disagreeing that good leadership in co-production is about ‘getting things done as a group’

(s10, 0, -3, +1, +1) or ‘all feed[ing] into something and com[ing] out with a collective voice’ (s17, -1, -3, +1, +2). Its negative position on ‘the group taking ownership of the process and facilitating that so that decision-making is shared’ (s11, +1, -3, +2, +4) was similarly distinctive. One exemplar explained, ‘It is rare for multiple minds genuinely to take joint ownership of an activity, goal, or process’ (RES32).

Outcomes-focused Leadership was more comfortable than the other viewpoints with hierarchies, with much less emphasis on addressing power relations. For example, emphatically rejecting the idea of leadership as ‘the very difficult task of inviting someone into a space and then trying to give them power’ (s29, -1, -4, +2, +2). It was distinguished in its neutrality that good leadership in co-production ‘sometimes means someone just saying, actually, this is the way we are doing it’ (s20, -3, 0, -2, -3).

Viewpoint Three: Visionary Leadership

Visionary Leadership emphasised ‘being visible and articulating a vision, but also being prepared to listen to people and to modify that vision’ (s28, 0, 3, +4, +4) and to have ‘empathy and awareness’, ‘holding people to the sense of purpose’ (s16, +1, +1, +4, 0). Whilst clarity on roles was deemed important, fixed processes were eschewed in favour of leader’s discretion to act, improvise and not be overly constrained by structure. Power dynamics were treated pragmatically.

Visionary Leadership was understood to be importantly empathetic. As one exemplar reflected, ‘my ability to empathise and engage with others has been the sole determining factor in helping me be successful when leading co-production activities’ (RES29). Such ‘soft’ skills were seen as crucial in catalysing people to act creatively and to ‘start thinking for themselves’ (RES29). As another exemplar suggested leadership in co-production was ‘to facilitate and guide, but not to impose my view of the world’ (RES9). Indeed, another statement positively characterising this viewpoint was, ‘good leadership in co-production should promote the individual ability of people to act with a degree of autonomy and creativity’ (s33, +3, +2, +4, +1).

Visionary Leadership was characterised by a pragmatic acknowledgement of unequal power. It valued clear roles for participants and space for leaders to lead, as reflected in the distinguishing statement ‘good leadership in co-production means knowing where you are, knowing what your role is, knowing what is expected of you and you getting on and doing it’ (s01, -2, +1, +3, 0). However, *Visionary Leadership* was also strongly negatively characterised by the statement ‘good leadership in co-production needs a clear process for how decisions will be made’ (s22, -1, +4, -3, +3). One exemplar elucidated that a ‘loose structure’ is needed, so that as a leader you can ‘go totally off-piste but still pull everything back together’ (RES29).

However, *Visionary Leadership* did not uncritically accept existing power relations. It was concerned with ‘giving everyone the opportunity to speak rather than it just being left for the kind of loudest voices to be the ones that are going to speak’ (s39, +3, 0, +3, +4). But this perspective was not the same as advocating sharing power. An exemplar offered useful nuance, ‘I don’t agree co-production shares power’ (RES09), ‘being present, “staying with the trouble” (Haraway, 2016), is essential as is being willing to adapt and re-orientate in order to reflect community concerns not just those of the academy/ funders’ (RES09).

Viewpoint Four: Egalitarian Leadership

Egalitarian Leadership in co-production of research was presented as creating a shared, inclusive process for a ‘collective purpose or identity’ (RES08). This viewpoint was characterised by the statements: ‘Good leadership in co-production means the group taking ownership of the process and facilitating that so that decision-making is shared’ (s11, +1, -3, +2, +4) and ‘that we all feed into something and come out with a collective voice’ (s17, -1, -3, +1, +2). *Egalitarian Leadership* facilitated this collective purpose primarily through creating transparent structures for decision-making, to constrain antecedent power of well-resourced group members and ensure that decision-making is genuinely shared by all.

Clear structures that empower and make co-production a shared process, lay at the heart of *Egalitarian Leadership*. As one exemplar reflected, ‘It is the most challenging and yet necessary activity to create structures that enable everyone in the group to [...] engage productively in decision-making’ (RES27). Empowering structures were coupled with actively including all members of the group. A ‘key competence of process leaders’ (RES24) was avoiding the ‘loudest voices’ (s39, +3, 0, +3, +4) to dominate. Another exemplar reinforced this, saying: ‘good leadership is about empowering, not leaving some behind’ (RES12).

Egalitarian Leadership also constrained the over-powerful. Describing how ‘good leadership in co-production needs structure in order to empower people’ (s08, -1, +2, -1, +2), another exemplar reflected: ‘Structure protects the weak and moderates the strong ... and thereby shares the load’ (RES21). Transparency was seen to bring power differentials into the open. So ‘good leadership in co-production is about identifying and addressing real but invisible hierarchies and how that shapes decision-making or what people feel’ (s38, +3, 0, 0, +2) because ‘sometimes power imbalances and various kinds of privilege are not overt’ (RES08). Structure and transparency constrained the exercise of arbitrary power, because, as one exemplar explained: ‘Without process, co-production can be hi-jacked by those with hidden agendas, embedded privileges, or implicit feelings of their own right to manipulate the process’ (RES21).

Comparison across the viewpoints

Our analysis found differences and similarities between the four viewpoints of leadership in the co-production of research. Table 1 presents the viewpoints, breaking them down into the lines of enquiry introduced earlier of purpose, practice, power, formality and authority.

Each viewpoint had a unique emphasis regarding the *purpose* of leadership in co-production of research, addressing the question of what leadership is for. The purpose of *Creative Leadership* was to allow creativity to flourish (s41, +4). *Outcome-focused Leadership* was focused upon delivering outcomes (s15, +4). The purpose of *Visionary Leadership* was to articulate a mobilising vision (s28, +4). *Egalitarian Leadership’s* overriding purpose was ensuring equal participation in determining group decisions (s11, +4).

Each viewpoint was also distinctive on the *practices* of leadership: on how leadership in the co-production of research should be enacted. Both *Creative Leadership* and *Outcomes-focused Leadership* emphasised the value of relationships. For the former, this emphasis was oriented towards building group resilience so co-production would not be derailed by differences. For the latter, relationships were a way to discover participants’ expertise, in order to harness it in pursuit of outcomes. In contrast, *Egalitarian Leadership* was focused less on relationships than in realising coherence and consensus through clear process. *Visionary Leadership* provided another departure, in its emphasis on enabling individuals to act on their passions, in order to realise a vision.

There was agreement across viewpoints that leadership in the co-production of research should acknowledge *power* dynamics between participants. But, there was divergence in how far the leadership of co-production should seek to transform power relations; each viewpoint had

Table 1. Summary of similarities and differences between viewpoints on leadership in co-produced research.

Viewpoint	1: Creative Leadership	2: Outcomes-focused Leadership	3: Visionary Leadership	4: Egalitarian Leadership
Purpose	Creativity	Outcomes	Vision	Equality
Practice	Building group resilience	Identifying and incorporating all relevant expertise	Enabling individuals to take responsibility for what they feel passionate about	Maintaining group cohesion and consensus
Power	Redistributing power	Working with power	Working with power	Redistributing power
Formality	Flexible and relational	Clear and formal	Flexible and relational	Clear and formal
Authority	Emergent	Leaders by expertise	Leaders by discretion	Group by consensus

a distinctive interpretation about whether antecedent power should be accommodated or redistributed, whether leadership should be primarily relational or subject to formalised structures, and who gets to take decisions and by what process. These differences were illustrated by different rankings of the statement: ‘leadership is about identifying and addressing real but invisible hierarchies’ (s38; +3, 0, 0, +2). *Outcomes-focused* and *Visionary Leadership* recognised that sensitivity to power dynamics is important, but were not actively concerned with transforming them. In contrast, *Creative* and *Egalitarian Leadership* actively sought to redistribute power within the group through either relationships or clear and transparent structures respectively.

The viewpoints were differently divided on the importance of *formality*, as evidenced by the statement, ‘good leadership needs structure in order to empower people’ (s08; -1, +2, -1, +2). Here *Outcomes-focused* and *Egalitarian Leadership* were aligned in seeing leadership exercised through formal structures, dividing them from *Creative* and *Visionary Leadership*, which both preferred a more relational and emergent leadership approach.

There were complex differences between the viewpoints on where authority lies and how it is exercised. *Outcomes-focused* and *Visionary Leadership* were comfortable with the idea of leaders who make decisions, even resorting to ‘undemocratic’ means (s27, -3, +3, +3, -3). But these viewpoints differed on the ground by which legitimacy to take decisions is claimed, between appropriate individuals based on their substantive expertise for *Outcomes-focused Leadership*, compared to flexibility allowing for the leader’s discretion in *Visionary Leadership*. For *Creative Leadership*, who decides and how decisions cannot be pre-specified and depended on specific circumstances and group dynamics. For *Egalitarian Leadership*, decisions were taken by the group through a clear and consensus-oriented structure.

Discussion

There has been limited engagement to date in the questions of leadership implied by the hidden politics of co-production in research. The wider literature on leadership has been similarly ‘impoverished’ in its engagement with issues of politics and contestation. Our study has sought to interrogate these lacunas through a Q-methodology study with respondents with experience of co-production in research. The study asked respondents what constituted ‘good’ leadership in the co-production of research. Our research identified four distinct viewpoints, and in this section, we will discuss the implications of our study for thinking about the politics of leadership in co-produced research.

Three of the four viewpoints aligned with the core normative concerns of advocates of co-produced research. For example, the emphasis in *Creative Leadership* on retaining flexibility to manage complexity and group dynamics, aligned with the emphasis in the theory and practice of co-production on emergence. The focus on *Egalitarian Leadership*, using structure to ensure equity and inclusion and to constrain the power of the dominant, was in line with an emphasis in co-production on opening up research to under-represented voices. *Visionary Leadership* emphasised the role of co-production in crossing boundaries between different actors or sets of expertise in research, allowing participants to pursue their own intellectual curiosities within a wider collaborative endeavour. In contrast to a focus on process, *Outcomes-focused Leadership* emphasised the role of leadership in co-production as a means of generating outcomes, for example, delivering the research and impact programme designed by the academics. This position was not seen as antithetical to co-production approaches in this viewpoint. The important differences between the viewpoints reinforce the contested nature of leadership and of co-produced research itself, supporting the value in centring questions of politics.

The viewpoints also had differing implications for the assumed authority of academics within the research process. *Creative Leadership* sought synergies between participants, but its emphasis on emergence may risk a potential default to academics dominating the process. Such emergence may

also challenge the rigour, potentially undermining both science and relevance. *Outcomes-focused Leadership* may reduce trade-offs between academic and societal outcomes (Newig et al., 2019), potentially supporting scientific standards, but also possibly diluting the distinctiveness of co-produced research. *Visionary Leadership* has the potential to empower diverse participants, but its pragmatism regarding power differentials again opens the risk of academic dominance. *Egalitarian Leadership* perhaps most explicitly seeks to guard against this risk, but in doing so may restrict the ability to enforce scientific standards. Our research suggests is that no single viewpoint on leadership is able to easily navigate the tension between espoused social distribution of expertise and the antecedent power of academics, with varying implications for the robustness, relevance and inclusiveness of co-produced research.

However, as the preceding section acknowledged, whilst the viewpoints are distinct, there are also important points of alignment or overlap. For example, the re-distributive approach to negotiating power differentials shared by *Creative* and *Egalitarian Leadership* viewpoints, and a more negotiated approach on working with power from *Outcomes-focused* and *Visionary Leadership* viewpoints. Similarly, on a flexible and relational approach to working shared by *Creative* and *Visionary Leadership*, and a preference for clear and formal structures shared by *Outcomes-focused* and *Egalitarian Leadership*. These points of connection offer a way to think about how these different viewpoints on leadership within co-production may be bridged, for example, at different points in the co-production process, or as the dynamics of the group or demands of the endeavour evolve. For instance, *Visionary Leadership* mobilising and enabling participants before shifting into *Outcomes-focused Leadership* focusing on delivery, or *Egalitarian Leadership* providing a grounding to allow *Creative Leadership* to flourish. The viewpoints were all sensitive to issues of equality, diversity and inclusion, but approached them differently. For example, *Egalitarian Leadership* reflected an emphasis on clear and formal structure as a means to redistribute power and embed a collective and shared endeavour. In contrast, *Outcomes-focused Leadership* had a less redistributive approach, but shared a preference for clear and formal decision-making structures in order to allow different forms of expertise to come to the fore.

Overall, the viewpoints contribute to the field by focusing attention to leadership skills or practices involved in the co-production of research, an area of noted neglect in both co-production and leadership literatures. Whilst some scholars, notably Jean Hartley, have developed a focus on political astuteness within leadership research over recent years, this is less developed in the context of co-production (Perry et al., 2019). They may also act as heuristics to enable those engaging in co-production to surface and discuss some of the messy realities of practice and points of contestation, for example, how different preferences for leadership may be met in different ways or points of the co-production process (Durose et al., 2021), and the different mixes of skills and practices required to lead (Perry et al., 2019).

Conclusion

The focus in this article on the leadership of co-produced research offers a contribution that challenges the misplaced assumptions of shared goals and assumed consensus, which remain influential within literatures on both leadership and co-production that retain a strongly normative orientation. Our contribution is to centre the inherent contestation within co-production and so bring questions of politics, and leadership to the fore within co-production of research.

We drew upon the tensions we experienced in our own efforts to co-produce research to develop a Q-methodology study on the question of leadership in co-production. Our use of Q-methodology enabled us to surface competing interpretations of leadership in co-production, including points of contention and agreement, in a way that both retained its empirical grounding but also offered systematic and replicable analysis. The viewpoints evidenced differences concerning the purpose of leadership in co-production of research, the practices it required, how to navigate power differentials, and formality and authority within decision-making. The differences in perspective we have

identified, are likely to be found within the same co-production effort, and have tangible consequences for how the challenge of leadership should be considered.

The significance and contribution of this article lies in devoting critical attention to uncovering and interrogating how viewpoints on leadership in co-production of research differ, as well as align. In doing so, we have opened up new avenues for research on co-production in other domains. These include the value of further theorising and interrogation of the implications of the different collaborative traditions that inform co-production, and their implications for practice. Also, the political leadership skills that co-production demands, how such skills may be enabled or constrained within different institutional and governance contexts, and how and when in co-production, the evolution or configuration of different leadership practices may occur. Whilst our Q-methodology approach allowed us to analyse the diversity of attitudes, it did not account for their prevalence nor how they align with particular groups, conditions or points in the process of co-production which, again, further research may usefully address.

By centring the politics of co-production, we have been able to offer a step-forward by surfacing distinct perspectives on leadership in the co-production of research and offering a heuristic for practice. Opening up such debate offers a way to help navigate the messy realities of practice in co-production, as well as advancing the theorising on how to respond to the contestation inherent in co-production. The consequence of our work is not to argue for a new model or template for leadership in the co-production of research. Instead, the findings point to the importance of elucidating these differences in perspectives on leadership, in the interests of surfacing hidden politics and provoking discussion on how differences can be negotiated within a co-production process.

Notes

1. The quoted scores demonstrate a particular statement's position in the respective PC array, for example, s41, +4 means that statement 41 is positioned in the most-agree column in the PC array for the viewpoint under discussion, hence is positively characterizing. See [Appendix 2](#) for full detail.
2. An identifier for the quoted exemplar respondent of a particular viewpoint.
3. The quoted scores demonstrate a particular statement's position in the respective PC array. For example, (s01, -2, +1, +3, 0) means that statement 1 is scored by viewpoint one as -2; by viewpoint two as +1, and so on. Where the score is given in bold, it is to indicate the viewpoint under discussion, see [Appendix 2](#) for further detail.
4. Participants were able to select more than one role, hence why the number is greater than 32.
5. HTMLQ is provided for free on GitHub by aproxima: <https://github.com/aproxima/htmlq>
6. 1. Kaiser–Guttman criterion suggested retaining eight PCs. 2. Humphrey's Rule suggested retaining three PCs. 3. The Scree Plot suggested retaining two PCs. 4. There were six unrotated PCs with two or more significantly loading Q sorts (at the 1% level).

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Appendix 1. A pre-set Q-sort grid

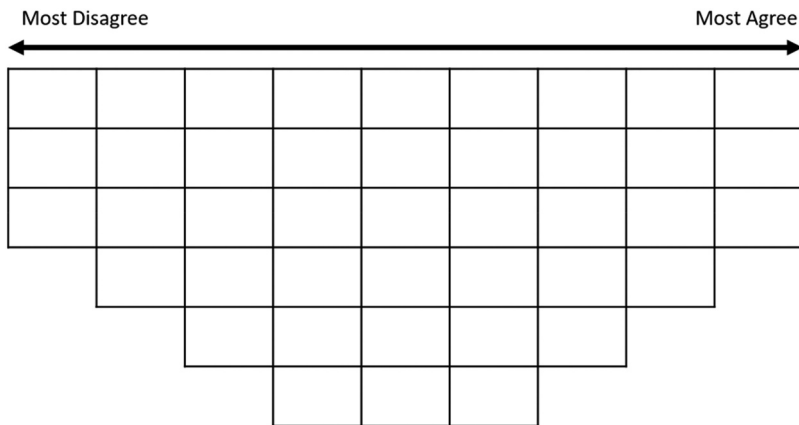


Figure 1. A pre-set Q-sort grid

Appendix 2. A five-step process for conducting a Q-methodology study

This methodological appendix provides technical detail about how we constructed our Q-methodology survey, carried out the collection of the Q-sorts, and analysed the results. We followed a five-step process, as laid out by McKeown and Thomas (2013). This approach is a well-established practice within Q-methodology, with other foundational texts, such as Brown (1980) and Watts and Stenner (2012), offering very similar guidelines.

Step 1: Developing the Q-sample

The first stage of Q-methodology study is to develop a 'Q-sample' of statements for the participants to rank. The Q-sample must be constructed to reflect the diversity of debate on the topic under consideration – here, leadership preferences in co-produced research. A Q-sample represents and summarises these debates, which are known in Q-methodology as the 'concourse'. Therefore, the first stage in creating the Q-sample is to map the concourse.

To map the concourse, we drew on two sources: a review of relevant literature and a series of semi-structured interviews, conducted with 17 individuals from within the initial co-production project, focusing on their experiences of and preferences for leadership. Of these 17, 4 were academics, 1 worked in a public sector organisation, 12 were from community, voluntary or social enterprise sector organisations; and of the 13 non-academics; 5 non-academics also offered consultancy, training, and research services. An initial concourse of 224 statements was generated from these sources. The next stage was to reduce this long-list to a smaller Q-sample of statements that was both manageable for participants and preserved the diversity of the concourse.

To achieve this, we employed a theoretically informed sampling grid, producing a structured Q-sample (Fisher, 1960; Brown, 1980). A sampling grid provides a framework for selecting the Q-sample, ensuring that statements have an underlying order and relationship with each other. Our sampling grid was based on two dimensions. The first was a typology of four ideal types of leadership along two continuums: one running between leadership aligned with formal authority, and leadership not aligned with formal authority; the other, from leadership aligned with particular individuals, and leadership not aligned with particular individuals. These ideal types – 'adaptive', 'distributed', 'shared' and 'directive' – represented our initial theoretical propositions based on our incipient analysis of the literature review and our qualitative data. The second dimension of our grid was based on key features of these different ideal leadership types – purpose, practices and power – specifically relevant for our study, given the leadership challenges in co-production identified. We also selected a fourth feature – dysfunction – to allow for greater critical engagement in the question at hand. The 224 statements were then assigned across the sampling grid, with duplicate statements iteratively removed to produce a Q-sample of 42 statements, as shown in Table 2.

Step 2: Recruiting the person sample

Q-method does not rely on large-N person samples to produce statistically meaningful results, with most Q-studies involving between 25 and 40 people (Watts & Stenner, 2012). A sample of 32 international key informants with prior experience of research projects involving a university partner and self-identifying as using co-production were recruited for this study. Personalised invitations were sent to 120 key informants who met these criteria and were involved in funded research supported by any of three relevant programmes, two in the UK and one in Sweden. These programmes were selected due to scale, international scope and portfolios of projects focusing on co-produced and/

Table 2. Structured Q-sample Grid.

Statement: "Good leadership in co-production..."				
	Purpose	Power	Practices	Dysfunctions
Directive Leadership	S01 means knowing where you are, knowing what your role is, knowing what is expected of you and you getting on and doing it.	S37 can mean telling someone what to do, that can have a plus side of speed, efficiency, coherence and very clear accountability.	S31 is being commended for success but also being held responsible when things go wrong.	S35 is strong leadership, even when it means some people tend to keep ideas to themselves.
	S09 is having a strong leader. That is not the enemy of participation, it is how you ensure people stay connected and engaged.	S20 sometimes means someone just saying, Actually, this is the way we are doing it.	S26 means someone being able to take the bull by the horns, but at the same time, putting your arms around people and nurturing them, being empathetic.	S04 may sometimes leave the people who are at the bottom of the hierarchy feeling a lack of control or a lack of agency about what they are doing. But that is the price of leadership.
Shared Leadership	S10 is about getting things done as a group.	S08 needs structure in order to empower people	S11 means the group taking ownership of the process and facilitating that so that decision-making is shared.	S21 is sharing power even at the expense of some clarity, some expediency.
	S17 means that we all feed into something and come out with a collective voice.	S22 needs a clear process for how decisions will be made.	S16 does not imply greater knowledge or anything else, it implies empathy and awareness and also holding people to the sense of purpose.	S42 is willing to sacrifice some responsibility for equality.
		S39 is giving everyone the opportunity to speak rather than it just being left for the kind of loudest voices to be the ones that are going to speak.	S28 means being visible and articulating a vision, but also being prepared to listen to people and to modify that vision.	S19 shares power but that sometimes means a sort of suffocation and an inability to act.
				S12 is not just sitting around talking about your feelings.

(Continued)

Table 2. (Continued).

Statement: "Good leadership in co-production..."				
	Purpose	Power	Practices	Dysfunctions
Adaptive Leadership	<p>S34 is about the underlying relationships, which are essential.</p> <p>S07 is not necessarily about agreeing with it, but about being on that journey together.</p> <p>S13 depends on the situation what kind of leadership is most appropriate.</p>	<p>S38 is about identifying and addressing real but invisible hierarchies and how that shapes decision making or what people feel.</p> <p>S25 is complicated, feeling that you can be a leader is about gender, class, experience, whether you think you have a right to be heard?</p> <p>S33 should promote the individual ability of people to act with a degree of autonomy and creativity.</p>	<p>S03 is about trusting in the process, and just kind of seeing what happens.</p> <p>S41 is marked by the presence of creativity, the ability of a group to move.</p> <p>S18 is about having fun, relating to people as people, not being so formal.</p> <p>S30 is not about being on a white horse, it is about enabling everybody else to fulfil a function or a role effectively.</p> <p>S36 is not about one particular style that suits all purposes.</p>	<p>S02 means fudging moment-to-moment.</p> <p>S05 is very loose, which makes some people feel uncomfortable.</p>
Distributed Leadership	<p>S15 is about ensuring activity towards an outcome.</p> <p>S24 is about bringing together a range of different capacities. That's got to be better than if one single brain tries to do everything.</p>	<p>S14 is people being comfortable enough to take the lead when it is appropriate, like if somebody has an insight or expertise in an area, it makes sense for them to lead.</p> <p>S23 sits with the person best qualified to lead on that particular thing.</p>	<p>S40 is about people feeling that they can say, I have this idea and I want to take it forward.</p> <p>S32 is about saying, Come on guys, we have got to do this! Making everyone feel good, pumping everyone up.</p>	<p>S29 involves the very difficult task of inviting someone into a space and then trying to give them power.</p> <p>S06 wants to be innovative but falls back into the old patterns.</p>

or engaged research. This process produced a sample of 19 individuals with experience of co-production as academic researchers, and 21 with a range of experience beyond academia.⁴

Step 3: Q-sort

The participants conducted the Q-sort online using the specialist programme HTMLQ,⁵ hosted on a domain that we created specifically for the purposes of this project. The software first presents the statements to the participants one-by-one in a random order, with an option to sort the statements into three categories: agree, neutral and disagree. Respondents are then presented with the statements in these categories for a second time, so that they can refine their choices by ranking them beginning with the extremes of the ranking grid – namely, in our study to choose their three most agree and three most disagree statements, iteratively working towards the neutral point (the middle of the grid presented in Figure 1). The software then presents the fully completed grid to the participant, asking them if they wish to make any changes (which they can do by dragging and dropping statements, much like in the digital version of the card game solitaire) before confirming their finalised Q-sort. Finally, participants were given the option to provide free-text responses clarifying their selection of their three ‘most agree’ and ‘most disagree’ statements. On average, respondents took 24.5 minutes to complete their sort, and contributed 204 words of free-text response.

Step 4: Analysis

We used principal component analysis (PCA) to identify statistically significantly different shared viewpoints across the Q-sorts. This analysis was conducted with the specialised software PQ Method (Schmolck and Atkinson 2014), which first generated a correlation matrix between the 32 Q-sorts, based on relative differences in statement rankings. Then, the PCA extracted the common variance from this correlation matrix as principal components. The next stage is to identify how many of the extracted principal components should be retained as substantively meaningful. We ran the four standard statistical tests for determining this, but, as is common (see Watts & Stenner, 2012), the results between tests varied, suggesting retaining between two and eight principal components (PCs).⁶ Therefore, we ran multiple solutions, extracting different numbers of PCs, varimax rotating them, and interpreting the resulting PC Arrays to judge their substantive meanings. We began with two PCs and added a new PC until doing so added nothing to the substantive interpretation. We stopped this process after analysing the six PC solutions, because we judged that in the five and six PC solutions, the additional PCs were not substantively meaningful and did not provide any advantage over the four PC solutions. As such, this process resulted in a varimax-rotated four PC solution.

In Q, the researchers’ interpretation of the most substantively meaningful solution is acknowledged to have primacy (McKeown & Thomas, 2013; Watts & Stenner, 2012). However, there were also some statistical factors that indicated a four PC solution provided the optimal trade-off between parsimony and comprehensiveness, measured in terms of explanatory variance and coverage of statistically significant Q-sort loadings. A varimax solution attempts to maximise Q-sorts loading on a single PC. The four PC solutions comprehensively covered the Q-sorts (every respondent had at least one significant loading), whilst also having only five confounded Q-sorts (that is, Q-sorts with more than one significant PC loading), the lowest number of the comprehensive solution. The four PC solutions captured 57% of the explanatory variance within the individual Q-sorts. Adding an extra PC increased the explanatory variance to 62%, but increased the number of confounded Q-sorts to 9 and diluted the clarity of the substantive interpretations of the PCs.

Step 5: Interpretation

The final step is to interpret the substantive meaning of the PCs, using the PC arrays created by PQMethod. PC arrays are composite Q-sorts created from the weighted average statement scores of all those Q-sorts with a statistically significant loading onto the PC (and without a similarly large loading on another PC). We include the statement-by-statement scores for the PC arrays and the participants’ PC loadings in the tables below. As aforementioned in the article, our interpretation of the arrays followed the standard Q-methodology practice of focusing on the full set of statements as ‘gestalt’, elaborating the relationships of the parts to the whole, though paying particular attention to ‘characterising statements’ (those at the extremes of the distribution grid), and ‘distinguishing’ statements (those with a statistically unique placement for a single viewpoint). The process of interpreting the PC arrays was one of intensive discussion amongst the four authors. This included a full-day workshop to discuss and agree a set of an initial set of interpretations, followed by an iterative process of drafting the interpretations, then sharing, commenting and redrafting. Throughout this process, we employed the free-text comments of exemplar participants (those respondents with a statistically significant loading on a single viewpoint) as a reference point to check the validity of our interpretations.

Appendix 3. Principal Component Arrays

Table 3: PC Arrays.

Statement	Creative Leadership		Outcomes-focused Leadership		Visionary Leadership		Egalitarian Leadership	
	Q-score	Z-score	Q-score	Z-score	Q-score	Z-score	Q-score	Z-score
S01	-2	-0.75*	1	0.45	3	1.38*	0	0.04
S02	-2	-0.58*	-4	-1.91	-3	-1.63	-3	-1.29
S03	2	0.89	-2	-0.75	3	1.05	-1	-0.37
S04	-4	-1.52	-4	-1.48	-2	-0.95	-4	-2.09*
S05	1	0.26*	-2	-1.06	-2	-0.92	-2	-1.20
S06	-2	-1.03	-1	-0.48	-4	-1.90	-4	-1.70
S07	2	0.96	-1	-0.47	0	0.15	3	1.19
S08	-1	-0.36	2	0.97	-1	-0.51	2	0.90
S09	-1	-0.45	1	0.67	2	0.66	-1	-0.65
S10	0	-0.15*	-3	-1.16*	1	0.58	1	0.62
S11	1	0.70	-3	-1.10*	2	0.86	4	1.60*
S12	1	0.13	3	0.99	1	0.45	0	0.32
S13	2	1.08	2	0.73	1	0.63	0	0.14
S14	<i>0</i>	<i>0.03</i>	<i>0</i>	<i>0.17</i>	<i>0</i>	<i>0.06</i>	<i>1</i>	<i>0.48</i>
S15	-2	-0.83	4	1.71*	-1	-0.27	1	0.66*
S16	1	0.81	1	0.43	4	1.50*	0	0.03
S17	-1	-0.41*	-3	-1.40*	1	0.55	2	0.70
S18	1	0.35	1	0.54	2	1.02	-2	-0.66*
S19	-3	-1.48	-2	-0.91	-4	-1.69	-3	-1.21
S20	-3	-1.38	0	0.21*	-2	-0.72*	-3	-1.58
S21	0	-0.15	-1	-0.63	-2	-0.69	0	0.23
S22	-1	-0.24*	4	1.86*	-3	-1.12*	3	1.11*
S23	-2	-0.95	1	0.56*	-3	-1.30	-1	-0.10*
S24	2	0.89	1	0.65	0	-0.13*	3	1.12
S25	2	1.09*	-2	-0.83	-3	-1.28	-1	-0.38
S26	<i>-1</i>	<i>-0.26</i>	<i>-1</i>	<i>-0.46</i>	<i>0</i>	<i>-0.14</i>	<i>-1</i>	<i>-0.32</i>
S27	-3	-1.51	3	1.21	3	1.34	-3	-1.32
S28	0	0.01*	3	1.08	4	2.14*	4	1.24
S29	-1	-0.22*	-4	-1.65*	2	0.68	2	0.75
S30	1	0.21	2	0.68	-1	-0.30	3	1.11
S31	<i>0</i>	<i>-0.12</i>	<i>0</i>	<i>-0.22</i>	<i>-1</i>	<i>-0.39</i>	<i>-1</i>	<i>-0.42</i>
S32	-3	-1.22*	-1	-0.50	0	-0.10	-2	-0.67
S33	3	1.15	2	0.90	4	1.39	1	0.57
S34	4	1.58	4	1.77	1	0.27	1	0.66
S35	-4	-1.79	-3	-1.38	-4	-1.81	-4	-2.00
S36	4	1.58	3	1.54	-1	-0.21*	1	0.52*
S37	-4	-1.76*	-1	-0.42	-2	-0.65	-2	-1.07
S38	3	1.53*	0	-0.23	0	-0.10	2	0.97*
S39	3	1.28	0	-0.19*	3	1.37	4	1.58
S40	3	1.15	2	0.73	1	0.43	0	0.47
S41	4	1.54*	0	0.09	2	0.65	2	0.69
S42	0	-0.06	-2	-0.71	-1	-0.36	-2	-0.66

Q-scores indicate placement in the composite Q-sort, i.e. the three statements with scores of 4 would be in the most agree column and the other three with -4 in the most disagree column, thus constitute 'characterising' statements.

Z-scores show the weighted average score for exemplar Q-sorts for the respective PC. Q-scores are derived from ranking the Z-scores. * indicates a 'distinguishing' statement that is uniquely placed for the respective PC, i.e. a statistically significant difference at the 5% level.

Italics indicates a consensus statement, where there is no statistically significant difference between any of the four PCs.

Table 4. Respondents' PC Loadings.

Respondent	PC1	PC2	PC3	PC4
01	0.51	0.03	0.27	-0.06
02	0.52	-0.06	0.23	0.38
03	0.42	0.33	0.51	0.33
04	0.23	0.06	-0.02	0.67
05	0.28	0.49	-0.35	0.16
06	-0.11	0.48	0.39	0.23
07	0.82	-0.13	0.17	0.18
08	0.30	0.03	0.13	0.73
09	0.37	0.16	0.49	0.39
10	0.15	-0.38	0.16	0.58
11	0.57	-0.06	0.34	0.32
12	0.20	0.05	0.25	0.72
13	-0.08	0.33	0.07	0.46
14	0.42	0.43	0.07	0.52
15	0.75	0.18	0.02	0.20
16	-0.42	0.33	0.26	0.47
17	0.35	-0.03	0.33	0.57
18	0.08	0.20	0.34	0.64
19	0.15	0.70	0.03	0.31
20	0.11	0.10	0.73	0.18
21	0.44	0.20	0.05	0.69
22	0.18	0.77	0.38	-0.02
23	0.60	-0.02	0.03	0.46
24	0.43	0.21	0.39	0.54
25	0.45	0.08	0.43	0.50
26	0.60	0.20	-0.14	0.36
27	0.20	0.25	0.05	0.66
28	0.58	0.23	0.25	0.35
29	0.18	0.00	0.75	0.11
30	0.49	0.36	0.09	0.55
31	0.30	0.23	0.30	0.44
32	-0.05	0.62	0.02	-0.02

Any PC loading greater than or equal to .40 is statistically significant at the 1% level

Bold indicates exemplar participants whose Q-sorts were used to create the PC arrays for the respective PC. Exemplars are selected if they have a significant loading on one PC and no similarly large significant loading on a second PC.