

Full Report

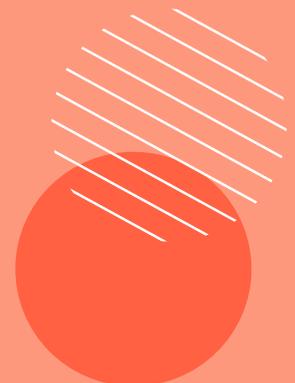
# The Value of Co-Production Research Project: A Rapid Critical Review of the Evidence

What are the different types of co-production  
within research and what are their value(s)?

Version 1.0 [31 October 2022]



Co-Production  
Collective



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# Summary of Key Findings

## Definitions of values and co-production

- There is no single definition of rich co-production; it tends to be characterised by a set of values (principles) or conditions.
- Although the absence of a single definition can lead to 'conceptual stretching' and even misuse of the term, flexible definitions may be needed until academic systems are more accommodating.
- Amongst the range of potential barriers to co-produced research mentioned, current academic culture and practice was one of the most mentioned.
- Potential facilitators typically involved ensuring that the underpinning values were considered and planned for.
- Expectations around what co-production of research could achieve included: enhancing the research, building capacity, changing mindsets, and developing relationships.
- The review identified more principles underpinning co-production than existing standards indicate. The principles often overlap and are interlinked, but they are likely to be important to distinguish when developing guidance or planning a co-produced research project.

## Different ways of doing co-production: how values are enacted (or not)

- We identified four main types of co-produced research report: (1) Rich co-production and co-authored (7 studies); (2) Rich co-production but not co-authored (3 studies); (3) Co-production vision but not execution (5 studies); and (4) Other Patient and Public Involvement (Patient and Public Involvement (PPI)) research approaches (13 studies).
- More than half of the sample of studies did not report that they had adequately implemented key principles of co-production, despite using the term co-production. It is unclear how much of this is due to a lack of reporting of key details.
- Co-authorship of all co-producers on research publications was often indicative of richer co-production and ensured that the different voices were retained throughout the project.

## The underexplored impacts of co-production

- Reported benefits of co-production were rarely formally evaluated; they were typically anecdotal.
- We are unable to speculate about the size of the impacts, but there was a general consensus that co-production is a positive approach for improving research projects and meeting their goals, plus outcomes for co-producers such as satisfaction and self-esteem.

## Overarching observations

- The current academic culture and systems, especially as they relate to funding and publication, do not create a good environment for most co-production research projects to reach their potential. However, this should spur researchers to challenge the academic status quo rather than be deterred from co-producing research.
- Co-production is a complex methodology that needs to be resourced, planned, evaluated, and reported—just like any other research methodology.
- Unlike most other research methods, though, co-production can also be seen as a complex intervention in its own right, with intended and unintended impacts beyond that of the focus of the research project. The values underpinning co-production can be seen as the mechanisms through which change can be achieved.
- We need to shift current thinking from a product/output focus, to also emphasise the impacts of the process of producing something, such as building relationships. In co-production, both the journey and the destination are important.





## Main Report

### Background

Recent reviews of co-production have noted an absence of research that documents some of the outcomes of co-production in research (**Fox et al. 2018, Slattery et al. 2020, Smith et al. 2022b**), which has led some to question whether the benefits of co-production actually outweigh the potential drawbacks of co-production in all cases (**Oliver et al. 2019**). Much of the literature on co-production recognises that there is a spectrum of approaches that are described as co-production (**Fox et al. 2018, Oliver et al. 2019, Smith et al. 2022b**) and that there are multiple and overlapping definitions of co-production (**Boyle and Harris 2009**). However, there is also recognition that not all co-production described in the literature upholds the values that are viewed as integral to co-production.

The deliberately egalitarian nature of co-production is thought to make it stand out from other forms of participatory involvement (**Williams et al. 2020**). However, not all research studies badged as co-production does fulfil this principle (**Williams et al. 2020**), and research that does not may be at greater risk of the type of drawbacks from incorporating co-production that others have described (**Oliver et al. 2019**). Conversely, an assumption that all 'co-produced' research follows a set formula or method overlooks the reality that co-production represents a spectrum of approaches, but these approaches are underpinned by a common set of values. Here we examine what these values should be and how researchers adopt (or ignore) these values in their work.

Understanding how the values (principles) of co-production are enacted is also dependent on co-producers reporting what activities are conducted and how. Previous reviews have called for better reporting of co-production activities (**Slattery et al. 2020, Smith et al. 2022b**), although only some have offered insights into what should be reported. In their recent review, **Smith et al. (2022b)** suggested that the following should be recorded:

- A description of activities they undertake as part of co-production;
- Which stakeholders were involved in this process and in what way ways, with a particular emphasis on how power is shared between stakeholders;
- The stages of the research and implementation process these stakeholders were involved in;
- Skills that were developed by participants (including researchers); and
- The desired and achieved outcomes of these activities and the methods used to assess these outcomes.

Furthermore, there is a need for the development of criteria on how we can distinguish between research that does uphold the values of co-production from research that uses co-production but does not uphold the values of co-production. This can reflect the depth of co-production implemented, and in the case of co-producing social care services, the Social Care Institute of Excellence (**SCIE 2022**) made a distinction between levels of co-production and co-production that is:

**Transformative** – where new relationships between staff and people who use services are created where people who use services are recognised as experts in their own right. There is respect for the assets that everyone brings to the process and an emphasis on all the outcomes that people value, rather than just those – such as clinical outcomes – that the organisation values

**Intermediate** – where there is more recognition and mutual respect, for example where people who use services are involved in the recruitment and training of professionals

**Descriptive** – where co-production already takes place in the delivery of services as people who use services and carers work together to achieve individual outcomes, but activities cannot challenge the way services are delivered, and co-production is not really recognised (this descriptive form may not actually reflect most people's understandings of co-production).

**In translating these to the production of research we could, for example, consider:**

**Transformative** involvement as where there is a documented change in decision-making in the course of the research through mutual recognition of expertise and respect and a shared agreement around the outcomes/focus of interest.

**Intermediate** where there is mutual recognition of expertise and the skills of co-producers through, for example, active involvement, although there is less evidence around shared decision-making.

**Descriptive** where co-producers are informed and engaged but not involved further.

## Research aims

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Using existing frameworks and criteria as a starting point, this rapid critical review aims to:

- (ii) Map the evidence and identify typologies of co-production based on the values and activities.
- (i) Explore and identify the characteristics of theoretical studies that examine co-production in terms of: the values/principles described, attempts to implement the values, and the barriers/facilitators that support/hinder the co-production of research.
- (iii) Identify and summarise the value/impacts/influences of co-produced research, and particularly to understand the value of co-produced research that upholds the values in (i).

To avoid being prescriptive and developing a technical algorithm of how co-production should be implemented (e.g., describing specific types of activities) (Moini 2011), the criteria developed will seek to assess how co-production values are supported and how these map onto stages of the research process (the latter of which does follow a more structured process).

## Methods

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### Identifying the evidence for the review

We developed our search strategy by pearl-growing search terms from the exemplar studies and reports recommended to us by experts and the review advisory group and conducted a separate search for systematic reviews on the topic to describe the overview of the literature. We then mapped the key search terms and search sources used to find relevant literature and checked for relevant references in the reviews

To achieve rapidity, we focussed only on the two largest bibliographic databases where the exemplar studies and those relevant studies from the reviews were also indexed (SCOPUS and Web of Science) and Google and Google scholar. To be included in the initial results the study had to use at minimum the term "co-production" but may have used other terms alongside this AND we searched for terms for Value OR Values OR Benefit as well as identified any subject headings relevant to each database. We combined concepts using Boolean operators.

Results from databases and handsearching were uploaded into EPPI reviewer information management software (Thomas et al 2003) deduplicated and screened against the inclusion criteria for both Stage 1 and Stage 2 sections of the review.

# Stage 1

## Identification of the values of co-production

This stage addresses research aim (i): Explore and identify the characteristics of studies that self-identify as co-production, in terms of: the values/principles described, attempts to implement the values, and the barriers/facilitators that support/hinder the co-production of research.

### Purpose

Our overall review seeks to understand the value of co-production. However, we recognise that the co-production of research involves a number of different approaches which are evolving. Some approaches described as co-production may fall squarely within what most would deem to be recognisably co-production, while others use the label of co-production without upholding some of the expected core principles (**Williams et al. 2020**). This 'cobiquitous' use of the label 'co-production' (**Williams et al. 2020**), to describe activities that have very different 'values' (principles), distorts our understanding of the potential and value (impact) of co-production in research.

In Stage 1, our main purpose was to understand the 'values' that should be considered core when undertaking co-production of research through examining theoretically orientated literature. Identifying if/how studies embody these values (principles) of co-production will help us to unpick the added value of co-production of research.

In addition, we were also interested in whether the ways in which studies define and frame co-production could help to illuminate what co-production represents or the impact that it should have. To help understand the potential applications and benefits of co-production in research, we examined what these papers described as the value of incorporating co-production in research. At this stage, these values could be considered 'stated' values for the most part – they represent theorised benefits of incorporating co-production in research. Ideas around the benefits and value of co-production may also be based on tacit (i.e., rooted in experience, practice, and values) knowledge and informal observation. In Stage 2 we explored the extent to which these benefits are realised in empirical studies (studies that report data).

## Approach

We developed a preliminary list of values that could be considered essential in co-production through initially drawing on values described by the Co-Production Collective (2022) and the Social Care Institute of Excellence (2022). These are described in table 1 below.

Source	Value	Description
Co-Production Collective (2022)	<b>Human</b>	"We value people as people, do everything wholeheartedly, and work to make a genuine difference."
	<b>Transparent</b>	"We share power, make decisions openly and collectively, and are accountable to our co-production community."
	<b>Inclusive</b>	"We support everyone to be included and participate fully in our co-production community."
	<b>Challenging</b>	"We say it like it is, continually questioning both the status quo and ourselves, even when that's the hard thing to do."
Social Care Institute of Excellence (2022)	<b>Equality</b>	Necessitating a shift in power towards research beneficiaries: "Everyone has assets; no one group or person is more important than any other group or person"
	<b>Diversity</b>	In perspectives, characteristics, and experiences
	<b>Accessibility</b>	Removing barriers to participation: "the process needs to be accessible if everyone is going to take part on an equal basis"
	<b>Reciprocity</b>	Ensuring that people receive something back for putting something in

Table 1: Core initial values as set out by Co-Production Collective (2022) and interpreted from Social Care Institute of Excellence (2022)

## Stage 1

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**We then sought to identify theoretical papers that could enhance our list of values that could be considered essential to co-production. Although this was the main focus of Stage 1 we also extracted data that could:**

- Provide further nuance on a value already identified.
- Could identify additional stages of research where co-production could enhance the value of the research.
- Described additional barriers or facilitators to conducting co-produced research.
- Provided a definition of co-production that helped to distinguish co-production from other forms of Patient and Public Involvement.

**We screened 1,266 records to identify whether studies were relevant to the theoretical review. Studies were excluded if they were:**

- Published before 2020;
- If they did not focus on Patient and Public Involvement (PPI) (for example, focusing on Patient and Public Involvement (PPI) other than co-production);
- Not focussed on UK settings;
- Or were not an eligible study type (we excluded protocols and conference abstracts for example).

Our choice to focus on records published from 2020 onwards was based on a desire to draw on current thinking and not to duplicate the efforts of others who have conducted recent reviews in this area (see, for example, recent work by **Smith et al. (2022b)**). Our choice to focus on records from the UK was both pragmatic (to meet the timescales of the review) and was based on our belief that the values described in UK co-production literature could be incorporated into future research studies taking place in the UK (i.e., were applicable to UK settings), whereas co-production values generated from other settings may not necessarily be.

## Stage 2

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**Identify different ways of doing co-production through exploring how values are enacted (or not)**

### Purpose

This stage is to address research aim (ii): map the evidence and identify typologies of co-production based on the values and activities identified in Stage 1. It focusses on empirical studies only – those studies that contain data from a specific co-produced project.

### Approach

After screening on title and abstract, we then descriptively mapped the characteristics of studies in order to understand the co-production literature and to make decisions on how to focus in on a core set of studies. We present the results of this descriptive mapping (which amounted to over 170 studies) to show some of the broad trends in the co-production literature. The mapping helped us to understand which terms were used to describe co-production; which disciplines of sciences and social sciences were incorporating co-production; and the types of research where co-production featured and/or the methods used to report co-production.

**After exploring the features of the studies, we focussed on those studies that:**

- Covered co-production in health and social care, education and arts and culture
- Exclusively considered co-production of research (not services, policy or guidance; these studies were eligible for Stage 1)
- Were explicitly using the term co-production
- Were published in 2021 onwards
- Were published in the UK

**These criteria kept the review manageable within the short timeframe of the project but were selected for the following reasons:**

- Health and social co-produced research are the area with the greatest co-production activity and where research funders appear to be particularly interested in the value of co-production. However, examining other disciplines also allows us to learn whether styles of co-production may differ or offer new opportunities/understandings around co-production.
- A focus on the terms 'co-production' allowed us to maintain conceptual coherence and allow us to challenge conventions in this space
- We chose a very recent cut off point in terms of publication date to ensure that we reflected new learning and built on the findings of others in this space
- Finally, as with Stage 1, a focus on the UK kept the scope manageable and would help to ensure the findings are more applicable to future UK activity.

**We obtained the full texts of these studies and extracted information on:**

- (I) The co-producers involved (i.e., their background)
- (II) The affiliation of study authors
- (III) The stages of research and the level of involvement non-academic co-producers had
- (IV) The extent to which the research was designed with the values of co-production in mind as well as the extent to which these values were upheld.

**We attach the coding tool used in Appendix 1. The data extracted using this tool is summarised narratively and forms the basis of types of co-production that were identified.**

## Stage 3

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### Explore benefits/drawbacks of different typologies of co-production

#### Purpose

This stage sought to address research aim (iii): summarise the value/impacts/influences of co-produced research for each typology.

We used the same studies as in Stage 2 but narrowed the set down to those that were categorised as rich co-production after the typologies were developed in Stage 2.

#### Approach

- We extracted data on any outcomes, impacts, or influences for each study. We used line-by-line coding in the software so that the source of the information was captured.
- We then described the findings using narrative synthesis techniques and a frequency table to show the count of outcomes across the studies.
- We also synthesised evidence on the cases where principles were stated but could not be implemented.

#### Underlying approach – How we co-produced the review and worked together

As part of the Value of Co-production project, people were given a choice of what work packages they would like to become involved with. Anne and Lynn joined the rapid systematic review work package to work with **Alison**, Dylan, Carol and Bridget from the Centre. As a team, we brought different experiences. Alison brought knowledge of systematic review methodology and some limited knowledge of the co-production of research through some training and small amount of experience in co-production-like research activities but was not familiar with much of the evidence base and debates in the field. **Anne** brought extensive lived experience of co-production and some postgraduate experience of co-producing qualitative research but had never

been involved with a systematic review. **Bridget** brought knowledge of systematic review methodology but limited familiarity of co-producing research and had no prior knowledge of the literature on coproduct or the tensions in the field. **Carol** brought knowledge of systematic review methodology and some experience of working with stakeholders with lived experience but not co-production of research. **Dylan** brought knowledge of systematic review methodology but was much less familiar with co-producing research and had little prior knowledge of the co-production literature and tensions in the field. **Lynn** brought personal experience of co-producing research from a lived experience, non-academic perspective and had some knowledge of how to conduct systematic reviews. She had some knowledge of the literature and good knowledge of the tensions surrounding co-production.

We co-produced the systematic review together, modelling the values and principles of co-production, within the constraints of time and individual skills and interests. It was recognized that producing a rapid systematic review is a technical, methodologically heavy endeavour, but we had a choice over what parts of the review we all became involved with. Dylan and Alison led on developing the protocol, but all team members contributed to the ideas and commented on the text. Anne and Lynn received access to, and brief training in, the software. Carol led on the searching. We all helped identify: the search terms, some key papers, the stages of the research process that can be co-produced, and the values that underpin co-production. The whole team were involved screening the studies for inclusion and the brief. Alison and Dylan did detailed extraction of the Stage 1 papers to produce the list of principles, and Dylan led on writing up the Stage 1 synthesis. Carol, Bridget, Alison, Dylan, and Lynn did the in-depth data extraction of the Stage 2 papers, and Lynn and Alison extracted data about impacts for Stage 3. Alison led the synthesis and write up of Stages 2 and 3. Although Alison and Dylan led on the write-up of the report, all team members reviewed and contributed to the text. Throughout, we spent time having reflexive discussions about the review, the way we worked together, and the differing insights and knowledge we all brought to the project. In particular, the "Discussion and Reflections" section was largely shaped by conversations amongst the team regarding our observations and interpretations of the evidence. We particularly felt equal, the diversity of knowledge, experience and perspective in the team was valued, and we challenged ourselves and each other.

## Deviations from protocol

The main changes from the protocol relate to the subsets of studies that we analysed at each Stage. This was required for pragmatic reasons (too many studies for the time and resources available) and sometimes for theoretical reasons (e.g., in Stage 3, we only looked at studies that could help to explore the broader research aim of the impact of co-production, so excluded studies that were classified as other types of public involvement). These decisions are discussed at the relevant points in the synthesis.

We were also unable to conduct a thematic synthesis in Stage 3 as we had planned, because of the decision to focus on only two of the typologies.

## Results for flow of literature through the review

After piloting the inclusion/exclusion criteria, a total of 1,268 records were screened on title and abstract (46 were screened on full text to help make a decision on inclusion for mapping), with the majority being excluded as not focussed on co-production (see Figure 1). However, 279 studies were selected as potentially eligible for in-depth reviewing, and we mapped the characteristics of 78 theoretically-orientated papers; 178 papers reporting on primary research; and 32 systematic reviews of co-production of services, policy or research (a small number were selected for multiple stages). From the mapping, 31 theoretically orientated papers were prioritised for Stage 1, and 28 empirical studies prioritised for Stage 2. Further justification around how records were prioritised is provided in the methods and the respective results sections.

<sup>1</sup> At the end of the review process one further study was identified through citation checking. After screening and data extraction the results neither contradicted nor added to qualitative themes found from the other studies.

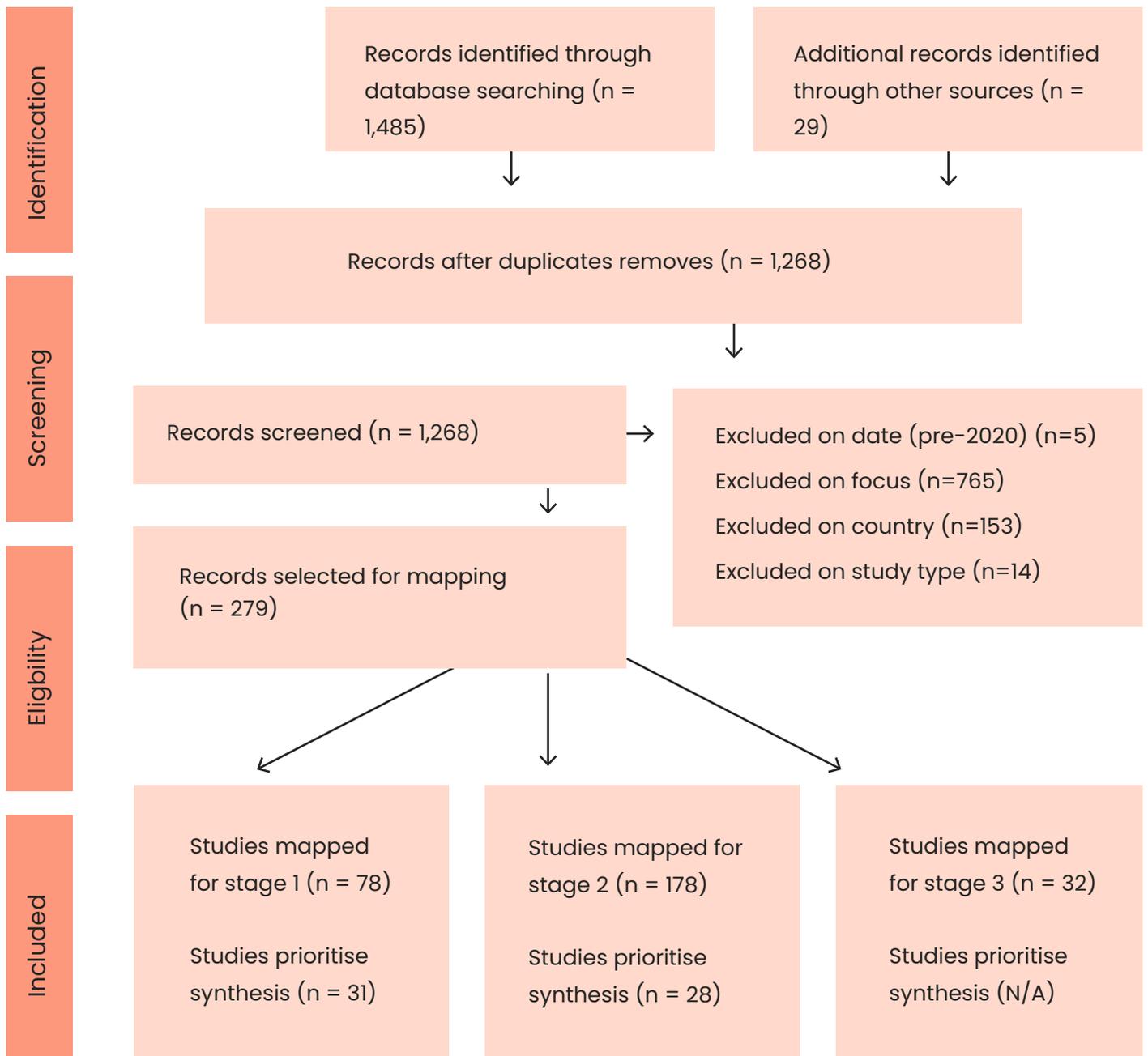


Figure 1: Flow of literature through the review



# Results for stage 1

## Exploration of theoretically orientated papers

### What are the characteristics of theoretically orientated papers on the co-production of research?

Of the 78 eligible papers mapped, many theoretically orientated papers had considered the application of co-production in health and social care research (n=28; 36%) with a further ten studies considering its application in research around mental health, cognitive disorders, and neurodevelopmental conditions (13%). Eight papers (10%) had considered co-production in multidisciplinary research, with other papers considering its application in environment and sustainability research (n=9; 12%), arts and culture (n=5; 6%), community development (n=4; 5%), as well as a number of other disciplines. Half of the papers were based on reflections, commentaries and think-pieces; a further two fifths of (n=30; 38%) were based on empirical observations including systematic reviews, with the remainder based on theories and frameworks derived through research or presented guidance or tools to facilitate co-production. The term co-production was used in virtually all papers, alongside co-creation (10 papers), co-design (4 papers), co-research(er) (1 paper), or variants of the word 'participation' in research. Based on this mapping, we observed that a substantial amount of the theorising about the values (principles) or value (impact) of co-production is built on tacit and experiential knowledge presented in reflective pieces, and while this knowledge is based on research taking place across a variety of disciplines, health and social care research accounts for the largest portion of this research.

After mapping, from the 78 eligible theoretically orientated papers, 31 studies were selected by the reviewers for in-depth data extraction. Studies were prioritised where they described reviewing or offering new frameworks for understanding the values of co-production, where they considered how co-production as a term was understood by different groups, or where they described co-production as occupying a spectrum of approaches. The characteristics of these 31 studies are presented in Appendix 2. Some of these papers focussed both on the co-production of services and policy as well as research; nevertheless their description of the values of co-production was deemed to be applicable to the co-production of research.

## How is co-production defined?

Frequently, theoretically orientated papers avoided attempting to define co-production through a narrow, crisp, unified definition, and often emphasised the contested nature of the term (**Green and Baker 2022, Habermehl and Perry 2021, Langley et al. 2022, Loblay et al. 2021**). Instead of attempting to provide a binding definition, many of the papers opted to provide a set of values or conditions through which co-production could be understood (**Habermehl and Perry 2021**). Some of these stated conditions emphasise that co-production involves working across institutional boundaries, with the purpose of opening up decision-making to the input of others to enable more equitable decision-making (**Howarth et al. 2022, Ledingham and Hartley 2021**). Including a plurality of voices and views in decision-making enables co-production to weave in social factors into the creation of policy and practice (**Langley et al. 2022**), as well as research.

**Cluley and Radnor (2021)** suggests that co-production involves reconfiguring relationships between all co-producers and the groups they represent in a fluid and heterogeneous process they describe as 'relational assemblage'. This crossing of boundaries and reconfiguring ways of working can be both radical and resistive to traditional academic culture and institutions of power, to the extent that co-production methods can be viewed as operating 'against academia' (**Cooper and Jones 2021**) or at least offering an opportunity to create a new vision of academia (**Staniszewska et al. 2022**). Whereas traditional practice may be output focussed, co-production is focussed as much on the process of generating the output as it is on the final output (**Green and Baker 2022**). By extension, this means that the concern of co-produced research is as much on establishing and enacting the values of co-production in creating research, as it is on establishing the value or impact of the final piece of research.

While most definitions of co-production implicitly describe the involvement of co-producers as being free from formal obligation, and based on working jointly towards a shared goal, (**Cluley and Radnor 2020, 2021**) also raise the possibility of involuntary involvement in their definitions of co-production (of services). Given that one principle of co-production involves levelling historic power relations between institutions of power and marginalised communities (**SCIE 2022**), involuntary involvement can appear to be antithetical to the very purpose of co-production. However, it nevertheless does highlight that co-producers may perceive themselves as embarking in co-production on different terms, and while co-production may involve working towards a common purpose, different co-producers will take part with different motives in mind.

While most agree that a single unifying definition of co-production is challenging to articulate, some do also highlight that the absence of a single definition can in itself be problematic. The absence of a single definition leads to 'conceptual stretching' see

(Howard and Thomas–Hughes 2021, Ledingham and Hartley 2021); with co-production being continually reimagined and generating multiple interpretations of the values that should be considered core when co-producing (Howarth et al. 2022). One particular tension is the broad use of ‘stakeholders’ as co-producers, with some being clear that the term co-production should be reserved for activities that involve those traditionally excluded in key decision-making processes (Reed et al. 2021, Williams et al. 2020); this means that the label co-production should be avoided in describing activities involving solely academic researchers and policy-makers for example, even if they involve crossing historical boundaries.

Some of the most useful definitions of co-production emphasise the complexity and unpredictability of co-production through first-hand experience. A definition of co-production offered by Rowley et al. (2022) epitomises this through describing that “...as a research method co-production embraces life rather than bracketing it out, neutralising or controlling it...When researchers accept they are part of the dynamic swirl of life and begin to genuinely make this part of the process, they realise that the lively affordances of the universe are not within the already “known”. Some manage to surf, improvise and intuit with lively forces and learn to embrace contingency, and this is when research really starts to come alive...”.

Finally, some have speculated that co-production should be understood through different ‘shades’ from more surface-level (thin) approaches that are instrumental in nature to more embedded and meaningful approaches (thick) (see Ledingham and Hartley (2021)). This aligns with our investigation in Stage 2 of this project in exploring different typologies of co-produced research. To do this, we explore some of the values of co-production described as integral in these theoretically-orientated papers.

## Where can co-production support research?

Here we consider which stages of research might be supported by co-production and should be explored in Stage 2. Within the review team, we had already identified different stages at which co-production could support research including in: (i) conception/identifying need for the research; (ii) applying for funding; (iii) designing and planning the research; (iv) delivering and doing the research; (v) evaluating the research; (vi) reporting the research; and (vii) disseminating the research.

In addition, **Green and Baker (2022)** prompted us to consider the extent to which the approach to co-production was itself co-produced, or whether the terms of involvement were set out by academic co-producers; as well as the way in which the project was managed in terms of project (for example setting up and chairing meetings). Other stages where co-production could support the research process include piloting the research (**Halvorsrud et al. 2021**), although we do not consider this aspect further as not all forms of research are piloted. Finally, although in our review we are considering the co-production of a piece of research, also point towards other research related activities that are co-produced, for example decisions that are made about which applications for funding are successful. In working through Stage 2, it also became clear that peer reviewing project outputs as well as responding to peer review comments in the publication process was an additional stage that could be co-produced towards the end of the research process.

## What are the barriers and facilitators to the co-production of research?

### Barriers

A key barrier to successful co-production is that current academic cultures and practices do not support the type of meaningful engagement necessary to undertake co-production. For example, describe the way in which researchers on precarious contracts are particularly challenged in conducting complex co-produced research due to low autonomy and the uncertainties they face. Similarly, funding councils have a preference for funding short-term discrete research projects which makes establishing the long-term relationships needed to co-produce research challenging from the outset (**Pearce 2021**), with institutions and funders giving a 'cramped space' for co-production alongside other competing pressures (**Rowley et al. 2022**). Resolving such challenges requires system-level change (**Staniszewska et al. 2022, Williams et al. 2020**). Nevertheless, given that harmful academic practice is so entrenched among academic researchers and in the system of funding research, some have highlighted the risk of 'slippage' where (academic) co-producers revert back to established habits and behaviours (**Ledingham and Hartley 2021**). Equally, harmful academic cultures and practices are entrenched to the extent that even when offered opportunities to co-produce, marginalised groups and communities may lack confidence to work together (**Egid et al. 2021**).

A contextual barrier to conducting co-produced research is the wider culture of austerity, which not only compromises the funding for specific research projects, but also contributes to the wider system of precariousness among academic researchers (**Habermehl and Perry 2021**); this in turn undermines the development of long-term relationships and commitments necessary for co-production in research (see values below). A further barrier is that co-produced research can focus exclusively on local or regional contexts in contrast to academic practice that sees the formation of cross-border and global collaborations (**Ledingham and Hartley 2021**).

While the barriers above reflect some of the pragmatic obstacles to producing co-produced research, some also describe barriers where the outputs from co-produced research were subject to additional scrutiny by the academic community. **Miles et al. (2021)** recount their journal submission being critiqued by peer-reviewers as too personal and deemed to surface the voice of non-academic co-producers too prominently through using a first-person approach. Nevertheless, despite these initial reservations, it is reassuring that the authors rejected this initial critique and maintained their approach, and the paper was subsequently published by the journal.

## Facilitators

Some of the main facilitators identified in the studies were around directly challenging established conventions in how academic research is created. For example, some emphasised that the creation of safe spaces can serve to facilitate co-production particularly among those traditionally excluded from academic institutions (**Egid et al. 2021**); similarly ensuring that these safe spaces are informal and that involvement incorporates an element of fun may also be viewed as positive aspect of co-producing research (**Liabo et al. 2020**). Creating a safe space may also involve moderating the language used to describe co-production to make it accessible and informal; for example a participant in Connolly et al. (2021) describes: "I tend not to use the word co-production or anything when I'm talking to ordinary people .... I talk about working together, I talk about changing things for the better. I tend not to use the word co-production straight away, and sort of drip-feed that a bit at a time because there's been so many terms for so many things, you know, that I've noticed it, whenever I use that word, I just see the looks on folks' faces" (p8).

Other pragmatic facilitators of co-production include (i) accommodation of co-producers' needs and priorities; (ii) adopting an iterative approach to conducting the research; and (iii) establishing what equality, empowerment and power sharing would look like within an individual project (**Halvorsrud et al. 2021**).

## What can we expect co-production of research to achieve?

**Williams et al. (2020)** group the reasons for implementing co-production in research into those that are more technocratic in nature (e.g., production of higher quality research, greater substantive knowledge and impact) and those that are more democratic in nature (normative and political). Some of these instrumental benefits are highlighted by **Price et al. (2022)**, who describe that co-production of (intervention) research could enhance the enrolment and retention of participants on trials and reduce costs, as well as enhance the experience of participants who are part of intervention research and/or use services developed through co-production. **Halvorsrud et al. (2021)** also attempt to quantify the effects of co-creation in research and their findings suggest beneficial effects from individuals through to communities.

Some of the long-term substantive benefits of co-producing research may be far reaching and lead to cultural changes in the way in which different forms of knowledge are valued (**Habermehl and Perry 2021**) and the development of new forms or integration of public accountability (**Lopes and Alves 2020**). Others also emphasise that co-production can lead to personal development for co-producers including improvements in their sense of well-being, fulfilment, and accomplishment (**Langley et al. 2022, Lopes and Alves 2020**) as well as contributing to broader capacity building among marginalised populations (**Ledingham and Hartley 2021**). However, the extent to which theorised benefits such as improvements in well-being are experienced among all co-producers (academic researchers and non-academic researchers) is unclear.

The literature is also suggestive that co-production adds value to research in complex, multi-pathway and non-linear ways, and that any framework for examining the value co-production brings to research needs to take this complexity into account (**Norström et al. 2020**). Such evaluation frameworks take into account the importance of learning and change over time among co-producers and involve establishing the quality of the processes, networks and relationships of co-production as well as the output of the research (**Green and Baker 2022, Norström et al. 2020**).

## What are the values that underpin co-production?

Below, we outline the values that emerge from our synthesis of the theoretically orientated literature, and we make a distinction between values around what co-production is intended to achieve and values around the processes of conducting co-production. These values are also explored in Stage 2 of the review.

## Values around what co-production is meant to achieve

### **Equality (and Shifts in Power Differentials):**

Equality was defined as necessitating a shift in power towards research beneficiaries (**SCIE 2022**). This was repeated across a number of papers, where co-production was expected to lead to a shift in focus around the purpose of conducting research away from satisfying the needs of decision-makers towards addressing the needs of marginalised communities (**Williams et al. 2020**). Some authors emphasised the importance of understanding power differentials across individual, interpersonal and structural levels (**Egid et al. 2021**).

### **Diversity:**

This signals the need to embrace diversity in perspectives, characteristics, and experiences (**SCIE 2022**) that should be reflected both in the process and the research that is co-produced. This diversity in perspectives involves valuing different forms of knowledge and experience equally (this has been termed as creating 'cultures of epistemic equality' in more technical language (**Habermehl and Perry 2021**)).

### **Challenging (and disruptive):**

Co-production should be considered challenging through continually questioning both the status quo and the perspectives of all co-producers, even when that's the hard thing to do (**Co-Production Collective 2020**). This challenge should ultimately serve to disrupt established lines of power, exploitation and domination (**Cooper and Jones 2021**), which can subvert traditional boundaries between institutions and people (**Howarth et al. 2022**). In practice, this challenge can see those who might usually contribute most in decision-making stepping aside to facilitate others to take a role (**Green and Baker 2022**). However, while co-production often involves challenge, it is also underpinned by kindness and a need for reciprocity both during the process and in its outcomes (see **Staniszewska et al. (2022)** and also see value of reciprocity below).

### **Building relationships and unifying communities:**

The process of co-production should ultimately involve building relationships and unifying sometimes disparate communities (**Green and Baker 2022**), even though this process may involve elements of challenge (see above). At its very core, co-production is centred around developing relationships between historically divided or separate groups.

### **Working towards social justice:**

A core value of co-production (often implicit) is that co-produced research is created to support social justice with the intention of creating a fairer and more equitable society (**Cooper and Jones 2021**).

### **Learning and personal development:**

Capacity building particularly among marginalised communities should be considered a value inherent to co-production, as should mutual learning (**Egid et al. 2021**). All of the people involved should learn or develop something through the experience of co-production.

### **Tackles challenging questions and creating systemic change:**

Co-production involves grappling with complexity and thinking about social problems in a holistic way. Co-produced research may seek to change social systems (large or small; e.g., a school's culture) rather than a small part of the system (e.g., the conduct of individual pupils).

## **Values around how co-production should be conducted**

### **Accessibility and inclusivity:**

Accessibility was originally described as removing barriers to participation (**SCIE 2022**) while inclusivity was the idea of support(ing) everyone to be included and participate (**Co-Production Collective 2020**).

### **Reciprocity and mutually beneficial:**

Was described as ensuring that people receive something back for putting something in (**SCIE 2022**), and that all members of a team benefit in ways that are meaningful to them.

### **Human (and personal and bespoke):**

Being human means valuing people as people, doing everything wholeheartedly, and working to make a genuine difference (**Co-Production Collective 2020**). This also inherently involves co-producers sharing personal as well as professional knowledge (**Cooper and Jones 2021**). This level of personal connection makes the organisation of co-production bespoke to each individual project (albeit while still maintaining other values).

### **Transparent (and authentic):**

Transparency in co-production means sharing power, making decisions openly and collectively, and being accountable to a co-production community (**Co-Production Collective 2020**). This also involves authentic interactions that go beyond simply 'representation' (**Green and Baker 2022**).

**Commitment/consistency/longevity:**

This value reflects the requirement for co-producers to stay part of the process of change continually for sometimes long-periods of time (**Green and Baker 2022, Howarth et al. 2022**). For co-producers who are from research backgrounds, this entails a change from 'academic outsider' to more involved and committed role. Doing co-production well means creating an environment where frequent interactions occur between co-producers across the research process (**Norström et al. 2020**).

**Flexibility and adaptability:**

Co-production is neither a uniform or linear process, requiring a substantial degree of nimbleness among co-producers from all backgrounds (**Cluley and Radnor 2021, Green and Baker 2022, Howarth et al. 2022**). As described by Cluley and Radnor (2021), co-production involves dealing with 'an assemblage of fluid and varying elements'.

**Mutual respect and trust:**

Co-productive practice involves co-producers showing mutual respect for each others' roles and contributions (**Green and Baker 2022, Liabo et al. 2020**) and developing trusting relationships among each other to uphold other values described here.

**Reflexivity:**

Co-production entails reframing knowledge and transforming established practices which requires reflexivity (examining one's feelings, reactions, and motives) among co-producers regardless of background (**Green and Baker 2022**). A further study described the benefits of 'slow co-production' where opportunities for reflexivity are maximised (**Rowley et al. 2022**).

**Training and capacity building:**

To ensure learning and development, a value that we associate with the process of co-production, is the incorporation of training and learning opportunities for all co-producers throughout the process (**Egid et al. 2021**). This includes equal access to information relevant to the goals and actions of the team (**Egid et al. 2021**).

**Action-orientated:**

Although implicit in its name, co-production is inherently action-orientated and dependent on establishing a common purpose and identifying a set of clear goals and actions (**Norström et al. 2020**). However, as much as co-production involves meeting those goals, successful co-production is also about understanding why different co-producers are participating in the process itself (**Howarth et al. 2022**).

## An underpinning principle around how co-production should be conducted

While the values above can form something of a checklist for some of the core values when conducting co-production, they are each interpreted differently depending on with whom and where research is being co-produced.

Therefore an underlying principle for interpreting each of the values above is that co-production is context-based: co-production is sensitive to the context in which the research is being co-produced (**Norström et al. 2020**). This can mean that understandings around equality, power, and diversity, for example, are dependent on the different contexts in which the research is to be conducted. For example, 'ensuring diversity' of voices in co-production would be different in the context of a UK-based health intervention compared to another country because the cultural, ethnic, socio-economic and other characteristics of the two nation's populations would be very different; a minority group that would be important to include in one context may not be relevant in another context. As another example, 'enabling power sharing' in a co-produced educational intervention would have different meanings, tensions, and ethical concerns if the educational setting is for young children compared to a higher education setting.

## Conclusions from Stage 1

There is no single definition of co-production and it tends to be characterised by a set of values or conditions. Although the absence of a single definition can lead to 'conceptual stretching' (**Howard and Thomas-Hughes 2021, Ledingham and Hartley 2021**) and even misuse of the term (as we found in the Stage 2 synthesis), it might be necessary to have a flexible definition until the traditional academic culture and institutions of power are better set up to accommodate co-production approaches.

Indeed, amongst the range of potential barriers to co-produced research mentioned, current academic cultures and practices was one of the most mentioned. Potential facilitators typically involved ensuring the underpinning values (e.g., power sharing) were considered and upheld, while changing academic conventions and systems was also a theme.

There were numerous expectations around what co-production of research could achieve, including enhancing the research, building capacity, changing mindsets, and developing long-lasting relationships. It is proposed that these benefits can be best realised when the values that underpin co-production are well-considered and securely enacted. The list of underpinning values identified through this review of theoretical papers far exceeded initial lists, and the interrelated nature of many of the values suggests that co-production is a complex methodology.

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## Results for stage 2

### What patterns can we see when we look for types of co-produced research?

This stage was designed to address research aim (ii): map the evidence and identify typologies of co-production based on the values and activities identified in Stage 1.

This research aim can be broken down into two components. Firstly, mapping the evidence, which involves identifying the key characteristics of the different studies and presenting descriptive characteristics (such as frequency counts and cross tabulations) to give a snapshot of the state of evidence on this topic. Secondly, identifying typologies of co-production, which involves looking for patterns across the studies and grouping similar study together in an interpretable way. We will start by mapping the evidence base.

### Mapping the evidence base of primary research

This section presents descriptive statistics about the 178 studies that were deemed to be relevant to the broader topic of co-production. This is based mainly on information reported in the title and abstracts of the records. This descriptive mapping gives a sense of the state of the evidence on co-production published between 2020 and summer 2022. Due to the large number of relevant studies, a subset of these 178 studies will be explored in the next step (i.e., identifying typologies of co-production and exploring the impact that different types of co-production have had, based on information reported in the full-text documents of each study).

## Term used to describe engagement approach

We present this as a cross-tabulation because many reports used multiple terms to describe the engagement approach. The vast majority of the 178 studies mentioned some form of the term co-production, which is unsurprising given that the inclusion criteria specified that co-production should be focal to the study. For example, looking in the first cell we can see that 147 studies exclusively used co-production and not another allied term; moving across the same row 5 studies used co-production along with co-creation. The table shows that while most studies badge themselves as having drawn on co-production in their title and/or abstract, a smaller number of studies (25) rely solely on using less precise terms reflecting ‘participation’ in their title/abstract.

Table 2: Types of terms used to describe the activity in the map of co-production activity

Term used	Co-produc*	Co-creat*	Co-design	Participat*	Co-res*	Other
Co-produc*	147	5	10	16	1	3
Co-creat*	5	24	8	2	0	2
Co-design	10	8	22	4	0	0
Participat*	16	2	4	25	1	2
Co-res*	1	0	0	1	2	0
Other	3	2	0	2	0	7

Note. Asterisks (\*) indicate that alternate forms of the term were also included. For example, “co-produc\*” could include a vast range of forms such as co-production, co-producing, co-produce, co-productive, co-production, co-producing, coproduce, coproductive, and so on.

## Type of study

Most reports focussed on case studies of one or a small number of research projects – this should assumedly increase the potential for understanding some of the detailed co-production processes taking place, although as our results show later, this was not always the case. Some reports included more than one study type (e.g., literature review and case study).

Table 3: The type and scope of the studies in the map of co-production activity

Type of study	Count
Case study or studies	169
Survey about multiple projects	2
Interview about multiple projects	3
Other method about multiple projects/experiences	5
Systematic review	1

### Discipline or sector

The majority of the 178 mapped studies were related to health and social care (n = 85), followed by Mental, cognitive and neurodevelopmental conditions (n = 53), and education (n = 23). Other disciplines were more sparsely represented.

Table 4: The discipline in which the co-production took place in the map of co-production activity

Discipline or sector	Count
Health and/or social care	85
Mental, cognitive and neurodevelopmental conditions	53
Education	23
Arts/culture	3
Criminal justice/ policing	9
Environment	7
Technology and computing	4
Community development	3
Multidisciplinary	7
Ergonomics	1
Other	5

Note. Some studies might report on more than one sector/discipline, so might add to more than 178.

### What was being co-produced in the study?

There was a range of different goals and products that were being co-produced in the studies, mostly relating to research projects or the design or delivery of services (again some studies were focussing on co-producing multiple outputs).

What was being co-produced?	Count
Research (observational or theoretical)	58
Research (intervention)	56
Service design/delivery	53
Policy	9
Educational or curriculum materials	14
Funding proposal	3
Unclear	3

## Types of co-production

The second component of research aim (ii) was to identify typologies of co-production. Given the size of the evidence base included in the mapping stage and the resources available to this project, we needed to identify a manageable subset of studies with which to conduct an in-depth analysis.

After much discussion between the systematic review team, and in consultation with the broader project team, it was decided to narrow our subset of studies for the synthesis with the following characteristics: (i) reporting primary research; (ii) focussed on co-producing research; (iii) explicitly using the term 'co-production'; (iv) published 2021/22; and (v) focussed on health and social care, education, and arts and culture (see [methods section](#) for further justification).

In total, 28 unique studies were identified with these characteristics. We extracted data (i.e., gathered information) from these. From the extracted data, we discussed which features were most important. We agreed to focus on whether the studies included non-academic researchers in the paper authorship team, and observations about the principles and implementation of those principles (see Appendix 3). These characteristics had been identified by the review team as being particularly indicative of the strength of co-production. Through exploring these patterns, and with discussions amongst the review team, four meaningful groupings became apparent. These are shown on the next page:

## 1 Rich co-production and co-authored (7 studies):

The key feature of these studies is the involvement of lived experience or service user team members in the write up of the published work. These studies have a good match between the vision and implementation of principles, and generally a wide range of principles are covered.

## 2 Rich co-production but not co-authored (3 studies):

These studies generally have a good match between the vision and implementation of principles, with lots of good co-production values evident in the projects, but they do not include lived experience/users in the write up of the published work.

## 3 Co-production vision but not execution (5 studies):

Characterised by a large mismatch between espousing various principles of co-production and their implementation.

## 4 Other public involvement (PI) approaches (13 studies):

Most of these have the involvement of public contributors or lived experience researchers, but not much else. They generally mention little about the principles or implementation of co-production.

It is important to note that our observations were limited to what was reported in the studies. In other words, some of the research projects may have actually had more co-production elements, but we were unable to detect it if they were insufficiently reported in the studies.



Furthermore, we have not placed any emphasis on the stages of research for which co-production was involved when developing these typologies. As can be seen in Table 5, the number of stages of a research project that involved shared responsibility between team members varied across studies, ranging from one to seven. We considered whether the following stages were co-produced: (i) conception/identifying need; (ii) designing/planning; (iii) delivering/doing; (iv) evaluating; (v) peer review; (vi) reporting; and (vii) dissemination. Notably, only one study had shared responsibility across the co-production team for all seven stages of research that we examined (a study conducted by Noyes et al. (2021)), while most only had shared responsibility in 1-3 stages. (NB. In some cases, team members may have been consulted across more of these phases than is indicated in this table, but in keeping with co-production values, we only counted evidence of shared responsibility here. In the terminology used by SCIE 2022, we focussed on transformative co-production, rather than intermediate or descriptive).

Table 5: Number of studies that exhibited shared responsibility of activities in a given number of stages of research

Number of stages with shared responsibility	Number of studies (total n = 28)
1	7
2	8
3	6
4	3
5	0
6	3
7	1



Figure 2 shows the frequencies of each stage across studies. It was most common to share responsibility in the designing/planning and delivering/doing stages.

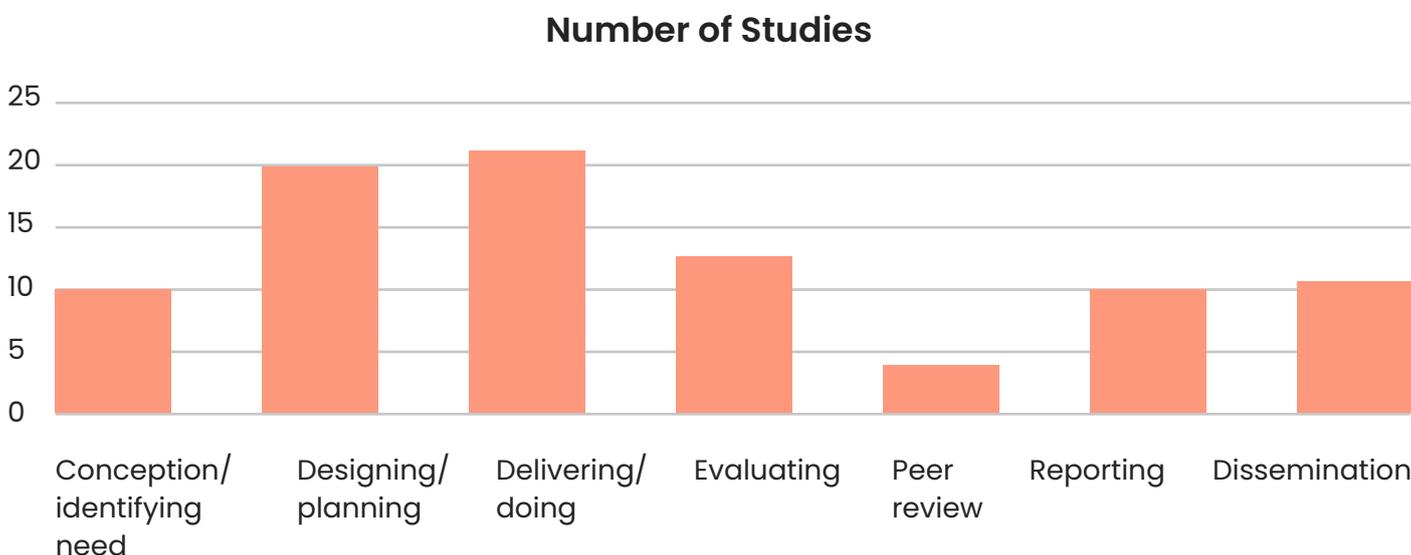


Figure 2: Number of studies with shared responsibility at each research project stage (n = 28 studies)

We did not place an emphasis on the stage of research projects in developing the typologies because of a broader observation about the constraints that may be placed on research projects, due to either academic systems and culture, or other aspects of the context, such as resources. We did not want to discourage work that genuinely attempts to coproduce at least some elements of their project but are limited by factors outside of their control. This tension is considered further in the discussion section.

Table 6 does not show a definitive link between the study type and the stages in which shared responsibility was evident. There is a trend, however, that the Type 1 studies are more likely to have shared responsibility beyond the two most common stages of involvement (i.e., designing/planning, and delivering/doing).

Table 6: Stages of research in which shared responsibility was evident, by Co-production type

Co-production type	Conception/ identifying need	Designing/ planning	Delivering/ doing	Evaluating	Peer review	Reporting	Dissemination
1. Rich co-production	2	5	7	4	3	3	4
2. Rich but not co-authored	0	2	2	2	0	0	0
3. Co-provision but not execution	3	2	5	2	1	1	1
4. Other PI approaches	5	11	7	4	0	1	1

We conclude that, although all 28 studies explicitly self-referred to aspects of their work as co-production, only Types 1 and 2 evidenced substantial elements of co-production. Types 3 and 4, though in many cases aspirational and worthwhile research in their own right, could not be called co-production – even by the flexible definition applied here.

## Conclusions from Stage 2

Evidence from this stage shows that co-production approaches are being used across a number of disciplines and in a variety of different contexts, although health and social care research currently dominates this space. Most of the studies did not include co-production throughout the whole research project, and instead focussed the co-production elements to certain stages of the work—most commonly, the design and delivery stages.

By exploring key features of the 28 different studies, we identified four main types of co-produced research report: (1) Rich co-production and co-authored (7 studies); (2) Rich co-production but not co-authored (3 studies); (3) Co-production vision but not execution (5 studies); and (4) Other PI approaches (13 studies). In other words, more than half of the sample of studies we looked at did not report that they had adequately implemented key principles of co-production, despite using the term co-production. It is unclear how much of this is due to a lack of reporting of key details.

## Results for stage 3

### What are the benefits and drawbacks of different typologies of co-production

This stage was designed to address research aim (iii): to summarise the value/ impacts/influences of co-produced research. We had originally planned to do this for each typology, but as we further came to understand the evidence base, this appeared problematic (see “Deviations from protocol”). This is largely because studies of Type 3 and 4 were not defined as genuine co-production using our definitions, and so these studies could not help in answering the research question relating to what is the value, impact, or influence of co-produced research. As such, the following text relates to the 10 studies marked as Type 1 or Type 2.

Consequently, the synthesis is not organized by typology as originally planned. Instead, we focus on outcomes. In Table 7, the number of studies reporting each outcome/ impact is presented.

Where mentioned, the impacts were almost universally positive. The studies reported a range of benefits, including enhanced research, satisfied team members, enhanced confidence and self-esteem, and the development of skills and knowledge. Overall, there was a stronger emphasis on project-related outcomes, especially relating to the ‘end product’. End products varied from study to study, but included interventions, resources, and questionnaires. There was a general under-reporting of participant outcomes: three of the ten studies did not explicitly mention any impacts on the co-production team members. This is notable given that these were identified as the “richer” studies in terms of co-production (Types 1 and 2).



Table 7: Number of studies that noted different types of impacts/outcomes

Impacts noted in report	Number of reports (n = 10)
<b>Project-related outcomes</b>	
Changes to findings/interpretation	4
Changes relating to any co-production principles	7
Recruitment/engagement of participants	1
(Co-)Production of research output/goal	7
Changes to governance or organisation of the project	1
Output credibility, reach, impact	2
<b>Participant-related outcomes</b>	
Skills	3
Self-esteem or related concepts	4
Knowledge	3
Enjoyment, satisfaction	4
Social capital	1
Emotional investment	1
Contributing to something they value	2
No participant-related outcomes clearly stated	3

Note. Studies often reported more than one outcome/impact, so numbers sum to more than 10.

When participant outcomes were mentioned, they often focussed on the lived experience participants only, not the broader team. Furthermore, they tended to be anecdotal rather than empirically measured. This made the extent of the impact hard to determine. This was also generally true for the project-related outcomes, although some studies had empirical measures of project-related impacts (e.g., evaluating the reach of co-produced resources through data on web page views and resource downloads). The low level of formal evaluation of the impacts of co-production (as opposed to the impacts of the research products) suggests a need to start measuring and evaluating the claims that are being made in research on co-production.

## Conclusions from Stage 3

We attempted to summarise the value, impacts, or influences of co-produced research across ten studies that were identified in Stage 2 as “rich co-production”. Whilst there was mention of a variety of benefits of co-production, they were very rarely formally evaluated. There was a distinct underreporting of participant outcomes; project-related outcomes, especially regarding the ‘end product’ of the project, were more likely to be mentioned.

We are unable to speculate about the size of the impacts, but there was a general consensus that co-production is a positive approach for improving research projects and meeting their goals. There was mention that the end products of the research now included the voice of diverse people, and that this changed the final output. There was also development in terms of the co-production principles, usually relationship building. Positive impacts for co-producers were also mentioned including satisfaction, enjoyment, skills, contributing to something the participants value, changes in viewpoints, and self-esteem. However, the latter were often in reference to the non-academic participants only.



# Discussion and Conclusions

## Summary of findings

### Stage 1

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#### Identification of the values of co-production

- There is no single definition of co-production; it tends to be characterised by a set of values (principles) or conditions.
- Although the absence of a single definition can lead to 'conceptual stretching' and even misuse of the term, flexible definitions may be needed until academic systems are more accommodating.
- Amongst the range of potential barriers to co-produced research mentioned, current academic cultures and practices was one of the most mentioned. Potential facilitators typically involved ensuring the underpinning values were considered and planned for.
- Expectations around what co-production of research could achieve included: enhancing the research, building capacity, changing mindsets, and developing relationships.
- The review identified more principles underpinning co-production than existing standards indicate. The principles often overlap and are interlinked, but they are likely to be important to distinguish when developing guidance or planning a co-produced research project.

### Stage 2

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#### Identify different ways of doing co-production through exploring how values are enacted (or not)

- We identified four main types of co-produced research report: (1) Rich co-production and co-authored (7 studies); (2) Rich co-production but not co-authored (3 studies); (3) Co-production vision but not execution (5 studies); and (4) Other PI approaches (13 studies).

- More than half of the sample of studies did not report that they had adequately implemented key principles of co-production, despite using the term co-production. It is unclear how much of this is due to a lack of reporting of key details.
- Co-authorship of all co-producers on research publications was often indicative of richer co-production, and ensured that the different voices were retained throughout the project.

## Stage 3

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### Explore benefits/drawbacks of different typologies of co-production

- Reported benefits of co-production were rarely formally evaluated; they were typically anecdotal.
- We are unable to speculate about the size of the impacts, but there was a general consensus that co-production is a positive approach for improving research projects and meeting their goals, plus outcomes for co-producers such as satisfaction and self-esteem.

## Discussions and Reflections

Co-production is typically defined by a shifting set of values or conditions. The absence of a defined method and definition of 'co-production' has led to some conceptual stretching around the use of the term (**Howard and Thomas-Hughes 2021, Ledingham and Hartley 2021**). In response, one of our main contributions in producing this review is to (i) understand the extent of potential 'conceptual stretching' through exploring different types of co-production (Stage 2); as well as (ii) start understanding which principles of co-production might be viewed as non-negotiable values that need to be enacted in each project (Stage 1).

It may be that a one-size-fits-all definition is impractical, and that conceptual stretching may be inevitable to some extent—and certainly as long as co-production is constrained by current academic conventions and systems (see below). Even if that is the case, there are ways that a project team can be more transparent about how they have conceived co-production.

**Recommendation:** Research should explicitly state the values/principles that are underpinning the work (the 'vision'), and then clearly state what they did to uphold or support those values in the implementation of their project (the 'execution'). These could reference the list of values reported in Stage 1 of this project to further enhance consistency across projects.

## Co-production as a research method

Co-production is a complex methodology that needs to be resourced, planned, evaluated, and reported – just like any other research methodology. Too frequently, the co-production aspects of a project we encountered in the literature were either under-described or reported separately from the main research project report. This is in stark contrast with more established research methods that are detailed for the sakes of transparency, accountability, and replicability. Whilst we would not suggest that the very intimate and organic nature of most co-production work could be replicated, that surely does not preclude it from being subject to transparency and accountability. The opportunity to critically examine recent co-production literature allowed the team the opportunity to reflect on our own experiences and views of co-production. For example, some of the team based at the EPPI-Centre had been involved in projects that involved co-producing research in the past, and this current review did leave some wondering whether these experiences did indeed constitute co-production and whether the values integral to co-production had been upheld. Reflexive discussions among the team helped to emphasise that co-production is not a prescriptive method, and that there may be some parts of the research process in some projects where full co-production (shared responsibility) is not possible, but where the values of co-production could still be upheld across the project as a whole. This leads us to view co-production as an approach that is bespoke to each research project, but that is nevertheless underpinned by a set of absolute principles.

**Recommendation:** Co-production should be treated as a research method, and therefore planned and reported as one would for other methods. Reporting may be particularly important because this is less prescriptive and more organic than many other research methods. The principle of reflexivity should be applied throughout.

## Co-production as a complex intervention

Co-production can also be seen as a complex intervention in its own right, with intended and unintended impacts beyond that of the focus of the research project. The values underpinning co-production can be seen as the mechanisms through which change can be achieved.

There is a burgeoning literature that supports researchers to consider complex relationships within interventions, and that supports researchers to consider the relationship between complex interventions and the systems into which they are embedded. Recognising that co-production shares some of the properties of complex interventions might involve, for example, (i) recognising that the outcome of co-production may not always be predictable; (ii) that co-production may not always progress in a linear way (there may be setbacks as well as periods of unexpectedly rapid progress); (iii) that some of the values underpinning co-production may only work in conjunction with one another (for example we might assume that we can't have equality and shifts in the balance of power without also having diversity in perspectives, even though both are distinct values); and that (iv) co-production often involves considering multiple 'moving parts' which are tailored to the contexts in which it takes place.

**Recommendation:** There needs to be a shift in current thinking from a product/output focus, to also emphasise the impacts of the process of producing something, such as building relationships. In co-production, both the journey and the destination are important. In addition, a critical appreciation of co-production from the lens of 'complex interventions' highlights that, in comparison to other forms of complex intervention (or intervention component), co-production receives little funding and little acknowledgement that these complex processes are methodologically challenging to measure and evaluate.

# Co-production as a challenge to academic conventions and systems

The current academic culture and systems, especially as they relate to funding and publication, do not create a good environment for most co-production research projects to reach their potential. As noted above, co-production is complex, and the academic system is not currently geared towards supporting it. Through our synthesis of theoretical and empirical papers, we found five key strands about the constraints that the academic context might be placing on co-production.

## 1 Funding mechanisms

Funding systems influence co-production in numerous ways. Notably, when a funding call is made, it places some parameters on the research, which may make it impossible for full co-production in some stages – especially the conception stage, but often the design stage too. When the funding call specifies the research question to be addressed, it limits the opportunity for co-producers to identify and define the research need and the methodological approach.

**Recommendation:** There needs to be an increase in mechanisms for community/user/co-production team-generated research questions and projects. That is, more funding through which the research needs are identified by those who are (usually) outside the funding system.

## 2 Resourcing

The amount of funding and the timeframes of research projects often set boundaries on what, when, and how co-production can occur. Under-resourced projects often rely on the actions of individuals to make it work. Some of the studies noted a challenge to the diversity principle because personal circumstances of individuals can make it difficult for them to engage, but adequate resourcing might help mediate some of the difficulties (e.g., provision of childcare so that parent co-producers can attend meetings and events). Also, the principle of “commitment/ consistency/ longevity” could be

undermined if the project is not resourced over a longer timeframe. Importantly, team members who were not paid a salary to work on the project felt that receiving payment was necessary for establishing the equality of the team, sharing power, and acknowledging that different types of expertise can have equal value.

**Recommendation:** Funding of research projects needs to allow for longer timescales and full costing of the whole co-production team.

### 3 Research ethics

Perhaps surprisingly, some of the empirical studies mentioned going through an ethics approval process. Where specified, this did not tend to include the academic members of the team. This would appear to treat non-academic team members as participants or stakeholders—people who are having research done on them, rather than co-producing the research with the researchers. This undermines the power sharing principle of co-production and, as one of our team members noted, can be seen as an insult to those that are seen to need ‘protecting’.

Either the team members are all conducting the research and therefore do not need ethical approval, or they are all co-participants in the complex intervention that is co-production and all need to be considered in an ethics application. This may in part be driven by institutional requirements to have ethics approval in place, poor understanding from Journals about co-production and their insistence on ethical approval, and the system not quite being able to accommodate roles that are somewhere between researcher and researched.

**Recommendation:** Ethics approval systems to adapt to better suit co-production projects; an initial step towards this may be raising awareness of how co-production differs from other public involvement/stakeholder engagement approaches.

#### 4 History of public involvement in interventions

We observed in the Stage 2 synthesis that many of the projects only demonstrated shared responsibility in a limited number of stages of the research project (e.g., in the delivery of the research but not earlier stages around identifying needs or later stages around interpretation and reporting). This might reflect limits on funding, resources, or the remit of the work granted by the funder. It might, however, also reflect the more established practices of other public engagement approaches, such as peer-delivered interventions. These may feel more “familiar” to academics, or more acceptable to funders and publishers, because they have a longer history.

**Recommendation:** Co-production teams should consider all the stages of the research project in which shared responsibility can be enacted. There has been a recent increase in guidance and support available for co-production research (e.g., through co-production specialist units) to enable this.

#### 5 Publication conventions and systems

There are several strands to this issue. Firstly, as noted above, reports of co-production were often light on the details of what was done—particularly relating to whether and how the principles of co-production were implemented. In some cases, there was a separation of the co-production methods from other aspects of the methodology, such that the co-production work was published separately to findings of the research project (e.g., reporting the effectiveness of an intervention). This is likely driven by journal publication aims and their targeted readership, plus word count.

**Recommendation:** Journal editors and peer reviewers need to be made aware that co-production is a methodology that needs to be adequately reported; it requires sufficient word count to allow for reporting; and it is a fundamental part of the project so should not be partitioned off for another journal's audience. A co-production reporting checklist, perhaps adapted from the GRIPP2 checklist for Patient and Public Involvement (PPI) research, should be encouraged. Journal editors should consider collecting information on co-production expertise of potential peer reviewers (e.g., in the keywords reflecting peer reviewer expertise) and select peer reviewers with experience of the methodology to review papers (and ultimately improve quality). Co-production should not be differentiated from other research methods in this respect.

Secondly, overall, the academic voice dominated the research in our review. For the Stage 2 studies, only 7 of 28 studies (25%) included public contributors or service users in the authorship team. Almost all first authors were academics. As the main communication device of research, papers should include the voice and perspectives of lived experienced researchers too. How else can the reader be assured that the interpretation of any findings is shared by the whole team?

One paper in the Stage 1 synthesis, Miles et al. (2021) discussed some of the potential reasons behind this. It could be an assumption from the researchers that other members of the team are not interested in publication. Also, for academics, journal publication can be a form of currency—it has value that helps with career progression. But Miles et al. argued that, although the value of co-authoring a paper might be different for each person, non-academic contributors can nonetheless hold great value in authorship. Moreover, including non-academic voices can ensure that the values that underpinned the research itself are followed through to the end.

**Recommendation:** Publication and dissemination of co-produced research should involve representatives of all parts of the team. Journal editors and peer reviewers need to be aware that co-produced might “sound different” as a result of the different voices, including potentially personal reflections—which is encouraged by the reflexivity principle. The Miles et al. (2021) paper includes guidelines for authorship in a collaborative health research that could be adapted for different disciplines.

<sup>2</sup> GRIPP2 reporting checklists available at <https://doi.org/10.1136/bmj.j3453>

Finally, it was noted during the process of extracting data that many of the studies had a female first author. This observation was highlighted during team discussions by Lyn, who had come across this phenomenon through another project and a paper that had reported this for patient and public involvement health research (Boylan et al. 2019).

We decided to formalize this query by coding studies based on the suspected gender of the first author of each study in Stage 1 and Stage 2. They were assessed separately to check whether there were systematic gender differences between those theorizing about co-production and those conducting co-production research projects. Of the 31 theoretical papers in Stage 1, 22 had female first authors (71%). Of the 28 empirical papers in Stage 2, 20 papers had female first authors (also 71%). This suggests no difference between the two types of publication.

The findings do, however, support the gender difference anecdotally spotted by the review team and found for Patient and Public Involvement (PPI) research in the Boylan et al. (2019) paper: overall, this is a female dominated space. This is in contrast to some disciplines that show a marked bias in favour of more first authorship for males (e.g., life sciences: Lerchenmüller et al. (2021); earth sciences: Pico et al. (2020)), and global analysis across disciplines reported by (De Kleijn et al. 2020) that found only “In every country, on average, women researchers author fewer publications than men, regardless of authorship position. The least difference is observed among first authors while the biggest difference is observed among all authors (p. 33).” It is beyond the scope of this paper to reflect on why this might be a more female-dominated research space compared to elsewhere.

**Recommendation:** Future research could explore why co-production is currently more likely to be led by females than males, and if/how it links with the broader issue of academic cultures and systems.

<sup>3</sup> Assignations of “female” were based on AOE’s knowledge of gender-typical names, photos of the author, and/or mention in the author’s biography as he/she etc. In other words, in most cases, they were the assumptions of the reviewer rather than explicitly self-identified by the primary study authors.

## Co-production as a challenge to the self

Much of the co-production literature has, quite rightly, focussed on the blurring of institutional boundaries. However, our own reflexive discussions highlight that co-production blurs individual identities and presents a challenge to identities, too. With this come an opportunity for personal growth.

For example, our discussions in creating this review frequently included mention of imposter syndrome, which left unchecked can mean that co-producers step aside from discussions and stages of the research. Such feelings of imposter syndrome may be an entirely understandable reaction to the entrenched power hierarchies within the academic system and given that co-production represents 'a fundamental and epistemologically different way of working from conventional knowledge production' (Boaz et al. 2021) where non-academic co-producers find themselves actively challenging historic conventions. Creating safe spaces where co-producers are supported in this challenge appears to be a recommended strategy (Egid et al. 2021), although the literature is less helpful in informing on strategies on how safe spaces should be developed.

We also discussed how imposter syndrome may be linked to an unwillingness among academic co-producers to fully accept the challenge of co-production. Academic co-producers can often enter the process of co-production and engage solely in terms of their professional identity (a comfortable space for academic co-producers); in contrast, non-academic co-producers are often expected to share some of their most personal histories and to simultaneously face new challenges in engaging in the practice of academic research. A convention among academic co-producers to only engage as professionals and not in a more rounded way can be viewed as reinforcing inequalities in power dynamics and as undermining a core value of co-production (being human). The literature suggests that the creation of safe spaces and trusting relationships are important facilitators of co-production (Knowles et al. 2020);

**Recommendation:** Project teams need to create a safe space where each person can contribute on their own terms, yet also support the personal development and growth of individuals, relationships, and the team. It may be helpful to prepare the team members for the potential challenges to their identity by discussing this at the start of the co-production journey, and by allowing honest discussions throughout about (perceived or actual) abilities to contribute.

## Co-production as impactful

As a body of evidence, co-production was presented as a positive approach for improving research projects and meeting goals. When reported, there were benefits for the co-production team members too, particularly satisfaction and self-esteem. These findings, however, were generally anecdotal notes in discussion sections, rather than from empirical evaluations reported in results sections.

In academic conventions, impacts are established through evaluation. A concern that emerged during reflexive discussions and comments is that the pursuit of measuring impact could lead to a pre-occupation with 'metricising' co-production and focussing on outcomes that are measurable but not necessarily meaningful. How do we reconcile the tension that, to legitimise funding and space in publications for the academic community, there may be an expectation to demonstrate impact that is inherently hard to evaluate? As one of our team members said, a lot of co-production is about "the feels". It is difficult to evaluate something that is hard to define yet powerful to experience. Another team member said, "my viewpoints have changed in invaluable ways that I would never have foreseen"; the flexible and adaptive nature of co-production makes it hard to anticipate when designing an evaluation what might need to be assessed.

This perhaps sounds a bit discouraging: co-production's benefits are not easily measurable in ways that would be recognised by the system that it seeks to benefit. There are, however, at least two promising ways forward here. The first is to turn to co-production approaches to develop evaluation methods. What better way to bring everyone to a common understanding of what the impact of co-production might be, than to co-produce the evaluation design?

The second is to embrace the fact that some of the value of co-production will be "feels" and other hard-to-capture impacts. As we have alluded to above, it is clear that co-production has impacts throughout the journey, not just the impact at the destination when some research output is produced. Early on in the synthesis of findings, it became clear that establishing the 'value' of co-production entails exploring both the enactment of 'values' (principles) as well as the value (impact). Due to the complexity of the 'intervention', measuring the latter of these is challenging. We know that it is possible to conduct research without co-production, although incorporating co-production is theorised to lead to a more equitable research system and more salient and impactful outputs. We might draw parallels with ethics; it is possible to conduct research without ethical approval, although gaining ethical approval is thought to lead to a more equitable research system (e.g., through creating systems that minimise the risks to participants) and is thought to improve the quality of the outputs.

**Recommendation:** Evaluation methods need to be co-produced too. This will almost inevitably require creative and flexible ways to consider impact, which can sometimes be hard to articulate or anticipate. Evaluation plans should ideally look at project impacts and contributor impacts, to assess the total impacts of the project. Work needs to be done on practical ways to measure the enactment of values and principles.

## Strengths and limitations of our approach

While we believe that this review offers novel insights and there are a number of strengths to this work, completion of this review was challenging because of (i) the rapid nature of the exercise; (ii) the complexity of undertaking co-production in research (see earlier point around co-production as a complex intervention); (iii) the breadth of the topic at hand.

We reflect on some of the aspects that we would approach differently in future exercises below. We feel that many of these could be avoided had we adopted the values of co-production that we synthesized in Stage 1 from the outset:

### **Clarity of expectations around co-production:**

Initially, the understanding that the review would be fully co-produced was not clear for all of the research team, and it was unclear whether the review was to be produced with stakeholder input or fully co-produced. In addition, while most of the review team had at least some experience of co-production, the approaches that we were each familiar with were very different. While co-producing the review clearly brought immense benefit to the process of conducting the research and the final review, in future, spending more time at the outset to clarify the expectations of each individual involved would have been helpful in forming the research team.

### **Non-linear progress:**

Forming a co-production team took time. Initially, our progress was relatively slow as we were learning from each other and about each other; however, progress accelerated when we found ways of working together that worked.

### **Revisiting the inclusion criteria:**

All reviews can be prone to a certain amount of over-inclusiveness in their screening decisions. This was particularly the case here, partly because the term itself has been used 'liberally' in a 'cobiquitous' way in the literature (for a descriptor of what this word means see **Williams et al. (2020)**). After the initial sift of the evidence, we identified a lot of evidence that did not meet a strict interpretation in a 'cobiquitous' way (i.e. appearing, or found everywhere) in the inclusion criteria and needed to be rescreened. More discussions earlier on about the types of evidence being encountered may have avoided this inefficiency.

### **Challenges of the system:**

This review was produced under many of the same circumstances that we highlight as hostile to co-production of academic research – e.g. with short timescales, modest funding, and a chronic lack of administrative support for much of the duration of the project. The development of the review has helped to identify that these are system-wide problems that contribute to a devaluing of co-produced research and not institutional – or project-specific challenges.



However, while the list above can be considered as limitations to our approach, we also reflect on some of the elements that helped to facilitate the production of the review or that can be considered strengths of the work:

### **A range of roles and ways to get involved:**

There are a number of ways in which co-researchers can work together and contribute to a (systematic) review. Some of our team felt more comfortable in helping to make decisions at the outset and in screening; others took a more active role in data extraction and interpretation; and all contributions were imperative to completing the work.

**Allowed time and space for trusting relationships to form:**

Once trust was established, we felt more comfortable in our roles. When the project deadline loomed, decisions needed to be made quicker, so as team members we had to play to our strengths more. However, despite working to our more typical roles, it still felt very much like a research team creating research together because we had developed trusting relationships within the team. Trusting relationships also facilitated management of the work (i.e. allowing an individual or individuals to undertake tasks to move the research on, for example instigating meetings and ensuring that the project kept to deadlines) while at the same time avoiding a research leadership role (i.e. an individual or individuals making decisions about the direction or content of the research).

**Co-produced a protocol:**

Although producing a protocol is standard practice in systematic reviewing, this is not the case across all disciplines. It was an important milestone to co-produce the protocol because it helped to set expectations across the team and to ensure key decisions about the research were co-produced.

**Allowed time for reflexivity:**

Although this is reflected in our co-production values, a core strength of this review is in the reflexivity and the discussions we had during the production of the review. The conversations informed the syntheses and gave a different lens to understand and interpret the findings, and helped to shape the discussion section.

While the 'limitations' and 'strengths' above reflect our ways of working, we also acknowledge that the final output has its strengths and limitations.

One overarching limitation is that conducting a rapid review increased the likelihood that some evidence may have been missed, that mistakes may have been made, and that compromises were made in the depth of treatment of studies and the familiarity that reviewers gained with individual studies. A rapid review also meant that parameters were put in place around the scope of the review which meant that not all research disciplines were represented, and only recent literature was synthesised.

The overriding strength of this work is to add nuance and understanding around the values of co-production and to identify typologies of how research is co-produced;

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One overarching limitation is that conducting a rapid review increased the likelihood that some evidence may have been missed, that mistakes may have been made, and that compromises were made in the depth of treatment of studies and the familiarity that reviewers gained with individual studies. A rapid review also meant that parameters were put in place around the scope of the review which meant that not all research disciplines were represented, and only recent literature was synthesised.

The overriding strength of this work is to add nuance and understanding around the values of co-production and to identify typologies of how research is co-produced; these values and typologies were informed by weaving together both non-academic and academic experiences, and perspectives on the evidence.



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## Conclusions

Co-production is a concept based on principles, a research method, a complex intervention, a challenge to academic conventions and systems, and a challenge to the self. Because it is so multifaceted, it can be hugely impactful, but it is hard to measure some of these impacts—particularly given the constraints of commonly-held ideals about research evaluation in academia. Unfortunately, the challenges of co-production without a traditional evidence base showing its clear impacts may make it vulnerable to critique (see, for example, Oliver et al. (2019)).

These critiques, however, may be partly misdirected, given that much of the evidence we reviewed that self-identified as co-production would not meet definitions presented in this report. Many of these critiques may instead be better placed towards questioning and challenging an academic system that fails to adequately support the values underpinning co-production. Moreover, we have identified barriers and facilitators to co-production, and made a series of recommendations, that point to ways to ensure that any “dark sides” of co-production can hopefully be avoided in the future.

From our review, it appears that current academic systems and culture do not create a good environment for most co-production research projects to reach their potential and need to adapt to be inclusive of co-production. The long list of meaningful values underpinning co-production suggest that it is worth trying to get right. Even more than that, co-production can be seen as a complex intervention in its own right, with intended and unintended impacts beyond that of the focus of the research project, and with impacts occurring along the process, not just in the end product. The principles of co-production need to be properly aligned with the design and implementation of the project, with a co-produced evaluation plan and collaborative authorship, to fully assess the total impacts of the co-produced research.

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# Appendix 1

## Tool used to extract/code studies in Stage 2

<ul style="list-style-type: none"><li>• <b>Which stakeholders were involved in this process and in what way ways, with a particular emphasis on how power is shared between stakeholders</b><ul style="list-style-type: none"><li>• Researchers</li><li>• Public contributor</li><li>• Practitioner <i>this includes third sector representatives that do not have lived experience</i></li><li>• Policy officer</li><li>• Lived Experience Researchers</li><li>• Teachers</li><li>• Other (add details in info box)</li></ul></li><li>• <b>Author affiliations</b><ul style="list-style-type: none"><li>• Experts by experience author is not academia affiliated. Author's status and contribution is based on their lived experience</li><li>• University affiliated</li><li>• Government affiliation</li><li>• Health and social care</li><li>• Research institute</li><li>• Third Sector</li><li>• User-led organisation</li><li>• Non governmental organisations</li></ul></li></ul>	<ul style="list-style-type: none"><li>• <b>Which stages, and to what extent were research stakeholders involved the stages of the research and implementation process these stakeholders were involved in</b><ul style="list-style-type: none"><li>• <b>Conception/identifying need</b><ul style="list-style-type: none"><li>• Not involved</li><li>• Consulted</li><li>• Shared responsibility</li><li>• Not evidenced</li></ul></li><li>• <b>Designing/planning</b><ul style="list-style-type: none"><li>• Not involved</li><li>• Consulted</li><li>• Shared responsibility</li></ul></li><li>• <b>Delivering/doing</b><ul style="list-style-type: none"><li>• Not involved</li><li>• Consulted</li><li>• Shared responsibility</li></ul></li><li>• <b>Evaluating</b><ul style="list-style-type: none"><li>• Not involved</li><li>• Consulted</li><li>• Shared responsibility</li></ul></li><li>• <b>Peer review</b><ul style="list-style-type: none"><li>• Not involved</li><li>• Consulted</li><li>• Shared responsibility</li></ul></li><li>• <b>Reporting</b><ul style="list-style-type: none"><li>• Not involved</li><li>• Consulted</li><li>• Shared responsibility</li></ul></li><li>• <b>Dissemination</b><ul style="list-style-type: none"><li>• Not involved</li><li>• Consulted</li><li>• Shared responsibility</li></ul></li></ul></li></ul>
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• **Stated co-pro values and principles**

Across the project, is there any evidence of the following principles being mentioned or planned/actually implemented?

• **Equality**

necessitating a shift in power towards research beneficiaries

- **Yes - Explicitly stated**
- **Yes - inferred**
- **Not mentioned**

• **Diversity**

in perspectives, characteristics, and experiences

- **Yes - Explicitly stated**
- **Yes - inferred**
- **Not mentioned**

• **Accessibility/ Inclusivity**

removing barriers to participation

- **Yes - explicitly stated**
- **Yes - inferred**
- **Not mentioned**

• **Reciprocity/ Mutually beneficial**

ensuring that people receive something back for putting something

- **Yes - explicitly stated**
- **Yes - inferred**
- **Not mentioned**

• **Being challenging**

continually questioning both the status quo and ourselves, even when that's the hard thing to do  
Continuous reflection, learning and improvement Embracing new ideas and ways of working

• **Being human**

valuing people as people, do everything wholeheartedly, and work to make a genuine difference  
Being human Valuing diversity of knowledge, experience and perspective Building mutually beneficial relationships based on honesty and trust

- **Yes - Explicitly stated**
- **Yes - inferred**
- **Not mentioned**

• **Actual implementation**

(i.e., was the principle acted upon?)

• **Equality**

necessitating a shift in power towards research beneficiaries

- **No (why not?)**
- **Partial (why not fully?)**
- **Yes**
- **Unclear**

• **Diversity**

in perspectives, characteristics, and experiences

- **No (why not?)**
- **Partial (why not fully?)**
- **Yes**
- **Unclear**

• **Accessibility/inclusive**

removing barriers to participation

- **No (why not?)**
- **Partial (why not fully?)**
- **Yes**
- **Unclear**

• **Reciprocity/mutually beneficial**

ensuring that people receive something back for putting something

- **No (why not?)**
- **Partial (why not fully?)**
- **Yes**
- **Unclear**

• **Being challenging**

continually questioning both the status quo and ourselves, even when that's the hard thing to do

- **No (why not?)**
- **Partial (why not fully?)**
- **Yes**
- **Unclear**

• **Being human**

valuing people as people, do everything wholeheartedly, and work to make a genuine difference

- **No (why not?)**
- **Partial (why not fully?)**
- **Yes**
- **Unclear**

• **Transparent and authentic**

share power, make decisions openly and collectively, and are accountable to our co-production community

- **Yes - explicitly stated**
- **Yes - inferred**
- **Not mentioned**

**Other stated principles**

- **Yes - explicitly stated**
- **Yes - inferred**
- **Not mentioned**

• **Transparent**

share power, make decisions openly and collectively, and are accountable to our co-production community

- **No (why not?)**
- **Partial (why not fully?)**
- **Yes**
- **Unclear**

## Barriers and facilitators of co-production

- Resources (time, money)
- Barrier - (Assumptions about) co-producers' time
- Barrier - Mismatch between interests
- Barrier - Concerns about co-producers anonymity
- Barrier - Including participants from different linguistic backgrounds
- Barrier - Different capacities around commitment
- Barrier - Objectivity and bias
- Barrier - Missing hard to reach, representativeness
- Barrier differing ways of knowledge production
- Barrier - lack of support, tools, or guidance
- Barrier - recruitment or retention of team members
- Barrier - timing of co-pro across the project
- Barrier - Risk of conforming
- Facilitator - offering a variety of ways to get involved
- Facilitator - offering support/training to co-producers
- Facilitator - some common experiences between participants
- Facilitator - Mentor or facilitator role
- Facilitator - underpinned by conceptual framework
- Facilitator - incorporate/address feedback throughout
- Facilitator - positive relationships
- Facilitator - shared understanding and clarity of roles
- Facilitator - Connecting with external Patient and Public Involvement (PPI) organisations
- None explicitly mentioned

## Co-pro outcomes

the desired and achieved outcomes of these activities and the methods used to assess these outcomes.

### Project related outcomes

- Changes to findings/ interpretation
- Changes relating to any co-pro principles
- Recruitment/engagement of participants
- (Co-)Production of research output/goal
- Changes to governance or organisation of the project
- Output credibility, reach, impact

### Participant outcomes

- Skills
- Self-esteem or related concepts
- Knowledge
- Enjoyment, satisfaction
- Social capital
- Emotional investment
- Contributing to something they value
- None clearly stated

# Appendix 2

## The characteristics of 31 theoretically orientated studies

Study	Discipline /sector	Research or commentary	Term used to describe the engagement process	Focus on co-pro
(Cluley and Radnor 2020)	- Other	Theory building through research	-Co-product* -Co-creat*	-Mixed with other PPI type concepts
(Cluley and Radnor 2021)	- Other	Reflections, thinkpiece, commentary, lessons learned	-Co-creat*	-Focal
(Colombo et al. 2021)	- Community development	Research findings from collected data incl. Systematic Reviews	-Co-product*	-Focal
(Cooper and Jones 2021)	- Mental, cognitive and neurodevelopmental conditions - Education	Research findings from collected data incl. Systematic Reviews	-Co-product*	-Focal
(Cowdell et al. 2022)	- Health and/or social care	Research findings from collected data incl. Systematic Reviews	-Co-product*	-Focal
(Egid et al. 2021)	- Health and/or social care	Research findings from collected data incl. Systematic Reviews	-Co-product* -Participat*	-Focal
(Green and Baker 2022)	- Community development	Theory building through research	-Co-product*	-Focal
(Habermehl and Perry 2021)	- Community development	Research findings from collected data incl. Systematic Reviews	-Co-product*	-Focal
(Halvorsrud et al. 2021)	- Health and/or social care	Research findings from collected data incl. Systematic Reviews	-Co-product* -Co-creat*	-Focal
(Hannibal and Martikke 2022)	- Multidisciplinary	Research findings from collected data incl. Systematic Reviews	-Co-product*	-Focal
(Howard and Thomas-Hughes 2021)	- Multidisciplinary	Research findings from collected data incl. Systematic Reviews	-Co-product*	-Focal
(Howarth et al. 2022)	- Environment and sustainability	Theory building through research	-Co-product*	-Focal
(Jaspers and Steen 2021)	- Other: urban mobility planning	Research findings from collected data incl. Systematic Reviews	-Co-product* -Co-creat*	-Focal
(Langley et al. 2022)	- Health and/or social care	Reflections, thinkpiece, commentary, lessons learned	-Co-product*	-Focal
(Ledingham and Hartley 2021)	- Environment and sustainability	Reflections, thinkpiece, commentary, lessons learned	-Co-product*	-Focal
(Liabo et al. 2020)	- Health and/or social care	Theory building through research	-Co-product*	-Focal
(Loblay et al. 2021)	- Health and/or social care	Research from collected data incl. Systematic Reviews	-Co-product*	-Focal
(Lopes and Alves 2020)	- Health and/or social care	Research findings from collected data incl. Systematic Reviews	-Co-product* -Co-creat*	-Mixed with other PPI type concepts

Study	Discipline /sector	Research or commentary	Term used to describe the engagement process	Focus on co-pro
(Miles et al. 2021)	-Health and/or social care	-Reflections, thinkpiece, commentary, lessons learned -Guidance or tool for co-production	-Co-product*	-Focal
(Chauhan et al. 2022)	-Other	-Research findings from collected data incl. Systematic Reviews	-Co-product*	-Focal
(Norström et al. 2020)	-Environment and sustainability	-Reflections, thinkpiece, commentary, lessons learned	-Co-product*	-Focal
(Pearce 2021)	-Health and/or social care	-Theory building through research	-Co-product*	-Focal
(Price et al. 2022)	-Health and/or social care	-Reflections, thinkpiece, commentary, lessons learned	-Co-product* -Other (PPI)	-Mixed with other PPI
(Reed et al. 2021)	-Health and/or social care	-Research findings from collected data incl. Systematic Reviews	-Co-product*	-Focal
(Rowley et al. 2022)	-Multidisciplinary	-Reflections, thinkpiece, commentary, lessons learned	-Co-product*	-Focal
(Smith et al. 2022a)	-Health and/or social care	-Guidance or tool for co-production	-Co-product*	-Focal
(Staniszewska et al. 2022)	-Health and/or social care	-Reflections, thinkpiece, commentary, lessons learned	-Co-product*	-Focal
(Tembo et al. 2021)	-Health and/or social care	-Reflections, thinkpiece, commentary, lessons learned	-Co-product* -Participat*	-Focal
(Connolly et al. 2021)	-Health and/or social care	-Research findings from collected data incl. Systematic Reviews	-Co-product*	-Focal
(Vargas et al. 2022)	-Health and/or social care	-Reflections, thinkpiece, commentary, lessons learned	-Co-product* -Co-creat* -Co-design -Other collaboration, engagement	-Mixed with other PPI type concepts
(Williams et al. 2020)	-Health and/or social care	-Reflections, thinkpiece, commentary, lessons learned	-Co-product* -Participat*	-Focal

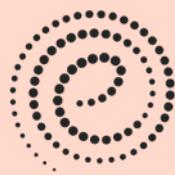
Study	Lived experience involved	Expert by experience author	P – equality	P – diversity	P – Accessibility/ Inclusivity	P – Reciprocity	P – challenging	P – human	P – transparent	I – equality	I – diversity	I – access	I – reciprocity	I – challenging	I – human	I – transparent	Mismatch between principle & implementation	Type
(Astell et al. 2021)	1		1	1	1	1		1	1	1	1	1	1		1		1	2
(Beardmore et al. 2022)	1	1															0	1
(Boaz et al. 2021)																	0	4
(Cruice et al. 2021)	1	1	1	1	1	1	1	1	1	1	1	1	1		1		2	1
(Culpin et al. 2021)	1		1	1	1	1	1	1	1		1	1					5	3
(Curran et al. 2021)	1	1	1		1	1	1		1	1		1	1	1	1		0	1
(Farr et al. 2021)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1
(Fawcett et al. 2021)	1		1		1			1									3	3
(Fellenor et al. 2021)	1																0	4
(Fotheringham et al. 2021)	1																0	4
(Fowler-Davis et al. 2021)	1																0	4
(Fox 2022)	1																0	4
(Gobat et al. 2021)	1			1			1										2	4
(McFadden et al. 2021)	1						1										1	4
(Montgomery et al. 2021)	1	1			1	1		1				1					2	1
(Neill et al. 2021)				1	1	1											3	3
(Noyes et al. 2021)	1		1	1	1	1			1								5	3
(O’Flaherty et al. 2021)				1													1	4

**Note.** Values of 1 in columns 2-17 indicate the presence of that principle or implementation category. “P” refers to principles of co-production (e.g., “P – equality” refers to the co-production principle of equality). “I” refers to the implementation of principles of co-production (e.g., “I – equality” refers to the implementation of the co-production principle of equality). “Mismatch between principle & implementation” is calculated as the difference between the sum of all the “P” columns subtracted by the sum of all the “I” columns; a larger number indicates a greater mismatch between the proposed principles and evidence of their implementation, whereas zero indicates a good match. Type 1 = Rich co-production and co-authored, 2 = Rich co-production but not co-authored, 3 = Co-production vision but not execution, 4 = Other public involvement (PI) approaches.

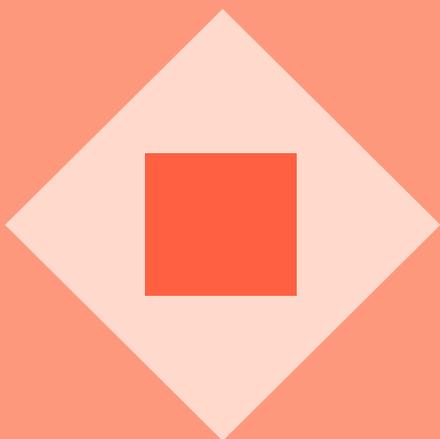
Study	Expert by experience author	Lived experience involved	Mismatch between principle & implementation														Type	
			P – equality	P – diversity	P – Accessibility/ Inclusivity	P – Reciprocity	P – challenging	P – human	P – transparent	I – equality	I – diversity	I – access	I – reciprocity	I – challenging	I – human	I – transparent		
(Pearson et al. 2021)			1	1	1	1	1	1	1							7	3	
(Pearson et al. 2022)	1	1	1			1	1	1	1	1			1	1	1	1	0	1
(Ponsford et al. 2021)	1		1													1	4	
(Ravenscroft 2022)	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	2
(Scally et al. 2021)				1	1											2	4	
(Singh and Damarell 2022)	1		1							1						0	4	
(Small et al. 2021)	1	1	1	1	1	1		1	1	1	1	1		1	1	0	1	
(Taggart et al. 2021)	1				1											1	4	
(Treneman-Evans et al. 2022)	1															0	4	
(Wray et al. 2021)	1		1	1	1			1			1	1		1		1	2	

**Note.** Values of 1 in columns 2-17 indicate the presence of that principle or implementation category. "P" refers to principles of co-production (e.g., "P – equality" refers to the co-production principle of equality). "I" refers to the implementation of principles of co-production (e.g., "I – equality" refers to the implementation of the co-production principle of equality). "Mismatch between principle & implementation" is calculated as the difference between the sum of all the "P" columns subtracted by the sum of all the "I" columns; a larger number indicates a greater mismatch between the proposed principles and evidence of their implementation, whereas zero indicates a good match. Type 1 = Rich co-production and co-authored, 2 = Rich co-production but not co-authored, 3 = Co-production vision but not execution, 4 = Other public involvement (PI) approaches.

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