OXFORD UNIVERSITY PRESS | Research Evaluation

Evaluating co-creation in social innovation projects. Towards a process orientated framework for EU projects and beyond

Journal:	*Research Evaluation*
Manuscript ID	RESEVAL-2022-0041.R3
Manuscript Type:	Article
Keywords:	EU, impact, Evaluation, co-creation, social innovation, Framework Programmes

Abstract: In the last two decades, co-creation and social innovation have become important concepts in academic research and public policy. The two concepts are conceptually linked, but this relationship has hardly been problematised in academic literature. In addition, social innovation and especially co-creation are not defined in EU policies, but merely included because they support policy aims. The lack of problematisation and definition not only hampers progress in the academic field, but is also constringing co-creation into an exercise of merely including stakeholders therefore neglecting the full potential of co-creation. The key question addressed in this paper is therefore: How can we evaluate the application of co-creation in EU-funded social innovation projects? A literature review revealed that co-creation and social innovation have become connected only very recently in academic literature. In this publication we analyse the meta narratives of this emerging body of literature and conclude that we can distinguish three distinct segments with their own characteristics. We used these insights to develop an adaptive evaluation framework. This framework can be used to assess the application of co-creation within social innovation in for example EU-funded projects. This could push the emerging academic field forward and open up new research themes and designs. We also suggest that the framework could specifically support policymakers in their efforts to evaluate processes of co-creation instead of focusing on the dominant impact evaluations.

Evaluating co-creation in social innovation projects

Towards a process orientated framework for EU projects and beyond

Abstract

In the last two decades, co-creation and social innovation have become important concepts in academic research and public policy. The two concepts are conceptually linked, but this relationship has hardly been problematised in academic literature. In addition, social innovation and especially co-creation are not defined in EU policies, but merely included because they support policy aims. The lack of problematisation and definition not only hampers progress in the academic field, but is also constringing co-creation into an exercise of merely including stakeholders therefore neglecting the full potential of co-creation. The key question addressed in this paper is therefore: How can we evaluate the application of co-creation in EU-funded social innovation projects?

A literature review revealed that co-creation and social innovation have become connected only very recently in academic literature. In this publication we analyse the meta narratives of this emerging body of literature and conclude that we can distinguish three distinct segments with their own characteristics. We used these insights to develop an adaptive evaluation framework. This framework can be used to assess the application of co-creation within social innovation in for example EU-funded projects. This could push the emerging academic field forward and open up new research themes and designs. We also suggest that the framework could specifically support policymakers in their efforts to evaluate processes of co-creation instead of focusing on the dominant impact evaluations.

Evaluating co-creation in social innovation projects

Towards a process orientated framework for EU projects and beyond

1. Introduction

In the last decade, co-creation has become a widely used concept in academic discourses and public policies on social innovation. More importantly, co-creation has not only become widely used in these fields, but is seen as an evaluation criterion in itself in for example European Union (EU) funded projects (Meister Broekema et al. 2021b). Because of this tendency to regard co-creation as a tick-box-exercise, there is a risk that the complex and contextual interactions between stakeholders in different types of social innovation projects are neglected. To understand and ultimately use the potential added value of co-creation, this paper will analyse the relationship between co-creation and social innovation in academic discourses and use these insights to come up with a new, more process orientated evaluation framework for co-creation in social innovation projects. This framework could be beneficial for for example EU funded projects.

Co-creation, often understood as a non-linear process in which stakeholders improve products, processes or services together, has already been mentioned in academic literature since 1979 (Lovelock & Young 1979). The concept was later popularised by Prahalad and Ramaswamy in 2000 (Prahalad, and Ramaswamy 2000). They ultimately defined it as "*…the process by which products, services, and experiences are developed jointly by companies and their stakeholders…"* (Ramaswamy 2009). Within the context of businesses and their stakeholders, co-creation has shown to be not only important in product innovation, but also for example in improving customer satisfaction and in creating new appreciations of value (Alves, Fernandes, and Raposo 2016). Co-creation was subsequently used in different fields and developed into a 'contested concept' (Ayob et al. 2016; Greenhalgh et al. 2016). The concept has also become very influential in for example urban transformation literature (Sillak et al. 2021) and has also been problematised in for example literature on transformation in the public sector (Ansell & Torfing 2021).

For decades, innovation has been considered a major driver in economic growth by researchers and policymakers. The concept of innovation itself can be traced back to the seventeenth century to the work of the Italian architect Borromini (Godin 2015), but it is the Austrian Economist Joseph Alois Schumpeter (1883-1950), who is often seen as the first scholar to conceptualize innovation as such. Schumpeter argued that innovation is an essential driver of competitiveness and economic dynamics and defined innovation as: "a process of industrial mutation, that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one" (Śledzik 2013).

Although the social meaning of 'innovation' was already a topic in the seventeenth century and the term 'social innovation' was first used in the eighteenth or early nineteenth century, academic debates on social innovation only started in the last quarter of the twentieth century when two separate academic research fields for the study of social innovation emerged. One focusing on entrepreneurship, the other more on the socioeconomics. The entrepreneurial segment had an influence on EU policies (Moulaert & MacCallum 2019), which is relevant because we are focusing on the application of co-creation in EU projects. Social Innovation could be defined as (see also Moulaert & MacCallum, 2019 for an overview on this concept): *"…the invention, development and implementation of new ideas with the purpose to (immediately) relieve and (eventually) solve social problems, which are in the long run directed at the social inclusion of individuals, groups or communities…"* (Oeij et al., 2018 p10).

Research on social innovation has mainly focused on good practices; authors have argued that it is not possible to uncover specific successful social innovation pathways ex ante (Oeij et al. 2018). Research on co-creation has uncovered that this non-linear process is heavily dependent on context characteristics (Voorberg et al. 2015). Both concepts can be described as processes with similar subsequent phases of ideation or input, development or throughput and implementation or output (Oeij et al. 2018; Voorberg et al. 2015).

Despite both social innovation and co-creation deserve more attention, we focus in this paper on the link between both concepts. The first mention of both conceptions in one publication can be traced back to 2015 (Sun & Im 2015) and after this moment the use of these concepts has been growing gradually into an intertwining field that has been labelled as 'co-creation for social innovation' (Kumari et al. 2020). Although there has been substantial attention for the background and emergence of the individual concepts within the academic 'co-creation for social innovation' literature, there has not been a systematic analysis on the relationship between co-creation and social innovation in this academic literature, because it is often seen as obvious.

This paper aims to advance the emerging knowledge on the intersection of co-creation for social innovation, using these insights to answer the main research question: 'How can we evaluate the application of co-creation in EU-funded social innovation projects?'. We aim to build a framework to support such evaluations. We target specifically projects in the large Framework Programmes on Research and Innovation, such as Horizon Europe, because these explicitly incorporate the concept of social innovation, but are momentarily evaluated by looking solely at the inclusion of stakeholders as such (Meister Broekema et al. 2021a).

In order to build an evaluation framework, we analysed more than 100 academic publications appearing between 2015 and 2021, answering the following sub-questions:

1. What are the characteristics of the segments we can distinguish in the emerging literature on 'co-creation for social innovation'?
2. How do these segments envision the relationship between co-creation and social innovation?
3. What kind of specific evaluation indicators could be developed based on this literature that could capture different types of co-creation for social innovation in especially EU projects?

By introducing a novel framework to better understand the complex relationship between co-creation and social innovation in different contexts, we will not only advance the academic disciplines focused on social innovation and co-creation, but we will also provide an alternative to existing, often more linear evaluation frameworks. To show the added value of our envisioned framework in contrast to existing evaluation frameworks we will introduce research into evaluation first. After this, we will describe our methodology that can be characterised as a systematic integrative narrative literature analysis. After addressing the sub research questions in the results section, we will reflect upon our findings in the discussion and answer our main question in the conclusion.

2. Context and evaluation of co-creation for social innovation

With this paper we aim to improve the evaluation of co-creation in EU funded social innovation projects. We focus specifically on projects in the large Framework Programmes on Research and Innovation, such as Horizon Europe, because these are explicitly incorporating social innovation and co-creation, but do not have specific evaluation indicators to evaluate co-creation (Meister Broekema et al. 2021b). Therefore, our context to model co-creation for social innovation is heavily influenced by the EU-policy landscape on different levels. On a conceptual level, the EU uses specific interpretations of social innovation (Moulaert & MacCallum 2019) and co-creation in open innovation ('Open Innovation 2.0' 2013), influenced by the concept of triple- and quadruple helix innovation in which universities, governments and enterprises are collaborating, sometimes for the benefit of society as a whole (Carayannis & Campbell 2012; Leydesdorff 2010). These interpretations trickle down towards specific funding programmes and calls and tend to be performative, because they change reality by pre-describing what people are going to do in order to secure funding (Meister Broekema et al. 2021a). This specific language and rigid project structure is also reflected in the almost linear *ex post* evaluation of EU projects that is based on quantitative activities, outputs and outcomes (Büttner & Leopold, 2016). Although the EU is striving for a more cyclical approach in which results from projects

actually feed into new programmes, this is quite difficult given the complex policy context (Smismans 2015).

Former work on EU policy paradigms and evaluation systems (Meister Broekema et al. 2021b; Smit & Hessels 2021), showed that the evaluation of co-creation for social innovation is influenced by the concept of impact. Co-creation is often seen as a precondition to create impact. Most definitions of societal impact emphasise the *demonstrable* contribution that for example research makes to society ('ESRC definition of impact' n.d.). Impact is also often regarded as long-term and the end of a process that started with input, followed by activities, outputs and outcomes (Connell 1995).

Many impact evaluation systems have been developed over the years (see for example Bornmann 2013). Smit and Hessels analysed ten of these impact evaluation systems meticulously (Smit & Hessels 2021). The authors conclude that impact evaluation models are often developed because of policy demands that show the societal value of research. They distinguish between linear, cyclical and co-production types of evaluation frameworks and also analysed if the respective frameworks are distinguishing separate forms of societal and scientific impact.

In line with former research, these ten evaluation systems have all been developed for specific purposes (Rijcke et al. 2016). For example the 'flows of knowledge approach' has been developed for the evaluation of research council programmes in the UK, the 'ASIRPA approach' has been developed to assess the socio-economic impact of public sector research organisations and 'contribution mapping' was first used as a learning tool in the context of global health research (Meagher et al. 2008; Joly et al. 2015; Kok & Schuit 2012). Due to the context and aims of the different evaluation frameworks, the authors are explicitly not preferring one framework over the other. They conclude their paper with an observation that evaluation methods that combine different aspects of societal value; they identified actors, mechanisms and concepts; with the perception of various stakeholders do most justice to the practice of research and impact (Smit & Hessels 2021 p. 11).

Interestingly, the authors have not been analysing impact evaluation at an EU level. As said before, academic research on the practice of evaluation of EU funded projects is scarce, but is showing that the evaluation is *ex post* and focused on deliverables and outcomes (Büttner & Leopold, 2016). In line with the research from Smit and Hessels, an analysis of different large EU framework programs for research and innovation has also shown that not only impact is becoming more important, but even that co-creation self is used as an indicator for successful social innovation in the Horizon Europe programme (Meister Broekema et al. 2021b).

Some research has been undertaken to come up with new evaluation frameworks that are for example tailored for transformative policies (Molas-Gallart et al. 2021) or that include outcomes and use a co-

creation process with policymakers (Ghosh et al. 2021). Also promising is work on the evaluation of systemic innovation and transition programmes, by for example combining formative and summative evaluations in different phases (Janssen et al. 2022). Although interesting, these models still take the implementation of policies that aim to transition society as a starting point, instead of including indicators such as the success of a project from the viewpoint of the people participating. Therefore, although these type of evaluations include co-creation with stakeholders, their perceptions are not taken seriously enough and the quality of the involvement and interactions of these stakeholders is not taken into account.

3. Methodology

In order to develop an evaluation framework that allows us to better understand the complex and changing relationship between social innovation and co-creation, we decided to systematically carry out a literature review of academic literature which combines both concepts. In line with former research, we chose to carry out an integrative review, because we aimed to integrate findings from diverse types of literature and different types of topics and in line with other researchers believe that integrative reviews are better suited for the social sciences (Fuglsang et al. 2021). We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework throughout this publication ('Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement' n.d.). In brief, this method provides a set of reporting items to ensure reproducibility and transparency and helps to include and exclude papers. We started our systematic literature review by carrying out a query in the Web of Science. We chose this database, because it is one of the largest databases for scientific literature and covers the widest variety of topics, ranging from natural sciences to social sciences. Our search for "co-creation AND social innovation" provided us with 114 hits.

In line with other systematic literature reviews (Gough et al. 2017), we downloaded the metadata in an excel sheet. This metadata included information on for example the title, journal, author keywords, abstract, author names and year of publication. We also downloaded all the references from all the available publications to search for key publications and -authors. To understand the different segments we focused mainly on the key words mentioned by the author(s) because we were interested in how they describe and categorise their own research.

We analysed constellations of these keywords and categorised them inductively. This provided us with some general and quantitative data on the emergence and use of the relations between social innovation and co-creation in different academic fields. However, we also realised that this analysis was not providing us with enough depth and detail to understand all the nuances in the emerging field

of co-creation for social innovation, let alone to develop a novel evaluation framework. Therefore, we decided to subsequently analyse the abstracts of the publications, focusing on the who (partners), why (aim) and what (activities). Although this exercise provided more analytical depth, due to the quality and/or differing structure of the abstracts it was hard to compare the abstracts and to use them to answer the key questions (who, why and what). Therefore, we considered the results still to be inconclusive.

We also noticed in for example our categorisation of the publications that authors frame social innovation and co-creation in different ways and have different disciplinary backgrounds. In addition, our preliminary research showed that policymakers also draw on this literature on social innovation and co-creation. Therefore, we decided to switch to a meta narrative literature review. In contrast to the more traditional integrative literature review that mainly integrate findings, meta narrative reviews are aiming to construct meta narratives especially in a fuzzy literature; such as our set of publications; by being pragmatic, embracing pluralism, looking for plots, unpacking contestations and reflecting continuously (Greenhalgh et al. 2005). Because of this narrative approach, we needed to take a closer look at the content of the publications. Therefore, the full texts of the publications were downloaded and read. Unfortunately, 14 publications were not available after multiple attempts, so in total we analysed 100 full documents.

In order to systematically carry out a narrative analysis of co-creation for social innovation in an EU context, we developed an extraction sheet with questions based on our used definition of social innovation. In addition, we decided to use the definition of co-creation from a EU-funded project called SISCODE, mainly their definition bridges multiple traditions of co-creation research (Moulaert & MacCallum 2019). Scholars in the SISCODE project defined co-creation as '[…] a non-linear process that involves multiple actors and stakeholders in the ideation, implementation and assessment of products, services, policies and systems with the aim of improving their efficiency and effectiveness, and the satisfaction of those who take part in the process.' ('SISCODE' 2019).

By using these definitions for our extraction sheet, we compared types of stakeholders, different phases of the process, their aim, and the level of satisfaction of stakeholders. In line with systematic reviews, we also included questions on the background of both social innovation and co-creation, their expressed relationship and mentioned key publications, (Gough et al. 2017). Finally, we looked for traces of evaluation indicators within the texts and used these to develop a framework.

4. Results

Figure 1 shows the results of our query and revealed that the combination of social innovation and co-creation emerged in 2015. Although the numbers are too low to draw firm conclusions, there appears to be a steady growth of this literature after 2015. Based on this, we believe that a new body of literature is emerging, labelled 'co-creation for social innovation'. To understand and define this body of literature, we categorised and analysed the keywords and abstracts of the 114 publications.

4.1 Distinguishing categories based on keywords and abstracts

As mentioned in the methodology section, it was quite difficult to distinguish separate categories within the analysed literature based on the keywords provided by the authors. Although we could only categorise roughly 65% of the publications, we were able to distinguish eleven distinct categories (Figure 2). This provided us with some baseline data for further - more narrative - analysis.

At first glance, these eleven categories appear to be unfocused, but a closer look reveals that these categories reflect contested elements of both social innovation and co-creation, because the categories reflect outcomes of a process, the process itself, the use of specific forms such as living labs or participatory research methods. Our qualitative analysis of the abstracts confirmed some of the findings from previous literature reviews on co-creation in the public sector (Voorberg et al. 2015). For example, most publications are still single or multiple case studies and qualitative in nature.

4.2 Key publications and authors

By using a visualisation tool, we could analyse the citations of- and between the 114 selected publications and based on the number of citations, we could also distinguish key publications that have influenced the co-creation for social innovation literature. We added more depth, by reading all the publications and focused on manually distinguishing and highlighting cited papers that the authors used to delineate their research. Based on the content of all the papers and former research on co-creation and social innovation, we argue that most publications are citing five distinct (groups) of publications (Figure 3):

Figure 3 illustrates that most publications since 2015 are primarily drawing from one of these (groups of) publications and also show the key message of these publications. Especially the work of Vargo and Lusch and Chesbrough has been cited around 10,000 times, followed by the work of Prahalad and Ramaswamy with roughly 5,000 citations. The figure also shows the influence of the work of the 'Mulgan cluster' within our selection of 114 publications.

We also looked more closely at the 16 publications taken from the selection that combined literature from more than one cluster. Twelve of these publications combined the work from the 'Mulgan cluster'

with one of the other clusters, most often with the work of Chesbrough (Morawska-Jancelewicz 2021; Pozzo R. et al. 2020; Rayna & Striukova 2019; Svensson & Hambrick 2019). The work of Chesbrough has also been combined nine times with other clusters in this sample of 16 publications. Based on this we conclude that in the distinguished emerging research field the concept of social innovation by the 'Mulgan cluster' is very influential. Within this cluster, social innovation is often characterised as a as a process and there is a focus on the practical application of social innovation as well (Mulgan 2006; Murray et al. 2010). The concept of 'open innovation', which has a background in value-creation and business studies is also influential and implies the inclusion of stakeholders in processes of innovation (Chesbrough 2003).

4.3 Meta narratives in the co-creation for social innovation literature

In our narrative analysis of the 100 available full publications, we focused specifically on the theoretical background, the process of co-creation, the aim of co-creation and the relationship with social innovation within the publications. During our analysis, we also noticed that except for one paper (Lorne 2020), every single author is intrinsically positive about co-creation and social innovation. We already noticed this in our analysis of the abstracts, which showed that authors intrinsically expect potential positive added value when including stakeholders in projects. This is also pointed out by Puerari who is stating that:

"*Nowadays, co-creation has become an almost 'magical concept' that is assumed to be able to achieve a variety of positive effects. It is said to be able to reform the public sector, to enable creativity and stimulate innovative solutions, as well as to make change processes more effective and meaningful* (Puerari et al. 2018 p. 4).

By systematically reading and analysing the co-creation for social innovation literature, we noticed that it was quite hard to systematically answer the questions from our template throughout all publications. Many publications did not systematically define co-creation or discuss social innovation. Our analysis also uncovered quite distinct terminology in different types of literature. For example, publications that cite the work of Vargo speak of 'value creation' and publications that cite Mulgan are more inclined to talk about social challenges. We also noticed that many publications mention EU policies, such as the large Framework Programmes. This could be explained by the fact that from the combined 176 countries of origin from the authors within this sample, 129 are based in European countries ('Document search - Web of Science Core Collection' n.d.).

Interestingly, the 'satisfaction' criterion, which we regard as important in our used definition, is almost impossible to trace throughout the selected publications, although some authors point at satisfaction

levels within for example companies (Díaz-Perdomo et al. 2021) or success in terms of shared common goals (Enciso-Santocildes et al. 2020).

However, based on the distinguished 11 categorisations (Figure 2) and the subsequent narrative analysis we have identified three distinct segments in the body of literature that all have their own meta narrative. We characterised them based on the sector where the co-creation for social innovation takes place and noticed that these types of stakeholders reflect the triple helix typology, that has been developed by Leydesdorff and Etkowitz and inspired the EU framework programmes for research and innovation (Etzkowitz & Leydesdorff 1995; Meister Broekema et al. 2021a).

1. The 'corporate' segment is aimed at co-creation and social innovation in enterprises.
2. The 'governmental/societal' segment is aimed at tackling societal challenges.
3. The 'action research' segment is aimed at participatory action research.

Although the borders between the segments are permeable, and there is some overlap between the segments, our narrative analysis provided sufficient detailed information. We specified the specific uses of co-creation and social innovation, the relationship between these concepts as well as information on the aim and expressions of co-creation. The latter is important as well, because different segments often regard to specific expressions of co-creation. The segments are visualised in Figure 4. The figure shows the sector, aim, concept of co-creation with the relation between co-creation and social innovation and expressions of co-creation. We also tried to summarise the main idea of each segment in a few words (value, social innovation and empowerment), based on a combination of the ideas in the distinguished segments and their aim of the co-creation for social innovation.

The corporate segment

The first segment is rooted in business studies and basically incorporates the in Figure 2 mentioned literature on corporate social innovation and social entrepreneurship (for example Chen & Lin 2018; Ma et al. 2020; Mirvis et al. 2016). Most authors in this segment see co-creation as a necessary bottom-up process to understand specific needs of stakeholders with the aim to develop products or processes or make them more efficient and effective (Lan et al. 2017; Witell et al. 2017). The key concept in this field is the idea of value creation (Vargo et al. 2008). The direct co-creation with end-users, for example takes place by setting up specific groups for co-creation within enterprises(Fiore et al. 2020). Besides this direct co-creation, there is also an increasing focus on the use of new digital technologies for co-creation and as a tool to realise social innovation (Hsu et al. 2018; Office 2018). There is also a trend in these publications to focus more on social entrepreneurship over the years and use concepts such as

the Sustainable Development Goals (SDGs) from for example literature on fab labs (Valenzuela-Zubiaur et al. 2021).

The governmental/societal segment

The second segment is the most diverse and largest in number of publications and includes a broad variety of types of publications from our preliminary analysis, such as public sector innovation, citizen led innovation, urban planning, and community development (Figure 2) The papers in this segment share the outlook that projects primarily should be aiming for a benefit for society. The key concept is Social Innovation, that is heavily influenced by the more practical work of the 'Mulgan cluster'. Often in this segment, citizens are collaborating with governments and apply co-creation and social innovation concepts in reality (Frantzeskaki 2019; Torill Nyseth et al. 2019). However, the types of stakeholders are mostly rather unclear or implicit, because publications tend to focus more on the application of co-creation in so called hubs or living labs (Angelini et al. 2016; Callaghan & Herselman 2015; Zavratnik et al. 2019). In some cases, universities are also involved, mainly by setting up and participating in living labs (Kumari et al. 2020; van Niekerk et al. 2020; Purcell et al. 2019). New technologies are also being used, mainly process-oriented tools to facilitate the co-creation process (Kohlgrüber et al. 2021). An increasing number of publications deal with tackling societal challenges and describe these challenges in terms of SDGs.

The action research segment

The third segment is relatively small and differs from the other two segments because authors focus on the use of a specific methodology for researchers called Participatory Action Research (PAR) (Figure 2) (Bradbury 2015). PAR could be defined as a specific form of co-creation between researchers and individuals or groups of people with the aim to answer a rich palette of diverse research questions (Wu & Sung 2021). The key concept in this segment is the empowerment of people (Sadabadi & Rahimi Rad 2021) and although researchers are always involved, the underlying idea is that research is demand driven, also called 'Mode 2' research (Nowotny et al. 2003 p. 2). Often, authors for example emphasise the mutual trust between researchers and communities and the democratisation of the research process (Davis et al. 2022).

4.4 Use of and relationship between co-creation and social innovation

Our literature analysis suggests that co-creation at its core is quite fixed as a concept and is described throughout the literature as the involvement of stakeholders in the development of products, services, or processes. Our analysis revealed that co-creation is often implemented by bringing specific people together in dedicated groups for product development, by using new technologies or by bringing

people together in a dedicated place, such as a living lab or hub. The use of co-creation is the most diverse in the governmental/societal segment, in which stakeholders are for example included to democratise the process (Agger 2021), to make the process more inclusive (Torill Nyseth et al. 2019) or to learn new skills (Spinelli G et al. 2019). Interestingly, co-creation as such is only questioned in the corporate segment. Within this segment some research has been undertaken to identify individuals who have characteristics that allow them to better produce valuable technological improvement suggestions (Schweitzer et al. 2015). The other two segments take co-creation more for granted and see it respectively as obvious, necessary or an essential element for social innovation (Babu et al. 2020; Colla et al. 2021; Desmarchelier et al. 2020; Eckhardt et al. 2021; Morawska-Jancelewicz 2021; Toros et al. 2020), describe the history of the concept (Ansell & Torfing 2021) or focus on the role of co-creation in PAR (Karadima & Bofylatos 2019; Wu & Sung 2021).

The concept of Social Innovation tends to be used more widely as a goal. Examples of such goals include increased inclusiveness (e.g., by furthering collaborations with people with disabilities), bridging policy and research into societal divisions or embedding social ambitions within core activities (Krüger & David 2020; Herrera 2016; Lindberg et al. 2019; Hsu et al. 2018). Interestingly, social innovation is sometimes seen as synonymous with public sector innovation itself (Parahoo & Al-Nakeeb 2019)

This fluidity of social innovation and the complementarity of co-creation has also been observed in an analysis of EU policies (Meister Broekema et al. 2021b). However, we did not find evidence of the problematisation of the concept of Social Innovation in the corporate segment or the action research segment. In the former it is basically being used to do something social in terms of outcomes, such as being sustainable or having a higher stakeholder value (Li et al. 2018), or internally by being more inclusive. In the latter segment, 'social' is used by authors to show that research is focusing on societal problems such as poverty. In the governmental/societal segment, social innovation is being problematised much more, by focusing on dimensions of 'social', and we noticed a clear preference to tackle societal challenges as well.

The relationship between the two concepts illustrates similar complexity. In general, we can distinguish between the following three types of relationships that corroborate with the respective three segments:

I. Method: co-creation is used as a method to accomplish social innovation.
II. Integrated: co-creation is an essential element of social innovation.
III. Intrinsic: co-creation is an aim in itself, because it leads to specific insights and social innovation.

We have also included the relationship between the two concepts in figure 4. The differences in these segments can be explained because they emerged in different fields (Ayob et al. 2016; Greenhalgh et al. 2016). The corporate segment evolved in business studies and was primarily focused on co-creation as a method for including end-users and only recently became connected with social innovation. The governmental/societal segment has its roots in more practical social innovation oriented literature, especially with local development and social and societal challenges embracing co-creation as part of social innovation. The action research segment evolved from literature on community development and is therefore more focused on co-creation in terms of doing research together with non-academics as co-researchers.

4.5 Uncovering indicators for good co-creation for social innovation in academic literature

As argued above, the relationship between co-creation and social innovation has not been properly problematised in the studied literature. Especially in the governmental/societal segment, social innovation and co-creation are very entangled and therefore successful social innovation is often described in terms of co-creation. As mentioned before, we see the same interconnectedness in EU policy (Meister Broekema et al. 2021b). Because co-creation is not properly defined in EU policy and the above mentioned governmental/societal segment, it is difficult to understand when co-creation could be regarded as good (quality) and how this leads to better social innovation. Quality is not only a concept, but also an operationalisation of variables, and recently is also being used as a criterion itself (Feller 2006). To understand if something is of good quality, one would need indicators that could give insight into specific elements of co-creation. Because co-creation for social innovation not been problematised a lot in the academic literature we decided to draw upon insights from a plethora of publications. After close reading our body of literature, we believe that 23 publications could be used to develop indicators for an evaluation framework. Interestingly, these publications are hardly citing each other (Figure 5).

In this selection of papers, most authors assume that the quality of co-creation for social innovation will be better if stakeholders are (inter)actively involved throughout the whole process (for example Hsiung et al., 2021; Morelli et al., 2017; Sorrentino et al., 2018). In addition, some authors claim that co-creation as such is an indicator for successful social innovation (Ahmed et al. 2020; Cangiano et al. 2017; Pozzo R. et al. 2020).

In line with our used definitions of co-creation and social innovation, we looked for indicators for the quality of co-creation for social innovation that could be used during the input, throughput, and output phase of the process. Indicators for the input phase give an indication of the set-up and scope of the project, the indicators for the throughput phase indicate and monitor the planned activities and the

output indicators indicate potential outcomes and eventually impact. However, we also noticed that it is sometimes difficult to attribute these indicators to only one specific phase. Mainly because authors are for example mentioning the importance of interaction throughout a whole process. Especially interactions with stakeholders need dedicated strategies to ensure participation and need to be developed and planned before the start of a project. We decided to attribute indicators such as interactions to the throughput phase (Figure 6).

In general, authors are inclined to come up with descriptive indicators for co-creation that have been tested in a few case studies. The outputs or outcomes of the co-creation process are described mostly in terms of efficiency and effectiveness and sometimes supplemented with indicators such as involvement or acceptance. Other publications are looking more at the process itself and are trying to optimise this process by including indicators such as inclusion, transparency and accountability or ownership. Interestingly, some authors conclude that the concept of serendipity plays an important role here as well (Sauer & Bonelli 2020). Finally, a smaller set of publications focuses more on the input phase, for example by trying to find out which people have specific skills that allow for better contributions (Schweitzer et al. 2015), ensure interactions by design (Morelli et al. 2017), or show a relationship between the heterogeneity of the stakeholders and the breadth of the social aims (De Silva & Wright 2019).

4.6 Building and using a grounded co-creation meta evaluation framework

Based on our analysis of the co-creation for social innovation literature and literature on evaluation systems (Smit & Hessels 2021), we consider the following elements as important:

a. the design of the process.
b. the use of different types of indicators and evaluation methodologies.
c. the continuous monitoring of co-creation throughout the process.

The design of the process implies that specific choices have to be made before the input phase by the initiating actors. We have made this visible with ‘start’ and by adding guiding questions in the framework (Figure 7). Our framework can also be described as reflexive, because it stimulates partners in a social innovation project to think about the indicators for success of their project before the start and provides them with indicators and evaluation methodologies.

Before the input phase, actors need to decide if they are aiming for a specific social aim or a broader social aim. In addition, we believe it is essential to decide on the amount; or in other words; level of serendipity as well. We envision serendipity as the occurrence or development of action by chance by bringing different types of stakeholders together. The level of serendipity allowed, basically how much

space for unexpected outcomes will be allowed upfront in combination with an open attitude towards unexpected outcomes; is also affecting how much emphasis is put on outputs and the number and variety of stakeholders. This choice is followed by a choice for the suitable expressions of co-creation. Based on our analysis, we distinguished between dedicated groups, digital platforms, hubs and living labs in paragraph 5.3 (Figure 4).

After agreeing on the design, it is essential to decide on the indicators of successful co-creation as well, by choosing upfront to evaluate the process and/or the outputs of co-creation. In general, for example a choice for a serendipitous broad social innovation, implies a larger number of diverse stakeholders and less focus on outputs. The choice for the evaluation of the process and/or outputs entails specific indicators as well. Indicators for successful co-creation processes can be quantitative, for example inclusion of different types of partners, or qualitative, for example the transparency of the process, accountability or ownership by partners.

As mentioned before, one needs different types of evaluations to fully understand the success of co-creation. For example, the co-creation process could be evaluated quantitatively by first determining the intended number and type of stakeholders and then contrast these during the project with the involved stakeholders. After this, the level of involvement of stakeholders could be determined and included, for example by using some kind of framework for increasing involvement on different levels such as information, consultation, collaboration, co-decision or empowerment (Luyet et al. 2012). The continuous monitoring and evaluation of this involvement could for example be done by using a questionnaire, having interviews or focus groups.

However, it is also important to understand the interactions between the stakeholders. The effect of these interactions has been described in the analysed literature as “traces we leave behind when we have a shared experience of cultural common goods” (Pozzo R. et al., 2020 427). These traces can be measured by using evaluation methodologies such as ‘evaluative inquiry’ or ‘contribution mapping’ which include techniques such as scientometrics, productive interactions, impact pathways, interviews and document analysis (de Rijcke et al. 2019; Kok & Schuit 2012; Smit & Hessels 2021).

Literature suggests that if successful co-creation is determined by outputs, the indicators could be quantitative, or qualitative by focusing on efficiency, effectivity, and acceptance of products. Both could be witnessed after the end of the project by quantitively and qualitatively contrasting the delivered outputs with the intended outputs or aims and by interviewing partners, stakeholders and other people involved in or affected by the project.

5 Discussion

Our analysis of more than 100 academic publications that combine social innovation and co-creation showed that we can distinguish three different segments within this body of literature. We noticed that authors within these segments perceive the relationship between social innovation and co-creation quite differently. Although a lot of publications mostly described successful examples of co-creation for social innovation, some of these also reflected on factors for this success and therefore can be used as indicators for an evaluation framework. The framework is based on literature and can be used to evaluate EU funded social innovation projects. However, we are also aware about the performativity of EU policies.

We believe that especially within the context of EU funded projects, a new type of research is emerging that we have named 'co-creation for social innovation'. This research is connected with research on innovation ecosystems (Gomes et al. 2018). As argued by Hall and Löfgren, some of the innovation system literature is lacking a critical distance between researchers and the object of policy research (Hall & Löfgren 2017). The lack of distance sometimes leads to 'innovationism', which entails a forward looking vision of purpose and presents a faith in the innovation system (Valaskivi 2012). Innovation is seen as the purpose for action, as well as the desired end result: growth is the aim, innovations are perceived to lead to growth, thus innovations are the solution" (Valaskivi 2020 p. 172). Subsequently, innovation is no longer primarily regarded as a tool to boost for example regional development, but as a deliverable for EU agendas such as Europe2020 (Lagendijk & Varró 2013). Based on our analysis of the governmental/societal segment, we believe that the same is happening with co-creation. Like innovation, co-creation is also seen a purpose for action and a desired result. Social innovation is the aim, co-creation is perceived to lead to social innovation, thus co-creation is the solution.

In addition, evaluation of funded EU projects still remains too much focused on *ex ante* indicators such as the number and type of stakeholders and *ex post* indicators as outputs, deliverables and milestones, thereby neglecting the different processes within a project (Büttner & Leopold, 2016; Meister Broekema et al. 2021a). This neglect has to do with the focus on accountability in EU bureaucracy and the unwillingness to use a more contextually adaptive and maybe less measurable evaluation approach. The evaluation framework used by the EU also results from specific EU-policy objectives and policies that are inclined towards inclusion and empowerment as such, rather than on promoting the best interactions between stakeholders.

We are aware that due to the limitations of our query some fields in which co-creation has been emerging, such as policy and action orientated transitions research are underrepresented (see for example the work of Janssen et al. 2022; Molas-Gallart et al. 2021). We believe that the insights from

our analysis could be valuable for these types of research as well and it would be interesting to include these adjacent fields in a future paper.

6 Conclusion

In this paper we answered our main research question 'How can we evaluate the application of co-creation in EU-funded social innovation projects?' We have answered this question by conducting a literature review and by developing a framework.

Although research has been problematising social innovation and co-creation as separate concepts, only since 2015 a new body of literature has emerged that is explicitly combining both concepts. Our literature review shows we can distinguish three separate segments in the literature, namely 'corporate', 'governmental/societal' and 'action research'. These segments are rooted in distinct research traditions and also interpret the relationship between social innovation and co-creation differently. Publications within the 'corporate' segment often regard co-creation as a method to accomplish an aim and publications within the 'action research' view co-creation more as an aim in itself.

The 'governmental/societal' segment is basically considering co-creation as an integral part of social innovation. This segment does not only hold the largest amount of analysed papers, but is also thematically closely related to EU policies on research and innovation. Former research has also shown that co-creation became more widely used from 2015 onwards in these types of policies. However, in contrast to academic literature, the concept in EU policies and subsequent funded research projects is merely used as a tick-box exercise to evidence the inclusion of stakeholders in evaluations (Meister Broekema et al. 2021b). In addition, we also pointed out that 'innovationism'; the believe that purely through innovations life becomes more worthwhile; is reshaping reality in terms of policies instead of the other way around. Because of these practices, we believe that social innovation projects do not fulfil their potential in terms of societal impact. We also believe that the belief in co-creation is so strong, that it is not scrutinised enough anymore.

Our analysis resulted in the development of an evaluation framework based on indicators we have uncovered in the academic body of literature that combines social innovation and co-creation. We envision that this framework can be used by partners and stakeholders in EU funded social innovation projects to better plan, monitor and evaluate co-creation in social innovation projects. By including our framework in for example the evaluation of funded EU projects, this can help to shift attention to the set-up, monitoring and understanding of the impact of co-creation in social innovation projects and can 'revive' the concept.

In addition, we also hope that the insights of this paper and the developed framework will ensure not just a deeper understanding of the concept of co-creation but also spur a discussion between researchers and policymakers how co-creation between stakeholders can be supported in research projects.

Literature

Agger, A. (2021). 'Democratic innovations in municipal planning: Potentials and challenges of place-based platforms for deliberation between politicians and citizens', *Cities*, 117: 103317. DOI: 10.1016/j.cities.2021.103317

Ahmed, J. U., Gazi, M. A., Iqbal, R., Islam, Q. T., & Talukder, N. (2020). 'Value co-creation through social innovation in healthcare: a case of WE CARE Solar', *World Journal of Entrepreneurship, Management and Sustainable Development*, 16/4: 341–57. Emerald Publishing Limited. DOI: 10.1108/WJEMSD-03-2020-0024

Alves, H., Fernandes, C., & Raposo, M. (2016). 'Value co-creation: Concept and contexts of application and study', *Journal of Business Research*, Designing implementable innovative realities, 69/5: 1626–33. DOI: 10.1016/j.jbusres.2015.10.029

Angelini, L., Carrino, S., Abou Khaled, O., Riva-Mossman, S., & Mugellini, E. (2016). 'Senior Living Lab: An Ecological Approach to Foster Social Innovation in an Ageing Society', *Future Internet*, 8/4: 50. DOI: 10.3390/fi8040050

Ansell, C., & Torfing, J. (2021). 'Co-creation: the new kid on the block in public governance', *Policy & Politics*, 49. DOI: 10.1332/030557321X16115951196045

Ayob, N., Teasdale, S., & Fagan, K. (2016). 'How social innovation "came to be": Tracing the evolution of a contested concept', *Journal of Social Policy*, 45/4: 635–53.

Babu, M. M., Dey, B. L., Rahman, M., Roy, S. K., Syed Alwi, S. F., & Kamal, M. M. (2020). 'Value co-creation through social innovation: A study of sustainable strategic alliance in telecommunication and financial services sectors in Bangladesh', *Industrial Marketing Management*, 89: 13–27. DOI: 10.1016/j.indmarman.2020.06.003

Bornmann, L. (2013). 'What is societal impact of research and how can it be assessed? a literature survey', *Journal of the American Society for Information Science and Technology*, 64/2: 217–33. DOI: 10.1002/asi.22803

Bradbury, H. (2015). *The SAGE Handbook of Action Research*. SAGE.

Büttner, S. M., & Leopold, L. M. (2016). 'A "new spirit" of public policy? The project world of EU funding', 3/1: 32.

Callaghan, R., & Herselman, M. (2015). 'Applying a Living Lab methodology to support innovation in education at a university in South Africa', *The Journal for Transdisciplinary Research in Southern Africa*, 11/1: 18. DOI: 10.4102/td.v11i1.30

Cangiano, S., Romano, Z., & Loglio, M. (2017). 'The growth of digital social innovation in Europe. An Open Design approach to support innovation for the societal good', *The Design Journal*, 20/sup1: S3546–59. Routledge. DOI: 10.1080/14606925.2017.1352857

Carayannis, E., & Campbell, D. (2012). 'Triple Helix, Quadruple Helix and Quintuple Helix and How Do Knowledge, Innovation and the Environment Relate To Each Other?', *International Journal of Social Ecology and Sustainable Development*, 1: 41–69. DOI: 10.4018/jsesd.2010010105

Chen, H.-W., & Lin, F.-R. (2018). 'Evolving Obligatory Passage Points to Sustain Service Systems: The Case of Traditional Market Revitalization in Hsinchu City, Taiwan', *Sustainability*, 10/7: 2540. DOI: 10.3390/su10072540

Chesbrough, H. (2003). 'Open Innovation: The New Imperative for Creating and Profiting fromTechnology',.

Colla, V., Matino, R., Schröder, A. J., Schivalocchi, M., & Romaniello, L. (2021). 'Human-Centered Robotic Development in the Steel Shop: Improving Health, Safety and Digital Skills at the

Workplace', *Metals*, 11/4: 647. Multidisciplinary Digital Publishing Institute. DOI: 10.3390/met11040647

Connell, J. (1995). 'New Approaches to Evaluating Community Initiatives. Concepts, Methods, and Contexts. Roundtable on Comperhensive Community Initiatives for Children and Families.', *undefined*.

Davis, S., van Nek, Y., & Horlings, L. G. (2022). 'How to Nurture Ground for Arts-Based Co-Creative Practice in an Invited Space: Reflections on a Community in North Netherlands'. Franklin A. (ed.) *Co-Creativity and Engaged Scholarship*, pp. 229–63. Springer International Publishing: Cham. DOI: 10.1007/978-3-030-84248-2_8

De Silva, M., & Wright, M. (2019). 'Entrepreneurial co-creation: societal impact through open innovation', *R&D Management*, 49/3: 318–42. DOI: 10.1111/radm.12362

Desmarchelier, B., Djellal, F., & Gallouj, F. (2020). 'Towards a servitization of innovation networks: a mapping', *Public Management Review*, 22/9: 1368–97. DOI: 10.1080/14719037.2019.1637012

Díaz-Perdomo, Y., Álvarez-González, L. I., & Sanzo-Pérez, M. J. (2021). 'A Way to Boost the Impact of Business on 2030 United Nations Sustainable Development Goals: Co-creation With Non-profits for Social Innovation', *Frontiers in Psychology*, 12: 3168. DOI: 10.3389/fpsyg.2021.719907

'Document search - Web of Science Core Collection'. (n.d.). . Retrieved June 30, 2022, from <https://www-webofscience-com.proxy-ub.rug.nl/wos/woscc/basic-search>

Eckhardt, J., Kaletka, C., Krüger, D., Maldonado-Mariscal, K., & Schulz, A. C. (2021). 'Ecosystems of Co-Creation', *Frontiers in Sociology*, 6: 642289. DOI: 10.3389/fsoc.2021.642289

Enciso-Santocildes, M., Vidu, A., & Gómez-Urquijo, L. (2020). 'Drivers for a cross-sector successful collaboration: the Basque country model of action', *International Journal of Social Economics*, 47/2: 268–84. Emerald Publishing Limited. DOI: 10.1108/IJSE-06-2019-0378

'ESRC definition of impact'. (n.d.). . Retrieved February 7, 2022, from <https://www.ukri.org/councils/esrc/impact-toolkit-for-economic-and-social-sciences/defining-impact/>

Etzkowitz, H., & Leydesdorff, L. (1995). 'The Triple Helix -- University-Industry-Government Relations: A Laboratory for Knowledge Based Economic Development'. SSRN Scholarly Paper, Rochester, NY.

Feller, I. (2006). 'Multiple actors, multiple settings, multiple criteria: issues in assessing interdisciplinary research', *Research Evaluation*, 15/1: 5–15. DOI: 10.3152/147154406781776020

Fiore, M., Galati, A., Gołębiewski, J., & Drejerska, N. (2020). 'Stakeholders' involvement in establishing sustainable business models: The case of Polish dairy cooperatives', *British Food Journal*, 122/5: 1671–91. Emerald Publishing Limited. DOI: 10.1108/BFJ-04-2019-0263

Frantzeskaki, N. (2019). 'Seven lessons for planning nature-based solutions in cities', *Environmental Science & Policy*, 93: 101–11. DOI: 10.1016/j.envsci.2018.12.033

Fuglsang, L., Hansen, A. V., Mergel, I., & Røhnebæk, M. T. (2021). 'Living Labs for Public Sector Innovation: An Integrative Literature Review', *Administrative Sciences*, 11/2: 58. DOI: 10.3390/admsci11020058

Ghosh, B., Kivimaa, P., Ramirez, M., Schot, J., & Torrens, J. (2021). 'Transformative outcomes: assessing and reorienting experimentation with transformative innovation policy', *Science and Public Policy*, 48/5: 739–56. DOI: 10.1093/scipol/scab045

Godin, B. (2015). *Innovation Contested: The Idea of Innovation Over the Centuries*. New York: Routledge. DOI: 10.4324/9781315855608

Gomes, L. A. de V., Facin, A. L. F., Salerno, M. S., & Ikenami, R. K. (2018). 'Unpacking the innovation ecosystem construct: Evolution, gaps and trends', *Technological Forecasting and Social Change*, 136: 30–48. DOI: 10.1016/j.techfore.2016.11.009

Gough, D., Oliver, S., & Thomas, J. (2017). *An Introduction to Systematic Reviews*. SAGE.

Greenhalgh, T., Jackson, C., Shaw, S., & Janamian, T. (2016). 'Achieving Research Impact Through Co-creation in Community-Based Health Services: Literature Review and Case Study: Achieving Research Impact Through Co-creation', *The Milbank Quarterly*, 94/2: 392–429. DOI: 10.1111/1468-0009.12197

Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., Kyriakidou, O., & Peacock, R. (2005). 'Storylines of research in diffusion of innovation: a meta-narrative approach to systematic review', *Social Science & Medicine*, 61/2: 417–30. DOI: 10.1016/j.socscimed.2004.12.001

Hall, P., & Löfgren, K. (2017). 'Innovation Policy as Performativity—the Case of Sweden', *International Journal of Public Administration*, 40/4: 305–16. Routledge. DOI: 10.1080/01900692.2015.1107740

Herrera, M. E. B. (2016). 'Social innovation for bridging societal divides: Process or leader? A qualitative comparative analysis', *Journal of Business Research*, 69/11: 5241–7. DOI: 10.1016/j.jbusres.2016.04.119

Hsu, H.-Y., Liu, F.-H., Tsou, H.-T., & Chen, L.-J. (2018). 'Openness of technology adoption, top management support and service innovation: a social innovation perspective', *Journal of Business & Industrial Marketing*, 34/3: 575–90. Emerald Publishing Limited. DOI: 10.1108/JBIM-03-2017-0068

Janssen, M. J., Bergek, A., & Wesseling, J. H. (2022). 'Evaluating systemic innovation and transition programmes: Towards a culture of learning', *PLOS Sustainability and Transformation*, 1/3: e0000008. Public Library of Science. DOI: 10.1371/journal.pstr.0000008

Joly, P.-B., Gaunand, A., Colinet, L., Larédo, P., Lemarié, S., & Matt, M. (2015). 'ASIRPA: A comprehensive theory-based approach to assessing the societal impacts of a research organization', *Research Evaluation*, 24/4: 440–53. DOI: 10.1093/reseval/rvv015

Karadima, D., & Bofylatos, S. (2019). 'Co-living as a means to re-engagement. A literature review', *The Design Journal*, 22/sup1: 751–62. Routledge. DOI: 10.1080/14606925.2019.1595397

Kohlgrüber, M., Maldonado-Mariscal, K., & Schröder, A. (2021). 'Mutual Learning in Innovation and Co-Creation Processes: Integrating Technological and Social Innovation', *Frontiers in Education*, 6. Frontiers Media S.A. DOI: 10.3389/feduc.2021.498661

Kok, M. O., & Schuit, A. J. (2012). 'Contribution mapping: a method for mapping the contribution of research to enhance its impact', *Health Research Policy and Systems*, 10/1: 21. DOI: 10.1186/1478-4505-10-21

Krüger, D., & David, A. (2020). 'Entrepreneurial Education for Persons With Disabilities—A Social Innovation Approach for Inclusive Ecosystems', *Frontiers in Education*, 5. DOI: 10.3389/feduc.2020.00003

Kumari, R., Kwon, K.-S., Lee, B.-H., & Choi, K. (2020). 'Co-Creation for Social Innovation in the Ecosystem Context: The Role of Higher Educational Institutions', *Sustainability*, 12/1: 307. Multidisciplinary Digital Publishing Institute. DOI: 10.3390/su12010307

Lagendijk, A., & Varró, K. (2013). 'European innovation policies from RIS to smart specialization: a policy assemblage perspective', *The Innovation Union in Europe*, 99–120. Edward Elgar Publishing.

Lan, J., Ma, Y., Zhu, D., Mangalagiu, D., & Thornton, T. (2017). 'Enabling Value Co-Creation in the Sharing Economy: The Case of Mobike', *Sustainability*, 9/9: 1504. DOI: 10.3390/su9091504

Leydesdorff, L. (2010). '(PDF) The Triple Helix, Quadruple Helix, …, and an N-Tuple of Helices: Explanatory Models for Analyzing the Knowledge-Based Economy?'. Retrieved July 22, 2019, from <https://www.researchgate.net/publication/47868742_The_Triple_Helix_Quadruple_Helix_and_an_N-Tuple_of_Helices_Explanatory_Models_for_Analyzing_the_Knowledge-Based_Economy>

Li, W., Sadick, M. A., Musah, A.-A. I., & Mustapha, S. (2018). 'The Moderating Effect of Social Innovation in Perspectives of Shared Value Creation in the Educational Sector of Ghana', *Sustainability*, 10/11: 4216. DOI: 10.3390/su10114216

Lindberg, M., Hallencreutz, D., & Tengqvist, A. (2019). 'Bridging Participatory Policy Trends and Research Traditions through Social Innovation', *Technology Innovation Management Review*, 9/4: 27–36. DOI: 10.22215/timreview/1231

Lorne, C. (2020). 'The limits to openness: Co-working, design and social innovation in the neoliberal city', *Environment and Planning A: Economy and Space*, 52/4: 747–65. SAGE Publications Ltd. DOI: 10.1177/0308518X19876941

Lovelock, C. H., & Young, R. F. (1979). 'Look to consumers to increase productivity', *Harvard business review*, 57/3: 168–78.

Luyet, V., Schlaepfer, R., Parlange, M. B., & Buttler, A. (2012). 'A framework to implement Stakeholder participation in environmental projects', *Journal of Environmental Management*, 111: 213–9. DOI: 10.1016/j.jenvman.2012.06.026

Ma, Y., Thornton, T. F., Mangalagiu, D., Lan, J., Hestad, D., Cappello, E. A., & Van der Leeuw, S. (2020). 'Co-creation, co-evolution and co-governance: understanding green businesses and urban transformations', *Climatic Change*, 160/4: 621–36. DOI: 10.1007/s10584-019-02541-3

Meagher, L., Lyall, C., & Nutley, S. (2008). 'Flows of knowledge, expertise and influence: A method for assessing policy and practice impacts from social science research', *Research Evaluation - RES EVALUAT*, 17: 163–73. DOI: 10.3152/095820208X331720

Meister Broekema, P., Horlings, L. G., & Bulder, E. (2021a). 'Tackling societal challenges together Co-creation strategies and social innovation in EU policy and funded projects', *European Policy Analysis*. DOI: 10.1002/epa2.1133

Meister Broekema, P., Horlings, L. G., & Bulder, E. A. M. (2021b). 'Understanding the value of co-creation for social innovation interpretations of social innovation and co-creation in European policy-related documents between 1995 and 2018', *Innovation: The European Journal of Social Science Research*, 0/0: 1–18. Routledge. DOI: 10.1080/13511610.2021.1909464

Mirvis, P., Herrera, M. E. B., Googins, B., & Albareda, L. (2016). 'Corporate social innovation: How firms learn to innovate for the greater good', *Journal of Business Research*, 69/11: 5014–21. DOI: 10.1016/j.jbusres.2016.04.073

Molas-Gallart, J., Boni, A., Giachi, S., & Schot, J. (2021). 'A formative approach to the evaluation of Transformative Innovation Policies', *Research Evaluation*, 30/4: 431–42. DOI: 10.1093/reseval/rvab016

Morawska-Jancelewicz, J. (2021). 'The Role of Universities in Social Innovation Within Quadruple/Quintuple Helix Model: Practical Implications from Polish Experience', *Journal of the Knowledge Economy*. DOI: 10.1007/s13132-021-00804-y

Morelli, N., Aguilar, M., Concilio, G., Götzen, A. D., Mulder, I., Pedersen, J., & Torntoft, L. K. (2017). 'Framing Design to support Social Innovation: The Open4Citizens Project', *The Design Journal*, 20/sup1: S3171–84. Routledge. DOI: 10.1080/14606925.2017.1352823

Moulaert, F., & MacCallum, D. (2019). *Advanced Introduction to Social Innovation*. Edward Elgar Publishing.

Mulgan, G. (2006). 'The process of social innovation', *Innovations: technology, governance, globalization*, 1/2: 145–62.

Murray, R., Caulier-Grice, J., & Mulgan, G. (2010). *The open book of social innovation*. National endowment for science, technology and the art London.

van Niekerk, L., Mathanga, D. P., Juban, N., Castro-Arroyave, D. M., & Balabanova, D. (2020). 'Universities as catalysts of social innovation in health systems in low-and middle-income countries: a multi-country case study', *Infectious Diseases of Poverty*, 9/1: 90. DOI: 10.1186/s40249-020-00684-5

Nowotny, H., Scott, P., & Gibbons, M. (2003). 'Introduction: "Mode 2" revisited: The new production of knowledge', *Minerva*, 41/3: 179–94. DOI: 10.1023/A:1025505528250

Oeij, P. R. A., Torre, W. van der, Vaas, S., & Dhondt, S. (2018). *Understanding Social Innovation as an innovation process*. TNO. Retrieved May 19, 2020, from </report-completed-understanding-social-innovation-as-an-innovation-process/>

Office, F. E. (2018). 'Developing Cutting-Edge Technologies to Achieve Digital Co-creation', *FUJITSU Sci. Tech. J.*, 54/5: 6.

'Open Innovation 2.0'. (2013). *Shaping Europe's digital future - European Commission*. Text, . Retrieved July 6, 2021, from <https://ec.europa.eu/digital-single-market/en/policies/open-innovation>

Parahoo, S. K., & Al-Nakeeb, A. A. (2019). 'Investigating antecedents of social innovation in public sector using a service ecosystem lens', *International Review on Public and Nonprofit Marketing*, 16/2–4: 235–53. DOI: 10.1007/s12208-019-00229-z

Pozzo R., Filippetti A., Paolucci M., & Virgili V. (2020). 'What does cultural innovation stand for? Dimensions, processes, outcomes of a new innovation category', *Science and Public Policy*, 47/3: 425–33. DOI: 10.1093/scipol/scaa023

Prahalad, C. K., & Ramaswamy, V. (2000). 'Co-opting Customer Competence', *Harvard Business Review*, 78/1: 79–90.

'Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement'. (n.d.). . Retrieved November 5, 2021, from <https://www.acpjournals.org/doi/10.7326/0003-4819-151-4-200908180-00135>

Puerari, E., De Koning, J. I. J. C., Von Wirth, T., Karré, P. M., Mulder, I. J., & Loorbach, D. A. (2018). 'Co-Creation Dynamics in Urban Living Labs', *Sustainability*, 10/6: 1893. Multidisciplinary Digital Publishing Institute. DOI: 10.3390/su10061893

Purcell, W. M., Henriksen, H., & Spengler, J. D. (2019). 'Universities as the engine of transformational sustainability toward delivering the sustainable development goals: "Living labs" for sustainability', *International Journal of Sustainability in Higher Education*, 20/8: 1343–57. Emerald Publishing Limited. DOI: 10.1108/IJSHE-02-2019-0103

Ramaswamy, V. (2009). 'Co-creation of value — towards an expanded paradigm of value creation', *Marketing Review St. Gallen*, 26/6: 11–7. DOI: 10.1007/s11621-009-0085-7

Rayna, T., & Striukova, L. (2019). 'Open social innovation dynamics and impact: exploratory study of a fab lab network', *R&D Management*, 49/3: 383–95. DOI: 10.1111/radm.12376

de Rijcke, S., Holtrop, T., Kaltenbrunner, W., Zuiderwijk, J., Beaulieu, A., Franssen, T., & van Leeuwen, T. (2019). 'Evaluative Inquiry: Engaging Research Evaluation Analytically and Strategically', *Impact of Research and Innovation Policy at the Crossroads of Policy Design, Implementation and Evaluation*, 48: 176–82. DOI: 10.22163/fteval.2019.386

Rijcke, S. de, Wouters, P. F., Rushforth, A. D., Franssen, T. P., & Hammarfelt, B. (2016). 'Evaluation practices and effects of indicator use—a literature review', *Research Evaluation*, 25/2: 161–9. DOI: 10.1093/reseval/rvv038

Sadabadi, A. A., & Rahimi Rad, Z. (2021). 'Social innovation participatory action research for empowerment of marginalized people', *Asian Social Work and Policy Review*, 15/2: 160–72. DOI: 10.1111/aswp.12228

Sauer, S., & Bonelli, F. (2020). 'Collective improvisation as a means to responsibly govern serendipity in social innovation processes', *Journal of Responsible Innovation*, 7/sup2: S44–63. Routledge. DOI: 10.1080/23299460.2020.1816025

Schweitzer, F., Rau, C., Gassmann, O., & van den Hende, E. (2015). 'Technologically Reflective Individuals as Enablers of Social Innovation*', *Journal of Product Innovation Management*, 32/6: 847–60. DOI: 10.1111/jpim.12269

Sillak, S., Borch, K., & Sperling, K. (2021). 'Assessing co-creation in strategic planning for urban energy transitions', *Energy Research & Social Science*, 74: 101952. DOI: 10.1016/j.erss.2021.101952

'SISCODE'. (2019). . Retrieved May 19, 2020, from <https://siscodeproject.eu/>

Śledzik, K. (2013). 'Schumpeter's view on innovation and entrepreneurship',.

Smismans, S. (2015). 'Policy Evaluation in the EU: The Challenges of Linking Ex Ante and Ex Post Appraisal', *European Journal of Risk Regulation*, 6/1: 6–26. Cambridge University Press. DOI: 10.1017/S1867299X00004244

Smit, J. P., & Hessels, L. K. (2021). 'The production of scientific and societal value in research evaluation: a review of societal impact assessment methods', *Research Evaluation*, rvab002. DOI: 10.1093/reseval/rvab002

Spinelli G, Weaver P, Marks M, & Victor C. (2019). 'Making a Case for Creating Living Labs for Aging-in-Place: Enabling Socially Innovative Models for Experimentation and Complementary Economies.', *Frontiers in sociology*, 4: 19. DOI: 10.3389/fsoc.2019.00019

Sun, S. L., & Im, J. (2015). 'Cutting microfinance interest rates: an opportunity co-creation perspective'. *Entrepreneurship: Theory and Practice*, 39/1: 101-.

Svensson, P. G., & Hambrick, M. E. (2019). 'Exploring how external stakeholders shape social innovation in sport for development and peace', *Sport Management Review*, 22/4: 540–52. DOI: 10.1016/j.smr.2018.07.002

Torill Nyseth, Torill Ringholm, & Annika Agger. (2019). 'Innovative Forms of Citizen Participation at the Fringe of the Formal Planning System', *Urban Planning*, 1: 7–18. DOI: 10.17645/up.v4i1.1680

Toros, K., Kangro, K., Lepik, K.-L., Bugarszki, Z., Sindi, I., Saia, K., & Medar, M. (2020). 'Co-creation of social services on the example of social hackathon: The case of Estonia', *International Social Work*, 0020872820904130. SAGE Publications Ltd. DOI: 10.1177/0020872820904130

Valaskivi, K. (2012). 'Dimensions of Innovationism'. *Post-Secular Society*. Routledge.

——. (2020). 'The contemporary faith of innovationism'. Bell E., Gog S., Simionca A., & Taylor S. (eds) *Spirituality, Organisation and Neoliberalism*, pp. 171–93. Edward Elgar: Cheltenham.

Valenzuela-Zubiaur, M., Torres-Bustos, H., Arroyo-Vázquez, M., & Ferrer-Gisbert, P. (2021). 'Promotion of Social Innovation through Fab Labs. The Case of ProteinLab UTEM in Chile', *Sustainability*, 13/16: 8790. Multidisciplinary Digital Publishing Institute. DOI: 10.3390/su13168790

Vargo, S. L., Maglio, P. P., & Akaka, M. A. (2008). 'On value and value co-creation: A service systems and service logic perspective', *European Management Journal*, 26/3: 145–52. DOI: 10.1016/j.emj.2008.04.003

Voorberg, W. H., Bekkers, V. J. J. M., & Tummers, L. G. (2015). 'A Systematic Review of Co-Creation and Co-Production: Embarking on the social innovation journey', *Public Management Review*, 17/9: 1333–57. DOI: 10.1080/14719037.2014.930505

Witell, L., Gebauer, H., Jaakkola, E., Hammedi, W., Patricio, L., & Perks, H. (2017). 'A bricolage perspective on service innovation', *Journal of Business Research*, 79: 290–8. DOI: 10.1016/j.jbusres.2017.03.021

Wu, C.-S. (Mike), & Sung, T.-J. (David). (2021). 'Applying Values-Led Communication Design to Engage Stakeholders in Developing Dementia-Friendly Visitor Destinations', *Sustainability*, 13/8: 4504. DOI: 10.3390/su13084504

Zavratnik, V., Superina, A., & Stojmenova Duh, E. (2019). 'Living Labs for Rural Areas: Contextualization of Living Lab Frameworks, Concepts and Practices', *Sustainability*, 11/14: 3797. DOI: 10.3390/su11143797

Figure Legends List

Figure 1: Number of publications in Web of Science that include Social Innovation AND co-creation. Source: https://www-webofscience-com.proxy-ub.rug.nl/wos/woscc/basic-search on 27/9/2021

Figure 2: Categorisations of Web of Science publications based on keywords. The percentages reflect the relative number of publications that contain social innovation and co-creation within this rudimentary categorisation. Source: the authors.

Figure 3: Visualisation of linked citations in the co-creation for social innovation literature. The grey dots represent papers that are not part of our set of analysed papers, but are cited most by the papers within our sample. The red dots represent the papers in our sample. The larger the red dot, the more cited and connected they are. The papers on the left are the oldest and the papers right the most recent. The green box provides more detail on the five distinguished clusters in terms of key message and total number of citations on the 16th of December 2022. Source: www.litmaps.co

Figure 4: Visualisation of three segments in the co-creation for social innovation literature. The figure represents three segments within the co-creation for social innovation literature by sketching the sector, aim, key concepts and expression of co-creation. Within the corporate and action research fields co-creation is a main concept; within the governmental/societal field it appears to be integrated in social innovation. Source: the authors. This figure has been designed using icons from flaticon.com.

Figure 5: Visualisation of linked citations in 22 publications that could be used to develop indicators for an evaluation model for co-creation for social innovation. The orange dots represent the 22 publications. The grey lines represent references between publications in this sample. This image has been made with www.litmaps.co

Figure 6: Potential indicators for good co-creation for social innovation in academic literature. Source: the authors.

Figure 7 Adaptive framework to evaluate co-creation for social innovation. Source, the authors. This figure has been designed using icons from flaticon.com.

Evaluating co-creation in social innovation projects

Towards a process orientated framework for EU projects and beyond

Abstract

In the last two decades, co-creation and social innovation have become important concepts in academic research and public policy. The two concepts are conceptually linked, but this relationship has hardly been problematised in academic literature. In addition, social innovation and especially co-creation are not defined in EU policies, but merely included because they support policy aims. The lack of problematisation and definition not only hampers progress in the academic field, but is also constringing co-creation into an exercise of merely including stakeholders therefore neglecting the full potential of co-creation. The key question addressed in this paper is therefore: How can we evaluate the application of co-creation in EU-funded social innovation projects?

A literature review revealed that co-creation and social innovation have become connected only very recently in academic literature. In this publication we analyse the meta narratives of this emerging body of literature and conclude that we can distinguish three distinct segments with their own characteristics. We used these insights to develop an adaptive evaluation framework. This framework can be used to assess the application of co-creation within social innovation in for example EU-funded projects. This could push the emerging academic field forward and open up new research themes and designs. We also suggest that the framework could specifically support policymakers in their efforts to evaluate processes of co-creation instead of focusing on the dominant impact evaluations.

Evaluating co-creation in social innovation projects

Towards a process orientated framework for EU projects and beyond

1. Introduction

In the last decade, co-creation has become a widely used concept in academic discourses and public policies on social innovation. More importantly, co-creation has not only become widely used in these fields, but is seen as an evaluation criterion in itself in for example European Union (EU) funded projects (Meister Broekema et al. 2021b). Because of this tendency to regard co-creation as a tick-box-exercise, there is a risk that the complex and contextual interactions between stakeholders in different types of social innovation projects are neglected. To understand and ultimately use the potential added value of co-creation, this paper will analyse the relationship between co-creation and social innovation in academic discourses and use these insights to come up with a new, more process orientated evaluation framework for co-creation in social innovation projects. This framework could be beneficial for for example EU funded projects.

Co-creation, often understood as a non-linear process in which stakeholders improve products, processes or services together, has already been mentioned in academic literature since 1979 (Lovelock & Young 1979). The concept was later popularised by Prahalad and Ramaswamy in 2000 (Prahalad, and Ramaswamy 2000). They ultimately defined it as "*…the process by which products, services, and experiences are developed jointly by companies and their stakeholders…"* (Ramaswamy 2009). Within the context of businesses and their stakeholders, co-creation has shown to be not only important in product innovation, but also for example in improving customer satisfaction and in creating new appreciations of value (Alves, Fernandes, and Raposo 2016). Co-creation was subsequently used in different fields and developed into a 'contested concept' (Ayob et al. 2016; Greenhalgh et al. 2016). The concept has also become very influential in for example urban transformation literature (Sillak et al. 2021) and has also been problematised in for example literature on transformation in the public sector (Ansell & Torfing 2021).

For decades, innovation has been considered a major driver in economic growth by researchers and policymakers. The concept of innovation itself can be traced back to the seventeenth century to the work of the Italian architect Borromini (Godin 2015), but it is the Austrian Economist Joseph Alois Schumpeter (1883-1950), who is often seen as the first scholar to conceptualize innovation as such. Schumpeter argued that innovation is an essential driver of competitiveness and economic dynamics and defined innovation as: "a process of industrial mutation, that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one" (Śledzik 2013).

Although the social meaning of 'innovation' was already a topic in the seventeenth century and the term 'social innovation' was first used in the eighteenth or early nineteenth century, academic debates on social innovation only started in the last quarter of the twentieth century when two separate academic research fields for the study of social innovation emerged. One focusing on entrepreneurship, the other more on the socioeconomics. The entrepreneurial segment had an influence on EU policies (Moulaert & MacCallum 2019), which is relevant because we are focusing on the application of co-creation in EU projects. Social Innovation could be defined as (see also Moulaert & MacCallum, 2019 for an overview on this concept): *"…the invention, development and implementation of new ideas with the purpose to (immediately) relieve and (eventually) solve social problems, which are in the long run directed at the social inclusion of individuals, groups or communities…"* (Oeij et al., 2018 p10).

Research on social innovation has mainly focused on good practices; authors have argued that it is not possible to uncover specific successful social innovation pathways ex ante (Oeij et al. 2018). Research on co-creation has uncovered that this non-linear process is heavily dependent on context characteristics (Voorberg et al. 2015). Both concepts can be described as processes with similar subsequent phases of ideation or input, development or throughput and implementation or output (Oeij et al. 2018; Voorberg et al. 2015).

Despite both social innovation and co-creation deserve more attention, we focus in this paper on the link between both concepts. The first mention of both conceptions in one publication can be traced back to 2015 (Sun & Im 2015) and after this moment the use of these concepts has been growing gradually into an intertwining field that has been labelled as 'co-creation for social innovation' (Kumari et al. 2020). Although there has been substantial attention for the background and emergence of the individual concepts within the academic 'co-creation for social innovation' literature, there has not been a systematic analysis on the relationship between co-creation and social innovation in this academic literature, because it is often seen as obvious.

This paper aims to advance the emerging knowledge on the intersection of co-creation for social innovation, using these insights to answer the main research question: 'How can we evaluate the application of co-creation in EU-funded social innovation projects?'. We aim to build a framework to support such evaluations. We target specifically projects in the large Framework Programmes on Research and Innovation, such as Horizon Europe, because these explicitly incorporate the concept of social innovation, but are momentarily evaluated by looking solely at the inclusion of stakeholders as such (Meister Broekema et al. 2021a).

In order to build an evaluation framework, we analysed more than 100 academic publications appearing between 2015 and 2021, answering the following sub-questions:

1. What are the characteristics of the segments we can distinguish in the emerging literature on 'co-creation for social innovation'?
2. How do these segments envision the relationship between co-creation and social innovation?
3. What kind of specific evaluation indicators could be developed based on this literature that could capture different types of co-creation for social innovation in especially EU projects?

By introducing a novel framework to better understand the complex relationship between co-creation and social innovation in different contexts, we will not only advance the academic disciplines focused on social innovation and co-creation, but we will also provide an alternative to existing, often more linear evaluation frameworks. To show the added value of our envisioned framework in contrast to existing evaluation frameworks we will introduce research into evaluation first. After this, we will describe our methodology that can be characterised as a systematic integrative narrative literature analysis. After addressing the sub research questions in the results section, we will reflect upon our findings in the discussion and answer our main question in the conclusion.

2. Context and evaluation of co-creation for social innovation

With this paper we aim to improve the evaluation of co-creation in EU funded social innovation projects. We focus specifically on projects in the large Framework Programmes on Research and Innovation, such as Horizon Europe, because these are explicitly incorporating social innovation and co-creation, but do not have specific evaluation indicators to evaluate co-creation (Meister Broekema et al. 2021b). Therefore, our context to model co-creation for social innovation is heavily influenced by the EU-policy landscape on different levels. On a conceptual level, the EU uses specific interpretations of social innovation (Moulaert & MacCallum 2019) and co-creation in open innovation ('Open Innovation 2.0' 2013), influenced by the concept of triple- and quadruple helix innovation in which universities, governments and enterprises are collaborating, sometimes for the benefit of society as a whole (Carayannis & Campbell 2012; Leydesdorff 2010). These interpretations trickle down towards specific funding programmes and calls and tend to be performative, because they change reality by pre-describing what people are going to do in order to secure funding (Meister Broekema et al. 2021a). This specific language and rigid project structure is also reflected in the almost linear *ex post* evaluation of EU projects that is based on quantitative activities, outputs and outcomes (Büttner & Leopold, 2016). Although the EU is striving for a more cyclical approach in which results from projects

actually feed into new programmes, this is quite difficult given the complex policy context (Smismans 2015).

Former work on EU policy paradigms and evaluation systems (Meister Broekema et al. 2021b; Smit & Hessels 2021), showed that the evaluation of co-creation for social innovation is influenced by the concept of impact. Co-creation is often seen as a precondition to create impact. Most definitions of societal impact emphasise the *demonstrable* contribution that for example research makes to society ('ESRC definition of impact' n.d.). Impact is also often regarded as long-term and the end of a process that started with input, followed by activities, outputs and outcomes (Connell 1995).

Many impact evaluation systems have been developed over the years (see for example Bornmann 2013). Smit and Hessels analysed ten of these impact evaluation systems meticulously (Smit & Hessels 2021). The authors conclude that impact evaluation models are often developed because of policy demands that show the societal value of research. They distinguish between linear, cyclical and co-production types of evaluation frameworks and also analysed if the respective frameworks are distinguishing separate forms of societal and scientific impact.

In line with former research, these ten evaluation systems have all been developed for specific purposes (Rijcke et al. 2016). For example the 'flows of knowledge approach' has been developed for the evaluation of research council programmes in the UK, the 'ASIRPA approach' has been developed to assess the socio-economic impact of public sector research organisations and 'contribution mapping' was first used as a learning tool in the context of global health research (Meagher et al. 2008; Joly et al. 2015; Kok & Schuit 2012). Due to the context and aims of the different evaluation frameworks, the authors are explicitly not preferring one framework over the other. They conclude their paper with an observation that evaluation methods that combine different aspects of societal value; they identified actors, mechanisms and concepts; with the perception of various stakeholders do most justice to the practice of research and impact (Smit & Hessels 2021 p. 11).

Interestingly, the authors have not been analysing impact evaluation at an EU level. As said before, academic research on the practice of evaluation of EU funded projects is scarce, but is showing that the evaluation is *ex post* and focused on deliverables and outcomes (Büttner & Leopold, 2016). In line with the research from Smit and Hessels, an analysis of different large EU framework programs for research and innovation has also shown that not only impact is becoming more important, but even that co-creation self is used as an indicator for successful social innovation in the Horizon Europe programme (Meister Broekema et al. 2021b).

Some research has been undertaken to come up with new evaluation frameworks that are for example tailored for transformative policies (Molas-Gallart et al. 2021) or that include outcomes and use a co-

creation process with policymakers (Ghosh et al. 2021). Also promising is work on the evaluation of systemic innovation and transition programmes, by for example combining formative and summative evaluations in different phases (Janssen et al. 2022). Although interesting, these models still take the implementation of policies that aim to transition society as a starting point, instead of including indicators such as the success of a project from the viewpoint of the people participating. Therefore, although these type of evaluations include co-creation with stakeholders, their perceptions are not taken seriously enough and the quality of the involvement and interactions of these stakeholders is not taken into account.

3. Methodology

In order to develop an evaluation framework that allows us to better understand the complex and changing relationship between social innovation and co-creation, we decided to systematically carry out a literature review of academic literature which combines both concepts. In line with former research, we chose to carry out an integrative review, because we aimed to integrate findings from diverse types of literature and different types of topics and in line with other researchers believe that integrative reviews are better suited for the social sciences (Fuglsang et al. 2021). We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework throughout this publication ('Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement' n.d.). In brief, this method provides a set of reporting items to ensure reproducibility and transparency and helps to include and exclude papers. We started our systematic literature review by carrying out a query in the Web of Science. We chose this database, because it is one of the largest databases for scientific literature and covers the widest variety of topics, ranging from natural sciences to social sciences. Our search for "co-creation AND social innovation" provided us with 114 hits.

In line with other systematic literature reviews (Gough et al. 2017), we downloaded the metadata in an excel sheet. This metadata included information on for example the title, journal, author keywords, abstract, author names and year of publication. We also downloaded all the references from all the available publications to search for key publications and -authors. To understand the different segments we focused mainly on the key words mentioned by the author(s) because we were interested in how they describe and categorise their own research.

We analysed constellations of these keywords and categorised them inductively. This provided us with some general and quantitative data on the emergence and use of the relations between social innovation and co-creation in different academic fields. However, we also realised that this analysis was not providing us with enough depth and detail to understand all the nuances in the emerging field

of co-creation for social innovation, let alone to develop a novel evaluation framework. Therefore, we decided to subsequently analyse the abstracts of the publications, focusing on the who (partners), why (aim) and what (activities). Although this exercise provided more analytical depth, due to the quality and/or differing structure of the abstracts it was hard to compare the abstracts and to use them to answer the key questions (who, why and what). Therefore, we considered the results still to be inconclusive.

We also noticed in for example our categorisation of the publications that authors frame social innovation and co-creation in different ways and have different disciplinary backgrounds. In addition, our preliminary research showed that policymakers also draw on this literature on social innovation and co-creation. Therefore, we decided to switch to a meta narrative literature review. In contrast to the more traditional integrative literature review that mainly integrate findings, meta narrative reviews are aiming to construct meta narratives especially in a fuzzy literature; such as our set of publications; by being pragmatic, embracing pluralism, looking for plots, unpacking contestations and reflecting continuously (Greenhalgh et al. 2005). Because of this narrative approach, we needed to take a closer look at the content of the publications. Therefore, the full texts of the publications were downloaded and read. Unfortunately, 14 publications were not available after multiple attempts, so in total we analysed 100 full documents.

In order to systematically carry out a narrative analysis of co-creation for social innovation in an EU context, we developed an extraction sheet with questions based on our used definition of social innovation. In addition, we decided to use the definition of co-creation from a EU-funded project called SISCODE, mainly their definition bridges multiple traditions of co-creation research (Moulaert & MacCallum 2019). Scholars in the SISCODE project defined co-creation as '[…] a non-linear process that involves multiple actors and stakeholders in the ideation, implementation and assessment of products, services, policies and systems with the aim of improving their efficiency and effectiveness, and the satisfaction of those who take part in the process.' ('SISCODE' 2019).

By using these definitions for our extraction sheet, we compared types of stakeholders, different phases of the process, their aim, and the level of satisfaction of stakeholders. In line with systematic reviews, we also included questions on the background of both social innovation and co-creation, their expressed relationship and mentioned key publications, (Gough et al. 2017). Finally, we looked for traces of evaluation indicators within the texts and used these to develop a framework.

4. Results

Figure 1 shows the results of our query and revealed that the combination of social innovation and co-creation emerged in 2015. Although the numbers are too low to draw firm conclusions, there appears to be a steady growth of this literature after 2015. Based on this, we believe that a new body of literature is emerging, labelled 'co-creation for social innovation'. To understand and define this body of literature, we categorised and analysed the keywords and abstracts of the 114 publications.

4.1 Distinguishing categories based on keywords and abstracts

As mentioned in the methodology section, it was quite difficult to distinguish separate categories within the analysed literature based on the keywords provided by the authors. Although we could only categorise roughly 65% of the publications, we were able to distinguish eleven distinct categories (Figure 2). This provided us with some baseline data for further - more narrative - analysis.

At first glance, these eleven categories appear to be unfocused, but a closer look reveals that these categories reflect contested elements of both social innovation and co-creation, because the categories reflect outcomes of a process, the process itself, the use of specific forms such as living labs or participatory research methods. Our qualitative analysis of the abstracts confirmed some of the findings from previous literature reviews on co-creation in the public sector (Voorberg et al. 2015). For example, most publications are still single or multiple case studies and qualitative in nature.

4.2 Key publications and authors

By using a visualisation tool, we could analyse the citations of- and between the 114 selected publications and based on the number of citations, we could also distinguish key publications that have influenced the co-creation for social innovation literature. We added more depth, by reading all the publications and focused on manually distinguishing and highlighting cited papers that the authors used to delineate their research. Based on the content of all the papers and former research on co-creation and social innovation, we argue that most publications are citing five distinct (groups) of publications (Figure 3):

Figure 3 illustrates that most publications since 2015 are primarily drawing from one of these (groups of) publications and also show the key message of these publications. Especially the work of Vargo and Lusch and Chesbrough has been cited around 10,000 times, followed by the work of Prahalad and Ramaswamy with roughly 5,000 citations. The figure also shows the influence of the work of the 'Mulgan cluster' within our selection of 114 publications.

We also looked more closely at the 16 publications taken from the selection that combined literature from more than one cluster. Twelve of these publications combined the work from the 'Mulgan cluster'

with one of the other clusters, most often with the work of Chesbrough (Morawska-Jancelewicz 2021; Pozzo R. et al. 2020; Rayna & Striukova 2019; Svensson & Hambrick 2019). The work of Chesbrough has also been combined nine times with other clusters in this sample of 16 publications. Based on this we conclude that in the distinguished emerging research field the concept of social innovation by the 'Mulgan cluster' is very influential. Within this cluster, social innovation is often characterised as a as a process and there is a focus on the practical application of social innovation as well (Mulgan 2006; Murray et al. 2010). The concept of 'open innovation', which has a background in value-creation and business studies is also influential and implies the inclusion of stakeholders in processes of innovation (Chesbrough 2003).

4.3 Meta narratives in the co-creation for social innovation literature

In our narrative analysis of the 100 available full publications, we focused specifically on the theoretical background, the process of co-creation, the aim of co-creation and the relationship with social innovation within the publications. During our analysis, we also noticed that except for one paper (Lorne 2020), every single author is intrinsically positive about co-creation and social innovation. We already noticed this in our analysis of the abstracts, which showed that authors intrinsically expect potential positive added value when including stakeholders in projects. This is also pointed out by Puerari who is stating that:

"*Nowadays, co-creation has become an almost 'magical concept' that is assumed to be able to achieve a variety of positive effects. It is said to be able to reform the public sector, to enable creativity and stimulate innovative solutions, as well as to make change processes more effective and meaningful* (Puerari et al. 2018 p. 4).

By systematically reading and analysing the co-creation for social innovation literature, we noticed that it was quite hard to systematically answer the questions from our template throughout all publications. Many publications did not systematically define co-creation or discuss social innovation. Our analysis also uncovered quite distinct terminology in different types of literature. For example, publications that cite the work of Vargo speak of 'value creation' and publications that cite Mulgan are more inclined to talk about social challenges. We also noticed that many publications mention EU policies, such as the large Framework Programmes. This could be explained by the fact that from the combined 176 countries of origin from the authors within this sample, 129 are based in European countries ('Document search - Web of Science Core Collection' n.d.).

Interestingly, the 'satisfaction' criterion, which we regard as important in our used definition, is almost impossible to trace throughout the selected publications, although some authors point at satisfaction

levels within for example companies (Díaz-Perdomo et al. 2021) or success in terms of shared common goals (Enciso-Santocildes et al. 2020).

However, based on the distinguished 11 categorisations (Figure 2) and the subsequent narrative analysis we have identified three distinct segments in the body of literature that all have their own meta narrative. We characterised them based on the sector where the co-creation for social innovation takes place and noticed that these types of stakeholders reflect the triple helix typology, that has been developed by Leydesdorff and Etkowitz and inspired the EU framework programmes for research and innovation (Etzkowitz & Leydesdorff 1995; Meister Broekema et al. 2021a).

1. The 'corporate' segment is aimed at co-creation and social innovation in enterprises.
2. The 'governmental/societal' segment is aimed at tackling societal challenges.
3. The 'action research' segment is aimed at participatory action research.

Although the borders between the segments are permeable, and there is some overlap between the segments, our narrative analysis provided sufficient detailed information. We specified the specific uses of co-creation and social innovation, the relationship between these concepts as well as information on the aim and expressions of co-creation. The latter is important as well, because different segments often regard to specific expressions of co-creation. The segments are visualised in Figure 4. The figure shows the sector, aim, concept of co-creation with the relation between co-creation and social innovation and expressions of co-creation. We also tried to summarise the main idea of each segment in a few words (value, social innovation and empowerment), based on a combination of the ideas in the distinguished segments and their aim of the co-creation for social innovation.

The corporate segment

The first segment is rooted in business studies and basically incorporates the in Figure 2 mentioned literature on corporate social innovation and social entrepreneurship (for example Chen & Lin 2018; Ma et al. 2020; Mirvis et al. 2016). Most authors in this segment see co-creation as a necessary bottom-up process to understand specific needs of stakeholders with the aim to develop products or processes or make them more efficient and effective (Lan et al. 2017; Witell et al. 2017). The key concept in this field is the idea of value creation (Vargo et al. 2008). The direct co-creation with end-users, for example takes place by setting up specific groups for co-creation within enterprises(Fiore et al. 2020). Besides this direct co-creation, there is also an increasing focus on the use of new digital technologies for co-creation and as a tool to realise social innovation (Hsu et al. 2018; Office 2018). There is also a trend in these publications to focus more on social entrepreneurship over the years and use concepts such as

the Sustainable Development Goals (SDGs) from for example literature on fab labs (Valenzuela-Zubiaur et al. 2021).

The governmental/societal segment

The second segment is the most diverse and largest in number of publications and includes a broad variety of types of publications from our preliminary analysis, such as public sector innovation, citizen led innovation, urban planning, and community development (Figure 2) The papers in this segment share the outlook that projects primarily should be aiming for a benefit for society. The key concept is Social Innovation, that is heavily influenced by the more practical work of the 'Mulgan cluster'. Often in this segment, citizens are collaborating with governments and apply co-creation and social innovation concepts in reality (Frantzeskaki 2019; Torill Nyseth et al. 2019). However, the types of stakeholders are mostly rather unclear or implicit, because publications tend to focus more on the application of co-creation in so called hubs or living labs (Angelini et al. 2016; Callaghan & Herselman 2015; Zavratnik et al. 2019). In some cases, universities are also involved, mainly by setting up and participating in living labs (Kumari et al. 2020; van Niekerk et al. 2020; Purcell et al. 2019). New technologies are also being used, mainly process-oriented tools to facilitate the co-creation process (Kohlgrüber et al. 2021). An increasing number of publications deal with tackling societal challenges and describe these challenges in terms of SDGs.

The action research segment

The third segment is relatively small and differs from the other two segments because authors focus on the use of a specific methodology for researchers called Participatory Action Research (PAR) (Figure 2) (Bradbury 2015). PAR could be defined as a specific form of co-creation between researchers and individuals or groups of people with the aim to answer a rich palette of diverse research questions (Wu & Sung 2021). The key concept in this segment is the empowerment of people (Sadabadi & Rahimi Rad 2021) and although researchers are always involved, the underlying idea is that research is demand driven, also called 'Mode 2' research (Nowotny et al. 2003 p. 2). Often, authors for example emphasise the mutual trust between researchers and communities and the democratisation of the research process (Davis et al. 2022).

4.4 Use of and relationship between co-creation and social innovation

Our literature analysis suggests that co-creation at its core is quite fixed as a concept and is described throughout the literature as the involvement of stakeholders in the development of products, services, or processes. Our analysis revealed that co-creation is often implemented by bringing specific people together in dedicated groups for product development, by using new technologies or by bringing

people together in a dedicated place, such as a living lab or hub. The use of co-creation is the most diverse in the governmental/societal segment, in which stakeholders are for example included to democratise the process (Agger 2021), to make the process more inclusive (Torill Nyseth et al. 2019) or to learn new skills (Spinelli G et al. 2019). Interestingly, co-creation as such is only questioned in the corporate segment. Within this segment some research has been undertaken to identify individuals who have characteristics that allow them to better produce valuable technological improvement suggestions (Schweitzer et al. 2015). The other two segments take co-creation more for granted and see it respectively as obvious, necessary or an essential element for social innovation (Babu et al. 2020; Colla et al. 2021; Desmarchelier et al. 2020; Eckhardt et al. 2021; Morawska-Jancelewicz 2021; Toros et al. 2020), describe the history of the concept (Ansell & Torfing 2021) or focus on the role of co-creation in PAR (Karadima & Bofylatos 2019; Wu & Sung 2021).

The concept of Social Innovation tends to be used more widely as a goal. Examples of such goals include increased inclusiveness (e.g., by furthering collaborations with people with disabilities), bridging policy and research into societal divisions or embedding social ambitions within core activities (Krüger & David 2020; Herrera 2016; Lindberg et al. 2019; Hsu et al. 2018). Interestingly, social innovation is sometimes seen as synonymous with public sector innovation itself (Parahoo & Al-Nakeeb 2019)

This fluidity of social innovation and the complementarity of co-creation has also been observed in an analysis of EU policies (Meister Broekema et al. 2021b). However, we did not find evidence of the problematisation of the concept of Social Innovation in the corporate segment or the action research segment. In the former it is basically being used to do something social in terms of outcomes, such as being sustainable or having a higher stakeholder value (Li et al. 2018), or internally by being more inclusive. In the latter segment, 'social' is used by authors to show that research is focusing on societal problems such as poverty. In the governmental/societal segment, social innovation is being problematised much more, by focusing on dimensions of 'social', and we noticed a clear preference to tackle societal challenges as well.

The relationship between the two concepts illustrates similar complexity. In general, we can distinguish between the following three types of relationships that corroborate with the respective three segments:

I. Method: co-creation is used as a method to accomplish social innovation.
II. Integrated: co-creation is an essential element of social innovation.
III. Intrinsic: co-creation is an aim in itself, because it leads to specific insights and social innovation.

We have also included the relationship between the two concepts in figure 4. The differences in these segments can be explained because they emerged in different fields (Ayob et al. 2016; Greenhalgh et al. 2016). The corporate segment evolved in business studies and was primarily focused on co-creation as a method for including end-users and only recently became connected with social innovation. The governmental/societal segment has its roots in more practical social innovation oriented literature, especially with local development and social and societal challenges embracing co-creation as part of social innovation. The action research segment evolved from literature on community development and is therefore more focused on co-creation in terms of doing research together with non-academics as co-researchers.

4.5 Uncovering indicators for good co-creation for social innovation in academic literature

As argued above, the relationship between co-creation and social innovation has not been properly problematised in the studied literature. Especially in the governmental/societal segment, social innovation and co-creation are very entangled and therefore successful social innovation is often described in terms of co-creation. As mentioned before, we see the same interconnectedness in EU policy (Meister Broekema et al. 2021b). Because co-creation is not properly defined in EU policy and the above mentioned governmental/societal segment, it is difficult to understand when co-creation could be regarded as good (quality) and how this leads to better social innovation. Quality is not only a concept, but also an operationalisation of variables, and recently is also being used as a criterion itself (Feller 2006). To understand if something is of good quality, one would need indicators that could give insight into specific elements of co-creation. Because co-creation for social innovation not been problematised a lot in the academic literature we decided to draw upon insights from a plethora of publications. After close reading our body of literature, we believe that 23 publications could be used to develop indicators for an evaluation framework. Interestingly, these publications are hardly citing each other (Figure 5).

In this selection of papers, most authors assume that the quality of co-creation for social innovation will be better if stakeholders are (inter)actively involved throughout the whole process (for example Hsiung et al., 2021; Morelli et al., 2017; Sorrentino et al., 2018). In addition, some authors claim that co-creation as such is an indicator for successful social innovation (Ahmed et al. 2020; Cangiano et al. 2017; Pozzo R. et al. 2020).

In line with our used definitions of co-creation and social innovation, we looked for indicators for the quality of co-creation for social innovation that could be used during the input, throughput, and output phase of the process. Indicators for the input phase give an indication of the set-up and scope of the project, the indicators for the throughput phase indicate and monitor the planned activities and the

output indicators indicate potential outcomes and eventually impact. However, we also noticed that it is sometimes difficult to attribute these indicators to only one specific phase. Mainly because authors are for example mentioning the importance of interaction throughout a whole process. Especially interactions with stakeholders need dedicated strategies to ensure participation and need to be developed and planned before the start of a project. We decided to attribute indicators such as interactions to the throughput phase (Figure 6).

In general, authors are inclined to come up with descriptive indicators for co-creation that have been tested in a few case studies. The outputs or outcomes of the co-creation process are described mostly in terms of efficiency and effectiveness and sometimes supplemented with indicators such as involvement or acceptance. Other publications are looking more at the process itself and are trying to optimise this process by including indicators such as inclusion, transparency and accountability or ownership. Interestingly, some authors conclude that the concept of serendipity plays an important role here as well (Sauer & Bonelli 2020). Finally, a smaller set of publications focuses more on the input phase, for example by trying to find out which people have specific skills that allow for better contributions (Schweitzer et al. 2015), ensure interactions by design (Morelli et al. 2017), or show a relationship between the heterogeneity of the stakeholders and the breadth of the social aims (De Silva & Wright 2019).

4.6 Building and using a grounded co-creation meta evaluation framework

Based on our analysis of the co-creation for social innovation literature and literature on evaluation systems (Smit & Hessels 2021), we consider the following elements as important:

a. the design of the process.
b. the use of different types of indicators and evaluation methodologies.
c. the continuous monitoring of co-creation throughout the process.

The design of the process implies that specific choices have to be made before the input phase by the initiating actors. We have made this visible with ‘start’ and by adding guiding questions in the framework (Figure 7). Our framework can also be described as reflexive, because it stimulates partners in a social innovation project to think about the indicators for success of their project before the start and provides them with indicators and evaluation methodologies.

Before the input phase, actors need to decide if they are aiming for a specific social aim or a broader social aim. In addition, we believe it is essential to decide on the amount; or in other words; level of serendipity as well. We envision serendipity as the occurrence or development of action by chance by bringing different types of stakeholders together. The level of serendipity allowed, basically how much

space for unexpected outcomes will be allowed upfront in combination with an open attitude towards unexpected outcomes; is also affecting how much emphasis is put on outputs and the number and variety of stakeholders. This choice is followed by a choice for the suitable expressions of co-creation. Based on our analysis, we distinguished between dedicated groups, digital platforms, hubs and living labs in paragraph 5.3 (Figure 4).

After agreeing on the design, it is essential to decide on the indicators of successful co-creation as well, by choosing upfront to evaluate the process and/or the outputs of co-creation. In general, for example a choice for a serendipitous broad social innovation, implies a larger number of diverse stakeholders and less focus on outputs. The choice for the evaluation of the process and/or outputs entails specific indicators as well. Indicators for successful co-creation processes can be quantitative, for example inclusion of different types of partners, or qualitative, for example the transparency of the process, accountability or ownership by partners.

As mentioned before, one needs different types of evaluations to fully understand the success of co-creation. For example, the co-creation process could be evaluated quantitatively by first determining the intended number and type of stakeholders and then contrast these during the project with the involved stakeholders. After this, the level of involvement of stakeholders could be determined and included, for example by using some kind of framework for increasing involvement on different levels such as information, consultation, collaboration, co-decision or empowerment (Luyet et al. 2012). The continuous monitoring and evaluation of this involvement could for example be done by using a questionnaire, having interviews or focus groups.

However, it is also important to understand the interactions between the stakeholders. The effect of these interactions has been described in the analysed literature as “traces we leave behind when we have a shared experience of cultural common goods” (Pozzo R. et al., 2020 427). These traces can be measured by using evaluation methodologies such as ‘evaluative inquiry’ or ‘contribution mapping’ which include techniques such as scientometrics, productive interactions, impact pathways, interviews and document analysis (de Rijcke et al. 2019; Kok & Schuit 2012; Smit & Hessels 2021).

Literature suggests that if successful co-creation is determined by outputs, the indicators could be quantitative, or qualitative by focusing on efficiency, effectivity, and acceptance of products. Both could be witnessed after the end of the project by quantitively and qualitatively contrasting the delivered outputs with the intended outputs or aims and by interviewing partners, stakeholders and other people involved in or affected by the project.

5 Discussion

Our analysis of more than 100 academic publications that combine social innovation and co-creation showed that we can distinguish three different segments within this body of literature. We noticed that authors within these segments perceive the relationship between social innovation and co-creation quite differently. Although a lot of publications mostly described successful examples of co-creation for social innovation, some of these also reflected on factors for this success and therefore can be used as indicators for an evaluation framework. The framework is based on literature and can be used to evaluate EU funded social innovation projects. However, we are also aware about the performativity of EU policies.

We believe that especially within the context of EU funded projects, a new type of research is emerging that we have named 'co-creation for social innovation'. This research is connected with research on innovation ecosystems (Gomes et al. 2018). As argued by Hall and Löfgren, some of the innovation system literature is lacking a critical distance between researchers and the object of policy research (Hall & Löfgren 2017). The lack of distance sometimes leads to 'innovationism', which entails a forward looking vision of purpose and presents a faith in the innovation system (Valaskivi 2012). Innovation is seen as the purpose for action, as well as the desired end result: growth is the aim, innovations are perceived to lead to growth, thus innovations are the solution" (Valaskivi 2020 p. 172). Subsequently, innovation is no longer primarily regarded as a tool to boost for example regional development, but as a deliverable for EU agendas such as Europe2020 (Lagendijk & Varró 2013). Based on our analysis of the governmental/societal segment, we believe that the same is happening with co-creation. Like innovation, co-creation is also seen a purpose for action and a desired result. Social innovation is the aim, co-creation is perceived to lead to social innovation, thus co-creation is the solution.

In addition, evaluation of funded EU projects still remains too much focused on *ex ante* indicators such as the number and type of stakeholders and *ex post* indicators as outputs, deliverables and milestones, thereby neglecting the different processes within a project (Büttner & Leopold, 2016; Meister Broekema et al. 2021a). This neglect has to do with the focus on accountability in EU bureaucracy and the unwillingness to use a more contextually adaptive and maybe less measurable evaluation approach. The evaluation framework used by the EU also results from specific EU-policy objectives and policies that are inclined towards inclusion and empowerment as such, rather than on promoting the best interactions between stakeholders.

We are aware that due to the limitations of our query some fields in which co-creation has been emerging, such as policy and action orientated transitions research are underrepresented (see for example the work of Janssen et al. 2022; Molas-Gallart et al. 2021). We believe that the insights from

our analysis could be valuable for these types of research as well and it would be interesting to include these adjacent fields in a future paper.

6 Conclusion

In this paper we answered our main research question 'How can we evaluate the application of co-creation in EU-funded social innovation projects?' We have answered this question by conducting a literature review and by developing a framework.

Although research has been problematising social innovation and co-creation as separate concepts, only since 2015 a new body of literature has emerged that is explicitly combining both concepts. Our literature review shows we can distinguish three separate segments in the literature, namely 'corporate', 'governmental/societal' and 'action research'. These segments are rooted in distinct research traditions and also interpret the relationship between social innovation and co-creation differently. Publications within the 'corporate' segment often regard co-creation as a method to accomplish an aim and publications within the 'action research' view co-creation more as an aim in itself.

The 'governmental/societal' segment is basically considering co-creation as an integral part of social innovation. This segment does not only hold the largest amount of analysed papers, but is also thematically closely related to EU policies on research and innovation. Former research has also shown that co-creation became more widely used from 2015 onwards in these types of policies. However, in contrast to academic literature, the concept in EU policies and subsequent funded research projects is merely used as a tick-box exercise to evidence the inclusion of stakeholders in evaluations (Meister Broekema et al. 2021b). In addition, we also pointed out that 'innovationism'; the believe that purely through innovations life becomes more worthwhile; is reshaping reality in terms of policies instead of the other way around. Because of these practices, we believe that social innovation projects do not fulfil their potential in terms of societal impact. We also believe that the belief in co-creation is so strong, that it is not scrutinised enough anymore.

Our analysis resulted in the development of an evaluation framework based on indicators we have uncovered in the academic body of literature that combines social innovation and co-creation. We envision that this framework can be used by partners and stakeholders in EU funded social innovation projects to better plan, monitor and evaluate co-creation in social innovation projects. By including our framework in for example the evaluation of funded EU projects, this can help to shift attention to the set-up, monitoring and understanding of the impact of co-creation in social innovation projects and can 'revive' the concept.

In addition, we also hope that the insights of this paper and the developed framework will ensure not just a deeper understanding of the concept of co-creation but also spur a discussion between researchers and policymakers how co-creation between stakeholders can be supported in research projects.

Literature

Agger, A. (2021). 'Democratic innovations in municipal planning: Potentials and challenges of place-based platforms for deliberation between politicians and citizens', *Cities*, 117: 103317. DOI: 10.1016/j.cities.2021.103317

Ahmed, J. U., Gazi, M. A., Iqbal, R., Islam, Q. T., & Talukder, N. (2020). 'Value co-creation through social innovation in healthcare: a case of WE CARE Solar', *World Journal of Entrepreneurship, Management and Sustainable Development*, 16/4: 341–57. Emerald Publishing Limited. DOI: 10.1108/WJEMSD-03-2020-0024

Alves, H., Fernandes, C., & Raposo, M. (2016). 'Value co-creation: Concept and contexts of application and study', *Journal of Business Research*, Designing implementable innovative realities, 69/5: 1626–33. DOI: 10.1016/j.jbusres.2015.10.029

Angelini, L., Carrino, S., Abou Khaled, O., Riva-Mossman, S., & Mugellini, E. (2016). 'Senior Living Lab: An Ecological Approach to Foster Social Innovation in an Ageing Society', *Future Internet*, 8/4: 50. DOI: 10.3390/fi8040050

Ansell, C., & Torfing, J. (2021). 'Co-creation: the new kid on the block in public governance', *Policy & Politics*, 49. DOI: 10.1332/030557321X16115951196045

Ayob, N., Teasdale, S., & Fagan, K. (2016). 'How social innovation "came to be": Tracing the evolution of a contested concept', *Journal of Social Policy*, 45/4: 635–53.

Babu, M. M., Dey, B. L., Rahman, M., Roy, S. K., Syed Alwi, S. F., & Kamal, M. M. (2020). 'Value co-creation through social innovation: A study of sustainable strategic alliance in telecommunication and financial services sectors in Bangladesh', *Industrial Marketing Management*, 89: 13–27. DOI: 10.1016/j.indmarman.2020.06.003

Bornmann, L. (2013). 'What is societal impact of research and how can it be assessed? a literature survey', *Journal of the American Society for Information Science and Technology*, 64/2: 217–33. DOI: 10.1002/asi.22803

Bradbury, H. (2015). *The SAGE Handbook of Action Research*. SAGE.

Büttner, S. M., & Leopold, L. M. (2016). 'A "new spirit" of public policy? The project world of EU funding', 3/1: 32.

Callaghan, R., & Herselman, M. (2015). 'Applying a Living Lab methodology to support innovation in education at a university in South Africa', *The Journal for Transdisciplinary Research in Southern Africa*, 11/1: 18. DOI: 10.4102/td.v11i1.30

Cangiano, S., Romano, Z., & Loglio, M. (2017). 'The growth of digital social innovation in Europe. An Open Design approach to support innovation for the societal good', *The Design Journal*, 20/sup1: S3546–59. Routledge. DOI: 10.1080/14606925.2017.1352857

Carayannis, E., & Campbell, D. (2012). 'Triple Helix, Quadruple Helix and Quintuple Helix and How Do Knowledge, Innovation and the Environment Relate To Each Other?', *International Journal of Social Ecology and Sustainable Development*, 1: 41–69. DOI: 10.4018/jsesd.2010010105

Chen, H.-W., & Lin, F.-R. (2018). 'Evolving Obligatory Passage Points to Sustain Service Systems: The Case of Traditional Market Revitalization in Hsinchu City, Taiwan', *Sustainability*, 10/7: 2540. DOI: 10.3390/su10072540

Chesbrough, H. (2003). 'Open Innovation: The New Imperative for Creating and Profiting fromTechnology',.

Colla, V., Matino, R., Schröder, A. J., Schivalocchi, M., & Romaniello, L. (2021). 'Human-Centered Robotic Development in the Steel Shop: Improving Health, Safety and Digital Skills at the

Workplace', *Metals*, 11/4: 647. Multidisciplinary Digital Publishing Institute. DOI: 10.3390/met11040647

Connell, J. (1995). 'New Approaches to Evaluating Community Initiatives. Concepts, Methods, and Contexts. Roundtable on Comperhensive Community Initiatives for Children and Families.', *undefined*.

Davis, S., van Nek, Y., & Horlings, L. G. (2022). 'How to Nurture Ground for Arts-Based Co-Creative Practice in an Invited Space: Reflections on a Community in North Netherlands'. Franklin A. (ed.) *Co-Creativity and Engaged Scholarship*, pp. 229–63. Springer International Publishing: Cham. DOI: 10.1007/978-3-030-84248-2_8

De Silva, M., & Wright, M. (2019). 'Entrepreneurial co-creation: societal impact through open innovation', *R&D Management*, 49/3: 318–42. DOI: 10.1111/radm.12362

Desmarchelier, B., Djellal, F., & Gallouj, F. (2020). 'Towards a servitization of innovation networks: a mapping', *Public Management Review*, 22/9: 1368–97. DOI: 10.1080/14719037.2019.1637012

Díaz-Perdomo, Y., Álvarez-González, L. I., & Sanzo-Pérez, M. J. (2021). 'A Way to Boost the Impact of Business on 2030 United Nations Sustainable Development Goals: Co-creation With Non-profits for Social Innovation', *Frontiers in Psychology*, 12: 3168. DOI: 10.3389/fpsyg.2021.719907

'Document search - Web of Science Core Collection'. (n.d.). . Retrieved June 30, 2022, from <https://www-webofscience-com.proxy-ub.rug.nl/wos/woscc/basic-search>

Eckhardt, J., Kaletka, C., Krüger, D., Maldonado-Mariscal, K., & Schulz, A. C. (2021). 'Ecosystems of Co-Creation', *Frontiers in Sociology*, 6: 642289. DOI: 10.3389/fsoc.2021.642289

Enciso-Santocildes, M., Vidu, A., & Gómez-Urquijo, L. (2020). 'Drivers for a cross-sector successful collaboration: the Basque country model of action', *International Journal of Social Economics*, 47/2: 268–84. Emerald Publishing Limited. DOI: 10.1108/IJSE-06-2019-0378

'ESRC definition of impact'. (n.d.). . Retrieved February 7, 2022, from <https://www.ukri.org/councils/esrc/impact-toolkit-for-economic-and-social-sciences/defining-impact/>

Etzkowitz, H., & Leydesdorff, L. (1995). 'The Triple Helix -- University-Industry-Government Relations: A Laboratory for Knowledge Based Economic Development'. SSRN Scholarly Paper, Rochester, NY.

Feller, I. (2006). 'Multiple actors, multiple settings, multiple criteria: issues in assessing interdisciplinary research', *Research Evaluation*, 15/1: 5–15. DOI: 10.3152/147154406781776020

Fiore, M., Galati, A., Gołębiewski, J., & Drejerska, N. (2020). 'Stakeholders' involvement in establishing sustainable business models: The case of Polish dairy cooperatives', *British Food Journal*, 122/5: 1671–91. Emerald Publishing Limited. DOI: 10.1108/BFJ-04-2019-0263

Frantzeskaki, N. (2019). 'Seven lessons for planning nature-based solutions in cities', *Environmental Science & Policy*, 93: 101–11. DOI: 10.1016/j.envsci.2018.12.033

Fuglsang, L., Hansen, A. V., Mergel, I., & Røhnebæk, M. T. (2021). 'Living Labs for Public Sector Innovation: An Integrative Literature Review', *Administrative Sciences*, 11/2: 58. DOI: 10.3390/admsci11020058

Ghosh, B., Kivimaa, P., Ramirez, M., Schot, J., & Torrens, J. (2021). 'Transformative outcomes: assessing and reorienting experimentation with transformative innovation policy', *Science and Public Policy*, 48/5: 739–56. DOI: 10.1093/scipol/scab045

Godin, B. (2015). *Innovation Contested: The Idea of Innovation Over the Centuries*. New York: Routledge. DOI: 10.4324/9781315855608

Gomes, L. A. de V., Facin, A. L. F., Salerno, M. S., & Ikenami, R. K. (2018). 'Unpacking the innovation ecosystem construct: Evolution, gaps and trends', *Technological Forecasting and Social Change*, 136: 30–48. DOI: 10.1016/j.techfore.2016.11.009

Gough, D., Oliver, S., & Thomas, J. (2017). *An Introduction to Systematic Reviews*. SAGE.

Greenhalgh, T., Jackson, C., Shaw, S., & Janamian, T. (2016). 'Achieving Research Impact Through Co-creation in Community-Based Health Services: Literature Review and Case Study: Achieving Research Impact Through Co-creation', *The Milbank Quarterly*, 94/2: 392–429. DOI: 10.1111/1468-0009.12197

Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., Kyriakidou, O., & Peacock, R. (2005). 'Storylines of research in diffusion of innovation: a meta-narrative approach to systematic review', *Social Science & Medicine*, 61/2: 417–30. DOI: 10.1016/j.socscimed.2004.12.001

Hall, P., & Löfgren, K. (2017). 'Innovation Policy as Performativity—the Case of Sweden', *International Journal of Public Administration*, 40/4: 305–16. Routledge. DOI: 10.1080/01900692.2015.1107740

Herrera, M. E. B. (2016). 'Social innovation for bridging societal divides: Process or leader? A qualitative comparative analysis', *Journal of Business Research*, 69/11: 5241–7. DOI: 10.1016/j.jbusres.2016.04.119

Hsu, H.-Y., Liu, F.-H., Tsou, H.-T., & Chen, L.-J. (2018). 'Openness of technology adoption, top management support and service innovation: a social innovation perspective', *Journal of Business & Industrial Marketing*, 34/3: 575–90. Emerald Publishing Limited. DOI: 10.1108/JBIM-03-2017-0068

Janssen, M. J., Bergek, A., & Wesseling, J. H. (2022). 'Evaluating systemic innovation and transition programmes: Towards a culture of learning', *PLOS Sustainability and Transformation*, 1/3: e0000008. Public Library of Science. DOI: 10.1371/journal.pstr.0000008

Joly, P.-B., Gaunand, A., Colinet, L., Larédo, P., Lemarié, S., & Matt, M. (2015). 'ASIRPA: A comprehensive theory-based approach to assessing the societal impacts of a research organization', *Research Evaluation*, 24/4: 440–53. DOI: 10.1093/reseval/rvv015

Karadima, D., & Bofylatos, S. (2019). 'Co-living as a means to re-engagement. A literature review', *The Design Journal*, 22/sup1: 751–62. Routledge. DOI: 10.1080/14606925.2019.1595397

Kohlgrüber, M., Maldonado-Mariscal, K., & Schröder, A. (2021). 'Mutual Learning in Innovation and Co-Creation Processes: Integrating Technological and Social Innovation', *Frontiers in Education*, 6. Frontiers Media S.A. DOI: 10.3389/feduc.2021.498661

Kok, M. O., & Schuit, A. J. (2012). 'Contribution mapping: a method for mapping the contribution of research to enhance its impact', *Health Research Policy and Systems*, 10/1: 21. DOI: 10.1186/1478-4505-10-21

Krüger, D., & David, A. (2020). 'Entrepreneurial Education for Persons With Disabilities—A Social Innovation Approach for Inclusive Ecosystems', *Frontiers in Education*, 5. DOI: 10.3389/feduc.2020.00003

Kumari, R., Kwon, K.-S., Lee, B.-H., & Choi, K. (2020). 'Co-Creation for Social Innovation in the Ecosystem Context: The Role of Higher Educational Institutions', *Sustainability*, 12/1: 307. Multidisciplinary Digital Publishing Institute. DOI: 10.3390/su12010307

Lagendijk, A., & Varró, K. (2013). 'European innovation policies from RIS to smart specialization: a policy assemblage perspective', *The Innovation Union in Europe*, 99–120. Edward Elgar Publishing.

Lan, J., Ma, Y., Zhu, D., Mangalagiu, D., & Thornton, T. (2017). 'Enabling Value Co-Creation in the Sharing Economy: The Case of Mobike', *Sustainability*, 9/9: 1504. DOI: 10.3390/su9091504

Leydesdorff, L. (2010). '(PDF) The Triple Helix, Quadruple Helix, …, and an N-Tuple of Helices: Explanatory Models for Analyzing the Knowledge-Based Economy?'. Retrieved July 22, 2019, from <https://www.researchgate.net/publication/47868742_The_Triple_Helix_Quadruple_Helix_and_an_N-Tuple_of_Helices_Explanatory_Models_for_Analyzing_the_Knowledge-Based_Economy>

Li, W., Sadick, M. A., Musah, A.-A. I., & Mustapha, S. (2018). 'The Moderating Effect of Social Innovation in Perspectives of Shared Value Creation in the Educational Sector of Ghana', *Sustainability*, 10/11: 4216. DOI: 10.3390/su10114216

Lindberg, M., Hallencreutz, D., & Tengqvist, A. (2019). 'Bridging Participatory Policy Trends and Research Traditions through Social Innovation', *Technology Innovation Management Review*, 9/4: 27–36. DOI: 10.22215/timreview/1231

Lorne, C. (2020). 'The limits to openness: Co-working, design and social innovation in the neoliberal city', *Environment and Planning A: Economy and Space*, 52/4: 747–65. SAGE Publications Ltd. DOI: 10.1177/0308518X19876941

Lovelock, C. H., & Young, R. F. (1979). 'Look to consumers to increase productivity', *Harvard business review*, 57/3: 168–78.

Luyet, V., Schlaepfer, R., Parlange, M. B., & Buttler, A. (2012). 'A framework to implement Stakeholder participation in environmental projects', *Journal of Environmental Management*, 111: 213–9. DOI: 10.1016/j.jenvman.2012.06.026

Ma, Y., Thornton, T. F., Mangalagiu, D., Lan, J., Hestad, D., Cappello, E. A., & Van der Leeuw, S. (2020). 'Co-creation, co-evolution and co-governance: understanding green businesses and urban transformations', *Climatic Change*, 160/4: 621–36. DOI: 10.1007/s10584-019-02541-3

Meagher, L., Lyall, C., & Nutley, S. (2008). 'Flows of knowledge, expertise and influence: A method for assessing policy and practice impacts from social science research', *Research Evaluation - RES EVALUAT*, 17: 163–73. DOI: 10.3152/095820208X331720

Meister Broekema, P., Horlings, L. G., & Bulder, E. (2021a). 'Tackling societal challenges together Co-creation strategies and social innovation in EU policy and funded projects', *European Policy Analysis*. DOI: 10.1002/epa2.1133

Meister Broekema, P., Horlings, L. G., & Bulder, E. A. M. (2021b). 'Understanding the value of co-creation for social innovation interpretations of social innovation and co-creation in European policy-related documents between 1995 and 2018', *Innovation: The European Journal of Social Science Research*, 0/0: 1–18. Routledge. DOI: 10.1080/13511610.2021.1909464

Mirvis, P., Herrera, M. E. B., Googins, B., & Albareda, L. (2016). 'Corporate social innovation: How firms learn to innovate for the greater good', *Journal of Business Research*, 69/11: 5014–21. DOI: 10.1016/j.jbusres.2016.04.073

Molas-Gallart, J., Boni, A., Giachi, S., & Schot, J. (2021). 'A formative approach to the evaluation of Transformative Innovation Policies', *Research Evaluation*, 30/4: 431–42. DOI: 10.1093/reseval/rvab016

Morawska-Jancelewicz, J. (2021). 'The Role of Universities in Social Innovation Within Quadruple/Quintuple Helix Model: Practical Implications from Polish Experience', *Journal of the Knowledge Economy*. DOI: 10.1007/s13132-021-00804-y

Morelli, N., Aguilar, M., Concilio, G., Götzen, A. D., Mulder, I., Pedersen, J., & Torntoft, L. K. (2017). 'Framing Design to support Social Innovation: The Open4Citizens Project', *The Design Journal*, 20/sup1: S3171–84. Routledge. DOI: 10.1080/14606925.2017.1352823

Moulaert, F., & MacCallum, D. (2019). *Advanced Introduction to Social Innovation*. Edward Elgar Publishing.

Mulgan, G. (2006). 'The process of social innovation', *Innovations: technology, governance, globalization*, 1/2: 145–62.

Murray, R., Caulier-Grice, J., & Mulgan, G. (2010). *The open book of social innovation*. National endowment for science, technology and the art London.

van Niekerk, L., Mathanga, D. P., Juban, N., Castro-Arroyave, D. M., & Balabanova, D. (2020). 'Universities as catalysts of social innovation in health systems in low-and middle-income countries: a multi-country case study', *Infectious Diseases of Poverty*, 9/1: 90. DOI: 10.1186/s40249-020-00684-5

Nowotny, H., Scott, P., & Gibbons, M. (2003). 'Introduction: "Mode 2" revisited: The new production of knowledge', *Minerva*, 41/3: 179–94. DOI: 10.1023/A:1025505528250

Oeij, P. R. A., Torre, W. van der, Vaas, S., & Dhondt, S. (2018). *Understanding Social Innovation as an innovation process*. TNO. Retrieved May 19, 2020, from </report-completed-understanding-social-innovation-as-an-innovation-process/>

Office, F. E. (2018). 'Developing Cutting-Edge Technologies to Achieve Digital Co-creation', *FUJITSU Sci. Tech. J.*, 54/5: 6.

'Open Innovation 2.0'. (2013). *Shaping Europe's digital future - European Commission*. Text, . Retrieved July 6, 2021, from <https://ec.europa.eu/digital-single-market/en/policies/open-innovation>

Parahoo, S. K., & Al-Nakeeb, A. A. (2019). 'Investigating antecedents of social innovation in public sector using a service ecosystem lens', *International Review on Public and Nonprofit Marketing*, 16/2–4: 235–53. DOI: 10.1007/s12208-019-00229-z

Pozzo R., Filippetti A., Paolucci M., & Virgili V. (2020). 'What does cultural innovation stand for? Dimensions, processes, outcomes of a new innovation category', *Science and Public Policy*, 47/3: 425–33. DOI: 10.1093/scipol/scaa023

Prahalad, C. K., & Ramaswamy, V. (2000). 'Co-opting Customer Competence', *Harvard Business Review*, 78/1: 79–90.

'Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement'. (n.d.). . Retrieved November 5, 2021, from <https://www.acpjournals.org/doi/10.7326/0003-4819-151-4-200908180-00135>

Puerari, E., De Koning, J. I. J. C., Von Wirth, T., Karré, P. M., Mulder, I. J., & Loorbach, D. A. (2018). 'Co-Creation Dynamics in Urban Living Labs', *Sustainability*, 10/6: 1893. Multidisciplinary Digital Publishing Institute. DOI: 10.3390/su10061893

Purcell, W. M., Henriksen, H., & Spengler, J. D. (2019). 'Universities as the engine of transformational sustainability toward delivering the sustainable development goals: "Living labs" for sustainability', *International Journal of Sustainability in Higher Education*, 20/8: 1343–57. Emerald Publishing Limited. DOI: 10.1108/IJSHE-02-2019-0103

Ramaswamy, V. (2009). 'Co-creation of value — towards an expanded paradigm of value creation', *Marketing Review St. Gallen*, 26/6: 11–7. DOI: 10.1007/s11621-009-0085-7

Rayna, T., & Striukova, L. (2019). 'Open social innovation dynamics and impact: exploratory study of a fab lab network', *R&D Management*, 49/3: 383–95. DOI: 10.1111/radm.12376

de Rijcke, S., Holtrop, T., Kaltenbrunner, W., Zuiderwijk, J., Beaulieu, A., Franssen, T., & van Leeuwen, T. (2019). 'Evaluative Inquiry: Engaging Research Evaluation Analytically and Strategically', *Impact of Research and Innovation Policy at the Crossroads of Policy Design, Implementation and Evaluation*, 48: 176–82. DOI: 10.22163/fteval.2019.386

Rijcke, S. de, Wouters, P. F., Rushforth, A. D., Franssen, T. P., & Hammarfelt, B. (2016). 'Evaluation practices and effects of indicator use—a literature review', *Research Evaluation*, 25/2: 161–9. DOI: 10.1093/reseval/rvv038

Sadabadi, A. A., & Rahimi Rad, Z. (2021). 'Social innovation participatory action research for empowerment of marginalized people', *Asian Social Work and Policy Review*, 15/2: 160–72. DOI: 10.1111/aswp.12228

Sauer, S., & Bonelli, F. (2020). 'Collective improvisation as a means to responsibly govern serendipity in social innovation processes', *Journal of Responsible Innovation*, 7/sup2: S44–63. Routledge. DOI: 10.1080/23299460.2020.1816025

Schweitzer, F., Rau, C., Gassmann, O., & van den Hende, E. (2015). 'Technologically Reflective Individuals as Enablers of Social Innovation*', *Journal of Product Innovation Management*, 32/6: 847–60. DOI: 10.1111/jpim.12269

Sillak, S., Borch, K., & Sperling, K. (2021). 'Assessing co-creation in strategic planning for urban energy transitions', *Energy Research & Social Science*, 74: 101952. DOI: 10.1016/j.erss.2021.101952

'SISCODE'. (2019). . Retrieved May 19, 2020, from <https://siscodeproject.eu/>

Śledzik, K. (2013). 'Schumpeter's view on innovation and entrepreneurship',.

Smismans, S. (2015). 'Policy Evaluation in the EU: The Challenges of Linking Ex Ante and Ex Post Appraisal', *European Journal of Risk Regulation*, 6/1: 6–26. Cambridge University Press. DOI: 10.1017/S1867299X00004244

Smit, J. P., & Hessels, L. K. (2021). 'The production of scientific and societal value in research evaluation: a review of societal impact assessment methods', *Research Evaluation*, rvab002. DOI: 10.1093/reseval/rvab002

Spinelli G, Weaver P, Marks M, & Victor C. (2019). 'Making a Case for Creating Living Labs for Aging-in-Place: Enabling Socially Innovative Models for Experimentation and Complementary Economies.', *Frontiers in sociology*, 4: 19. DOI: 10.3389/fsoc.2019.00019

Sun, S. L., & Im, J. (2015). 'Cutting microfinance interest rates: an opportunity co-creation perspective'. *Entrepreneurship: Theory and Practice*, 39/1: 101-.

Svensson, P. G., & Hambrick, M. E. (2019). 'Exploring how external stakeholders shape social innovation in sport for development and peace', *Sport Management Review*, 22/4: 540–52. DOI: 10.1016/j.smr.2018.07.002

Torill Nyseth, Torill Ringholm, & Annika Agger. (2019). 'Innovative Forms of Citizen Participation at the Fringe of the Formal Planning System', *Urban Planning*, 1: 7–18. DOI: 10.17645/up.v4i1.1680

Toros, K., Kangro, K., Lepik, K.-L., Bugarszki, Z., Sindi, I., Saia, K., & Medar, M. (2020). 'Co-creation of social services on the example of social hackathon: The case of Estonia', *International Social Work*, 0020872820904130. SAGE Publications Ltd. DOI: 10.1177/0020872820904130

Valaskivi, K. (2012). 'Dimensions of Innovationism'. *Post-Secular Society*. Routledge.

——. (2020). 'The contemporary faith of innovationism'. Bell E., Gog S., Simionca A., & Taylor S. (eds) *Spirituality, Organisation and Neoliberalism*, pp. 171–93. Edward Elgar: Cheltenham.

Valenzuela-Zubiaur, M., Torres-Bustos, H., Arroyo-Vázquez, M., & Ferrer-Gisbert, P. (2021). 'Promotion of Social Innovation through Fab Labs. The Case of ProteinLab UTEM in Chile', *Sustainability*, 13/16: 8790. Multidisciplinary Digital Publishing Institute. DOI: 10.3390/su13168790

Vargo, S. L., Maglio, P. P., & Akaka, M. A. (2008). 'On value and value co-creation: A service systems and service logic perspective', *European Management Journal*, 26/3: 145–52. DOI: 10.1016/j.emj.2008.04.003

Voorberg, W. H., Bekkers, V. J. J. M., & Tummers, L. G. (2015). 'A Systematic Review of Co-Creation and Co-Production: Embarking on the social innovation journey', *Public Management Review*, 17/9: 1333–57. DOI: 10.1080/14719037.2014.930505

Witell, L., Gebauer, H., Jaakkola, E., Hammedi, W., Patricio, L., & Perks, H. (2017). 'A bricolage perspective on service innovation', *Journal of Business Research*, 79: 290–8. DOI: 10.1016/j.jbusres.2017.03.021

Wu, C.-S. (Mike), & Sung, T.-J. (David). (2021). 'Applying Values-Led Communication Design to Engage Stakeholders in Developing Dementia-Friendly Visitor Destinations', *Sustainability*, 13/8: 4504. DOI: 10.3390/su13084504

Zavratnik, V., Superina, A., & Stojmenova Duh, E. (2019). 'Living Labs for Rural Areas: Contextualization of Living Lab Frameworks, Concepts and Practices', *Sustainability*, 11/14: 3797. DOI: 10.3390/su11143797

Figure Legends List

Figure 1: Number of publications in Web of Science that include Social Innovation AND co-creation. Source: https://www-webofscience-com.proxy-ub.rug.nl/wos/woscc/basic-search on 27/9/2021

Figure 2: Categorisations of Web of Science publications based on keywords. The percentages reflect the relative number of publications that contain social innovation and co-creation within this rudimentary categorisation. Source: the authors.

Figure 3: Visualisation of linked citations in the co-creation for social innovation literature. The grey dots represent papers that are not part of our set of analysed papers, but are cited most by the papers within our sample. The red dots represent the papers in our sample. The larger the red dot, the more cited and connected they are. The papers on the left are the oldest and the papers right the most recent. The green box provides more detail on the five distinguished clusters in terms of key message and total number of citations on the 16th of December 2022. Source: www.litmaps.co

Figure 4: Visualisation of three segments in the co-creation for social innovation literature. The figure represents three segments within the co-creation for social innovation literature by sketching the sector, aim, key concepts and expression of co-creation. Within the corporate and action research fields co-creation is a main concept; within the governmental/societal field it appears to be integrated in social innovation. Source: the authors. This figure has been designed using icons from flaticon.com.

Figure 5: Visualisation of linked citations in 22 publications that could be used to develop indicators for an evaluation model for co-creation for social innovation. The orange dots represent the 22 publications. The grey lines represent references between publications in this sample. This image has been made with www.litmaps.co

Figure 6: Potential indicators for good co-creation for social innovation in academic literature. Source: the authors.

Figure 7 Adaptive framework to evaluate co-creation for social innovation. Source, the authors. This figure has been designed using icons from flaticon.com.

Rebuttal Manuscript ID RESEVAL-2022-0041.R2 entitled "Evaluating co-creation in social innovation projects. Towards a process orientated framework for EU projects and beyond"

General

We would like to thank both reviewers and the editors again for the considerable time they spend on reviewing the second revision of our publication. We believe that their valuable suggestions improved the former revisions and we think that the implementation of this (final) round of comments from reviewer 1 will strengthen our publication even more. We have clarified all the changes below and have also added a revised version of our text with the changes highlighted in yellow.

Reviewer: 1

My remaining question has to do with the indicators or criteria for evaluation.

1) First of all, you use the terms interchangeably and reflect very little on how they relate to 'quality'. Quality of what? And how do the indicators function as proxy for that reality?

After rereading the text, we agree that we use the terms interchangeably, which leads to confusion. In brief we regard criteria as intermediate points where information provided by indicators can be integrated and interpreted. Indicators therefore define what information is delivered to evaluate the criteria (Pokorny & Adams, 2003). We have aligned the use of both terms throughout the text.

The reviewer is right that the relation with quality also needs more explanation. Quality is not only a concept, but also an operationalisation of variables, and recently is also being used as a criterion itself (Feller, 2006). Within for example academic research, it is assumed that researchers have specific methods to sift research of 'higher quality' from the rest, by using indicators such as transformative/routine type of research or the scientific merit of this research (Ibidem).

In our paper we apply the same procedure. We used our literature review to understand how researchers describe when co-creation in a social innovation setting is going well and used these descriptions as indicators. Based on literature research, we grouped these indicators into specific phases of the process of co-creation (input, throughput, output). These indicators provide insight in specific elements of co-creation (interaction, context etc. etc.) and together can be used to integrate and interpret the quality of co-creation as such. In other words, we are using the indicators derived from the literature review as a proxy to determine if co-creation is of good quality

We have added a few sentences on our understanding of quality mentioned above in relation to the indicators on page 13.

2) Secondly, in fig 6 it's quite ambiguous what the identified indicators are precisely proxies for: of quality of co-creation, of quality of social innovation, of both, etc. What adds to this ambiguity, is the fact that many of the indicators are described in a rather oblique fashion that is hard to comprehend for a reader unfamiliar with the cited literature (e.g. 'added value is a multidimensional construction with functional and emotional benefits'? what does that mean? and 'effective and efficient' as such is not an indicator; effectivity and efficiency of what/with respect to what?) So, please have a fresh look at the table, it also contains some typos.

We agree with the reviewer and have revised figure 6 and also changed the introduction to this figure in the text of the paper (page 14). The indicators are proxies for the quality of co-creation for social innovation (co-creation in the context of social innovation, often combined with tackling societal

challenges). To clarify this, we also changed the title of the figure as well (see below for the revised figure, revisions in yellow).

Phase	Potential indicators for good co-creation for social innovation in academic literature	References
input	breadth of openness vs focused/broader social value	De Silva & Wright, 2019
input	the inclusion of participatory action research as an approach	Karadima & Bofylatos, 2019
input	alignment of citizen participation to particular contexts and policy problems	Torill Nyseth et al., 2019
input	scale to decide which individuals are better in co-creation	Schweitzer et al., 2015
input	accomplishing an optimum for innovation by facilitating different viewpoints that are also sufficiently similar to understand each other	Hean et al., 2015
input	participation of citizens	Sauer & Bonelli, 2020
input	the use of third spaces such as platforms, methods, and innovative experimental spaces	Zurbriggen & Gonzalez Lago, 2019
input	understanding expectations by different stakeholders	Zurbriggen & Gonzalez Lago, 2019
input	understanding contexts, multi-stakeholder perspectives, diversity in needs, cooperation capabilities	Maciuliene et al., 2018; Eckhardt et. al. 2021
throughput	active participation and interaction	Fuglsang et al., 2021; Hsiung et al., 2021; Go Jefferies et al., 2021; Karadima & Bofylatos, 2019; Paskaleva & Cooper, 2018; Windrum et al., 2016; Morelli et al., 2017
throughput	co-creation (is seen an indicator for social innovation)	Ahmed et al., 2020; Pozzo R. et al., 2020; Cangiano et al., 2017
throughput	serendipity and improvisation	Sauer & Bonelli, 2020
throughput	added value that is defined as functional and emotional benefit for stakeholders	Fiore et al., 2020
throughput	executive command-control systems versus agile community of social networks	Purcell et al., 2019
throughput	number of workshops, - people who participated, - prototypes	Zurbriggen & Gonzalez Lago, 2019
output	effectivity (intended goals reflected in outcomes) and efficiency (outcomes delivered in the optimal manner)	Hsiung et al., 2021; Purcell et al., 2019; Sillak et al., 2021
output	social innovation in project has proven to be a longer term social benefit	Go Jefferies et al., 2021; Voorberg et al., 2017
output	acceptability, availability, affordability of the deliverables and awareness about the deliverables and project	Ahmed et al., 2020; Alonso-Martínez et al., 2019
output	improving the welfare of individuals and communities	Pozzo R. et al., 2020;

3) Most principally, however, it is not yet supported sufficiently why, when 'innovationism' is a serious issue, it makes sense to contribute more indicators to the EU policy realm. How does the proposed framework avert or deal with this problem of performativity, not only of EU innovation policy, but also of the evaluation and indicators proposed by the authors themselves.

We have introduced the concept of 'innovationism' in the discussion and conclusion sections as an analogy. Innovationism argues that 'innovation' has turned into some kind of 'belief system' and because of this, the concept is no longer problematised and is seen as intrinsically positive. As argued by Valaskivi in more recent work as well: "Innovation is the purpose for action, as well as the desired end result: growth is the aim, innovations are perceived to lead to growth, thus innovations are the solution" (Valaskivi, 2020 p. 172).

This belief is also reflected in EU policies, where innovation is used as a purpose for EU policies and therefore innovations are also the solution (Lagendijk & Varró, 2013). We argue that the same has happened with co-creation for social innovation. Like innovation, co-creation is also seen a purpose for action and a desired result. Social innovation is the aim, co-creation is perceived to lead to social innovation, thus co-creation is the solution.

We are not arguing that by focusing on the quality of the process and a deeper understanding of the process of co-creation, we will directly tackle the problems of 'innovationism'. Nor are we arguing that the problem of performativity will be solved by including more indicators. Unavoidably, including more indicators will still lead to 'gaming', because stakeholders will find a way to meet the criteria by describing and fulfilling the indicators in the most efficient way. However, we do argue that by including more processual indicators and operationalising concepts as 'good co-creation' with specific

indicators in for example evaluation standards for funded projects, will shift attention to the set-up, monitoring and understanding the impact of co-creation for social innovation and will 'revive' the concept, because people will be tempted to use the framework to meet the criterion of good co-creation. We have added the above mentioned reflections on innovationism in both the discussion and conclusion (pages 16-17).

4) few small suggestions:

- why do you limit the indicator literature to 22 sources, but then include a 23rd source on p.14? Just use 23 sources as selection in that case.

Reviewer 1 is right, it only confuses the reader. We have changed 22 sources throughout the text in 23 sources and changed the text (deleted the part of Eckhardt on page 14) and figure 6 according.

- figure 6 - please specify in the title/description what these things are indicators of: of co-creation or of social-innovation?

We have changed the title/description into indicators of co-creation for social innovation. This refers to co-creation activities within the domain of social innovation. We are specifically focusing on this domain and are contrasting these type of activities with for example co-creation of products by consumers.

p.15 evaluative inquiry still misspelled (and I would suggest there to refer to original publications of EI and contribution mapping instead of literature review).

We have changed the typo from enquiry into inquiry and have added references to the original publications.

p.16 sentence is incorrect: "...Hall and Löfgren, some of the innovation system literature is lacking a critical distance between researchers and the object of study policies"

We would like to thank the reviewer for spotting this. We have changed the sentence into the correct form: "As argued by Hall and Löfgren, some of the innovation system literature is lacking a critical distance between researchers and the object of policy research".

Reviewer 2:

Thank you once again for this round of revisions on the paper, which turned out to be immensely valuable. The paper is now clear, consistent and engaging to read. I find the discussion of serendipity, of satisfaction of stakeholders, and of fuzziness of the literature, in response to my previous remarks all very convincing and value added to manuscript. Thank you for checking the bibliography and for explaining the revisions and deletions well in the responses. I don't have any further comments and hope to see the paper published.

Thank you for your valuable contributions!

Literature

Feller, I. (2006). Multiple actors, multiple settings, multiple criteria: Issues in assessing interdisciplinary research. *Research Evaluation*, *15*(1), 5–15. https://doi.org/10.3152/147154406781776020

Lagendijk, A., & Varró, K. (2013). European innovation policies from RIS to smart specialization: A policy assemblage perspective. *The Innovation Union in Europe*, 99–120.

Pokorny, B., & Adams, M. (2003). What do criteria and indicators assess? An analysis of five C&I sets relevant for forest management in the Brazilian Amazon. *International Forestry Review*, *5*(1), 20–28. https://doi.org/10.1505/IFOR.5.1.20.17434

Valaskivi, K. (2020). The contemporary faith of innovationism. In E. Bell, S. Gog, A. Simionca, & S. Taylor (Eds.), *Spirituality, Organisation and Neoliberalism* (pp. 171–193). Edward Elgar.

Groningen, April 17th, 2023

Dear Thed van Leeuwen, Julia Melkers and Emanuela Reale,

On behalf of my co-authors, I would like to resubmit our original research paper now entitled 'Evaluating co-creation in social innovation projects. Towards a process orientated framework for EU projects and beyond' for consideration by Research Evaluation.

In this original paper, we propose a new reflexive evaluation framework that has been developed by looking for indicators via a narrative systematic literature review of a new emerging research field. This field, dubbed 'co-creation for social innovation' is becoming very influential because it corroborates with specific EU- and other research policy aims and objectives on grand societal challenges such as the Sustainable Development Goals.

We focus specifically on EU-funded Social Innovation projects and argue that these type of Research & Innovation projects are often evaluated by looking at (promised) deliverables *ex ante* or *ex post*. However, these type of projects are also increasingly emphasising co-creation with stakeholders throughout the project. We argue that although evaluators look at the included partners at the start and the end of the project, it is not entirely clear if the stakeholders truly collaborated together in a process of co-creation. We therefore introduce a new framework that could be used by coordinators, partners and evaluators in a project and helps them to look at co-creation for social innovation projects in amore nuanced way, by focusing on the process, the outcomes or both.

Our research also uncovered that it is possible to identify three different types of subfields that have their own characteristics and need their own evaluation criteria to understand success in co-creation and social innovation.

Our research is therefore important for an academic community interested in social innovation and co-creation in EU R&I programmes and subsequently for policymakers as well. In our conclusion we also argue that our model will be easier to implement than some of the very elaborative research impact evaluation frameworks and might be giving a better indication of success of these types of projects.

Our work has not been published before and is not under consideration by another journal.

We (Peter Meister Broekema, Lummina G. Horlings and Elisabeth Alice Maria Bulder) also declare that we have no conflict of interest to disclose.

Please address all correspondence concerning this paper to me at p.meister-broekema@pl.hanze.nl

Thank you for considering our paper for your journal,

Sincerely,

Peter Meister Broekema
Rijksuniversiteit Groningen
Department of Spatial Planning and Environment
Landleven 1
9747 AD Groningen, The Netherlands

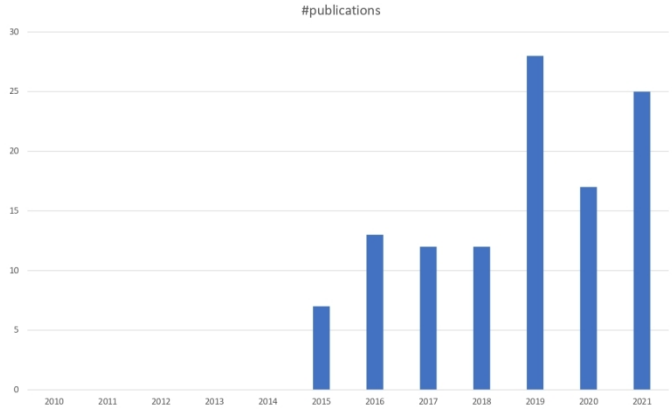


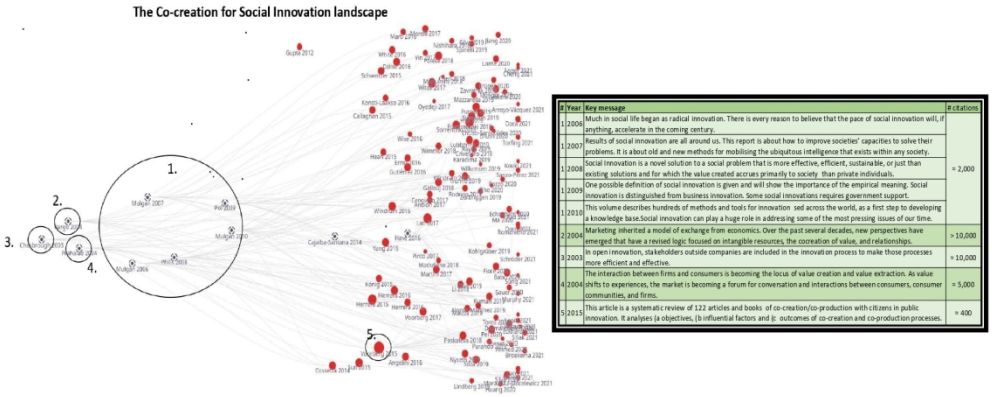
Figure 1: Number of publications in Web of Science that include Social Innovation AND co-creation. Source: https://www-webofscience-com.proxy-ub.rug.nl/wos/woscc/basic-search on 27/9/2021

148x105mm (300 x 300 DPI)

Category	%of pubs.
Public Sector Innovation	22%
Social Entrepreneurship	19%
ICT	10%
Health	10%
Service Innovation	8%
Participatory Action Research	6%
Living Labs	6%
Community Development	6%
Corporate Social Innovation	5%
Urban Transformations	5%
Citizen Led Innovation	4%

Figure 2: Categorisations of Web of Science publications based on keywords. The percentages reflect the relative number of publications that contain social innovation and co-creation within this rudimentary categorisation. Source: the authors.

148x105mm (300 x 300 DPI)



#	Year	Key message	# citations
1	2006	Much in social life began as radical innovation. There is every reason to believe that the pace of social innovation will, if anything, accelerate in the coming century.	≈ 2,000
1	2007	Results of social innovation are all around us. This report is about how to improve societies' capacities to solve their problems. It is about old and new methods for mobilising the ubiquitous intelligence that exists within any society.	
1	2008	Social innovation is a novel solution to a social problem that is more effective, efficient, sustainable, or just than existing solutions and for which the value created accrues primarily to society than private individuals.	
1	2009	One possible definition of social innovation is given and will show the importance of the empirical meaning. Social innovation is distinguished from business innovation. Some social innovations requires government support.	
1	2010	This volume describes hundreds of methods and tools for innovation sed across the world, as a first step to developing a knowledge base.Social innovation can play a huge role in addressing some of the most pressing issues of our time.	
2	2004	Marketing inherited a model of exchange from economics. Over the past several decades, new perspectives have emerged that have a revised logic focused on intangible resources, the cocreation of value, and relationships.	> 10,000
3	2003	In open innovation, stakeholders outside companies are included in the innovation process to make those processes more efficient and effective.	≈ 10,000
4	2004	The interaction between firms and consumers is becoming the locus of value creation and value extraction. As value shifts to experiences, the market is becoming a forum for conversation and interactions between consumers, consumer communities, and firms.	≈ 5,000
5	2015	This article is a systematic review of 122 articles and books of co-creation/co-production with citizens in public innovation. It analyses (a objectives, (b influential factors and (c outcomes of co-creation and co-production processes.	≈ 400

Figure 3: Visualisation of linked citations in the co-creation for social innovation literature. The grey dots represent papers that are not part of our set of analysed papers, but are cited most by the papers within our sample. The red dots represent the papers in our sample. The larger the red dot, the more cited and connected they are. The papers on the left are the oldest and the papers right the most recent. The green box provides more detail on the five distinguished clusters in terms of key message and total number of citations on the 16th of December 2022. Source: www.litmaps.co

148x105mm (300 x 300 DPI)

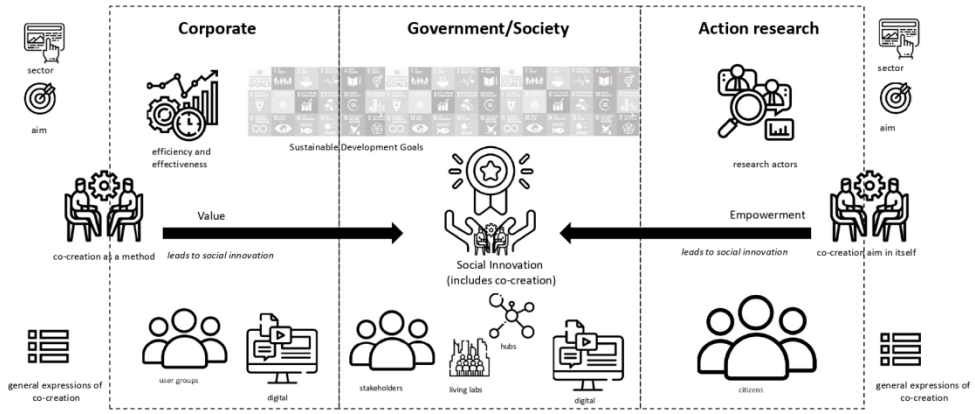


Figure 4: Visualisation of three segments in the co-creation for social innovation literature. The figure represents three segments within the co-creation for social innovation literature by sketching the sector, aim, key concepts and expression of co-creation. Within the corporate and action research fields co-creation is a main concept; within the governmental/societal field it appears to be integrated in social innovation. Source: the authors. This figure has been designed using icons from flaticon.com.

148x105mm (300 x 300 DPI)

Figure 5: Visualisation of linked citations in 22 publications that could be used to develop indicators for an evaluation model for co-creation for social innovation. The orange dots represent the 22 publications. The grey lines represent references between publications in this sample. This image has been made with www.litmaps.co

148x105mm (300 x 300 DPI)

Phase	Potential indicators for good co-creation for social innovation in academic literature	References
input	breadth of openness vs focused/broader social value	De Silva & Wright, 2019
input	the inclusion of participatory action research as an approach	Karadima & Bofylatos, 2019
input	alignment of citizen participation to particular contexts and policy problems	Torill Nyseth et al., 2019
input	scale to decide which individuals are better in co-creation	Schweitzer et al., 2015
input	accomplishing an optimum for innovation by facilitating different viewpoints that are also sufficiently similar to understand each other	Hean et al., 2015
input	participation of citizens	Sauer & Bonelli, 2020
input	the use of third spaces such as platforms, methods, and innovative experimental spaces	Zurbriggen & Gonzalez Lago, 2019
input	understanding expectations by different stakeholders	Zurbriggen & Gonzalez Lago, 2019
input	understanding contexts, multi-stakeholder perspectives, diversity in needs, cooperation capabilities	Maciuliene et al., 2018; Eckhardt et. al. 2021
throughput	active participation and interaction	Fuglsang et al., 2021; Hsiung et al., 2021; Go Jefferies et al., 2021; Karadima & Bofylatos, 2019; Paskaleva & Cooper, 2018; Windrum et al., 2016; Morelli et al., 2017
throughput	co-creation (is seen an indicator for social innovation)	Ahmed et al., 2020; Pozzo R. et al., 2020; Cangiano et al., 2017
throughput	serendipity and improvisation	Sauer & Bonelli, 2020
throughput	added value that is defined as functional and emotional benefit for stakeholders	Fiore et al., 2020
throughput	executive command-control systems versus agile community of social networks	Purcell et al., 2019
throughput	number of workshops, - people who participated, - prototypes	Zurbriggen & Gonzalez Lago, 2019
output	effectivity (intended goals reflected in outcomes) and efficiency (outcomes delivered in the optimal manner)	Hsiung et al., 2021; Purcell et al., 2019; Sillak et al., 2021
output	social innovation in project has proven to be a longer term social benefit	Go Jefferies et al., 2021; Voorberg et al., 2017
output	acceptability, availability, affordability of the deliverables and awareness about the deliverables and project	Ahmed et al., 2020; Alonso-Martínez et al., 2019
output	improving the welfare of individuals and communities	Pozzo R. et al., 2020;

Figure 6: Potential indicators for good co-creation for social innovation in academic literature. Source: the authors.

148x105mm (300 x 300 DPI)

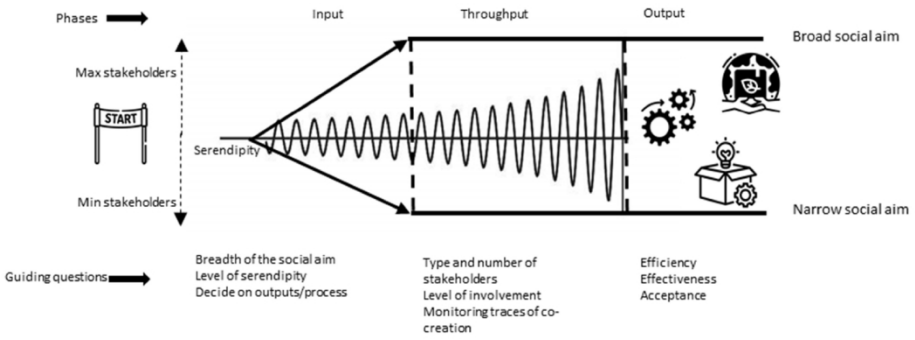


Figure 7 Adaptive framework to evaluate co-creation for social innovation. Source, the authors. This figure has been designed using icons from flaticon.com.

148x105mm (300 x 300 DPI)