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Abstract

As the concept of co-creation has evolved in the innovation management literature its meaning has become ambiguous and the boundaries between it and the concept of open innovation have become opaque. The purpose of this paper is to more clearly define the concept of co-creation and to articulate how it differs from and relates to the concept of open innovation. Scholars are divided as to whether co-creation is a subsidiary concept of open innovation, a surrogate concept that is essentially indistinguishable from open innovation, or a separate concept that developed independently but was subsequently intermingled and interfused with open innovation. This paper addresses this scholarly confusion by conducting a systematic two-stage review of the innovation management literature, commencing with of a 'broad brush' bibliometric analysis, focused on the origins and evolution of co-creation and open innovation, followed by a 'deep dive' literature review in which the two concepts were rigorously compared. By proposing a cogent definition and taxonomy of co-creation, and thereby distinguishing it from open innovation, the paper goes beyond the current state of the literature and provides a more robust basis for future research.

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Co-creation – Child, Sibling or Adopted Cousin of Open Innovation?

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Abstract: As the concept of co-creation has evolved in the innovation management literature its meaning has become ambiguous and the boundaries between it and the concept of open innovation have become opaque. The purpose of this paper is to more clearly define the concept of co-creation and to articulate how it differs from and relates to the concept of open innovation. Scholars are divided as to whether co-creation is a subsidiary concept of open innovation, a surrogate concept that is essentially indistinguishable from open innovation, or a separate concept that developed independently but was subsequently intermingled and interfused with open innovation. This paper addresses this scholarly confusion by conducting a systematic two-stage review of the innovation management literature and by proposing a cogent definition and taxonomy of co-creation, thereby distinguishing it from open innovation.

Keywords: co-creation; open innovation; innovation management; collaborative innovation

1. Introduction

The model of closed innovation that dominated the R&D of big companies for most of the 20th century has receded as a feature of corporate strategy. This transition has happened as managers have awakened to the fact that their companies' innovation projects should not draw solely on internal resources and competences but also on the contributions of a wide range of external players who may accelerate innovation and take product offerings in unexpected directions that serve a broader range of needs (Bahemia & Squire, 2010; Brown & Hagel III, 2005). Empirical research has been published showing that technology companies emphasizing open approaches rather than closed approaches to innovation typically demonstrate superior business performance (Willoughby, 2004). The locus of innovation has shifted in recent decades from internal R&D laboratories to various networks of start-ups, universities, research consortiums, and other external organizations; and companies rely increasingly on individual external contributors—not just customers, but also students, researchers, independent experts, etc.—who are willing to join collaborative innovation projects and who can provide valuable input for innovation.

This openness, created by the transformation of companies' closed boundaries into semi-permeable membranes (Chiaroni, Chiesa, & Frattini, 2011), enables innovation to move easily between the external and internal environment, involving a diverse array of participants in innovation projects. Even though this trend is usually labeled as “open innovation,” these characteristics also describe the concept of “co-creation.” Evolving from its origins in the [general] management and other literatures, the concept of value co-creation has moved gradually in to innovation management scholarship, where co-creation is receiving

remarkable attention as a powerful engine for innovation (Brown & Hagel III, 2005). However, the amorphous evolution of ideas associated with the rubric of co-creation has impeded the development of a widely accepted and comprehensive definition of co-creation in the field of innovation management. Consequently, there is confusion in the literature about exactly how this concept differs from or is similar to related concepts such as open innovation. This confusion has undermined the building of clear conceptual foundations for future research about co-creation.

Innovation management scholars are divided in their opinions about the nature of the relationship between co-creation and open innovation. Some scholars take the position that co-creation was preceded in the literature by open innovation and then emerged as an intellectual “child” of the parent concept. Others perceive that co-creation developed simultaneously with open innovation in the literature, with the two concepts emerging as intellectual “siblings” within the same conceptual family. A third group of innovation management scholars believes that the concepts of co-creation and open innovation emerged independently in their respective literatures (i.e., that they were born in different conceptual families, related but one or two steps removed from each other), and that the commonalities and proximity of their respective conceptual families facilitated interaction between them, leading to the two concepts becoming *de facto* conceptual “cousins,” sometimes indistinguishable from each other. A core goal of our research has therefore been to identify the actual history and current state of the pertinent literature, to determine which of the three scholarly points of view best corresponds to the facts. Stated metaphorically, the question is whether co-creation is a conceptual child, sibling or adopted cousin of open innovation.

This paper summarizes the results of a two-stage systematic review of the innovation management literature in which we compared the concept of co-creation and the concept of open innovation and, drawing upon our analysis, posited a definition and practical taxonomy of co-creation. The first stage of the review consisted of a “broad brush” analysis of the co-creation and open innovation literatures, focusing on the origins and evolution of the two concepts. The second stage of the review consisted of a “deep dive” analysis of the literature in which the concepts of co-creation and open innovation co-appeared in individual papers, thereby allowing us to more rigorously compare the definitions and contexts of these two terms in the field of innovation management. In this paper, based on the results of our two-stage review, we address the paucity of rigorous scholarship comparing the two concepts, and put forward a simple and clear definition of co-creation that may serve as a useful foundation for future research.

2. Co-creation and open innovation in the innovation management literature

In the field of innovation management scholars have employed a heterogeneous array of definitions of *co-creation*, and have directed their research towards dissimilar aspects of innovation, making it difficult to build a coherent body of knowledge about the topic. Building on the early ideas of shifting from value chain to value constellation, and involving consumers as co-producers of value (Normann & Ramírez, 1993; Ramírez, 1999; Wikström, 1996), C. K. Prahalad and Venkat Ramaswamy have popularized the term “co-creation” by focusing on the co-creation experience (Prahalad & Ramaswamy, 2003). They defined co-creation as a function of human experiences that come from interactions, based on the information access, global view, networking, experimentation and activism of people in all areas, having a great impact in collaborative development (Prahalad & Ramaswamy, 2004). This view of co-creation has served as the basis

for a research stream in the academic literature that sees co-creation as a form of collaborative innovation (Piller & West, 2014; Roser, DeFillippi, & Samson, 2013; Westerlund & Rajala, 2010), with the purpose of incrementally improving existing products or developing radically new ones. Additionally, discussion of co-creation in the innovation management literature frequently draws upon the user innovation concept espoused by Eric von Hippel (Gemser & Perks, 2015).

Amongst those who view co-creation as a category of collaborative innovation, however, there are wide differences in meaning associated with the term, and the scope of perspectives on external actors involved is broad. Co-creation is usually defined variously as collaboration between producers and users for the purpose of innovation (Kristensson, Matthing, & Johansson, 2008; Santos-Vijande, González-Mieres, & López-Sánchez, 2013), open innovation with users (Rayna & Striukova, 2015), or collaboration with external individuals during a new product or service development process initiated and facilitated by a company (Piller & West, 2014; West & Bogers, 2014). However, co-creation is sometimes also portrayed more broadly as a continuous feedback loop and collaboration with all stakeholders in a value network throughout innovation processes (Kirah, 2009).

Within another stream of the innovation management literature the term *open innovation* is strongly related to the original model posited by Henry W. Chesbrough, where open innovation includes inbound processes, based on external knowledge sourcing, technology exploration and leveraging inventions developed outside the company's own R&D, and outbound processes, including external exploitation of internal assets, for example by licensing out, selling intellectual property, or technology commercialization in new markets (Chesbrough, 2003). Coupled open innovation, as the third mode of open innovation processes involving the joint development and commercialization of innovations through partnerships, was later added to the original model (Enkel, Gassmann, & Chesbrough, 2009). Finally, a variation—the interactive model of coupled open innovation—was introduced by Piller and West (2014), focused on collaborative innovation activities between a company and external individuals.

We may observe that even though the concept of open innovation has evolved from the foundations of the lucid original model articulated by Chesbrough (2003), it is nevertheless affected by ambiguity (Dahlander & Gann, 2010; Remneland Wikhamn & Wikhamn, 2013). The ambiguity of the open innovation concept appears to have arisen primarily as a result of differences in the perspectives of analysts and commentators regarding the nature of the external actors involved in the internal innovation activities of companies. Open innovation is usually related to cooperation between *organizations*, as such, either inter-firm (Belderbos, Cassiman, Faems, Leten, & Van Looy, 2013; Chesbrough, 2003) or university-industry collaboration (Bodas Freitas, Geuna, & Rossi, 2013; Chiaroni et al., 2011). However, the involvement of individual customers and users in innovation processes is sometimes also included under the general rubric of open innovation (Bahemia & Squire, 2010; Straub, Kohler, Hottum, Arrass, & Welter, 2013) where it is related to the collaborative engagement of a wide variety of stakeholders (Gould, 2012; Noh & Lee, 2015). These different perspectives on open innovation—emphasizing either organizations or individuals as external collaborators—have hampered the development of a coherent body of knowledge in the innovation management scholarly community. Something similar has arguably also happened in the co-creation literature.

When the various definitions of co-creation and open innovation are compared it may be readily observed that the two concepts are built on the same ideas of the openness of companies' boundaries, innovation

flow between the external and internal environments, and the involvement of a diverse array of participants in innovation projects. They share a good number of common characteristics and elements, making the concepts of co-creation and open innovation difficult to distinguish within the innovation management literature. However, bearing in mind that the heterogeneity of assumptions in the literature about the nature of the *external actors* involved in co-creation and open innovation appears to be the common cause of the ambiguity associated with each of the concepts as a whole, we believe that looking at the differences between co-creation and open innovation from the perspective of the identity of the key external actors has the advantage of enabling more lucid and cogent analysis than is possible using other approaches. We have therefore chosen to focus our review of the literature on the theme of the external actors involved in co-creation and open innovation.

Additionally, the relationship between these two concepts—co-creation and open innovation—is typically portrayed quite vaguely in the literature. Co-creation is almost always seen as being related to open innovation in some way (Giannopoulou, Yström, Elmquist, Fredberg, & Ollila, 2010; Randhawa, Wilden, & Hohberger, 2016), but it is sometimes portrayed as a sub-category of open innovation rather than as a discrete concept in its own right (Barczak, 2012), and sometimes as the next step in the evolution of open innovation (Bughin, Chui, & Johnson, 2008). We therefore designed our research to enable us to systematically identify and understand both the relationships between and differences between the concepts of co-creation and open innovation.

3. Methodology

With the aim of identifying whether a sharp distinction may be plausibly asserted between the concept of co-creation and the concept of open innovation, and with the additional aim of seeking to understand the relationship between these two concepts, we designed our research as a two-stage review of the pertinent academic literature published up to and including December 2016. We employed the SciVerse Scopus online database as the primary source of our data.

The first stage of our review was focused on getting a better understanding of the origins and evolution of the respective concepts of co-creation and open innovation, regardless of the discipline or academic subject-matter domain in which the concepts appeared. Therefore, it consisted of a “broad brush” analysis of all academic publications indexed in Scopus containing either the terms “co-creation” or “cocreation” or the term “open innovation.” The search identified 10,803 publications that contained “co-creation” or “cocreation” in any part of the text, published in the timeframe between 1979 and 2016, and 13,808 publications that contained “open innovation” in any part of the text, published in the timeframe between 2003 and 2016.

During the second stage of our review—the aim of which was to conduct a systematic comparison of the concepts of co-creation and open innovation—we engaged in a “deep dive” analysis of the academic literature in innovation management, utilizing the extensive online database of SCImago Journal Rank (<http://www.scimagojr.com/journalrank.php>). We focused our search on the papers from the top 50 journals in the subject category of *Management of Technology and Innovation* within the subject area of *Business, Management and Accounting*, ranked by total citations in 3 years, according to the 2015 SCImago

Journal Rank. To enable us to understand the relationship between co-creation and open innovation, and to define the difference between these concepts from the vantage point of the external actors involved, we systematically searched for papers that dealt with both concepts. The resultant list of publications included 141 papers in which the concepts of both co-creation and open innovation co-appeared, mentioning both “co-creation” or “cocreation” and “open innovation” in any part of the text. After exclusion of papers that included these terms within their list of references and not within the title, abstract, keywords and main body of the text, our final list contained 63 papers, published in the timeframe between 2008 and 2016 inclusively. We carefully read each of the 63 individual papers and analyzed the definitions and contexts of use of the concepts of co-creation and open innovation in each paper. In this manner we were able to identify how far the concepts of co-creation and open innovation had converged, or otherwise evolved, in the pertinent literature.

4. “Broad brush” analysis of the co-creation and open innovation literature

The first stage of the review consisted of a “broad brush” analysis of the exponentially growing co-creation and open innovation literature indexed in Scopus, with the goal of understanding the origins and the evolutionary paths of the two concepts, regardless of the putative disciplines or subject areas of the respective papers. The “broad brush” analysis—which included over 20,000 published academic papers—enabled us to understand whether the concepts of co-creation and open innovation evolved independently or whether, as asserted by many authors, co-creation had its roots in open innovation.

Our search results containing the terms “co-creation” or “cocreation” in any part of the text led us to identify the first known scholarly paper mentioning co-creation, namely a paper on bioethics published in 1979 by Albert S. Moraczewski, in which the term referred to what the author saw as the Christian concept of the role of humans in renewing (i.e., co-creating) the universe (Moraczewski, 1979). We also discovered many papers, across multiple disciplines—including the social sciences (broadly construed), psychology, arts, the humanities, and medicine, etc.—that were published during the two decades leading to the early 2000s, which featured the concept of co-creation. The turning point for co-creation in the innovation management literature is represented by C. K. Prahalad and Venkat Ramaswamy’s influential paper, “The new frontier of experience innovation,” published in the MIT Sloan Management Review in 2003. Defining co-creation experience in that paper as the basis for value creation, these two authors portrayed experience environments, supported by a network of companies and consumer communities, as the new competitive space for innovation (Prahalad & Ramaswamy, 2003). Prahalad and Ramaswamy catalyzed the process by which co-creation moved from being a subject of general academic interest across multiple fields to a topic of spirited debate in the innovation studies literature. Thus, by the time we conducted our research for this paper, the concept of co-creation had been visible in the formal academic literature for almost four decades.

In contrast, the first scholarly journal publications containing “open innovation” in any part of the text did not appear until 2003. There were eleven such publications published that year, but the birth of the term “open innovation” is widely linked to one of the most cited articles on this topic, “The era of open innovation,” authored by Henry W. Chesbrough. In that article—published in the MIT Sloan Management Review in 2003—Chesbrough posited a model of open innovation in which knowledge flowed over

organizational boundaries, enabling companies to exploit internal knowledge in more diversified markets, as well as to identify and absorb external knowledge to support the internal innovation process (Chesbrough, 2003).

As we can observe from these examples, 2003 was a year of crucial importance for both the co-creation literature and the open innovation literature, because two of the most influential works on these topics—by Prahalad and Ramaswamy (2003) and by Chesbrough (2003) respectively (which interestingly were both published in MIT Sloan Management Review)—appeared in print that year. The timeline of publications on co-creation and open innovation indexed in Scopus since 2003 leads us to the conclusion that these two concepts have evolved simultaneously, in parallel (see Figure 1). The early papers that employ the terms “co-creation” or “cocreation,” published between 1979 and the early 2000s, together reveal that the theme of co-creation was in fact embraced by many scholars across a strikingly wide variety of disciplines for many years prior to the emergence of “open innovation” in the innovation studies literature and other literatures. Thus, *in contrast with the point of view intimated, presumed or erroneously asserted by many authors, the concept of co-creation did not evolve from the concept of open innovation and is not built upon the concept of open innovation.* Additionally, even though the concepts have attracted attention in a plurality of research fields, both co-creation and open innovation are deeply embedded within the subject area of *Business, Management and Accounting*. This subject area is by far the single largest academic domain in which articles about co-creation and open innovation have appeared, with roughly half of all articles on each topic published within this domain.

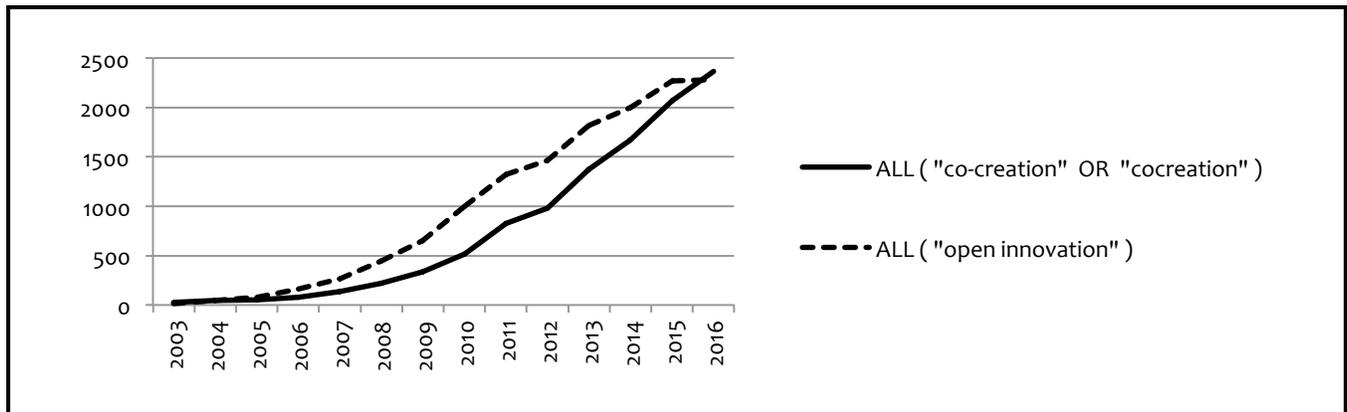


Figure 1. Number of publications indexed in Scopus (2003-2016).

5. “Deep dive” analysis of the co-mingled co-creation and open innovation literature

In the second stage of research we conducted a systematic review of the innovation management academic literature where the two topics of co-creation and open innovation co-appeared. The final set included 63 papers published in 19 journals indexed in the subject category of *Management of Technology and Innovation* by SCImago Journal Rank (Table 1). These papers received 1,014 Scopus citations in total by December 2016, with an average of 16.1 citations per paper. We also identified the most influential papers from the final set, which we defined as those papers with a citation count above the average citation count of the whole set of 63 papers. Twenty papers met this criterion and in aggregate they accounted for 839 citations (i.e., 83% of the citations for the total set).

Rank*	Journal Title	Number of papers
1	Research Policy	4
3	Technological Forecasting and Social Change	4
9	Journal of Product Innovation Management	7
16	Technovation	6
17	International Journal of Operations and Production Management	1
18	International Journal of Management Reviews	1
19	Journal of Knowledge Management	2
20	British Journal of Management	2
21	Organization	2
22	Electronic Commerce Research and Applications	1
24	Service Industries Journal	3
30	Science and Engineering Ethics	1
36	Decision Sciences	1
39	R and D Management	4
40	International Journal of Business Information Systems	1
43	Creativity and Innovation Management	8
47	International Entrepreneurship and Management Journal	1
48	Industry and Innovation	2
49	International Journal of Innovation Management	12
Total number of papers mentioning both “co-creation” / “cocreation” and “open innovation”		63

Table 1. List of journals including papers selected for the “deep dive” analysis (* 2015 SCImago Journal Rank, by total citations in 3 years, in the subject category of “Management of Technology and Innovation” within the subject area of “Business, Management and Accounting”).

Our final set of 63 papers, dealing to some extent with both co-creation and open innovation, contains a wide variety of perspectives on the relationship and distinctions between these two concepts. The terms “co-creation” and “open innovation” are sometimes used in the same context—e.g., “co-creation community” (Füller, Hutter, & Faullant, 2011) and “open innovation community” (Kosonen, Gan, Vanhala, & Blomqvist, 2014; Ruffin, Medina, & Rey, 2013; West & Bogers, 2014), “co-creation platform” (Bogers, Hadar, & Bilberg, 2016; Füller et al., 2011; Zhao, Renard, Elmoukhli, & Balague, 2016) and “open innovation platform” (Zhao et al., 2016), “co-creation projects” (Füller, Matzler, Hutter, & Hautz, 2012) and “open innovation projects” (Füller et al., 2012)—and sometimes they are even combined—e.g., “open innovation in co-creation context” (Erzurumlu, 2010). After carefully reading the whole set of 63 papers in which the terms co-creation and open innovation are co-mingled we are led inevitably to the conclusion that, with some minor exceptions, these two terms are typically used simply as buzzwords to loosely describe similar practices in innovation management, as part of the contemporary fashion in the academic literature to embrace the themes of openness and collaboration.

5.1. Defining the relationship between co-creation and open innovation

Even though most papers we reviewed describe co-creation and open innovation as related concepts, there are only a few papers that explain the nature of that relationship, and they tend to see open innovation as a phenomenon that is broader in scope than co-creation (Barczak, 2012; Kosonen et al., 2014). In these papers co-creation is described as a form of open innovation (Frow, Nenonen, Payne, & Storbacka, 2015), as a part of open innovation (Marchi, Giachetti, & De Gennaro, 2011), as an aspect of open innovation (Cheng & Huizingh, 2014; Randhawa et al., 2016), as a dimension of open innovation (Gamble, Brennan, & McAdam, 2016), and as an approach to open innovation (Fosfuri, Giarratana, & Roca, 2013). Other researchers see co-creation and open innovation as overlapping concepts (Zhao et al., 2016) and, notwithstanding the results from the first stage of our research, they also portray co-creation as a concept rooted in open innovation (Shanmugam & Durugbo, 2015).

After reviewing the pertinent articles, we have identified two important and influential streams in the literature that operate from within the general perspective that open innovation is a broader concept than the concept of co-creation. One stream sees co-creation through crowdsourcing as a form of open innovation, more specifically as inbound open innovation (Bauer & Gegenhuber, 2015; El-Ella, Stoetzel, Bessant, & Pinkwart, 2013; Füller et al., 2011; Garcia Martinez & Walton, 2014; Kosonen et al., 2014), and another stream portrays co-creation as a coupled mode of open innovation (Lee, Han, & Suh, 2014; West & Bogers, 2014).

5.2. Identifying the differences between co-creation and open innovation

As most of the theoretical ambiguity about the differences between co-creation and open innovation arises from incongruent understandings as to whether the pertinent external actors in innovation are individual contributors or partnering organizations, or both, we believe that focusing on the theme of the key external actors involved in co-creation and open innovation has the advantage of enabling more lucid and cogent analysis than is possible using other approaches. Thus, our review of the selected 63 papers in the subject category of *Management of Technology and Innovation* was structured to organize the literature in to three different theoretical categories based upon which of the following three points of view they adopted regarding the external actors involved in innovation projects through co-creation and/or open innovation:

- both individual external contributors and partnering organizations, including a variety of actors and stakeholders;
- individual external contributors only, such as users, customers, scientists, field experts, or innovation enthusiasts;
- partnering organizations only, such as other companies (customers, suppliers or competitors), universities, or government institutions.

The results of our literature review, covering all the selected papers that mentioned both the concept of co-creation and the concept of open innovation, are summarized in Table 2. We were unable to categorize four papers with certainty within our framework, as they did not assert a point of view on the question of external actors involved in innovation projects specifically regarding co-creation and/or open innovation (El-

Ella et al., 2013; Gateau & Simon, 2016; Kosonen et al., 2014; Steen, 2013). With the exception of these four indeterminate papers, our systematic review of the innovation management literature enabled us to successfully classify all papers according to which of the three alternative perspectives they embraced regarding external actors involved in co-creation.

Based on our assessment of the most prominent of the three streams of literature we conclude that, on the whole, co-creation tends to be perceived as collaborative innovation between a company and *individual external contributors* who are able to provide a valuable input to innovation projects based on their experience, expertise, knowledge and skills. The individual external contributors to companies' co-creation projects are variously presumed in the most prominent stream of the literature to be individuals such as customers and users of a company's products (who are sometimes portrayed as lead users, innovators, or "prosumers"), field experts, students, or amateurs and hobbyists. Examples from the literature for each of these instances include:

- *Customers and users of a company's products*: Agarwal and Selen (2011); Barczak (2012); Candi et al. (2015); Konsti-Laakso et al. (2012); Mina et al. (2013); Randhawa et al. (2016); Ryzhkova and Pesamaa (2015); Trimi and Berbegal-Mirabent (2012); Vaquero Martín et al. (2016);
 - *Customers and users portrayed as lead users*: Dell'Era and Landoni (2014); Fosfuri et al. (2013); Füller et al. (2011); Füller et al. (2012); Greer and Lei (2012); Kim et al. (2008); Kohler et al. (2009); Marchi et al. (2011); Roberts et al. (2016); Schuhmacher and Kuester (2012); Schweisfurth and Raasch (2015); Shanmugam and Durugbo (2015); Sundbo et al. (2015);
 - *Customers and users portrayed as innovators*: Adamczyk et al. (2012); Bauer and Gegenhuber (2015); Bogers et al. (2016); D'Ippolito (2014); Kim et al. (2008); Marchi et al. (2011); Schuhmacher and Kuester (2012); Schweisfurth and Raasch (2015); Wang et al. (2015);
 - *Customers and users portrayed as "prosumers"*: Bauer and Gegenhuber (2015); Bogers et al. (2016); Gabriel et al. (2015); Kohler et al. (2009);
- *Field experts*: Bauer and Gegenhuber (2015); D'Ippolito (2014); Dell'Era and Landoni (2014); Füller et al. (2011); Füller et al. (2012); Garcia Martinez and Walton (2014); Greer and Lei (2012); Kohler et al. (2009); Marchi et al. (2011); Potts et al. (2008); Roberts et al. (2016); Schuhmacher and Kuester (2012); Shanmugam and Durugbo (2015); Simula and Vuori (2012);
- *Students*: Adamczyk et al. (2012); D'Ippolito (2014); Dell'Era and Landoni (2014); Füller et al. (2011); Garcia Martinez and Walton (2014); Schuhmacher and Kuester (2012); Zhao et al. (2016);
- *Amateurs and hobbyists*: Bauer and Gegenhuber (2015); Garcia Martinez and Walton (2014); Greer and Lei (2012); Kohler et al. (2009); Marchi et al. (2011); Pera and Viglia (2015); Potts et al. (2008); Simula and Vuori (2012).

Additionally, we also identified a subdominant research stream in which co-creation was portrayed as involving *a wide variety of stakeholders as external actors* in innovation projects, both individual external contributors and partnering organizations (Bogers & West, 2012; Cheng & Huizingh, 2014; Frow et al., 2015; Lin & Hsieh, 2014; Miller, McAdam, & McAdam, 2014; Ruffin et al., 2013; Schulz, Geithner, Woelfel, & Krzywinski, 2015), sometimes also specifically emphasizing the importance of customer and user engagement in co-creation (Brohman et al., 2009; Henkel, Schöberl, & Alexy, 2013; Lee et al., 2014; Lehmann, Frangioni, & Dubé, 2015; Zeng & Glaister, 2016).

Finally, we identified only four papers using the notion of co-creation to explain collaborative innovation strategies exclusively between *partnering organizations*, more specifically in inter-firm collaboration (Paasi et al., 2010; Piening & Salge, 2015), and university-industry collaboration (Lubik, Garnsey, Minshall, & Platts, 2013; Taheri & van Geenhuizen, 2016).

Thus, we see the *collaboration of a company with individual external contributors as a hallmark of co-creation*.

As we turn our attention to open innovation, our systematic literature review shows that researchers adopt only two points of view regarding external actors.

Open innovation is mostly seen as a concept in which a *variety of external actors*, including both individual external contributors and partnering organizations, are involved in innovation projects (Barczak, 2012; Bogers & West, 2012; Cheng & Huizingh, 2014; Dell’Era & Landoni, 2014; Du, Leten, & Vanhaverbeke, 2014; Garcia Martinez & Walton, 2014; Henkel et al., 2013; Lin & Hsieh, 2014; Mina et al., 2013; Randhawa et al., 2016; Roberts et al., 2016; Rufin et al., 2013; Schulz et al., 2015; Simula & Vuori, 2012; Vaquero Martín et al., 2016; Wang et al., 2015; West & Bogers, 2014). Within this influential stream of literature, we observe a growing research interest in *customer and user involvement in open innovation*, typically portrayed similarly to co-creation (Adamczyk et al., 2012; Candi et al., 2015; Füller et al., 2012; Gabriel et al., 2015; Gamble et al., 2016; Kohler et al., 2009; Konsti-Laakso et al., 2012; Lee et al., 2014; Lehmann et al., 2015; Marchi et al., 2011; Pera & Viglia, 2015; Ryzhkova & Pesamaa, 2015; Sundbo et al., 2015; Taherparvar, Esmaeilpour, & Dostar, 2014).

On the other hand, there is also a research stream in which the concept of open innovation is related only to cooperation between organizations, most typically *inter-firm collaboration* (Erzurumlu, 2010; Ferreras-Méndez, Fernández-Mesa, & Alegre, 2016; Magnusson & Nilsson, 2013; Paasi, Lappalainen, Rantala, & Pikkarainen, 2014; Potts et al., 2008; van Geenhuizen & Nijkamp, 2012; Zeng & Glaister, 2016) and *university-industry collaboration* (Ferreras-Méndez et al., 2016; Miller et al., 2014; Taheri & van Geenhuizen, 2016; van Geenhuizen & Nijkamp, 2012; Zeng & Glaister, 2016), usually supported by contractual agreements between organizations and formalized through strategic alliances, partnerships or joint ventures.

Finally, we have identified no published research portraying open innovation as a concept in which only external individuals are treated as contributors to a company’s innovation projects.

Even though these findings (summarized in Table 2) lead us to the conclusion that the extant literature in the field of innovation management is congruent in neither its conceptualization of open innovation and co-creation nor its distinction between the two concepts, the findings nevertheless manifest and support the general presumption that the external actors involved in co-creation are *individual persons* who are able to provide a valuable input to innovation projects based on their experience, expertise, knowledge and skills. Conversely, the findings do not manifest such a presumption for open innovation. Although our “deep dive” analysis was restricted to the academic literature where the two topics of co-creation and open innovation co-appear, we believe that the overall findings of our review are robust, as most of the results of our analysis of the 20 most influential papers mirror the results of our analysis of the full set of 63 papers in our final set. The 20 most influential papers are denoted by an asterisk (*) in Table 2.

	Co-creation	Open innovation
Both individual external contributors and partnering organizations	12 papers *Bogers and West (2012); *Brohman et al. (2009); *Cheng and Huizingh (2014); Frow et al. (2015); Henkel et al. (2013); Lee et al. (2014); Lehmann et al. (2015); Lin and Hsieh (2014); Miller et al. (2014); Ruffin et al. (2013); Schulz et al. (2015); Zeng and Glaister (2016)	31 papers *Adamczyk et al. (2012); *Barczak (2012); *Bogers and West (2012); Candi et al. (2015); *Cheng and Huizingh (2014); Dell'Era and Landoni (2014); *Du et al. (2014); *Füller et al. (2012); Gabriel et al. (2015); Gamble et al. (2016); Garcia Martinez and Walton (2014); Henkel et al. (2013); *Kohler et al. (2009); *Konsti-Laakso et al. (2012); Lee et al. (2014); Lehmann et al. (2015); Lin and Hsieh (2014); *Marchi et al. (2011); *Mina et al. (2013); Pera and Viglia (2015); Randhawa et al. (2016); Roberts et al. (2016); Ruffin et al. (2013); Ryzhkova and Pesamaa (2015); Schulz et al. (2015); *Simula and Vuori (2012); Sundbo et al. (2015); Taherparvar et al. (2014); Vaquero Martín et al. (2016); Wang et al. (2015); *West and Bogers (2014)
Individual external contributors only	36 papers *Adamczyk et al. (2012); *Agarwal and Selen, (2011); *Barczak (2012); Bauer and Gegenhuber (2015); Bogers et al. (2016); Candi et al. (2015); D'Ippolito (2014); Dell'Era and Landoni (2014); *Du et al. (2014); Fosfuri et al. (2013); *Füller et al. (2011, 2012); Gabriel et al. (2015); Garcia Martinez and Walton (2014); *Greer and Lei (2012); *Kim et al. (2008); *Kohler et al. (2009); *Konsti-Laakso et al. (2012); *Marchi et al. (2011); *Mina et al. (2013); Pera and Viglia (2015); *Potts et al. (2008); Randhawa et al. (2016); Roberts et al. (2016); Ryzhkova and Pesamaa (2015); *Schuhmacher and Kuester (2012); Schweisfurth and Raasch (2015); Shanmugam and Durugbo (2015); *Simula and Vuori (2012); Sundbo et al. (2015); Taherparvar et al. (2014); *Trimi and Berbegal-Mirabent (2012); Vaquero Martín et al. (2016); Wang et al. (2015); Zeng and Glaister (2016); Zhao et al. (2016)	0 papers -
Partnering organizations only	4 papers Lubik et al. (2013); Paasi et al. (2010); Piening and Salge (2015); Taheri and van Geenhuizen (2016)	9 papers Erzurumlu (2010); Ferreras-Méndez et al. (2016); Magnusson and Nilsson (2013); Miller et al. (2014); Paasi et al. (2014); *Potts et al. (2008); Taheri and van Geenhuizen (2016); van Geenhuizen and Nijkamp (2012); Zeng and Glaister (2016)

Table 2. Overview of perspectives on the theme of external actors involved in co-creation and open innovation (An asterisk (*) indicates that the paper belongs to the group of the 20 most influential papers in our final set, which received more than the average citation count of 16.095 citations and accumulated 839 citations in total).

6. Discussion: Towards a definition and taxonomy of co-creation

Placing the concept of co-creation alongside the concept of open innovation helps us to understand the differences and relationships, as well as the level of convergence, between these two concepts in the field of innovation management. Even though our “broad brush” analysis shows that the concept of co-creation did not evolve from the concept of open innovation and that the two concepts emerged independently, a strong relationship and interconnectedness between the two concepts emerged over time as they evolved simultaneously in the field of innovation management. Emphasizing the same idea of openness of a company’s boundaries and involvement of external actors in innovation led to co-creation and open innovation become conceptual cousins. Nevertheless, despite this observable cumulative interplay of the two concepts in the literature, the results of our “deep dive” analysis of the comprehensive set of 63 papers in the subject category of *Management of Technology and Innovation*, dealing with both open innovation and co-creation, enable us to discern and assert a crucial distinction between these two concepts from the vantage point of the *external actors* involved in innovation. Based on our analysis of the reviewed papers, and to facilitate cogent future research about co-creation, we propose the following differentiation between co-creation and open innovation:

- co-creation is a concept concerned with involving individual external contributors in a company’s innovation projects, and
- open innovation is a concept concerned with involving a wide variety of actors and stakeholders in a company’s innovation projects, including both individual external contributors and partnering organizations.

Thus, regarding the relationship between the two concepts, we see co-creation as an adopted cousin of open innovation. Our proposition accords with the perspective of some commentators that the open innovation concept is broader than the concept of co-creation (Barczak, 2012; Cheng & Huizingh, 2014; Fosfuri et al., 2013; Frow et al., 2015; Gamble et al., 2016; Kosonen et al., 2014; Marchi et al., 2011; Randhawa et al., 2016). If we compare the results of our “deep dive” analysis to the early concepts of co-creation and open innovation that appeared in the innovation management literature at the beginning of the 2000s, we can conclude that the concepts of both co-creation and open innovation broadened over time from the vantage point of presumptions about the characteristics of the external actors involved in a company’s innovation activities. The focus of co-creation moved gradually from the involvement of consumers in innovation, as it was posited originally by Prahalad and Ramaswamy (2003), to the involvement of a diverse array of individual external contributors, i.e., of any persons with the requisite experience, skills, knowledge and expertise. Likewise, open innovation evolved from the original concept dealing with outside-in and inside-out innovation flows between organizations (Chesbrough, 2003) to an expanded concept incorporating the idea of collaboration amongst a variety of actors and stakeholders, including both individual external contributors and partnering organizations. We can observe that, even though its picture of what type of person might play the role of an individual external actor broadened over time, the co-creation literature remained stable its general presumption that the external actors involved in co-creation are individual persons. In the case of open innovation, however, the story is different. The expanded perspective in the open innovation literature on the characteristics of external actors involved in open innovation embraced both partnering organizations and individual contributors, thereby this naturally

leading to an overlap of the concepts of co-creation and open innovation. In this regard, our literature review results help us to better understand the relationship and differentiation between the two concepts, and on that basis to offer a lucid definition and practical taxonomy of co-creation.

Thus, drawing on the insights educed from our literature review, we offer a **definition of co-creation** from the innovation management perspective: *co-creation is a form of collaborative innovation initiated by a company, involving individual external contributors or co-creators—not just users and customers, but also field experts, students, or amateur innovation enthusiasts—who may provide valuable input to the company’s innovation projects.*

Additionally, our review of the two significant streams in the innovation management literature that we identified as operating from within the general perspective that open innovation is a broader concept than the concept of co-creation, enabled us to define two types of co-creation and understand their position within the concept of open innovation.

The first stream sees co-creation as a form of inbound open innovation, typically based on crowdsourcing (Bauer & Gegenhuber, 2015; El-Ella et al., 2013; Füller et al., 2011; Garcia Martinez & Walton, 2014; Kosonen et al., 2014). Even though inbound open innovation is mainly seen as a unidirectional outside-in flow of innovative knowledge, it can be a fruitful basis for co-creation with individual external contributors through crowdsourcing. Following the very first definition of crowdsourcing proposed by Howe (2006), we see this type of co-creation as the outsourcing—, typically in the form of a contest—of a problem that needs to be solved to an undefined, generally large, group of people who may possess relevant knowledge. Even though through crowdsourcing a company usually collects many potential solutions to its problem, it normally chooses the best one as the winning solution and as an optimal contribution to its innovation project. As co-creation in this case takes place between a company and only one co-creator, the winner who contributes the best solution to a specific problem, and who is in most cases involved in further stages of product innovation (Figure 2), we define this type of co-creation as “*company-to-one co-creation.*”

The other influential stream in the innovation management literature portrays co-creation as a form of coupled open innovation (Cheng & Huizingh, 2014; Lee et al., 2014; West & Bogers, 2014), emphasizing the collaborative innovation activities of all parties involved. Bearing in mind that coupled open innovation as introduced by Enkel, Gassmann and Chesbrough (2009) referred to joint development and commercialization of innovation through alliances, cooperation, and joint ventures, in our development of the second type of co-creation we adopt the ideas of Piller and West (2014), who proposed the interactive model of coupled open innovation, focused on co-creation between a company and customers, users, and other external individuals. With the aim of creating intensive interactions among these external individuals and of taking advantage of their innovation potential, companies frequently support and sponsor communities of people who share interests (Bogers & West, 2012). Sometimes they use these communities to identify and select the most promising contributors for their co-creation workshops, where they intensively interact in problem solving with a selected group of co-creators. Bearing in mind that in these communities and workshops co-creation takes place between a company and a group of co-creators who also interact among themselves and join their efforts to develop a solution to a specific problem (Figure 2), we define this second type of co-creation as “*company-to-many co-creation.*”

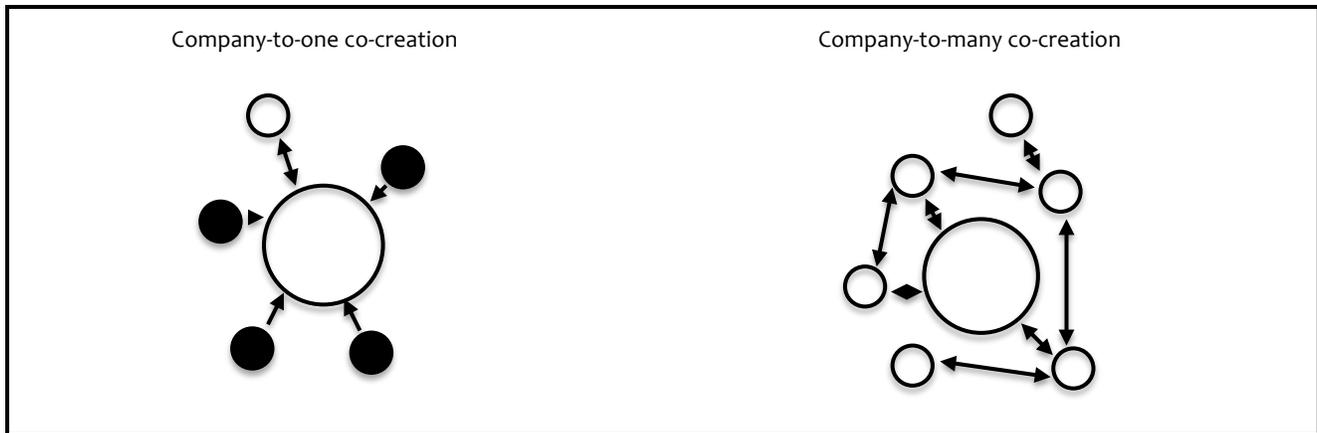


Figure 2. Co-creation taxonomy: company-to-one and company-to-many co-creation.

Conceptualizing the two types of co-creation proposed here, as portrayed in Figure 2, helps us to understand how companies practice co-creation as collaborative innovation with individual external contributors, within inbound and coupled modes of open innovation, both involving outside-in knowledge-sourcing processes.

7. Conclusions

Although co-creation has attracted a lot of attention in the academic world since the beginning of the 21st century, a consistent and widely accepted definition of co-creation as a form of collaborative innovation has been missing in the literature until now, and there is a poor understanding in the literature as to how co-creation differs from and relates to the concept of open innovation. Notwithstanding the independent origins of co-creation and open innovation in the innovation management literature, and the different perspectives embodied by each, these two concepts are united by the fact that they both embrace the idea of involving external actors in innovation across organizational boundaries.

In this paper we focus on the *role and characteristics* of the external actors involved in companies' innovation projects as the main feature of co-creation that distinguishes it from open innovation more generally. The results of our literature review show that open innovation is a concept concerned with opening the boundaries of a firm to a wide variety of actors and stakeholders, including both individual external contributors and partnering organizations. On the other hand, our results have enabled us to define co-creation as *a form of collaborative innovation initiated by a company, involving individual external contributors or co-creators who may provide valuable input to the company's innovation projects*. Our results have also enabled us to posit a taxonomy of co-creation, differentiating between the *company-to-one* and the *company-to-many* co-creation type.

Thus, there are three crucial distinguishing elements in our concept of co-creation, as follows:

- the collaborative innovation must generally be initiated by the company itself rather than by outsiders;
- the external contributors must be individual people—co-creators—rather than companies or other organizations;
- the external co-creator or co-creators must contribute to an innovation project of the initiating company.

Based on a systematic two-stage review of contemporary literature within the fields of co-creation and open innovation, our research demonstrates that substantively different approaches to the management of innovation may be discerned that correspond to the two respective rubrics. We have shown that the popular presumption that the concept of co-creation has evolved from, or has been built upon, the concept of open innovation, is not compatible with the factual evidence. Our research provides grounds to support our proposition that these two terms—“co-creation” and “open innovation”—correspond to related but distinct concepts of innovation management, where co-creation may be described as an adopted cousin of open innovation.

The main limitations of our research are that our “broad brush” review is based solely on publications indexed by Scopus, and that our “deep dive” review is restricted to academic papers in journals within the *Management of Technology and Innovation* category within the *Business, Management and Accounting* subject area in the SCImago Journal Rank database. Broadening the reach of our research by including academic papers published in journals not captured by these data sources may have allowed us to generate a more nuanced set of results. Future research may redress this limitation, although we believe that the data sources upon which we have drawn are sufficiently representative of the scholarly domain in which we are interested for our results to be robust.

To the best of our knowledge, the research presented in this paper is the first study to simultaneously focus on and systematically analyze the nature of both co-creation and open innovation, and to analyze the purported convergence of the two concepts in the literature. By providing a perspective on this issue which goes beyond the current state of the literature—which is characterized by conceptual and terminological ambiguity and confusion—this paper contributes to the contemporary conversation in the literature about co-creation and open innovation, and thereby provides a more robust basis for future research about collaborative innovation. Hopefully, this will make it easier for practitioners to gain useful insights from the research. Having produced a coherent concept of co-creation, with a definition of the concept that more clearly differentiates it from other concepts within the innovation management literature, we are now in a position to engage in additional—more cogent—research about the role of co-creation within innovation management.

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