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The conceptual and methodological development of the Social Innovation Measurement Model Questionnaire (SIMM-Q)

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Abstract

An increased knowledge of innovation depends on high-quality research. However, what aspects of innovation impact positive outcomes for different actors? New insights call for the development of research methodology to be used to explore and investigate the phenomenon of innovation, i.e., processes and outcomes. In this paper, our aims are to a) describe the development of a conceptual model of social innovation at the micro level and b) describe the development of a quantitative methodology named the Social Innovation Measurement Model Questionnaire (SIMM-Q). We will also discuss some principal issues linked to research on social innovation and its relevance for co-creation.

Keywords: Social innovation, collaboration, responsible innovation, questionnaire, nursing homes, co-creation, SIMM-Q

Introduction

Even though there is an increasing interest in social innovation (SI), there is a lack of reliable metrics for assessing the effectiveness and its impact (Young Foundation 2014). According to Michi (2019), traditional measures of neither technical nor social innovation show very promising results. This lack of promise is linked to all aspects of the research process, from conceptual fuzziness (what we actually measure) to statistical and other methodological problems. Accordingly, there is complexity embedded in the study of innovation as a phenomenon that is not easily solved from a research point of view. Innovation research calls for intensive efforts to a) understand the phenomenon of innovation and b) to develop a research methodology to be used to explore and investigate the phenomenon. Similar issues are connected to researching the concept of co-creation, along with the intertwined relationship between SI and co-creation (Voorberg et al. 2015; Agger & Tortzen 2015). Hence, we assume that clarifying the phenomenon of SI will be of relevance to the call for elucidating the concept of co-creation.

Our main contribution in this paper is to explore and clarify how innovation can be understood within a health and social care context, with the aim of focusing on the concept of social innovation and introducing a new methodology that may enrich research possibilities in the field. The background for developing a new research

method was the *Social Innovation in Nursing Homes* (SIS) project. There are huge challenges related to elder care due to an increase in the elderly population. Social innovation constitutes a key step towards meeting some of these challenges, and the services themselves constitute an important prerequisite for potential success (Willumsen and Ødegård 2015). Potentially, the relation between the specific methodological development example presented in this paper (SIMM-Q), may have interest for more general discussions and conclusions of social innovation in different contexts? The conceptual development of the SIMM-Q is one of the first measurement methods developed to explore perceptions of SI at the micro level, which may also contribute to aspects of co-creation.

The specific aims of this paper are to a) describe the development of a conceptual model of social innovation at the micro level, b) describe the development of a quantitative methodology named the Social Innovation Measurement Model Questionnaire (SIMM-Q), and c) discuss principal issues linked to conducting research on social innovation. The relevance to co-creation will also be elaborated.

What is innovation and social innovation?

Innovation is all about creating values from ideas (Tidd and Bessant 2014). However, innovation is not only about creating economic value (Schumpeter 1934; Freeman 1990). In Scandinavia, there has been an increased concern about why changes occur and how they come about. This concern is reflected in an increased level of attention towards innovation, seen, for example, in a range of white papers and research efforts in recent years (Willumsen & Ødegård 2015; Husebø et al. 2021). However, as we will elaborate below, innovation as a phenomenon is a complex and multifaceted phenomenon (Tepsie 2014; Willumsen & Ødegård 2015; Husebø et al. 2021).

Generally, social innovation can be understood as the process and the outcome of using new knowledge, either by putting together existing knowledge in new ways or applying knowledge within new contexts. This process is primarily about creating positive social change, improving social relations and working together to meet social needs (European Commission 2013). A relatively widely used definition is as follows:

> Social innovation is about new ideas that work to address pressing unmet needs. We simply describe it as innovations that are both social in their ends and in their means. Social innovations are new ideas (products, services and models) that simultaneously meet social needs (more effectively than alternatives) and create new social relationships or collaborations (Murray and Mulgan 2010).

Van der Have and Rubalcaba (2016) found in a study of existing literature examining a total of 172 publications that the field of social innovation was characterized by a high degree of diversity of definitions and conceptual ambiguity, which is a situation that hampers the integration of findings. There is a need to clarify social innovation as a phenomenon before the development of research methodology can take place.

Given this high degree of diversity of definitions of social innovation, our main concern was to try to develop a methodology that could explore social innovation on a micro level. This kind of methodology could potentially enrich our understanding of social innovation and its outcomes. Our notion was that certain aspects of social innovation need to be understood as processes between people involved in collaboration and creative processes. Thus, our point of departure for developing SIMM-Q was to focus on how the actors perceive innovation and aspects involved in innovation processes.

Research on social innovation

There is complexity embedded in the study of innovation as a phenomenon that is not easily solved from a research point of view. Increased research on innovation depends on the development of a new research methodology. Such methodology calls for intensive efforts to a) understand the phenomenon of innovation, and b) develop a research methodology to be used to explore the phenomenon. In a recent review study, Husebø et al. (2021) found that social innovation studies within fields of education, health and welfare are dominated by qualitative studies; only 5 of 41 studies apply a quantitative design. Husebø et al. (2021) concluded that "the lack of a common definition and framework makes it difficult to measure and quantify, reflecting the dominance of qualitative research methods in the selected research contexts" (p. 2).

Several authors have argued that the measurement of social innovation is in an early (infancy) stage (Mihci 2019; Husebø et al. 2021). Reported problems in this early stage are mainly due to three fuzzy areas: 1) the identification problem, 2) statistical and methodological problems, and 3) problems with different levels of analysis (Mihci 2019). The identification problem is a fundamental problem in social innovation research: "without adequately identifying the main conceptual framework of the research agenda, obtaining misleading and/or dead-end results is almost unavoidable" (Michi 2019, 16). Statistical and methodological problems are also a major problem in social innovation research: "current measurement approaches only focus on the input and output indicators but almost totally ignore processes (throughput) indicators" (Michi 2019, 18). The same author proposed, after a survey of the literature on social innovation measurement, that the level of analysis differs between studies and ranges from micro to meso to macro levels of analysis. According to Mihci (2019), research on social innovation should undergo "a *creative destruction* leading to the emergence of new indicators, methods, and findings acceptable for the majority of the researchers and wisely implementable for policy makers" (p. 20).

Theoretical framework and the development of a conceptual model

Conceptual development for exploring social innovation

Our point of departure is the call for quantitative approaches to study SI that focus on the processes between "input" and "output". The questionnaires that have been developed thus far seem to be largely focused on a) product development, b) management, or c) overall aspects of social innovation, e.g., organizational, local or regional development (Tepsie 2014). For our purposes, we considered social innovation, as presented in the following model.

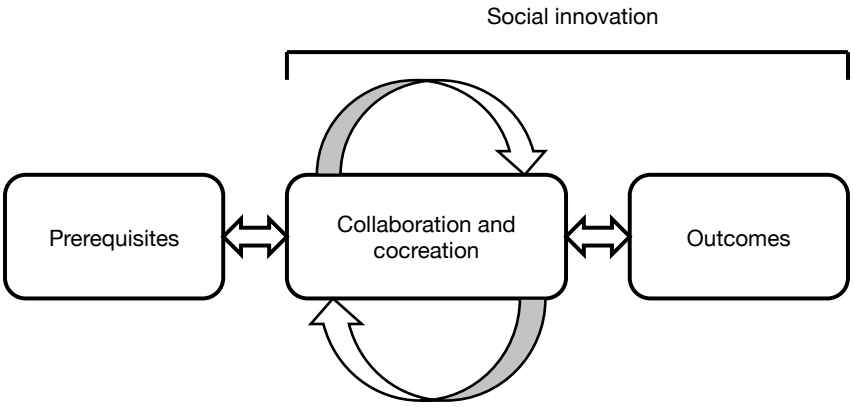

Figure 1. Social innovation as a linear and circular process.

Figure 1 illustrates that social innovation can be understood as a linear process, depending on prerequisites such as time, leadership, competence, etc., which is shown by the movement from left to right in the figure. Such linear processes might be understood by studying macro aspects of innovation, for example, what characterizes communities that produce the best innovations – giving high economic output? Figure 1 also illustrates that the main aspects of social innovation could be understood at the micro level, where the dynamic interaction between the actors involved in the innovation process becomes central (collaboration and co-creation) (c.f. Bason 2010; Voorberg et al. 2015; Agger & Tortzen 2015). In this regard, social innovation might be understood as circular processes involving collaboration and co-creation. These are both dynamic processes between different actors. In the development of SIMM-Q, these circular aspects of social innovation were specifically focused on.

Next, we suggest that researchers need to identify what aspects of collaboration and co-creation are central to social innovation and include them in the conceptual model. One example would be communication, which is a central aspect of collaboration and co-creation processes. An understanding of the micro level of social innovation is, in our opinion, crucial if we are to gain insight into what aspects in the collaboration process foster the emergence of new solutions (and outcomes).

Development of the SIMM-Q

The main features of the PINCOM and the responsible innovation (RI) framework were included in the development of the SIMM-Q. As shown in Figure 1, the "black box of collaboration" (cf. Salazar and Holbrook 2004) needs to be understood before we can move on to the measurement of how collaboration is perceived by actors in the innovation process.

Perceptions of interprofessional collaboration

The conceptual model (PINCOM) was originally developed to explore perceptions of interprofessional collaboration (IPC) between professionals within child mental health care (Ødegård 2006). The basic idea of this methodology was to develop a conceptual model and a measurement methodology that could explore how different actors (professionals) perceived interprofessional collaboration – that is, how does a person give meaning to his or her environment? It was a basic notion that professionals perceive IPC differently and that further investigation was needed to understand IPC as a phenomenon. Likewise, to understand aspects of social innovation, it would be interesting to explore how actors collaborate and co-create new solutions to solve problems and actually perceive what they are doing in these processes. Hence, the development of the SIMM-Q was an attempt to accomplish this.

Conceptually, the PINCOM model was based on twelve constructs derived from a pilot study and theoretical input from organizational and social psychology (Ødegård 2006). The following definition of interprofessional collaboration was suggested: *perceptions and behaviour between professionals in the interprofessional collaboration process on an individual, group and organizational level* (Ødegård 2006, 4).

The individual aspects that may be involved in interprofessional collaboration processes are professional power (C1), role expectations (C2), personality style (C3) and work motivation (C4). It is suggested that these constructs represent central aspects of individual influence in interprofessional collaboration processes and hence in social innovation processes. The central features of interprofessional groups and teams were identified by Ødegård (2006) as perception of leadership (C5), coping abilities (C6), communication (C7) and social support (C8). For example, it is obvious that com-

munication processes are a prerequisite for the development of new ideas and hence social innovation. Organizational aspects in the PINCOM are organizational culture (C9), organizational environment (C10), organizational aims (C11) and organizational domain (C12). For example, we suggest that organizational culture will most likely influence how social innovation processes are initiated and how they unfold.

Responsible innovation (RI)

Responsible innovation emphasizes that the inclusion of different stakeholders in the innovation process is a necessary condition for ensuring the socially responsible outcomes of innovations (Stilgoe et al. 2013; Owen et al. 2012). The inclusion of different opinions allows us to broaden the discussion of what questions to include and how they should be achieved, and reflection and anticipation processes help to pivot innovations in the right directions (Iakovleva et al. 2019). According to Stilgoe et al. (2013), "responsible innovation" involves preparing for the future through collective management of today's knowledge and innovations. To achieve this, various societal actors and innovators must interact so that they become mutually dependent on each other with regard to ethical aspects, sustainability and desire for innovation and results (von Shomberg 2011).

We argue that the purpose, innovation and outcome of the innovation to ensure ethical and responsible behaviour must be assessed on the basis of these four elements: inclusion, expectation, reflection and response. For example, investments in the digitization of health services and the introduction of welfare technology should be responsible and provide more accessible care for the population.

Methodological development (SIMM-Q)

Further development of the questionnaire, after conceptual clarifications (PINCOM-Q and RI influence), can be described as consisting of four phases: 1) brainstorming, 2) making decisions, 3) pilot testing, and 4) testing the final version.

Phase 1. **Brainstorming**: During the development of the questionnaire (SIMM-Q), a range of suggestions on which topics and questions (items) should be included were brought forwards among the authors of this paper. A main decision was made to focus on relational aspects of social innovation, especially collaboration.

Phase 2. **Making decisions**: Based on phase 1, choices were made regarding the development of the first draft of the questionnaire. It was decided which themes should be included and how these should be operationalized. This was a crucial step in the development of the questionnaire, as the themes and the items chosen would have a major impact on the construct validity of the scores.

Phase 3. **Pilot testing**: After the completion of the first draft of the SIMM-Q, pilot testing was performed by getting other participants in the project (SIS) and a few professionals working in nursing homes to complete the questionnaire. Both electronic and paper-based versions were used, and a total of fifteen questionnaires were completed in the pilot phase. This was a particularly important phase in the development of the questionnaire, as we received many comments and significant feedback on the first draft of the SIMM-Q. Accordingly, we chose to make some radical changes in the design, particularly the length of the SIMM-Q.

Phase 4. **Testing the final version**: The final version of the SIMM-Q was tested on a sample of 112 elderly health and social care professionals working in nursing homes. The content of the SIMM-Q included the following 46 items: central demographic factors (5 items), collaboration (24 items), responsible innovation (12 items) and outcomes (5 items).

Discussion

In this paper, we aim to describe the development of a conceptual model of social innovation and the development of the SIMM-Q questionnaire. In the following discussion, we will focus upon some principal issues linked to doing research on social innovation.

Is it possible to measure social innovation?

We have referred to Mihci (2019) several times in this paper as he has discussed this question extensively in the publication *Is measuring social innovation a mission impossible?* Although there have been attempts made to measure social innovation, research shows that these attempts have mainly focused on macro levels of innovation. The development of the SIMM-Q therefore seems to be novel to the research field, as the methodology focuses on the micro level of social innovation. The SIMM-Q has the potential to glimpse into the "black box" (see Figure 1), which we consider highly relevant to gain in-depth knowledge about how innovation processes unfold. Social innovation, at the micro level, is deeply linked to how actors interact and cannot be overlooked.

However, the complexity does not stop here, as the context of social innovation is often complex due to the context in which new solutions are needed. Bloch (2013) pointed out that the public sector has a complex organizational structure and is governed by politicians, with a large diversity of organizations at different administrative levels and with front-line collaboration between service providers and recipients of welfare benefits. In addition, innovation in the health and welfare sector is often focused on new functions, new concepts, new products or new services related to human and social needs. Thus, it follows that it is necessary to adapt the innovation concept and make it relevant to the framework, values and professional practice in health and welfare services (cf. Fitjar 2015; Willumsen & Ødegård 2015). Such adaptation will provide guidelines for how research on innovation is planned and conducted in this context.

Following this, it is relevant to ask – *is it truly possible to measure social innovation*? Our answer is: *it depends*! To illustrate this, we have developed a tentative figure that shows some of the steps that must be considered before potential results can be delivered.

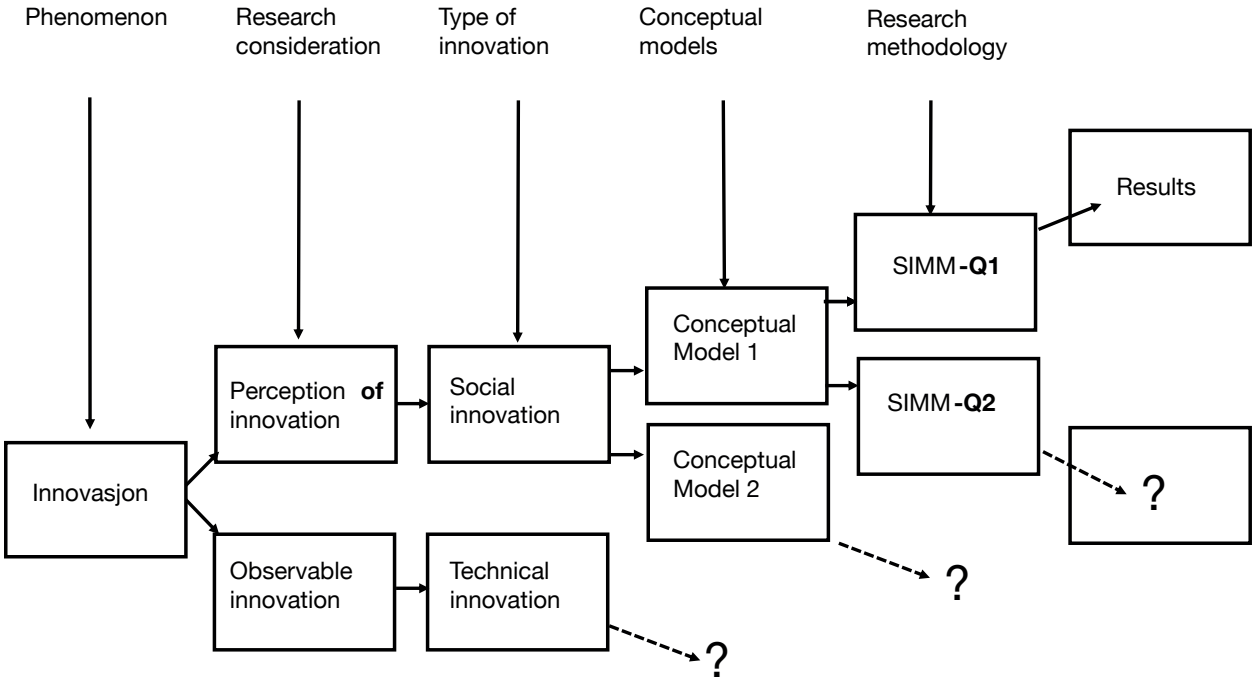

Figure 2. The complexity of social innovation research is illustrated.

There are many potential research approaches to innovation that the researcher must consider. Relevant examples could be to investigate economic issues or use register data to look at epidemiological factors (health, education, etc.). Another option would be to explore perceptions of innovation. An example of such exploration could be to examine the subjective experiences of actors involved in innovation processes, as we attempt to do using SIMM-Q.

Next, as illustrated in Figure 2, would be to consider what innovation is about, for example, *social* innovation or *technical* innovation. Furthermore, in the study of social innovation, there are many potential conceptual models that could give meaning to the "content" of social innovation. The researcher needs to make some choices as to what should be included or not in the conceptual model and at what level. Does the research (research questions) ask for information about political, organizational, group or individual aspects of innovation, or does it ask for information on all of these aspects? From a research perspective this is of course an important question, as the conceptual model will guide the development of the research

instrument (i.e., the questionnaire, e.g., SIMM-Q1 or SIMM-Q2). All these choices during the research process will influence the results and hence what kind of knowledge about innovation we gain.

Relevance for co-creation

SI, interprofessional collaboration and co-creation appear intertwined in practice, and several similar aspects can be identified. However, it is interesting to clarify the concepts for analytical purposes and discuss their relevance. Following Voorberg et al. (2015) and Agger & Tortzen (2015), co-creation is associated with active citizen involvement in the production of welfare and public service delivery to improve services and living conditions and with the involvement of end-users in various stages of the production process. Co-creation is a network-based way of collaborating across professions, disciplines and services/sectors and may include public, private and 3rd sector actors at the individual and/or community level. We conclude that co-creation is the widest and most complex concept compared to SI and interprofessional collaboration (Willumsen & Ødegård 2020). However, several similar aspects exist. Hence, research and practice from SI as well as interprofessional/ interdisciplinary and intersectoral activities and co-creation have mutual relevance. For instance, measuring how actors perceive SI and aspects of the innovation process focus on how actors interact and may contribute to understanding the roles and attitudes of public officials/professionals (Agger & Tortzen 2015; Voorberg et al. 2015), such as their willingness to support co-creation considering the risk of losing status and control to "unreliable" partners. Furthermore, measuring SI in combination with responsible innovation highlights the importance of including all stakeholders in the innovation process to ensure socially responsible outcomes in terms of ethical and responsible behaviour, which will contribute to understanding how co-creation can achieve a value-based direction regarding purpose, innovation and outcome and contribute to sustainable relationships with citizens (Agger & Tortzen 2015; Voorberg et al. 2015). These issues represent interesting research questions that can be explored in different contexts.

Validity issues

Over fifty years ago, Nunnally (1967) claimed that as a first step in any measurement procedure, the researcher should specify the domain of indicators of the construct. This means that without domain specifications, it is difficult to decide to what extent a measure

includes irrelevant information or underrepresents the constructs. For example, different aspects of social innovation may not be targeted properly, either because the indicators chosen are of little importance (irrelevant) or because the indicators do not sufficiently capture the construct (underrepresentation). Both of these failures to develop proper domain specifications are a threat against construct validity (Messick 1995). Giving attention to domain specifications of social innovation will increase the likelihood of clarifying social innovation in each study. Accordingly, this will also reduce the chances of confusion about what is meant by social innovation.

Thus, research on social innovation (SI) may lack construct validity if researchers have a too narrow operationalization of SI or if they include irrelevant information, for example, items that belong to other theoretical constructs. The conceptual development, testing and evaluation of its psychometric properties is a crucial step in trying to measure perceptions of SI, which will be presented in another paper. Based on these general guidelines for test development, a great emphasis is placed on linking theory to the conceptual model – as described above – to ensure that the items developed were meaningful for its purpose.

Following this, SIMM-Q needs to be empirically tested to explore its psychometric properties, and its potential as a measure of the conceptual model. Thus, an exploratory factor analysis and reliability analysis are relevant steps to be taken, as well as a confirmatory factor analysis. If results from these approaches fail to support SIMM-Q, the conceptual model that have been suggested and the indicators used, must be reconsidered (cf. Figure 2).

Conclusion

Messick (1995) stated that "validity is an evolving property and validation a continuing process" (p. 741). The development of the SIMM-Q was conducted in the specific context of nursing homes. Although we believe that this methodological development at the micro level may provide new insight into social innovation in this context, other studies should test the suggested measures in different situations and across a variety of contexts as well as with different actor groups involved in SI and co-creation.

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