2 The nature of qualitative construction partnering research. A literature Review.

Author's notes

The first words of the literature review of this section were written in April 2015, but the idea was already born in 2008, when I followed the course 'Philosophy of Science' at the University of Amsterdam. This course, and especially reading 'The Structure of scientific Revolutions' by Kuhn (2012), have inspired me to conduct this review. In 'Structure of scientific Revolutions' Kuhn describes how phases of normal science are followed by crises and phases of new normal science. A phase of normal science means, according to Kuhn, that research is based firmly upon 'one or more past scientific achievements, achievements that some particular scientific community acknowledges for a time as supplying foundation for its further practice'. This way of thinking about science shows the importance of the academic community and its acknowledgement and shared ideas about the acceptability of science and knowledge. The experience of working as a PhD-student in an academic community, resulted in a deeper personal understanding of Kuhn's theory and the importance of the academic community. My experience is that scholars form and are being formed by the formal and informal academic discourse they work in. This is expressed in different ways and levels.

I my experience, one expression of forming and being formed by the discourse is the process of publishing peer reviewed articles in academic journals. In the process of publishing articles, a researcher depends on the international community of fellow-researchers, supervisors and other peers. The ongoing interactions between the individuals in this network create the international standards for research in the field of study we operate in. My experience is that an academic article (such as the articles in this thesis) goes through multiple phases before it gets published. In that process, the researcher(s) collaborates with peers in its/their community. The article constantly adjusts to the researcher's and other's individual explicit and implicit standards for good research and therefore the final article is an expression of the collaboration between the researcher(s) and the community he/they operate in. Examples of these phases of collaboration are described below and are based on my own personal experiences of publishing an academic peer reviewed article.

First, I (the first author) have chosen to write an article about the research process more or less chronologically. I consciously use the phrase 'more or less', because often, the research process is a lot messier than the author can describe in the article. To produce a clear, concise, redundancy-free and understandable article, the researcher must 'tidy up' the direct experiences and make the direct experiences more abstract. This is a first reduction of data, which requires first steps of interpretation. This process of interpretation and finding the right words to get the message across, already implies academic standards. In an early phase of this PhD-process I followed a course called 'academic writing in English', and I learned that academic authors utilize an academic discourse, and that written academic products contain specific use of words, phrases, style, and structure.

Secondly, the co- author constantly reads and comments on early concepts of the article. In my case, in all articles of this PhD-project, the co-authors were more experienced than me. They commented on several versions based on their experiences and their frame of reference and standards for acceptable research in this specific field of academic research. The co-authors commented on the content of the article, as well as on the structure, style and used language. In this literature review, for example, it was a sometimes a search for the right tone of voice.

Thirdly, when submitting the article, the researcher should take into account the journal's standards for reviewing articles, such as the domain of interest of the journal, a word limit, and formats for developing an abstract. Relatively simple standards, such as word limit, may influence decisions taken by the authors. In most cases, I had to omit paragraphs in the original manuscript. Striking out paragraphs can be difficult, because it requires to make choices. At the same time, it forces authors to be more focused and go to the essence of the message that the author wants to get across. I like to emphasize that such standards enable and restricts at the same time.

Fourthly, after submitting the first version of this article, the article gets reviewed by international peers, who have their own ideas, understanding and work in their own local scientific community with perhaps slightly differing scientific standards. The peers, in my case, are more experienced and commented based on their experiences and frames of reference. In my experience, the feedback that the reviewers provide is always extensive, constructive and critical. From the perspective of the researcher, sometimes it feels that the reviewers are mild, and sometimes the comments are sharper. Besides the content of the feedback itself, the tone of voice of the reviewers may also influence how a researcher responds to the feedback. Besides, sometimes the feedback by reviewers seems contradictory. It is up to the author to convince the reviewers that she made the right choices. That shows that there is always a rhetorical element in getting the article published. Although in first instance it can be difficult to receive the feedback,

we truly feel that it helped to improve the quality of the articles. For example, based on the reviewer's comments, we reframed this article and we adjusted the purpose, which highly influenced the structure and message of the article.

By describing this iterative process of writing and publishing an article I attempt to show that the final paper represents a collaboration between the first author's ideas, the co-authors, the journal's revisers, and that it is informed by the wider discourse in the field. It is therefore maximally adapted to the discourse of this specific field. This shows that scholars not only shape the scientific research discourse, but at the same time the scholars are shaped by the research discourse. I understand this as an interpretation of what Kuhn calls 'normal science'. As an academic researcher, I operate in a phase of normal science.

Kuhn, T.S. (2012). The structure of Scientific Revolutions. With an introductory Essay by Ian Hacking. Chicago, The University of Chicago Press.

This article was written by Marieke Venselaar and Hans Wamelink. This article was accepted by Engineering, Construction and Architectural Management at January 4th 2017 and will be published by this journal.

§ 2.1 Abstract

This paper investigates the nature of qualitative construction partnering research, by reviewing academic peer reviewed papers about this topic. Results show that most papers focus on multi-player, inter-organizational relationships in supply chains that collaborate in new building projects. Intra-organizational relationships collaborating in existing projects are underexposed. Also, four methodological gaps are identified. 1) Insight in the process of data analysis is underexposed. 2) Reflection on the role of the researcher(s) in the research process is underexposed. 3) The individual level of analysis is underexposed. 4) The way in which the results are generalized remain somewhat opaque, especially reflections on internal generalization is underexposed. All identified gaps have in common that specific time and place dependent details that may have influenced understanding of studied individuals are underexposed. This may explain why construction partnering research is experienced by some authors as stylized and abstracted from working practice. The identified gaps are translated into recommendations for further study. Applying the recommendations, will lead to a research discourse that represent the characteristics of ordinary working practice and the process of studying that working practice. More focus on local time and place

dependent factors of the studied individuals as well as the process of studying it, inevitably leads to encountering (and becoming more aware of) personal, subjective and unexplainable decisions and behavior. By applying the recommendations, this paper attempts to contribute to further development of academic research on this topic and increase effectiveness of partnering in the construction sector.

§ 2.2 Introduction

Professionals as well as scholars are interested in improving building processes in order to deliver higher quality to end users. A potential method to improve building processes is to strengthen collaboration between parties within the building supply chain. Forms of improved collaboration are often referred to as, for example, partnering, project partnering, supply chain partnering, supply chain integration, supply chain collaboration, or supply chain management. In this paper we use 'construction partnering' as overarching concept of all its before mentioned concepts. Construction partnering promises improvement of working relationships and project performance in terms of quality, cost and time (e.g. *Bresnen, 2009*, *Bygballe et al., 2010*, *Hong et al., 2012*).

Over the past decades, a considerable number of peer-reviewed research papers related to construction partnering has been published, covering a wide scope, and many perspectives and aspects of partnering (e.g. *Bygballe et al. 2010*; *Hong et al., 2012*). *Bygballe et al. (2010)* show that construction partnering encompasses project-based as well as strategic-based relationships. *Bygballe et al. (2010)* also show that partnering studies may focus on the dyadic relationship between client and contractor or may take into account multi actors within the construction supply chain, such as consultants, designers or end users. *Hong et al. (2012)* show that peer-reviewed research papers about construction partnering cover a wide variety of topics, such as theory and model development, problems and barriers to implementation and review of development and application.

Different research approaches and methodologies are employed in studying construction partnering. According to *Hong et al. (2012)* 'the core methodology used in partnering research primarily relied on empirical analysis of the industrial feedback and a hands-on partnering experience'. *Anvuur and Kumuraswamy (2007)* suggest that empirical studies as well as 'a plethora of anecdotal evidence support the espoused benefits of partnering'. The observation that there is a considerable amount of qualitative peer-reviewed construction partnering research seems to support the

statements by *Hong et al. (2012)* and *Anvuur and Kumuraswamy (2007)*. *Bygballe et al. (2010)* show that approximately 34% of their set of 87 peer-reviewed construction papers consists of case studies. (36% of the population consists of surveys, 17% were purely conceptual/literature review articles. 'The remainder was a combination of other qualitative studies, simulations, etc.', *Bygballe et al., 2010*). *Bemelmans et al. (2012)* reviewed partnering literature, specifically focusing on supplier-contractor collaboration in the construction industry. Although this study represents only a small part of partnering papers in the construction industry, *Bemelmans et al. (2012)* and shows that 15 articles of a total of 32 of the articles studied used a case study approach. These observations imply a close fit between construction partnering research with the actual practice and performance of construction partnering.

Other authors suggest that construction partnering research is somewhat abstracted from daily practice. *Bresnen (2007)* suggests that the effect of a more prescriptive approach of partnering research is that it promotes a model of partnering 'that is stylised and abstracted from any immediate practical context in which it might be applied'. According to *Phua (2013)* methods conducted by scholars in construction management often reflect a 'hypothetic-deductive tradition', focusing on quantifying and determining 'the relationships between variables of interest in context-specific situations'. According to *Pink et al. (2014)* in construction research in general there 'has been an apparent reluctance to embrace the interpretative paradigm and qualitative methods more generally'.

Thus, on one hand construction partnering research seems to fit closely with actual practice and performance of construction partnering, and on the other hand it is said to be hypothetic-deductive, stylized and abstracted from daily practice. This seemingly aberrant observation raises questions about the nature of qualitative construction partnering research. Therefore, by assessing peer-reviewed papers, this paper investigates the nature of qualitative construction partnering research.

Insight in the nature of qualitative construction partnering research is valuable, because it helps to identify gaps and/or saturation in methodology and content. Therefore, it can contribute to determining new directions and ideas for future research. However, no systematic research about the nature of qualitative construction partnering research has been conducted yet.

This paper is divided into five sections. **Section 2.3** describes a theoretical framework in which we explain our understanding of the 'nature of qualitative construction partnering research'. **Section 2.4** focuses on the methodology that was used to review the papers. **Section 2.5** presents the results. **Section 2.6** discusses the findings and describes our conclusions.

§ 2.3 Theoretical framework

Construction partnering research

In order to be able to assess peer-reviewed papers about construction partnering research, we first needed to explore our understanding of 'construction partnering research'. Construction partnering is a general concept, containing many synonyms and derivatives, such as supply chain collaboration, supply chain management, construction partnering, etc. Because construction partnering is seen as a general concept, it is difficult to define construction partnering.

Scholars like *Vrijhoef (2011)*, and *Yeung et al. (2012)* have been involved in defining supply chain partnering and articulating differences between supply chain partnering and its synonyms and derivatives. However, among professionals in daily work life these terms seem to be used in an arbitrary way and not in a strict sense as the definitions might imply. Moreover, there seems general agreement about a lack of a unified understanding of the concept (*Bygballe et al. 2010*).

Bresnen (2009) argues that supply chain partnering is an informal and emergent practice, arguing that it is best described as developing towards collaboration using various formal and informal tools. It can be seen as a 'highly situated phenomenon' that, although informed by a wider discourse and institutional norms, manifestation in practice 'owe as much to local sense-making and situated (experiential) learning processes' (*Bresnen, 2009*). That means that in practice it is manifested in various ways, depending on unique local and time-related circumstances. All in all, we consider supply chain partnering as a general concept referring to different kinds and processes of collaboration between agents within the construction supply chain, rather than a specific form of collaboration between partners in a construction supply chain.

Because we understand construction partnering as a general concept, boundaries of what construction partnering research is, are not delimited, but have some grey areas. For the authors of this paper, the most questionable boundary was whether research about Public-Private Partnerships (PPP) is part of Construction Partnering research. According to *Tang et al. (2010)* PPP evolved in different generations and also knows several definitions that vary locally. One of the definitions is 'contractual arrangement between a public-sector agency and a for-profit private-sector development, whereby recourses and risks are shared for the purpose of delivery of a public service or development of public infrastructure' (*Li et al., 2005*; *Tang et al, 2010*). The definition of PPP seems to overlap our understanding of construction partnering in terms of collaboration between parties within the construction industry. However, for the sake

of this study about the nature of construction partnering, we consider PPP research as a different scientific community that holds different scientific traditions. For example, important literature reviews concerning construction partnering, such as *Bygballe et al. (2010)* and *Hong et al. (2012)*, did not include PPP-oriented papers either. Therefore, in this study we do not take into account PPP-oriented research. For the same reasons we decided to not take into account literature about (international) joint ventures.

The nature of research

In order to be able to gain insight in the nature of qualitative construction partnering research, we also needed to explore our understanding of the phrase 'nature of research'. Understanding this phrase is necessary to be able to develop assessment criteria to assess qualitative construction partnering research. The remainder of this section explains what criteria we used, and why we used these criteria.

The phrase 'nature of research' can be understood in several ways. The nature may be understood by examining aspects of the position in the field that is addressed, as was done previously by *Hong et al. (2012)*. The nature may also be understood by examining the approach and methodologies that are employed, as was done by *Bygballe et al. (2010)* and *Bemelmans et al. (2012)*. We consider content and approach as intertwined and interrelated. Therefore, we included both aspects in our assessment.

To assess the nature of partnering research, we followed the standard structure of each peer-reviewed research paper. This structure was divided into three dimensions: 1) the aim and background of study, 2) approach and methodology, and 3) conclusions. The remainder of this section describes the criteria that we used to assess those three dimensions.

First, we assessed the aim of research, because the way in which the aim of research is formulated reveals something about the nature of the research. On one hand, as might be expected in qualitative research, the researcher might try to get better understanding of a certain phenomenon, with the underlying assumption that more understanding leads to improvement (*De Lange et al., 2010*). These types of research often do not focus on producing the one and only (generalizable) truth, but put emphasis on in-depth and profound understanding of a specific situation. Those research aims and research questions often have a broad character. Not seldom words like 'getting more understanding of…' or 'get more insight in…' or 'exploring…' are used in formulating an interpretative aim or research question. One the other hand, the researcher might attempt to find knowledge, with the purpose to explain, control or predict a phenomenon, sometimes with the purpose of prescribing behavior and/

or actions for actors in this phenomenon. These aims are often more associated with quantitative research approaches. In that case, according to *Baarda and De Goede (2006, pp 51)*, in general there are three types of research questions (frequency, differences, and specific cause-effect relations) that may be asked. However, these types of questions might also be used in case study research. If that is the case, this might explain why some research is experienced as 'positivistic', 'stylised' and 'abstracted from reality'.

Secondly, we used the introduction and the aim of study (and if necessary other parts of the paper as well) to assess the position of the research in the field of qualitative construction partnering research. Inspired by *Bygballe et al. (2010)*, *Eriksson (2015)* and *Hong et al. (2012)*, we categorized each paper into: 2a) focus on dyadic or multi-player relationship (*Bygballe et al., 2010*), 2b) focus on intra- or inter-organizational relationships (*Eriksson, 2015*), 2c) focus on project-based or strategic-based relationships (*Bygballe et al. (2010)*, and 2d) focus on new building or existing projects.

The third assessment criterion concerns employed methods of gathering data. This can be done in a plethora of ways. First, we identified whether or not a case study was conducted. If applicable, we also identified the type of case study, such as longitudinal or action research. Further, we identified ways of gathering data at a more practical level, which are often techniques such as different types of interviews, observations, or documents.

Fourth, we assessed how data were analyzed. This might be done in either a hypothetic-deductive way, or an inductive way, or a combination of the two. Also, we assessed what analysis techniques are used, for example pattern matching, or explanation building (*Yin, 2014*).

Fifth, the role of the researcher in the research was assessed. Qualitative data are often gathered using techniques such as interviews and observations. These techniques require a close relationship between the researcher and his or her object of research, or the researcher actively holds distance to his or her object of study. Either way, in an ideal situation the researcher actively develops and communicates a strategy about managing this relationship. In qualitative research it is important to show reflexivity on their role as a researcher in relation to the object of study (*Maxwell, 1992*). That means, in general, that the role of the researcher is problematized. According to *Riley and Love (2000)* on one hand, data can be presented 'with no explanation about the process of analysis', and on the other hand these processes can be described particularly and precisely. We assessed the role of the researcher by indicating to what extent the researchers problematized and/or were reflexive about their own role within the research process.

The sixth assessment criterion is the theoretical background on which the research is based. This issue was raised previously by *Phua (2013)*. *Phua (2013)* addresses this topic, and argues that many theoretical lenses that are used in construction management research, such as transaction cost theory, resource dependency theory and agency and social exchange theory, 'rest on the assumption that decisions are based on bounded rational choices that are driven by considerations for economic efficiencies'. Those theoretical lenses are said to place 'too little emphasis on individual-level constructs', while at the same time, the idea that people deliver projects and not the systems is widely recognized (*Phua, 2013*). We assessed the theoretical background of each paper on this point.

The seventh assessment criterion is related to data analysis, and concerns the level of analysis. *Phua (2013)* addresses the issue of level of analysis and observes that in construction management research individual-level constructs are seldom taken into consideration. *Bemelmans et al. (2012)* observed that in the context of supplier-contractor collaboration in the construction industry the inter-organizational level dominated over interpersonal level, claiming that in none of the articles in the field of study solely interpersonal relationships were considered and only four articles paid structural attention to both interpersonal and inter-organizational relationships. According to *Phua (2013)*, by not adopting individual level, important insights from organizational studies are missing. 'Research in management and organizational studies show that individual-level constructs in terms of individual beliefs, cognition, values and prepositions can have a significant effect on organizational-level decisions and performance' (*Phua, 2013*). We assessed our papers on level of analysis by identifying whether a country level, case level, case/individual level, or individual level was adopted.

The eighth criterion concerns generalizations and is divided into three sub-criteria 8a) internal generalizations, statistical generalizations, and analytical generalizations. Generalizing qualitative data is often perceived as more complex than generalizing quantitative data, since generalizing quantitative data can rely on very specific prescribed statistical procedures. According to *Maxwell (1992)* generalizability refers to 'the extent to which one can extend the account of a particular situation or population to other persons, times, or settings than those directly studied'. Three main issues have to be considered in generalizability. First, *Maxwell (1992)* claims that for qualitative researchers internal generalization (generalizing within the studied community, group, or institution) is usually more important than external generalizations (generalizing to other communities, groups or institutions). We assessed to what extent internal generalizability is considered in the peer-reviewed papers. Further, as *Maxwell (1992)* claims, qualitative research is usually not designed to generalize the outcomes to wider populations, especially not in a statistical sense (*Maxwell, 1992*). In assessing the

peer-reviewed papers, we looked at whether or not the authors externally generalize their findings, and if so, whether this is done in a statistical and/or analytical way. Concerning analytical generalizations, according to *Yin (2014)* case study results 'may shed empirical light' on theories that 'go beyond the specific case or experiment'. Lessons learned in one case study 'could be applied in reinterpreting the results of existing studies of other concrete situations [...] or to define new research focusing on yet additional concrete situations' (*Yin, 2014*). For this study, we assessed whether the authors generalized their findings in an analytical sense as *Yin (2014)* suggests. **Figure 2.1** shows an overview of the assessment criteria.

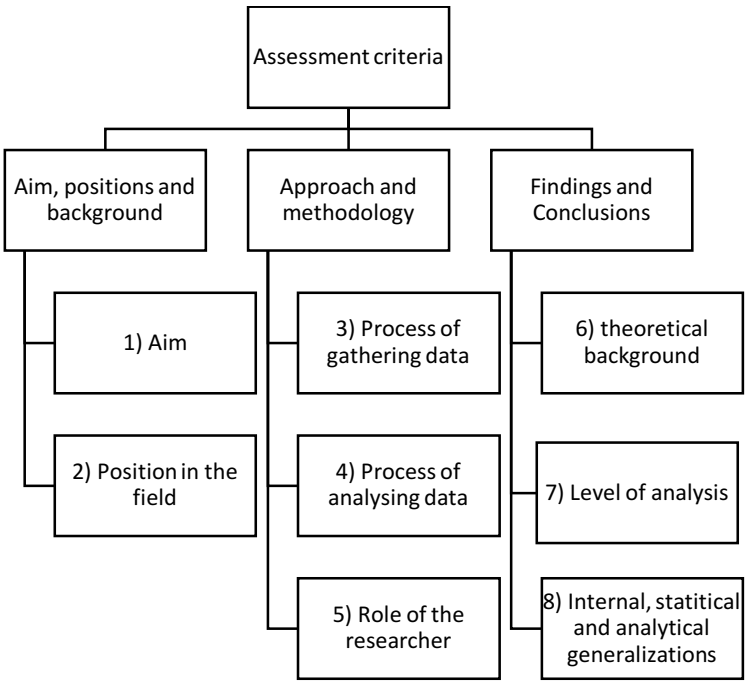

FIGURE 2.1 Assessment Criteria

§ 2.4 Methodology

The process of selecting papers

Before we got started with our analysis, we needed to select papers using keywords that cover the wide range of derivatives and synonyms related to construction partnering (since we consider supply chain partnering a general concept). We used two combinations of keywords: 1) supply chain AND construction, and 2) Partnering OR Partner OR Partnership AND Construction. Inspired by *Bygballe et al. (2010)* and *Hong et al. (2012)* we searched Business Source Complete and Scopus for papers. Since we are interested in describing the state of the art, instead of describing a complete historical development, we only searched these databases for papers published since 2010. This first phase resulted in a set of 176 peer-reviewed papers.

Based on abstract analysis, we excluded papers about PPP and Joint Ventures (see **section 2.3** for the explanation). Also, the selection contained papers that did not have construction partnering as the main topic. For example, we found papers on the evaluation of BIM software. The abstract mentioned that BIM could be used in partnering constructions, but that was not the main topic of the paper. After also excluding these papers, our final selection consisted of 125 papers.

At this point in the research, we analyzed abstracts from those 125 papers (and if necessary consulted the paper itself) to identify empirical and non-empirical papers such as literature reviews and conceptual studies. We had two reasons for doing this. The first was that literature-based studies are difficult to categorize into qualitative or quantitative research, and secondly, non-empirical studies are by definition abstracted from practice. Including these types of papers would lead to a discussion that reaches beyond the scope of this paper. Therefore, these types of papers were excluded.

Then we divided the empirical-based papers into two groups: 1) quantitative empirical-based papers (which appeared to consist mainly of survey questionnaires, and papers that focus on developing a model, sometimes using simulation techniques to 'test' the model, and which used empirical data to develop the model), and 2) other. As shown in **figure 2.2**, we identified 59 empirical-based papers in the latter category. **Figure 2.2** shows the results of our abstract analysis.

We considered 59 papers too large a dataset for in-depth qualitative investigation. To reduce this number of papers, we had to find the articles that represented the research community the best. Therefore, we decided to select the most cited papers. Because the publishing year influences the number of citations, simply because an 'old' paper

has more chance to be cited than a more recent one, we decided to select the top four cited papers of each year. This allowed us to reduce our initial selection to 20 papers that represent the research community most. We considered 20 papers sufficient to conduct proper qualitative analysis and also a manageable number in terms of practical feasibility.

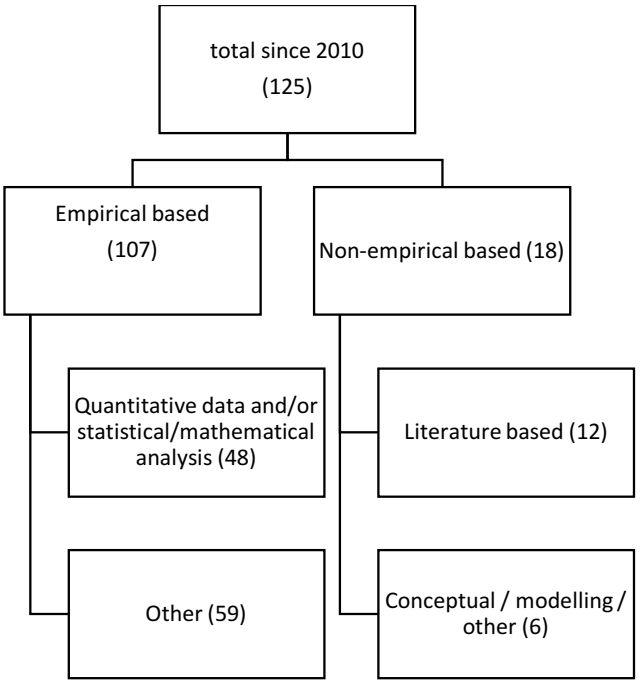

FIGURE 2.2 Overview results abstract analysis.

The numbers refer to the total amount of published peer-reviewed papers on construction partnering from 2010 until 2014

The process of analyzing the papers

First, using a preliminary version of *appendix A*, the first author of this paper conducted a pilot study. The purpose of the pilot study was to refine and adjust the assessment criteria. This allowed us to make the step-by-step process of interpreting the papers more transparent. For this pilot study, papers from before 2010 were use. Thus, these papers were not included in our final dataset. The first author assessed the papers deductively using an Excel sheet to get a quick overview of the results. In addition,

analysis reports were written. General notes were reported, as well as the author's interpretations and ideas about the papers that could not be processed in our initial theoretical framework. Writing the analysis reports resulted in adding two important criteria: 'level of analysis' and 'generalization'.

Secondly, the pilot study approach as well as the pilot study results were discussed with several experts, the second author of this paper and one of the co-authors of *De Lange et al. (2010)*. Furthermore, the provisional results were presented and discussed in an expert platform consisting of PhD students who are no experts on construction partnering, but with good knowledge of philosophy of science and differences in research paradigms.

Thirdly, we processed the feedback and reduced, adjusted and refined our final assessment framework (**figure 2.2**). The 20 papers were assessed by the first author using this final assessment framework. This involved reading the papers as a whole for the purpose of getting a basic understanding of them, and then carefully re-reading each paper for a more detailed assessment. Meanwhile, the second author assessed five of these papers as well in a similar way, using the final framework. Differences in interpretations were discussed and resulted in final adjustments of the framework. Finally, the first author went through all 20 papers again.

§ 2.5 Results

Appendix A shows the results of our assessment of the 20 most cited peer-reviewed papers on construction partnering since 2010. It needs to be emphasized that *Appendix A* (and underlying explanation in the remainder of this section) should not be seen in isolation, but rather in the context of this study. Also, our results should not be taken as a definitive truth. Please be aware that this is our interpretation and we hope it inspires fellow researchers. The last part of this section is a step-by-step explanation of our assessment as shown in *Appendix A*.

1. Aim of research

The way in which the aim of the research is formulated sometimes reveals something about the nature of the research. In 11 of the 20 papers, words like 'explore', 'understanding', 'addressing', 'gain insight in' or 'scrutinize' were used to describe the research aim. *Badenfelt (2010)*, for example, formulated their aim as 'The present

paper seeks to deepen our understanding of the complex and dynamic relationship between aspects of trust and control in client–contractor interactions'. Here, the purpose is to gain a deep understanding of a specific situation.

Other formulations of research aims seem to point at predicting and controlling a situation. For example, in their abstract, *Hughes et al. (2012)* formulate their aim as: '*This research aimed to test the hypothesis "The use of incentivisation with a gain/pain share of about 15 per cent is a precursor to the achievement of successful infrastructure partnering projects in South Wales"*'. Testing such a hypothesis and investigating a cause-effect relationship indicates quantitative research, as suggested by *Baarda and de Goede (2006)*. And indeed, a part of this study concerns quantitative research, processing quantitative data in statistical procedures.

Although there are clearly two directions research aim formulations can take, assessing them is not as black and white as that. In some cases, formulations can be interpreted in both ways. For example, *Osipova and Eriksson (2011)* formulate their aim as: 'The aim of this study, therefore, is to investigate how procurement options influence risk management in construction projects'. This formulation does not explicitly reveal a quantitative or qualitative execution of the research. It needs to be emphasized that one direction is not 'better' than the other. However, the second way of formulating an aim (which implicitly leads to predict and control a future situation) might lead to what *Bresnen (2007)* identifies as 'stylised and abstracted from any immediate practical context in which it might be applied.'.

2. Position in the field

The construction industry is a wide industry, including small and large, new and existing civil and building projects across the world. Supply chains in this industry can be large and complicated, involving many inter- and intra-organizational individuals and groups of individuals. Not surprisingly the peer-reviewed papers cover a wide range of projects and supply chains operating in this industry. *Appendix A* shows an overview of the position of each paper within the field.

Appendix A shows three studies involve a case study focus on a dyadic relationship for the duration of one project. The list also shows that the main focus in most studies is on inter-organizational relationships. Only *Ellegaard and Koch (2012)*, *Eriksson (2010)* and *Sandberg and Bildsten (2011)* focus on intra-organizational as well. Like inter-organizational aspects, intra-organizational supply chains are part of the supply chain as a whole, as emphasized by *Flynn (2010)*. Although it is acknowledged that the intra-organizational supply chains are an important factor in the supply chain as a whole, this intra-organizational focus in underexposed in qualitative construction partnering research.

Appendix A also shows that most research focuses on new building projects. Of this list, only *Eriksson (2010)*, *Hughes et al. (2012)*, *Jefferies et al. (2014)* and *Laan et al. (2011)* (explicitly) focus on partnering in existing projects or situations. In the case study employed by *Laan et al. (2011)*, new building and existing building are combined. Perhaps coincidentally, but the three studies mentioned concern civil projects. This means that, as far as we can assess (because in some papers it remains unclear whether the case study concerns an existing or new building project), none of the papers explicitly focus on renovation or maintenance of existing residential or non-residential buildings. However, for example in the Netherlands, this branch of the construction industry is becoming increasingly important. For example, Dutch housing associations own 2.4 million residential units and their assets are increasing with each year (*www.aedes.nl, retrieved 17 October 2016*). Partnering in maintenance and renovation in such housing associations may lead to a decrease in costs and an increase in quality, and is therefore an important factor in the strategies of housing associations in the Netherlands. All in all, it seems that partnering in existing projects is underexposed in qualitative construction partnering research.

To summarize, we can say that this set of papers focus on multi-player, inter-organizational, project-based supply chains that collaborate in new building projects.

3. Process of gathering data

The set of papers can be divided into two groups: papers that are based on one or several case studies (17), and papers that are not (3). Data are gathered using different methods, such as interviews and expert panels, and different types of observations Four studies are based on action research (*Pan et al., 2012*; *Taggart et al., 2014*; *Smyth, 2010*; and *Zimina et al. ,2012*). *Appendix A* shows an overview of the methods used for data collection.

Among the papers about case studies, the author most referred to was *Yin (1994)*, *Yin (2003)* and *Yin (2009)*. 10 papers referred to one of Yin's works on design and methods of case study research (*Badenfelt, 2010*; *Berente et al., 2010*; *Ellegaard and Koch, 2012*; *Eriksson, 2010*; *Jefferies et al. 2014*; *Johnson et al, 2013*; *Laan et al., 2011; Pan et al, 2012*; *Sandberg and Bildsten, 2011*; *Ying and Tookey, 2014*).

Further, the majority of the authors have their own unique approach, combining several existing approaches and data-gathering techniques provided by several authors that they refer to. Scholars that adhered strictly to the principles of an existing research approach are *Fernie and Tennant (2013)*. *Fernie and Tennant (2013)* used a Grounded Theory Strategy as proposed by *Glaser and Strauss (1967)*. *Lu et al. (2013)* and *Osipova and Eriksson (2011)* do not base their research design on existing approaches by other authors.

To conclude, our assessment of the way in which data are gathered in qualitative construction partnering research does not specifically point at research that can be characterized as stylized and abstracted from daily work practice.

4. Process of analyzing data

Appendix A shows that two of the assessed papers (*Hughes et al. 2012*; *Smyth, 2010*) used statistical procedures to analyze data, while all other papers adopted an interpretative procedure to analyze data. **Table 2.1** shows the numbers of words spent on the methodology section and the number of words used to describe the process of analysis and the relationship between these two. In general, relatively little attention is paid to describe the process of analyzing data. Some authors do not describe this research phase at all. However, this phase is just as important as the method of data collection, especially when qualitative data are the object of analysis, and the researcher cannot rely on statistical procedures.

	AVERAGE	MINIMUM	MAXIMUM	MEDIAN
Total amount of words spent on methodology section	880	330	2885	700
Total amount of words spent on process of analysis	140	0	525	75
Proportions in percentage Words spent on process of analysis	17%	0%	18%	16%

TABLE 2.1 Number of words spent on the methodology section and the process of analysis and the relationship between the two (numbers are rounded off).

5. Do the researchers reflect on their role in the process?

In our assessment, we found that *Fernie and Tennant (2013)*, *Taggart et al. (2014)*, *Pan et al. (2012)* and *Zimina et al. (2012)* provide relatively more information, compared to other authors, on the researchers' relationship with the object of study. For example, *Zimina et al. (2012)* described that 'previous professional experience of the researchers as quantity surveyors and cost engineers contributed to a better understanding of the current state of the industry'. Also, *Zimina et al. (2012)* describes that in the process of gathering data 'the researchers were directly involved and worked with the project teams almost on a daily basis'. *Taggart et al. (2014)* for example, provide specific and concrete insight in the relationship between the researcher and his object of study. For example, they describe that 'posters were placed on site explaining who the field researcher was and his intentions'. Further 'the field researcher (author 1) spent

time (typically one half day per week) over a four-month period on the project and 'participated' in the process of snagging data as a participative observer'. Perhaps coincidentally, *Taggart et al. (2014)*, *Pan et al. (2012)* and *Zimina et al. (2012)* all adopted an action research strategy. *Fernie and Tennant (2013)* based their extensive reflections on 'six recognized tenets of grounded theory, namely: emergence and researchers distance, theory development, coding procedures, specific/non-optional procedures, core category and evaluation criteria'.

The ability to reflect on the role of the researcher in the research process and in relation to his object of study lacks substance, or is described in a somewhat unstructured, meager and scattered manner. *Berente et al (2010)*, for example, state that 'the interviewers probed these differences to understand their significance to the participants as well as the probable impact on the firm or industry as a whole' (*Berente et al, 2010*). *Berente et al. (2010)* also explain that the researchers 'iterated through these analyses multiple times and compared findings to ensure that the examples and episodes were tightly grounded and consistent with the individual firm' (*Berente et al., 2010*). However, these comments may cause confusion among readers, because, for example 'iterating through data' is still rather vague and does not accurately describe specific action of the researchers. Questions about, for example, problems and dilemmas they faced and differences in interpretation of data, remain unclear but are potentially interesting to enrich findings.

6. Theoretical background

As mentioned earlier, *Phua (2013)* suggests that many theories on which the papers are based, 'rest on the assumption that decisions are based on bounded rational choices that are driven by considerations for economic efficiencies'. The content of the theoretical background is also described in *Appendix A*. It is very difficult to assess whether a theoretical lens 'rests on the assumption that decisions are based on bounded rational choices', because the theory itself as well as the interpretation of the theory depend greatly on the author and the reader of the paper. Therefore, it appeared impossible to categorize the theoretical background of each paper. However, one salient observation is explained by using an example.

For example, *Ellegaard and Koch (2012)* mention that they apply a 'resource-based perspective' meaning that 'business exchange is perceived as a process where buying and supplying companies actively access and influence their resource mobilization. This theory can be understood and applied as a theory that 'rests on the assumption that decisions are based on bounded rational choices' (*Phua, 2013*). However, as the study shows, the results of the research also describe non-rational behavior of actors in the field. Thus, although the theoretical background implies rational behavior, the

execution of the research (as well as the findings) of studies with such a theoretical background does not necessarily imply rational behavior as well. Using those 'rational' theories, however, could lead to a feeling that the research as a whole is stylized, predictive and abstracted from daily work practice.

7. Level of analysis

Appendix A also shows that 15 papers analyze data at case level. In seven of these papers individuals are quoted to illustrate the case level. However, no specific individual level of analysis is used in any of the assessed papers. In-depth research of the position of an individual (in relation to the network in which he operates) is lacking. The emphasis on case-level or higher, might explain why construction partnering research is perceived as being somewhat abstracted from individual experiences.

In our set of peer-reviewed papers, we identify a great interest in case study research. Obviously, case study research delivers different insights than non-case study research. In general, case studies give insight in local practice and the papers offer insight to a lesser or greater degree into what actually happens on the work floor and how participants give shape to their daily work routines.

The knowledge and insight that is gained through conducting case studies varies in level of abstraction. In some papers the actual voice and behavior of participants is apparent through quotes from participants and by providing detailed descriptions of actual situations and behaviors. Other papers tend to present data in a more abstracted way, such as through constructing models and abstracted theories.

An example of a paper in which the actual voice and behavior of participants is represented written by *Taggart et al. (2014)*. *Taggart et al. (2014)* identified that electrical design drawings usually give no 'dimensional layout' of placing sockets and that the electricians executing the work 'randomly decided themselves on what spacing to use', resulting in many defects and thus rework. *Taggart et al. (2014)* also identified that this rework is generally accepted as 'simply' part of the job. Another example is provided by *Badenfelt (2010)*. *Badenfelt (2010)* describes that a client of a construction project put a web camera at the building site with the purpose – as claimed by that client – to keep track of the construction process. However, the contractor says that the client every now and then called about 'a pile of dirt in one of the corners' and how this type of behavior affects the trust-relationship between those parties. Also, *Berente et al. (2010)* stay close to their empirical data and use 'vignettes' to show the collaboration between architect, contractor and sub-contractor and how collaboration practices are adjusted with each sub-contractor. However, these examples are few.

8. Internal, statistical and analytical generalizations

We assessed that *Smyth (2010)* considers internal generalization, by mentioning that the used sample represents 33% of the population, which is, according to *Smyth (2010, pp. 259)* reasonable. As *Appendix A* suggests, other papers do not problematize internal generalizations (the extent to which the findings can be generalized within the studied community, group, or institution *Maxwell, 1992*), although most papers do list the respondents that were involved in the study.

For example, *Ellegaard and Koch (2012)* provide a clear overview of studied companies and their 20 interviewees who are, according to *Ellegaard and Koch (2012)*, 'the most central production and purchasing employees' of the main organization and their direct partners. However, the total number of individuals who were active in their case is unclear. Therefore, it remains unclear to what extent the individuals represent the case study. Thus, in this example, it is clear who participated in the case, but the internal generalization was not problematized. Therefore, we can only conclude that focus on internal generalization in qualitative construction partnering research is underexposed.

We also assessed the use of statistical analysis. *Hughes et al. (2012)* and *Smyth (2010)* used statistical procedures to analyze their data. *Hughes et al. (2012)* combined questionnaires and interviews 'to gather both breadth and depth of data' from two infrastructural case studies and used statistical procedures to analyze the data gathered with the questionnaires. Also *Smyth (2010)* combined his qualitative approach with a quantitative component. The quantitative part entails categorizing and ranking 150 demonstration projects, of which 20 projects were selected for further qualitative analysis. Two of the assessed papers (namely *Ellegaard and Koch, 2012* and *Ying and Tookey, 2014*) literally recommend to perform a quantitative study in order to be able to generalize results in a statistical manner. Assessment criteria 3 already showed that not much quantitative data was gathered. Thus, we conclude that qualitative construction partnering research make little use of quantitative data gathering and analysis procedures.

Appendix A shows that *Berente et al. (2010)*, *Ellegaard and Koch (2012)*, *Eriksson (2010)*, and *Gottlieb and Haugbølle (2013)* literally refer to possibilities for analytical generalization. For example, *Ellegaard and Koch (2012)* argue that the single case study 'also represents a limitation as broader analytical generalizability has traded off with detailed insight'.

Most of the other authors do consider opportunities and limitations for (analytical) generalizations. A difficulty is that authors point at limitations and/or opportunities for external generalizations, but are not always clear about what exactly these

opportunities and limitations are. We observe a highly varied list of projects that served as case study, in many cases the possibility for generalizing results analytically from one case to another remains questionable, also when the cases are similar in terms of type of relationship studied and type of project that served as case study. When partnering is considered an emergent practice, local and personal circumstances may have influenced the results and also analytical generalizations might become problematic.

The assessment of generalizations, especially analytic or 'external' generalizations, gave rise to discussion and debate among assessors. We observed that papers sometimes lack transparency about the assumptions on which the (suggestions and limitations of) generalizations are based. We also observed that papers can be ambiguous about generalizing results. Ambiguity is when on one hand it is suggested that it is not possible (or one should be careful with) generalizing results, while on the other hand, results and conclusions are formulated in such a way that the authors imply generalization at a high level. The process in which construction partnering research is generalized is sometimes opaque and/or ambiguous.

§ 2.6 Discussion and conclusion

The aim of this study was to analyze the nature of qualitative construction partnering in order to find gaps and/or saturation in position in the field as well as the methodologies that are used. The study shows that since 2010, 125 papers about construction partnering have been published, of which 59 papers are empirical and non-quantitative. We cannot conclude that qualitative construction partnering research is saturated, but we do think that qualitative construction partnering research has matured over time. Based on an abstract analysis (as shown in **figure 2.2**), we conclude that peer-reviewed construction partnering research is not biased towards quantitative nor qualitative research.

We assessed 20 qualitative empirical peer-reviewed papers, covering a broad range of case studies in different fields and with different focus areas. Although not all papers are transparent about whether their case study concerns an existing or new building project, most papers focus on multi-player, inter-organizational relationships in supply chains that collaborate in new building projects. Intra-organizational relationships collaborating in existing projects are underexposed.

Observing the list of case study projects, we found that the case study projects vary in size, type of construction, and place. This raises questions about whether or not it is appropriate to speak of 'a construction industry'. After all, individuals working on an infrastructural project in the Netherlands will probably encounter different problems than individuals building a tower block in New Zealand. Therefore, readers should be careful to apply the insights gained in one situation to another situation.

In the 20 analyzed papers we identified four methodological gaps: 1) Insight in the process of data analysis is underexposed. 2) Reflection on the role of the researcher(s) in the research process is underexposed. 3) The individual level of analysis is underexposed. 4) The way in which the results are generalized remain somewhat opaque, especially reflection on internal generalization is underexposed.

All identified methodological gaps have in common that specific place and time dependent details that may have influenced understanding of studied individuals are underexposed. Local situations are often chaotic, messy, unruly, capricious, intuitive and unpredictable. The process of studying that local situation may be characterized the same. Underexposing that character may contribute to a feeling that construction partnering research can be stylized and abstracted from individual experiences.

We think that the chaotic character of working practice and studying that working practice can be represented more in the peer-reviewed papers. The above-mentioned four methodological gaps are easily transformed into recommendations for further study. 1) The first recommendation is to problematize and elaborate more on the way in which data are analyzed. It is recommended to explicate important decisions that are made in the process of analysis. 2) The second recommendation is to be more explicit and detailed about the role of the researcher in the research process. There is an opportunity to enrich qualitative research by involving researchers and participants, and by explicating the researchers' role, the participant's role and the relationship between these two roles within the research process. 3) The third recommendation is to conduct an individual level of analysis, although that choice highly depends on the exact object of study. 4) The fourth recommendation is to be more explicit about the extent to which the results of the particular study can be generalized, or what local and personal circumstances may prevent from generalization to other situations. Special focus should be placed on the extent to which the studied individuals represent the group or community.

Following the recommendations (which are one-on-one related to the identified gaps), will result in research that better represents the chaotic characteristics of ordinary working practice and the process of studying that working practice. Adopting the recommendations will increase awareness in the working field of the difficulties and

decisions encountered by the researcher, and in that way the reader is more aware and knowledgeable of the context-related character of the study. This will reduce the chance that the reader takes away insights from the study that are irrelevant to his own working practice. Applying the recommendations will lead to different conclusions and recommendations to improve construction partnering in working practice.

Also, adopting the recommendations will lead to the questioning of objectivity of knowledge. More focus on local time and place dependent factors of the studied individuals as well as the process of studying them, inevitably leads to encountering (and becoming more aware of) personal, subjective and unexplainable decisions and behavior. Describing and analyzing these personal, subjective and unexplainable points in the research process will improve the quality of the research, although it sometimes may seem contrary to what is commonly considered scientific research (namely objective and rational). Taking these unexplainable points in the research process seriously may lead to opportunities for further improvement of research and construction partnering practice.

We have attempted to provide more insight into the nature of qualitative construction partnering research. However, our study is limited to some degree. Firstly, by the fact that this paper divides empirical-based papers into either qualitative and quantitative research, but the boundary between those categories is not as clean cut as it may appear. This is because studies may combine qualitative and quantitative approaches. Moreover, studies that are based on surveys (and in this study are identified as quantitative), may be less quantitative as they may initially seem. The data that were gathered in a quantitative study may be the object of a more interpretative analysis by the researcher.

Another limitation is that this study took into account peer-reviewed papers only. However, peer-reviewed papers are just one of many possible sources of information. Although these papers are quite formal, they are produced by a much more informal research community. Discourse analysis of (parts of) that global informal research community could be interesting to get to know more about why the nature of qualitative construction partnering research is as it is. It could make implicit underlying (conscious or subconscious) power dynamics explicit, which in turn could play a role in educating and emancipating of scholars.

Finally, comparing the nature of construction research to the nature of qualitative research in other fields of study could increase our understanding of both fields. In this case, for example, comparing qualitative construction partnering research to partnering research in other – not so technical – fields of studies may be interesting, such as education or the medical field. Also comparison with fields of study that are perceived as innovative, such as marketing or ICT, could be interesting.

Despite these limitations, our research explicates 'gaps' that lead to opportunities for scholars studying construction partnering. These opportunities may also be valuable for reviewers, supervisors and other actors that shape and at the same time are being shaped by the academic research discourse on construction partnering. By applying these opportunities, we hope to contribute to the further development of academic research on this topic and to increase effectiveness of partnerships in the construction sector.

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