



USING PHILOSOPHICAL AND METHODOLOGICAL TRIANGULATION TO IDENTIFYING INTERESTING PHENOMENA

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Category: 10 PROJECT ORGANIZING >> 10_00 PROJECT ORGANIZING GENERAL TRACK

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ISBN 978-8386437-60-0.

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ABSTRACT

The scarcity of accepted research designs within each research philosophy paradigm limits the variance of research approaches, which reduces the chances to identify real new phenomena. We propose that researchers use triangulation of alternative research philosophies to identify interesting new phenomena, provide alternative perspectives to complex problems, and gain a richer and more holistic understanding of complex project management problems. Philosophical triangulation extends methodological triangulation into the realm of ontology and provides for more comprehensive understanding as it resembles a more realistic view towards social science phenomena, which, by their nature, appear differently to people, and thus are seen from different ontological perspectives simultaneously. Three related studies are used to exemplify the approach, where the results of two sets of empirical data (qualitative and quantitative) are discussed in different philosophical contexts. Implications for scholars include more practice-oriented research perspectives in line with the projects-as-practice stream by extending existing benefits from methodological triangulation into philosophical triangulation in order to identify and understand complex phenomena.

Keywords: Philosophical triangulation, research methods

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Abstract

The scarcity of accepted research designs within each research philosophy paradigm limits the variance of research approaches, which reduces the chances to identify real new phenomena. We propose that researchers use triangulation of alternative research philosophies to identify interesting new phenomena, provide alternative perspectives to complex problems, and gain a richer and more holistic understanding of complex project management problems. Philosophical triangulation extends methodological triangulation into the realm of ontology and provides for more comprehensive understanding as it resembles a more realistic view towards social science phenomena, which, by their nature, appear differently to people, and thus are seen from different ontological perspectives simultaneously. Three related studies are used to exemplify the approach, where the results of two sets of empirical data (qualitative and quantitative) are discussed in different philosophical contexts. Implications for scholars include more practice-oriented research perspectives in line with the projects-as-practice stream by extending existing benefits from methodological triangulation into philosophical triangulation in order to identify and understand complex phenomena.

Keywords: Philosophical triangulation, research methods, governance, methodologies, comparatives

Introduction

Research in project management has been criticised for its lack of relevance for practitioners (Blomquist, Hällgren, Nilsson, & Söderholm, 2010; Sahlin-Andersson & Söderholm, 2002). As a result, several streams of literature developed in support of more practice-oriented approaches to research, which is manifested, among others, in new perspectives towards project management, rethinking papers, and broader concepts (Svejvig & Andersen, 2014). However, this trend is not

matched by a development in research designs (Müller & Söderlund, 2015). Blomquist et al. (2010) suggest increasing a practical relevance approach to project management research by first understanding what people do within the context of projects before such projects are investigated. Researchers following these and other related suggestions are immediately confronted with the fact that research is typically done from a narrow theoretical perspective, involving one or, at most, two different theoretical lenses towards the phenomenon under study; whereas practitioners hold a multitude of perspectives simultaneously. Examples include the popular governance theories in management, such as Agency Theory (Jensen & Meckling, 1976), which assumes a *homo economicus*, motivated by the lower levels of Maslow's hierarchy of needs (Maslow, 1970). With its economic focus, this theory fails to explain, for example, altruistic, loyal or other behaviour related to the higher levels of Maslow's theory. This is done through Stewardship Theory (Davis, Schoorman, & Donaldson, 1997), a complementary theory to Agency Theory. While most of the research is done from either an Agency or a Stewardship perspective, the practitioner in a governance situation does not know which theory to apply at what point in time; thus, the practitioner does not know which theory to use to develop a governance system in terms of what to expect regardless of the theoretical lens used and what to expect when using either one of the two perspectives. A comprehensive understanding of phenomena arises from a researcher's simultaneous look at a phenomenon from both perspectives. This is typically done using mixed-methods studies,—an approach increasingly popular in recent years. Cameron and Molina-Azorin (2011) estimate that about 14% of business and management studies use mixed methods. However, in project management research, this number is as small as 1.5% (Cameron, Sankaran, & Scales, 2015), indicating that the vast majority of researchers use a singular paradigm to understand the phenomenon under study, which does not align with the practitioners' perspectives. This single-paradigm approach either produces results of questionable relevance for practice or fails to identify phenomena of practical relevance. Moreover, within a singular paradigm, the number of accepted

research designs is limited. This leads to repetitive use of similar research designs, which then leads to almost predictable research results (Müller, Sankaran, & Drouin, 2013; Williams & Vogt, 2011).

In this paper, we argue that the application of several philosophical perspectives, which includes the use of mixed-methods studies, provides for more practice-relevant identification and understanding of phenomena. Applying several perspectives simultaneously comes closer to the practitioners' reality and thereby creates more realistic situations for researchers. We further argue that more than two perspectives towards the same phenomenon will provide a more comprehensive identification of the phenomenon per se, its context, and scope. This approach extends over and above methodological triangulation into the realm of ontologies and uses philosophical triangulation (Bechara & Van de Ven, 2011), which makes use of methodological triangulation at the epistemological level.

The purpose of this paper is to show that philosophical triangulation can help to identify phenomena whilst gaining a deeper and richer understanding of the phenomena using a natural science comparative that otherwise cannot be explained within or across the respective research paradigm(s). Using this approach in project management research may lead to previously unobserved phenomena within a particular paradigm that is discovered but cannot be explained within the context of the paradigm.

This leads to the research question:

Is it possible to use a philosophical triangulation to identify interesting phenomena, as well as to provide alternative perspectives?

The benefits of this study are to break free from the constraints of a single paradigm and its accepted methods, therefore allowing the researcher to identify phenomena that may not be identified using a

single paradigm as well as providing an alternative perspective through the use of a natural science comparative.

The paper continues with a review of related literature on triangulation and continues with the description of the multidimensional approach for philosophical triangulation. This is followed by the application of the approach by triangulating three distinct philosophical perspectives, which provide for new insights and new phenomena. The paper finishes with a discussion and a conclusion.

Literature Review and Hypotheses

We set out to address the question of relevant research for practitioners as a “knowledge production problem” in the sense of Van de Ven (2007), created through an unengaged process of inquiry, in which researchers deal with single theoretical models for addressing the research problem or question. We build on Van de Ven’s suggestions for scholars being engaged with practitioners and other stakeholders and suggest to add philosophical multiplicity to the research design. This is required due to the limitations stemming from the use of singular research paradigms.

Limitations of current research approaches

The research designs being accepted within a research paradigm shape the nature of the studies and impact the research results. Too often researchers adjust the research questions to the methods they are familiar with, instead of adjusting the research design to the questions (Williams & Vogt, 2011). This reduces the variance in research designs, which in turn leads to repetitive and narrowly designed studies with often predictable results (Müller et al., 2013). A consequence of this approach is the risk of carrying out research that not only provides predictable results but also finds fewer or potentially less interesting phenomena. As phenomena are described within theories, the theories will also be considered more interesting or less interesting. According to Davis (1971), interesting theories hence interesting phenomena are those that deny certain assumptions of their audience, while noninteresting theories are those that affirm certain assumptions of their audience. This implies

interesting theories (or phenomena) are more impactful than less interesting theories (or phenomena). A consequence of less interesting theories and phenomena is that these are often forgotten and rarely cited. Perhaps a more concerning aspect is that if the trend in current research theories falls into the category of “less interesting,” this signals the need for new and alternative research approaches. A study by Turner, Pinto, and Bredillet (2011) showed that the number of conceptual papers and new techniques dropped by 10 to 25% between 1997 and 2007 in two of the three main research journals in project management. This indicates a decline in the discovery of new phenomena. This decline appears at a time when the variety of research designs is stagnating. (Biedenbach & Müller, 2011; Müller & Söderlund, 2015). We propose a link between these two observations: (a) repetitive use of similar research designs limits the researchers’ perspectives and (b) the chance to identify and understand real new phenomena. This present paper addresses this shortcoming through philosophical triangulation (Bechara & Van de Ven, 2011). This approach allows to leverage the strengths of different research designs following Flyvbjerg’s notion (2001, p. 53) of “where natural science is weak, social science is strong, and vice versa,” by combining natural and social science methods to identify the many facets of a phenomenon, thereby coming closest to the view that a practitioner has of a phenomenon.

Triangulation

Many researchers strive to provide rich data that is unbiased and can be understood with a comfortable degree of assurance (Breitmayer, Ayres, & Knafl, 1993; Jick, 1979). One way is to decrease biases, increase validity and strength of the study, and provide multiple perspectives by using methods that involve triangulation (Denzin, 1970). The term triangulation is a military term used for surveying, which has been used as a metaphor in social science (Smith, 1975).

The concept of triangulation is that when you need to locate your position on a map, a single landmark can only provide the information that you are situated somewhere along a line in a

particular direction from the landmark. With two landmarks, however, your exact position can be pinpointed by taking bearings on both landmarks; you are at the point where the two lines cross. In social research, the analogy is that when one relies on a single piece of data, there is the danger that an undetected error in the data production, bias, or methodology process may render the analysis incorrect. Therefore to triangulate in social science, the combination of two or more data sources, investigators, methodological approaches, theoretical perspectives (Denzin, 1970), or analytical methods (Kimchi et al., 1991) about a measurement (D. T. Campbell, Schwartz, & Sechrest, 1966) is used to find out, “if a hypothesis can survive the confrontation with a series of complementary triangulations of testing” (D. Campbell & Fiske, 1959, p. 82). In the social sciences, the use of “triangulation” can be traced back to Campbell and Fiske (1959), and then developed further by Denzin (1970) where multiple triangulation was first introduced, for example, two data sources along with two investigators. So by triangulating, researchers can hope to overcome the weakness or intrinsic biases and the problems that come from a single method, single observer, single data source, and single-theory studies.

Types of triangulation

According to Denzin (1970) there are four types of triangulation. First is a data triangulation, which involves using multiple sources of data during a study. Data sources can vary based on the times when the data were collected, the location of collection, and the person/people who obtained the data (Denzin, 1970; Mitchell, 1986).

The second type of triangulation is the investigator triangulation where more than one investigator is used in a study to engage in observations, interviews, coding, or analysis of participants’ responses. Using multiple investigators reduces the potential bias inherent in employing only one investigator or analyst by allowing for data consistency through auditing. Independent confirmation of data among investigators lends greater credibility to the observations (Denzin, 1970).

The third type of triangulation is methodological triangulation, which is also known as multi-method, mixed-method, or methods triangulation (Greene & Caracelli, 1997). This is the most commonly used type of triangulation (Hastings & Salkind, 2013) which uses multiple methods to study a research problem. Qualitative and quantitative methods may be used simultaneously (e.g., conducting a case study whilst distributing a questionnaire). Methodological triangulation can be classified into two types: within-method triangulation and between- or across-method triangulation. Within-method triangulation uses at least two data --collection procedures from the same design approach (Denzin, 1970). For quantitative approaches, the procedures could consist of a survey questionnaire using existing information from a database. In qualitative approaches, nonparticipant observations could be combined with focus group interviews. These methods are either qualitative or quantitative, but not both. Researchers using between- or across-method triangulation employ both qualitative and quantitative data collection methods in the same study (Denzin, 1970; Tashakkori & Teddlie, 2009).

The fourth type is theory triangulation, which provides multiple theoretical perspectives either in conducting the research or in interpreting the data. Multiple theoretical perspectives, such as from a marketing theory and a leadership theory, can help to rule out competing hypotheses and reduce the risk of premature acceptance of plausible explanations whilst increasing the confidence in developing concepts or constructs in theory development (Banik, 1993).

Another type of triangulation is described by Bechara and Van de Ven (2011) as philosophical triangulation. In this case, triangulation is performed from alternative philosophical perspectives. This provides for a richer and more holistic understanding of complex managerial and organizational problems, because each philosophy sheds light on a different aspect or facet of the phenomenon. It reveals the interdependence among various dimensions of the phenomenon and overcomes instability risks stemming from a singular perspective. Moreover it adds to (a) reliability through converging

information from different methods, and (b) validity through discussion of the divergent information from different methods. This method of triangulation is proposed in this paper.

The literature on triangulation, irrespective of what type of triangulation is used, mostly focused on reducing bias and increasing the validity of expected phenomena. This is typical for the usage of the first three types of triangulation, that is, data, observer, and methodological triangulation. The literature on philosophical triangulation helps to improve validity indirectly by providing alternative explanations for a phenomenon (Mitchell, 1986). This is a point of departure from the first three triangulation methods. Theoretical and philosophical triangulation help to create different perspectives that can help to support or disprove competing hypothesis, but -more importantly, prevent premature acceptance of plausible rationale, creating confidence in developing concepts of theory development (Banik, 1993). The literature on theoretical and philosophical triangulation only covers how alternative perspectives can help provide confidence of the accepted hypothesis. There is a research gap for using philosophical triangulation to discover interesting phenomena that may not be part of the original research question. This gap may be due to the use of the triangulation metaphor, which only uses two points to triangulate the third point. This is explained in Figure 1 where phenomenon “E” has been triangulated by using alternative philosophical paradigms. But what if there are two additional phenomena “A” and “B”? Using the philosophical triangulation as shown in Figure 1, it shows that phenomenon “A” was observed, for example, using a Critical Realist ontology (and qualitative epistemology QUAL), which cannot be explained from the Positivist perspective (Natural Science Comparative– Conceptual). Likewise if phenomenon “B” was observed from a Positivist perspective of the conceptual study, it cannot be explained from a Critical Realism perspective and, therefore, is methodological specific. This creates a dilemma for the researcher as to whether the unexplained aspects relate to the same or different phenomena. There is a risk that researchers stop at that point and fail to further test the results, leading to merely a

reporting of findings, and probably not a contribution to the development of new theory. Thus, a reduction in the richness and depth of information that could have been used to help to identify and understand a new phenomenon E. If A and B were proved to also be phenomena, they may also be related to phenomenon E and, therefore, would influence the identification of and understanding of E and a theory development covering A, B, and E.

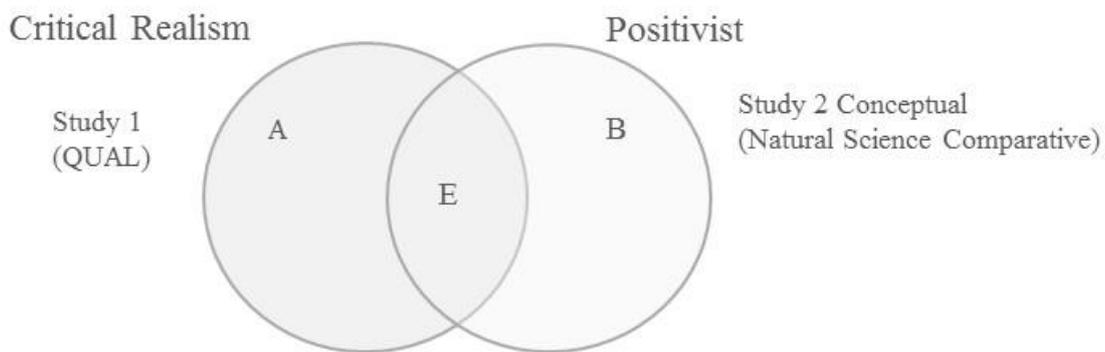


Figure 1: Two-point philosophical triangulation

When there are three points of observation (i.e., three alternative perspectives or philosophical positions) it is possible to discover new and interesting phenomena that may not have been observed before through a two-point triangulation.

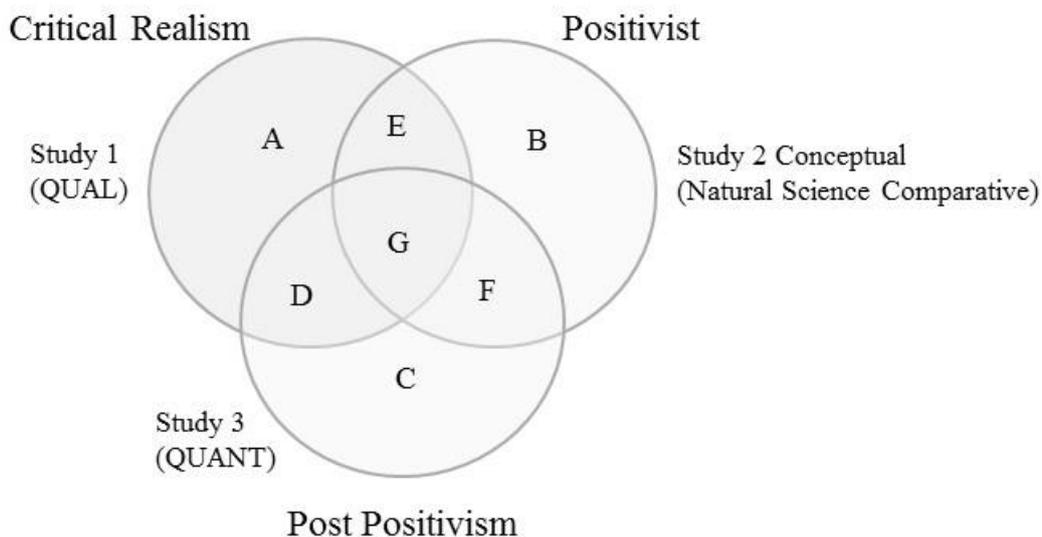


Figure 2: Three-point philosophical triangulation

Referring to Figure 2, three philosophies (or ontological positions) are used which allow for four sets of triangulation.

Intersect A: Observed phenomena from the main QUAL research, which cannot be explained from a natural science perspective nor from the QUANT main study research; therefore, it is methodology specific.

Intersect B: Observed phenomena from the conceptual study, which cannot be explained from any other perspective; therefore, it is methodology specific.

Intersect C: Observed phenomena from the main QUANT research, which can neither be explained from a natural science perspective nor from the QUAL research of the main study; therefore, it is methodology specific.

Intersect D: Observed phenomena from the main studies for QUAL and QUANT research giving *philosophical triangulation*, but cannot be explained from a natural science perspective; therefore, this part is methodology specific.

Intersect E: Observed phenomena from the main QUAL study, which can also be explained from a natural science perspective giving *philosophical triangulation*, but cannot be explained in the QUANT research; therefore, this part is methodology specific.

Intersect F: Observed phenomena from the main QUANT, which can be explained from a natural science perspective, giving *philosophical triangulation*, but cannot be explained from the QUAL research; therefore, this part is methodology specific.

Intersect G: Observed phenomena, which can be explained from a natural science and both QUAL and QUANT perspectives; therefore, giving a full *philosophical triangulation*.

Therefore, using a tri-philosophical triangulation where perhaps the metaphor triangulation should be taken from the perspective of what is being used to observe rather than what is being observed. Here

it is possible to triangulate an additional set of three phenomena E, D, and F, which will allow for a deeper and richer identification and understanding of the phenomenon's face G with E, D, and F.

Disadvantage and criticism of triangulation

Triangulation does not come without critique. The disadvantages of triangulation include: (a) the increased amount of time needed in comparison to single strategies, (b) difficulty of dealing with the vast amount of data, (c) potential disharmony based on investigator biases, (d) conflicts because of theoretical frameworks, and (e) lack of understanding about why triangulation strategies were used.

However, probably the largest point of discussion is philosophical reconciliation, which is the question as to whether different ontological perspectives can be reconciled in the mind of the researcher. This boils down to an ontological question and, therefore, cannot be judged as right or wrong, doable or not doable. It is in the eyes of the beholder whether a researcher can accept that different "versions of the truth" can be reconciled to a larger picture based on integrated worldviews or will remain as separate entities based on different worldviews.

The next section describes a research study that benefited from using a three-point *philosophical triangulation* to identify new and interesting phenomena that may otherwise have gone unnoticed or considered as methodology-specific phenomena.

Applying philosophical triangulation

Background of the three related studies

The purpose of the three related studies was to understand the relationship between a project methodology and project success in different project governance contexts (Joslin, 2015). The

literature on project methodologies and project success was based only on a single philosophical perspectives. The literature is divided as to whether methodologies that were standardized, customized, or a combination of both, led to greater project success (Joslin & Müller, 2015b). None of the literature covered the potential moderating effect of different project governance contexts on the relationship between project methodology and project success. In light of the fact that (a) there was no consistent view of whether methodologies that are standardized, customized, or a combination of both led to greater project success; and (b) combined with the interest in academic research to find alternative research methods that might reduce areas of academic discord (such as the topic on methodologies and project success), a conceptual study was undertaken. Its aim was to understand if a comparative could be developed and provide an alternative perspective on project methodologies and project success. This comparative was developed under a positivist paradigm that looked for facts and causes using a deductive approach. This comparative showed how a project methodology could be seen in a different perspective. Using the comparative directly resulted in uncovering a number of interesting phenomena described in Joslin and Müller (2014). The comparative also provided an alternative philosophical perspective in the multiparadigm study.

The second study used a critical realism paradigm, applying qualitative methods with the aim to validate the constructs of a theoretically derived research model whilst gaining insights to steer the direction of a greater study on methodologies, their elements, and their impact on project success. The qualitative study also investigated whether different project environments, notably project governance, impacted the relationship between methodologies and project success. The critical realism paradigm was appropriate as it emphasized the need to critically evaluate objects for the purpose of understanding social phenomena (Sayer, 1992). Also critical realism consists of different levels, which addresses the fact that complex social phenomena cannot be explained by solely looking at mechanisms and processes that operate on purely one level (Wikgren, 2005).

The third study undertaken used post-positivism as the underlying philosophy. Post-positivism assumes that the world is mainly driven by generalizable (natural) laws, but their application and results are often situational dependent. Post-positivist researchers therefore identify trends, that is, theories that hold in certain situations but cannot be generalized (Biedenbach & Müller, 2011).

Explanation of the Natural Science to Social science comparative

This section provides a short introduction into the natural to social science comparative to aid in the understanding of the findings in the following section. The natural science comparative model of Joslin and Müller (2013) compares project methodology elements to the genes of an organism. The genes of an organism are the building blocks of the organism (including the observable characteristics) called a phenotype (Malcom & Goodship, 2001). Genes are switched on and off throughout the life of an organism, which the authors argue is the same concept as the elements of a methodology being applied to a project throughout its life cycle: they are switched on when required; then switched off when not required. The natural science comparative reifies a project methodology that is considered as the core makeup of a project; therefore, it is responsible for the switching on and off of methodology elements. The project manager is considered to be an environmental variable. Some of the genes in an organism are highly pleiotropic, meaning their impact can be seen in the organism's phenotype, for example, hair colour, eyes, and height (Stearns, 2010). The comparative explains that the same is true for elements of the applied project methodology. The highly pleiotropic methodology elements noticeably impact the characteristics of project success. In summary, the elements of a methodology and their attributes are compared to and mapped against the attributes of the genes of an organism and the attributes of a project outcome (product or service) are compared to and mapped against the attributes of a physical organisms (phenotype). A detailed explanation, definitions, and mapping tables are described in Joslin and Müller (2013).

Findings from the three point philosophical triangulation

Each of the three studies identified phenomena within and across one or more of the three philosophical perspectives. The phenomena that were identified within only one of the three philosophical perspectives were considered to be methodology dependent. However, phenomena that were identified across two or three philosophical perspectives were considered to be triangulated.

Nine phenomena were identified in total across three philosophical perspectives, and eight of the nine phenomena were triangulated either by the second or third philosophical perspective. Three of the nine phenomena are described in detail below to explain the triangulation of results, and the rest are listed in Appendix A.

Observed Phenomena identified at intersect G (see Figure 2) included the following:

A comprehensive set of project methodology elements (where methodology elements may include tools, techniques, knowledge areas and capability profiles), positively impact project success. This phenomena was observed in both the qualitative and quantitative studies; and by using the natural science comparative, the same phenomena can be explained. The comparative shows that a comprehensive methodology and its elements can be mapped to the genes of an organism, which ensure the organism is, in Darwinian terms, “fit” (i.e., adapted to the environment and a reproductive success) (Darwin, 1859). Therefore, having a comprehensive set of methodology elements ensures full applicability and hence support during the project life cycle. This is the first and simplest example showing that triangulation identifies the different facets of the phenomenon under study.

Observed Phenomena identified at intersect E (see Figure 2) included the following:

The impact of supplementing missing methodology elements to achieve project success that is moderated by project governance was an observed phenomena in the qualitative study. It can also be explained using the natural science comparative where genes of an organism can not only be

switched on and off, but new genes can be created (albeit rarely in an evolutionary timeframe), in response to environmental changes (Holliday & Pugh, 1975). For example, for hundreds of thousands of years, our ancestors used to see only in black and white; then with the creation of new genes, our ancestors evolved to have colour vision (Yokoyama et al., 2014). The trigger for the creation of new genes was due to changing environmental conditions where plants, trees, and shrubs' started to use colour to differentiate their fruits. The creation of new genes was an a potential trigger for stepped or punctuated evolution in a species, so it is more the exception than the norm (Milligan, 1986). A more recent and rare example of new genes being created in an organism, is the discovery of Chinese boy in 2013 who has the ability to see in pitch black (Scutti, 2015). Whether the Chinese boy genetic mutation will proliferate or die out will conform to the laws of Darwinism "fitness" (Darwin, 1859).

The quantitative study (study three) did not observe the phenomena at intersect 2. This may be because the respondents of the study did not experience the situation where a governance paradigm influenced whether or not an incumbent methodology was supplemented by missing methodology elements.

For information, this particular phenomenon was further investigated using exploratory research to understand if project governance perhaps had a direct impact on the comprehensiveness of project methodology (Joslin & Müller, 2015a). The findings showed that depending on the project governance paradigm (Müller, 2009), a shareholder as opposed to stakeholder orientated organization is more likely to have incomplete methodology(s) and hence, project managers within a shareholder oriented organization are more likely to supplement the incumbent methodology. Using a single-paradigm approach would have likely missed this phenomenon and/or missed providing an alternative perspective, therefore making it unlikely that it would have been further researched.

Observed Phenomenon identified at segment B (see Figure 2):

Segment B in figure 2 denotes the natural science comparative study where one of the phenomenon observed was how the ‘core makeup of a project’ is defined in terms of the comparative. The comparative sees that the core makeup of a project is its “applied methodology,” which contains the *what* to build plus also the information on *how* to build it. What follows is how this phenomenon was derived from the comparative and an explanation as to why it was not triangulated by the other two philosophical perspectives.

In the natural sciences, the core makeup of an organism is not the organism itself but the genes that define how the organism will develop, that is, its phenotype (Dawkins, 1974). The genes are part of the chromosomes, which in turn are reflected within the DNA of a cell (Dawkins, 1974). The development or growth of the organism, which is akin in the comparative to the project outcome, is decentralized, meaning every cell is programmed to replicate and develop the organism to the collective good of the organism’s genes. There are, however, master genes that control and monitor the progress of the other genes within their domain to collectively orchestrate the development and maintenance of the organism (Pearson, Lemons, & McGinnis, 2005). This master gene concept has been compared to local governance in the social science perspective of projects (Joslin & Müller, 2014). Using the comparative and the mapping tables within the comparative produces the phenomenon that describes the ‘core makeup of a project’ as the project methodology, but where the *what* to build and then *how* to build it are integrated within the project methodology. This phenomenon derived from the comparative can be explained and understood within the context of the comparative.

The observed phenomenon that ‘core makeup of a project’ is the applied methodology was discussed as part of the qualitative study, but there was no common agreement. As many of the people interviewed were project managers or in some way heavy influencers of their projects, they invariably felt that they and their team were the core makeup of project. Even though the knowledge of *what* to build and *how* to build it was invariably documented in and applied to a structured

methodology. The idea that the core makeup of a project is the applied methodology is not unrealistic, but for the participants of the studies, it was too great a conceptual shift; therefore, the phenomenon was not triangulated.

One of the questions in the qualitative study asked if there was value to integrating the knowledge of *what* to build and *how* to build it into an applied methodology. The majority of the interviews saw the value of this for certain types of projects.

	One-off Projects	Projects to develop Product/Service which will evolve over time	
Evolution	Generic methodology that may or may not tailored to the type* of project	Knowledge of what to build integrated into methodology elements of how to build	 Closest to Nature
Revolution	Generic methodology that is tailored to the type* of project	Proven methodology based on a previous product or service that is tailored to the type* of project	

**Project types – maintenance, development, research which can result in either a one-off or a product/service ongoing development*

Figure 3: Project methodology approaches for evolutionary–revolutionary project outcomes

Referring to Figure 3, the projects that would benefit the most from integrating the *how* and the *what* to build are the evolutionary projects that have long project or service lineage. This model’s nature and was derived from the natural science comparative. Now consider that for evolutionary projects with long durations—project people come and go, but what remains constant is the knowledge of *what* and *how* to build future versions of the product and service as well as incorporating lessons learned. This information will be reflected in the evolving project methodology for that particular

product or service. This is another example of a new and interesting phenomenon that may not have been identified and discussed if a single-paradigm approach was adopted.

In summary, although this observed phenomenon within the comparative was not correlated to other philosophical perspectives mainly due to engrained beliefs of the participants in the study, phenomenon may be observed and therefore triangulated in future studies that focus on longer term evolutionary projects.

Summary of findings

The research question that asked if it was possible to use a philosophical triangulation to identify interesting phenomena, as well as to provide alternative perspectives, has been answered in the above study. A research study using philosophical triangulation can provide many alternative perspectives. Even with a two-point triangulation, that is, two philosophical perspectives, the phenomena under observation can be triangulated, and each can be seen from the other phenomena perspective, which provides new and interesting insights especially when the phenomena are related or correlated in some way.

The natural science comparative is perhaps one of the most thought-provoking philosophical perspectives because of its objectiveness. The comparative is flexible enough to allow many topics of observation to be reified and explained under a natural science perspective and with sometimes counter-intuitive findings. For example topics relating to phenomena that has been observed using the comparative include: lessons intentionally not learned, selfish projects, methodologies with a bricolage of competing elements, impotent (generic) methodologies, lone projects (irrespective of size) in a portfolio which are at higher risk of being cancelled than related projects, and lessons learned but fighting for management attention; all which may or may not be explainable using current philosophical perspectives.

Discussion

The understanding for the need to cross-check the findings of research has been around for over five decades with the publishing of the first paper on triangulation from Campbell and Fiske (1959). The term triangulation is in fact a metaphor taken from the military and applied to natural and social science research (Mathison, 1988). The initial expectations of triangulation were at the lower of four levels described by Denzin (1970) which looked at addressing validity and bias. However, with the adoption of new research methods and techniques, the need arose to carry out inter- and intra-method triangulations (Campbell & Fiske, 1959). One of the challenges in considering triangulation is the extra effort required to design and run a parallel stream of data collection approaches, additional investigators, and methods. Perhaps this is why only 1.5% of all project management research uses mixed methods, that is, triangulation. This could be an indication of the project management researchers' limited time where many may work only part-time on their research and therefore disregard the benefits of triangulation. When comparing project management research against business and management research, Cameron and Molina-Azorin (2011) estimate that about 14% of the business and management studies use mixed methods. If there is a link between carrying out different levels of triangulation and observing new phenomena, then project management research is in crisis. If one looks outside the project management research area into the world of practitioner projects, then the low project success rates that are frequently published also imply some form of

crisis in the project management field. A study by Turner, Pinto, and Bredillet (2011) showed that the number of conceptual papers and new techniques in the field of project management has dropped by 10 to 25% between 1997 and 2007 in two of the three main research journals in project management. This indicates not only a decline in the discovery of new phenomena, but also appears with a stagnating variety of research designs (Biedenbach & Müller, 2011; Müller & Söderlund, 2015). This sounds depressing, but there is hope in finding new methods based on transformative research (Drouin, Müller, & Sankaran, 2013), such as the natural science comparative, which was one of the three related studies, and also in using philosophical triangulation as a way to triangulate expected phenomena and discover new and interesting phenomena. This extended use of philosophical triangulation that is described in this paper requires three or more philosophical perspectives and not just the two that are typically described in the literature. In doing so, this opens the door to uncover new phenomena. However, philosophical triangulation does require an understanding at the outset of a research study that additional effort and rigor are required in the research process to ultimately identify new phenomena in conjunction with the expected phenomena (as part of the overall research study). Using this approach, many of the arguments of the critics of philosophical triangulation are no longer relevant, because the purpose is to discover new phenomena and not necessarily to triangulate expected phenomena as in the studies to-date. As a worst case scenario, once the new phenomena have been identified using this approach, then the researcher can always fall-back to a single-paradigm approach, which the authors believe is rather unlikely.

Conclusions

We identified one the main reasons why from the practitioners perspective, project management research produces results of questionable relevance or fails to identify the phenomena of practical relevance. The scarcity of accepted research designs within each research philosophy paradigm limits

the variance of research approaches, which reduces the opportunity to identify new phenomena. To address this issue, we first performed a literature review of the four types of triangulation to better understand how triangulation was used and the main benefits it provided which was primarily in terms of increasing validity and reducing bias. An additional benefit of triangulation notably at the most abstract level was philosophical triangulation, which was investigated and provided alternative perspectives on expected phenomena. We then used three related studies to exemplify the approach of philosophical triangulation, where the results of two sets of empirical data (qualitative and quantitative) plus a conceptual study were discussed in different philosophical contexts. The findings show that it is not only possible to create a philosophical triangulation on expected phenomena, but if three or more philosophical perspectives were used, then new phenomena that were not necessarily part of the research hypothesis can be uncovered. This approach to triangulation should provide for richer and more holistic theories. These in turn should help to address the concerns of practitioners by applying the theories that are based on a more integrated view of the project environment.

We can now answer the research question: Philosophical triangulation using three or more different perspectives provides for the identification and better understanding of phenomena. Implications for researchers include more detailed understanding of phenomena due to better understanding of the different facets of phenomena, theorized from a multitude of ontological perspectives. Theoretical implications include the multilevel triangulation, which allows for better and more realistic theories about phenomena.

This study has, of course, some strengths and weaknesses. The strengths are in the use of existing techniques, which combined in a new way, allows for new perspectives towards phenomena. The weaknesses are the limited testing of the application of the new approach. More studies are needed that use this approach to identify its benefits and need for further development. Future research should investigate the use of this new approach for a variety of combinations of philosophies and their triangulations using multimethod and mixed-method designs.

This paper provided the description and argument for using a new technique in project management research. It is now up to the researchers to use it and reap the benefits from it.

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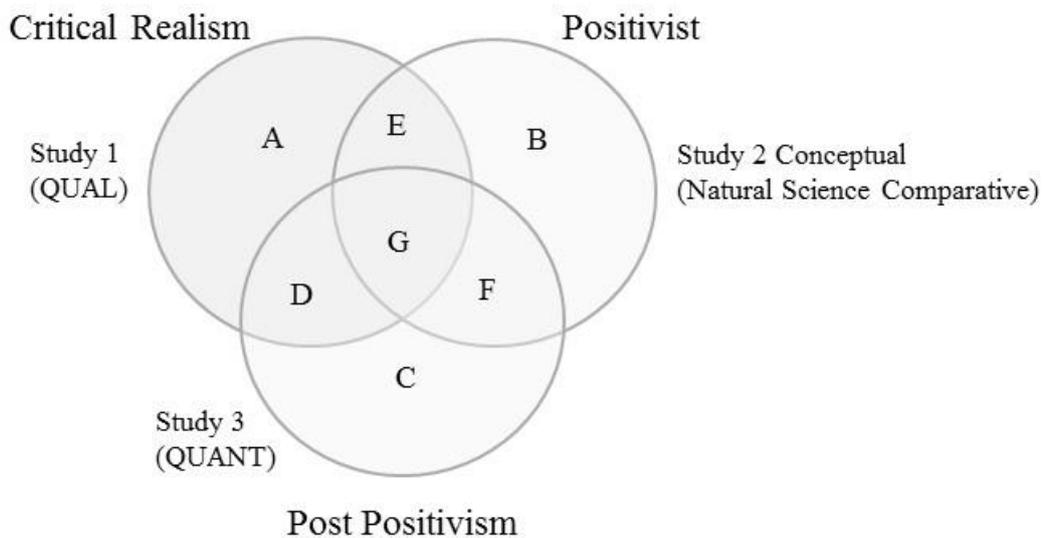
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Appendix A: Observed phenomena across the three theoretical perspectives (triangulation)

The table below lists the observed phenomena from the related studies described in the paper and which of the phenomena are triangulated to which theoretical perspective.



Observed phenomena	Intersect	Comments
A comprehensive set of project methodology elements (where methodology elements can include tools, techniques, knowledge areas, and capability profiles) all of which positively impact project success.	G	See description within the study

The impact of supplementing missing methodology elements to achieve project success, which is moderated by project governance.	E	See description within the study
The core makeup of a project is the project methodology where the <i>what</i> to build and <i>how</i> to build are integrated within the methodology.	B	See description within the study
Necessary and unnecessary complexity	G	A methodology should contain the necessary complexity needed to fully support a project during the project life cycle. In the natural science comparative, there is no such thing as unnecessary complexity, however in the social science world, a symptom of unnecessary complexity is an ill-fitting methodology that is generic or one that tries to be a one-size fits all methodology invariably includes unnecessary complexity. This phenomena was observed in all three theoretical perspectives.
Methodologies with a bricolage of competing elements	G	A methodology contains a number of elements that can be tools, techniques, processes, knowledge areas, and capacity profiles. For each element selected on a project, there are several other similar elements that are not selected. Therefore a methodology consists of a bricolage of completing elements, however once the elements are selected, they work and fit together. This is a similar concept to genes where the dominant gene is one that has been selected and on the DNC loci where the recessive genes are the genes that were not successful in being selected (Mendel, 1866). The concept of methodologies that comprise a bricolage of competing elements was observed in all three studies.
The impact of a comprehensive set of methodology elements on project success is moderated by project governance.	E	In the natural science comparative, the equivalent to a comprehensive set of elements is a genome of an organism that allows the organism to be “fit” in the Darwinian sense (Darwin, 1859). The environment can impact the genes; and depending whether the impacted genes are highly pleiotropic or not, the effect of the environment may be seen in the phenotype, that is, the organism. The qualitative study also identified the impact of governance on the whether the methodology elements were considered comprehensive, resulting in an impact on project success. This phenomena was not observed in the quantitative study.
H2.3: The impact of application of relevant methodology elements on project success is moderated by project governance.	G- E	The natural science comparative explains that genes (equivalent in the comparative to elements of a methodology) that are considered relevant and already selected are the dominant genes. These dominant genes can be impacted by the environment. There is little difference in the comparative in explaining the difference between a comprehensive set of genes (elements) and the application of relevant genes (elements). One explanation is that a comprehensive set of genes is the gene pool and at the point of conception, the bricolage of competing genes are selected. These become the relevant genes which are then applied (switched on) or not applied (switched off). The phenomena of project governance impacting the relationship between the application of relevant methodology

		elements and project success was fully observed in the qualitative study; however, in the quantitative study the phenomena was only partly observed and questionable due to governance being a quasimoderator, that is, a indeterminable effect. Hence G or E.
H1.2: There is a positive relationship between supplementing missing methodology elements and project success.	D	The triangulation only occurs in qualitative and quantitative studies as there is not natural science equivalent of supplementing missing genes (elements). Organisms conceived with missing genes would typically be terminated soon after conception (Wright, 1932). In the social science world of project management, corrections to missing things are allowed and may be encouraged in certain environments. This phenomenon was observed in both qualitative and quantitative studies.
H1.3: There is a positive relationship between applying relevant methodology elements and project success.	G	This phenomenon was observed in all three studies.