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Illustrating Multi-Grounded Theory - Experiences from Grounding Processes

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Abstract

This paper challenges traditional grounded theory. Both theoretical and empirical grounding is proposed as claims of validity for theory generation. This paper builds on a framework about multi-grounded theory (MGT) presented in Goldkuhl & Cronholm (2003). In that paper the framework is presented on a conceptual and procedural level. The aim of this paper is to support the use of multi-grounded theory. This paper also takes a critical stand towards MGT.

Key-words: Grounded theory, data analysis, theoretical grounding, empirical grounding, multi-grounded theory

1. Introduction

A framework for Multi-grounded theory (MGT) is presented in Goldkuhl & Cronholm (2003). The purpose of this framework is to challenge some corner stones of grounded theory (GT), (Glaser & Strauss, 1967; Strauss & Corbin, 1988). MGT is both based on and is a reaction against traditional GT. MGT can be characterized as an extended alternative approach for data analysis and theory development. MGT is not only empirically grounded; it goes beyond pure inductivism and adds theoretical grounding to empirical grounding. MGT uses explicitly existing theories in the grounding process (Goldkuhl & Cronholm, 2003). The aim of MGT is combine aspects from inductivism and deductivism. Other than these combined aspects MGT proposes a structure of how to work with the grounding processes.

The presentation of MGT in Goldkuhl & Cronholm (2003) can be seen as a framework. This means that it is not presented at the methodological level and therefore it lacks details of how to do and also from examples that supports users to understand important concepts and how to follow the process of generating theory. The aim of this paper is to support the use of MGT. There are illustrative examples of how induction, deduction and internal grounding can be combined (see section 4). There are also proposals for different forms of notation. A case study concerning the usability of CASE-tools is utilised as a basis for illustrating MGT.

The paper will also take a critical stand. The experiences from the usage of MGT based on the framework presented in Goldkuhl & Cronholm (2003) is discussed. Identified strengths and problems will be discussed in order to suggest improvements of MGT. This paper can in this light be seen as empirical grounding of MGT. The paper written by Goldkuhl & Cronholm (2003) is primary involved with the process of theoretical grounding. Therefore this paper should be seen as a complement.

This paper is organized as follows. After this introductory section MGT is briefly described. Section 3 consists of a shorter description of the case study used. In section 4, examples from the case study are illustrated and section 5 contains concluding remarks.

2. Multi-Grounded Theory

This aim of this section is to briefly describe MGT and its relationship to GT. The interested reader should refer to Goldkuhl & Cronholm (2003) for a broader description. More or less GT prescribes a strict inductive way of generating theory from empirical data. Different coding processes (open coding, axial coding, selective coding) are performed which implies abstracting and relating categories to each other. The use of established theoretical categories when studying data should be avoided. GT has been criticized for this pure emergent procedure. This inductive way of working with data is conceived as a major strength of GT, but also as a weakness. Rejecting the use of established theories implies a loss of knowledge. Established theories can act as a source for inspiration and also a challenge to abstractions made from empirical data. There is a potential to compare and contrast the empirical findings and abstractions to other theories. We claim that theory development should aim at knowledge integration and synthesis.

In order to incorporate established theories in the theory development process the concept of MGT is proposed. MGT can be viewed as a reaction against GT and tries to combine certain aspects from inductivism and deductivism[1]. In a dialectical spirit we try to abolish oppositions through avoiding weaknesses and incorporating strengths in each approach (see Figure 1).

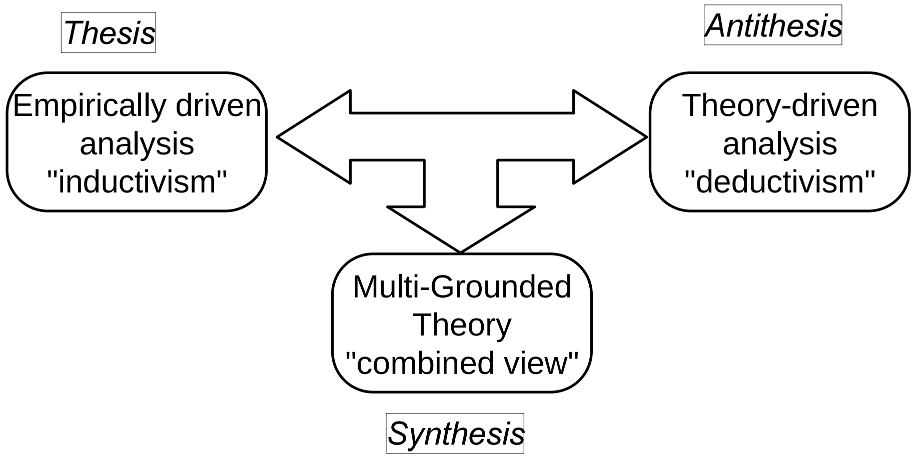

Figure 1 Multi-grounded theory as a dialectical synthesis between inductivism (GT) and deductivism

MGT differs between generation and grounding/validation. According to MGT there are three kinds of work:

- Theory generation
- Explicit grounding
- Research interest reflection and revision

Theory generation embraces the stages of inductive coding, conceptual refinement, building categorical structures and theory condensation. Inductive coding corresponds to open coding in GT. The researcher should keep an open mind towards the data and acts without con-

[1] To combine inductive and deductive thinking is sometimes called abductive (cf e.g. Peirce, 1931-35; Alvesson & Sköldberg, 1999). We will not use this concept in our text. It is important to be explicit when an inductive vs. a deductive strategy is applied.

straints from pre-categorisations. Conceptual refinement means that the researcher should not take empirical statement for granted. He/she should have a critical attitude towards what has been said or observed. To start building categories on vague formulations in data will not render any valid theories.

There should also be an ontological and linguistic determination of the phenomenon identified. MGT introduces procedures for a critical category determination. Every category that is developed should be reflected upon concerning its ontological status. In Goldkuhl (2002) there is a description of a procedure for ontological determination of scientific categories. The different ontological categories of the framework are:

1. Humans
2. Human inner worlds (knowledge, intentions, emotions etc)
   - 2a. Intra-subjective part (individualised)
   - 2b. Inter-subjective part (shared knowledge and social institutions)
3. Human actions
   - 3a. Intervention-as-action (communicative or material actions)
   - 3b. Interpretation-as-action
   - 3c. Reflection-as-action
4. Symbolic objects (signs)
5. Artefacts (artificially made material objects and their processes)
6. Natural environment (objects and processes)

Building categorical structures corresponds to axial coding in GT. An action-oriented paradigm model is used to support the building of categorical structures. The stage of theory condensation corresponds to selective coding in GT. The grounding/validation in MGT consists of three types of explicit grounding processes (see also Goldkuhl, 1999 for ideas about multi-grounding):

- Theoretical matching
- Explicit empirical validation
- Evaluation of theoretical cohesion

The concept of grounding means an analysis and control of the validity of the evolving theory. The three grounding processes correspond to three kinds of validity claims: theoretical, empirical and internal validity. Theoretical validity means that the theory is in accordance with other theoretical abstractions. The evolving theory and its categories is matched in that way that it is compared and contrasted with other existing theories. This stage does, thus, imply theoretical grounding. References can be made to external theories and abstractions with the purpose of providing theoretical warrants. Theoretical matching may lead to revisions of the evolving theory. Categories from other theories can be proven to be more adequate and they can replace some earlier formulated categories.

Explicit empirical validity means that the theory is in accordance with empirical observations of the world. Validating the theory means a focus shift from theory generation towards control and testing of validity. Evaluation of theoretical cohesion means an internal grounding. The conceptual structure of the evolving theory is systematically investigated. Consistency and congruency of the conceptual structure are checked. There may be a need for good illustrations of the theory for such an internal validation. MGT proposes the use of graphical illustrations besides textual presentations. During the process of theory development the research interest should be reflected upon. Gathering and analysing data will successively increase the knowledge of the researcher. This increased knowledge may lead to a revised or refined research question that redirects the empirical and theoretical orientation.

3. Briefly about the case

The illustrations of MGT are from a case study about usability of CASE-tools (Cronholm 1998). In this case study principles for MGT have been used but not in an articulated way. CASE-tools can be understood as computer-based and method supported tools for information systems development (ISD). The research question in this study reads: How should CASE-tools be designed in order to be useful? The aim of the study was to suggest usability goals in order to improve the design of the CASE-tools. The study can be characterised as qualitative and iterative. The process was divided into three in three steps. In the first step a questionnaire was send to informants (users) in order to achieve a background on the knowledge domain. In the second step informants were interviewed and in the third step the CASE-tools were observed in use. Between each step a qualitative analysis was performed. Theoretical sampling[2] was used in order to fill in knowledge gaps identified from earlier steps. The research process in the case study has been reconstructed in terms of MGT.

4. Empirical grounding and illustrations of MGT

In order to support the use of MGT this section illustrates how the different kinds of work (see section 2) can be performed and documented. There are illustration for both theory generation and explicit grounding. Two illustration techniques are presented: the action-oriented paradigm model (Strauss & Corbin, 1988) and Goal diagrams (Goldkuhl & Röstlinger, 1988). The examples used are a view from the broader case study described above and there is no claim that there is full transparency towards the data from this study.

4.1. Illustration of theory generation

The first stage in theory generation is inductive coding. The working procedures, conceptualising and discovering categories, are borrowed from GT (see Strauss & Corbin, 1998). This initial work is inductive and should be done with an open-mind. This first data analysis should be done as free as possible from pre-conceptions. The reason for starting with induction is that it is harder to discover something new if you ground data on predefined categories. Important question to be asked during the analysis are “What is this about?”, “What is happening?” and “What is this an example of?”.

In the studied case concerning usability of CASE-tools the following statements were identified: “I would like to create a list of the occurring activities in the process model” and “ I would like a selection of all activities that Mrs Robinson is responsible for”. These statements are about search functionality and obviously there is a desire of improved search functionality. For documenting this analysis a simple figure is used where the category “search functionality” is labelling the figure. The properties are “overview of an activity list” and “selection of responsibility and activities”. The word “desire” is used in order to represent a value. It is described between brackets after the property (see Figure 2).

According to MGT the induced empirical category should be classified according to an ontological category (see section 2) and Goldkuhl, 2002). The question “What kind of phenomenon is this?” should be asked. The answer to this question is that it is desirable to improve the properties of the artefact (the case tool). The ontological questions should be supplemented

[2] Confer Strauss & Corbin (1998) and Glaser B. (1978)

by the following linguistic questions (see Goldkuhl, 2002): Is there an adequate correspondence between the category and its word form? Is this category a separate entity, or an attribute or a state of an entity, or some process? The main point of these questions is to be careful when labelling what has been induced. The chosen words should not be too abstract and thus unclear. Furthermore, the labels should not be too brief. As you see below, the chosen formulation of the label of the category is "Search functionality" (see Figure 2). This is what the category is about. The properties are clear formulated and the word "desire" has been kept. The word "missing" or "requirements for" could be used instead of "desire" but the statements from the informants represents the state "desires" and nothing else. Desires should later on be judged and be in balance with other desires, technical capacity and economical possibilities.

Search functionality (ontological category: properties of the artefact)
• overview of an activity list (desire) • selection of responsibility and activities (desire)

Figure 2 Category: Search functionality

Another category from the case study is about "method support". The following statements were identified: "I would like to have a control that my diagram follows the method rules", "The tool should support the working processes of the method". The properties generated from these statements are "controls of method rules" with the value "strict" and "modelling acts" with the value "high support". The category is ontological classified as properties of the artefact (see Figure 3).

Method support (ontological category: properties of the artefact)
• controls of method rules (strict) • modelling acts (high support according the ISD method)

Figure 3 Category: Method support

Another example from the case is about "common conceptual understanding". An identified statement reads "It is easier to understand each other if we use the same concepts". The property for this category is communication with the value "high support for using the same concepts" (see Figure 4). The ontological classification is the intersubjective part (shared knowledge) of human-inner worlds.

Common conceptual understanding (ontological category: human inner worlds, intersubjective part)
• communication (high support for using the same concepts)

Figure 4 Category: Common conceptual understanding

A category labelled "concepts" was also generated from the case study. Statements from informants read, "the tool should offer concepts that are familiar" and "the concepts used should be well-known and well-defined". Clearly, these statements are about concepts. The first property is labelled "correspondence to the concepts in the system development method" with the value "high". The second property is labelled "definitions" and has the value "clear and well articulated ". The ontological classification is the intersubjective part (shared knowledge) of human-inner worlds (see Figure 5).

Concepts (ontological category: human inner worlds, intersubjective part)
• correspondence to the concepts in the system development method (high) • definitions (clear and well articulated)

Figure 5 Category: Concepts

Another example from the case study is about "learnability" (see Figure 6). Among the data there are statements like "It must be easy and flexible to interact with the tool" and "it is important that the tools can be used without a taking a two-weeks course". The data analysis has generated the properties "interaction" with the values "easy and flexible" and the property ”learning threshold" with the value "low". This category can be ontological classified into several ontological categories. The properties "interaction" and "learning threshold" are classified as properties of the artefact. "Interaction" and "learning threshold" are also related to humans. Since the category aims at increased user knowledge it is also ontological classified as "interpretation-as-action" and "reflection-as-action".

Learnability (ontological category: properties of the artefact, interpretation-as-action and reflection-as-action)
• interaction (easy and flexible) • learning threshold (low)

Figure 6 Category: Learnability

The next stage is to build categorical structures. This stage corresponds mainly to axial coding in GT. Categories are combined into theoretical statements. The action-oriented paradigm model suggested by Strauss & Corbin (1998) should be used. Strauss & Corbin claim that "Grounded theory is an *action/interactional method of theory building*". The action-oriented paradigm model aims at explaining actions in terms of conditions, actions/interactions and consequences.

Between the categories generated (search functionality, method support, common conceptual understanding, concepts and learnability) there are several relationships. Well-defined "concepts" and a well developed "method support" are seen as a conditions for an improved "common conceptual understanding" and "learnability" (see Figure 7).

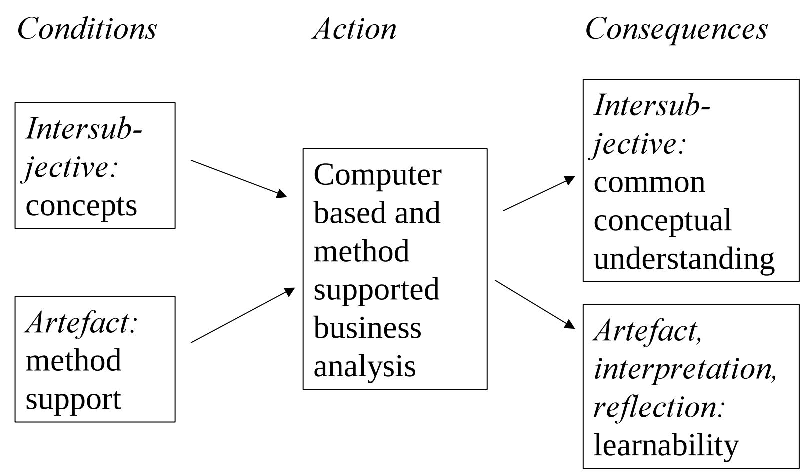

Figure 7 1st illustration of building categorical structures

The next example of building categorical structures is illustrated in Figure 8. Another category generated from the data is "productivity". "Productivity" is ontological classified as symbolic objects (signs) since productivity can be measured in terms of information systems models produced. This category is on a higher level and therefore the categories "common conceptual understanding", "learnability" and "search functionality" are seen as conditions for the consequence "productivity". Note that in Figure 7 "common conceptual understanding" and "search functionality" are seen as consequences. In Figure 8 they are seen as a conditions.

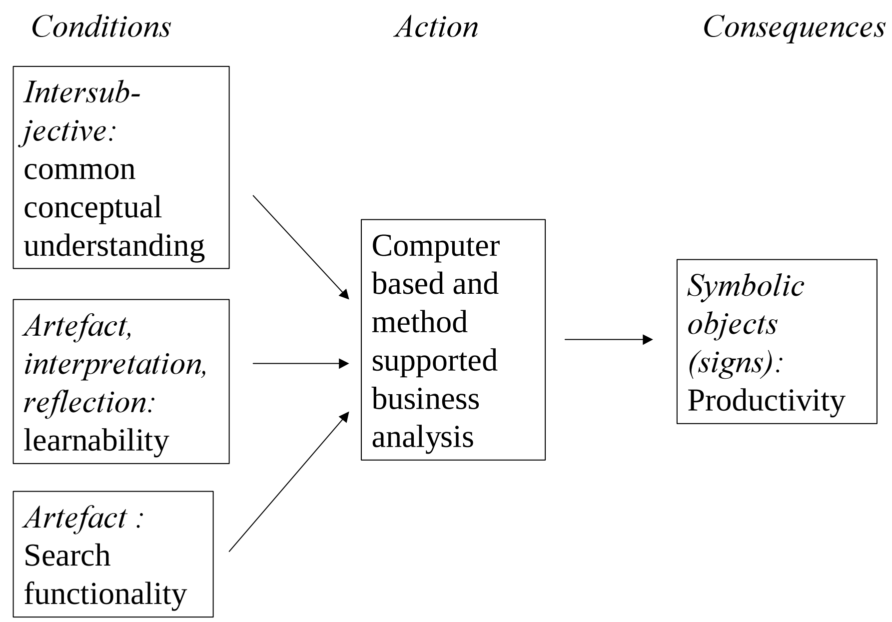

Figure 8 2nd illustration of building categorical structures

Another way of illustrating the categorical structure is to use goal diagrams (Goldkuhl & Röstlinger, 1988). This is convenient in this context since the research question in the case study is searching for design goals. A goal should be understood as something that should be fulfilled. In a goal diagram the categories/goals are ordered in a hierarchical structure. A category that is located underneath another category is viewed as goal at a lower level but also as a means for the category located above. The category located at the top of the diagram should be understood as a high-level goal. Note, that the goals are formulated with a verb together with substantive or in other words an action together with a phenomenon (see Figure 9).

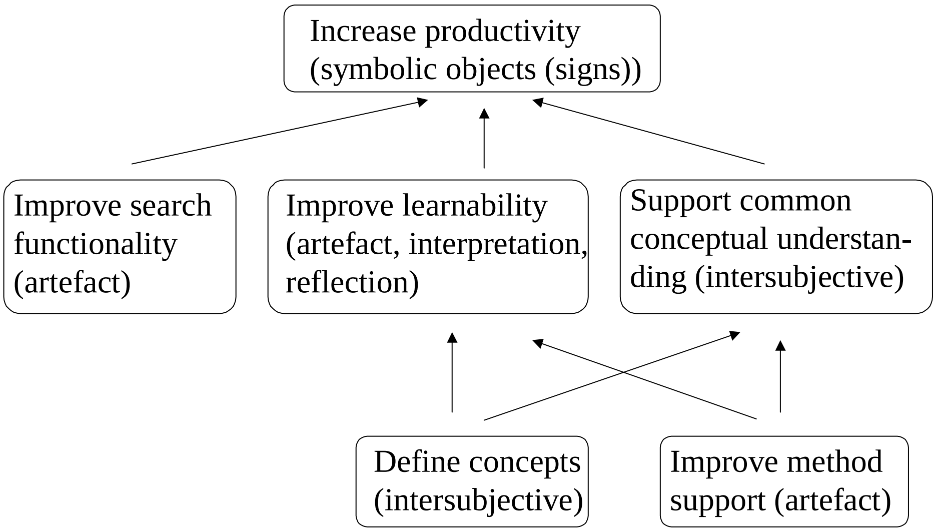

Figure 9 Building categorical structures with goal diagram

The last stage, theory condensation corresponds to selective coding in GT. However, the same claim for one core category is not raised. Of course there is a need for densifying the theory, but this must not lead to just one main category. Theory condensation is a concluding stage in MGT. Three different explicit grounding processes should precede it (see section 4.2).

4.2. Explicit grounding

Explicit grounding includes the processes of theoretical matching, explicit empirical validation and evaluation of theoretical cohesion. Theoretical generation means induction. Now, in theoretical matching the researcher turns to deduction. Theoretical matching means that the evolving theory is confronted with other existing theories and that references can be made to these external theories. Exemplifying theoretical matching with the category learnability means that some adjacent external theories have been studied. The concept of learnability of IT-systems has for example been studied in the field of human- computer interaction. In this field, Norman (1988) claims that the conceptual model of the IT-system should be transparent. This claim is not conflicting with the induced data. It is viewed as an enrichment of the induced data in the case study. As illustrated, the property that is related to external theory is marked with the letters “ET” and a reference to the theoretical source (see Figure 10).

Doing explicit empirical validation means to test the validity of the categories. Walking through the categories and their properties tests the validity. As illustrated, each property that is related to empirical data is marked with the letter “ED” (see Figure 10). If a more specific trace mark is needed the letters “ED” can be combined with an explicit reference to an interview or an observation protocol. Evaluation of theoretical cohesion means to do an internal grounding. Consistency and congruency are checked. Adding properties derived from external theories could mean that new insights are achieved which affects the categorical structure. This means that there is a need for re-checking the conceptual structure.

Learnability (ontological category: properties of the artefact, interpretation-as-action and reflection-as-action)
• interaction (easy and flexible), (ED), (Interview #1) • learning threshold (low), (ED), (Interview #2) • the conceptual model of the CASE-tool (transparent), (ET), (Norman, 1988)

Figure 10 Illustration of explicit grounding

4.3. Iterating the stages

Performing an iterative study means that the stages presented are repeated. There is an alternation between empirical data and external theory (see Figure 11). First, there is probably an idea or a research interest about something. At this time the researcher has a low pre-understanding of the phenomenon of interest. In this stage, the research question can be more vaguely formulated. The researcher performs an open-minded and inductive study in order to generate a rough theory. This rough theory is then validated as described in section 4.2.

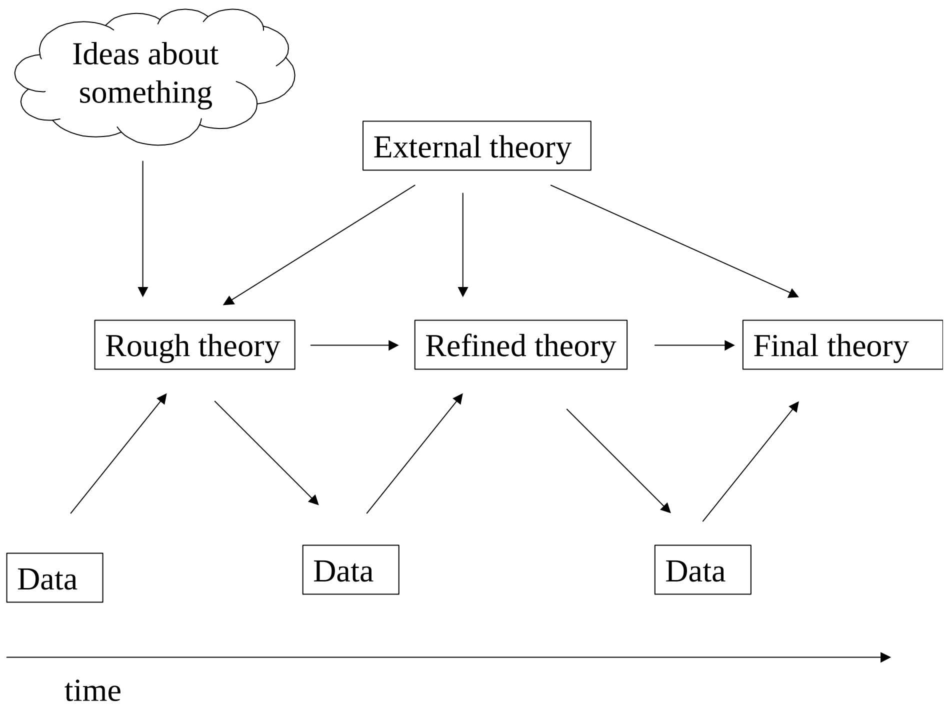

Figure 11 The research approach as an iterative process

The result from the first analysis can point out new interesting research directions or information about where to "dig deeper". The researcher performs a theoretical sampling (Strauss & Corbin, 1998). Theoretical sampling means that the evolving theory governs the following data gathering. In the second iteration the results from the first analysis acts as a base for revising or refining the research question. The data analysis in the second iteration will lead to a refined theory that is validated in same way as in the first iteration. Finally, the data reaches an maturity and the researcher ends the iterating with a final theory.

5. Conclusions

The aim of this paper is to support the usage of MGT through illustrating the different stages presented in Goldkuhl & Cronholm (2003. Illustrations are presented in section 4. As mentioned in section 1 this paper also takes a critical stand. Revising MGT and also being a co-author of MGT means that there is a question of credibility. However, there are some strengths and improvements that have been identified. First the combination of an empirical driven analysis and a theoretical driven analysis has contributed to the final theory. This has been made obvious in the case study used for illustration. Important aspects in existing theories have been identified and added to the empirical findings. This means that the final theory has been enriched by existing theory. This also means that the risk for isolated knowledge development is reduced. Instead, the use of MGT has supported knowledge integration. The relation of the evolving theory to related research during the process has meant that the risk for non-cumulative theory development is reduced. Letting the existing theory contribute to the evolving theory means that the external theory can be viewed as a complementing knowledge source.

The orthodox form of GT prescribes a strict inductive way of generating categories from empirical data. Being un-prejudiced in data collection and data analysis is an imperative of GT. The users of GT are encouraged to rid themselves of presumptions so that the “true nature” of the field of study will be revealed. A practical implication of this is that GT researchers should avoid reading pertinent literature (Rennie et al, 1988). This also means that there is an obvious risk for an unfocused analysis. Being unprejudiced can also mean running the risk of being too naive and even ignorant when entering the empirical field. The importance of being open-minded is also important for MGT. It is emphasized that the first data analysis shall be done inductively with an open mind and as free as possible from pre-categorizations. This introductory inductive way of working is perceived as a strength since it offers the possibility to discover categories without preconceptions. Of course it would have been harder to discover something new if pre-defined categories have been obtruded on the data.

On the other hand, if you are too open minded in the data collection phase, this might leave you with a large and diverging amount of data. There must be a formulated preliminary research question that supports and governs the data collection. However, this preliminary research question can and should be criticized. In MGT there is a certain stage labelled research interest reflection and revision. This stage is understood as a strength since it provides the possibility to change or refine the research question according to new insights.

The process of the ontological determination of the categories supports the understanding of the phenomena identified. To determine if the phenomenon, for example, has to do with intervention or the human inner contributes to important knowledge. However, several of the phenomena identified could be classified into several of existing categories (see Goldkuhl & Cronholm, 2003; Goldkuhl, 2002) since they are overlapping each other. This means that a phenomenon can be classified into several ontological categories. A suggestion of improvement is to classify a phenomenon as a primary category and as secondary categories. Another improvement of MGT is the iterative process suggested (see section 4.3). The reconstructed process of the case study has inspired a development of an iterative process of MGT. This process is illustrated in Figure 11. The suggested process catches the core elements of MGT. As you can see there is a continuous shift between empirical data and existing theory. The conclusions are based on one case study. As future research we suggest further empirical grounding. In order to increase the credibility of this study, persons other than the authors of MGT should perform future grounding processes.

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