Exploring Evidence-Based Practice Through New Forms of Engagement

Exploring Evidence-Based Practice Through New Forms of Engagement

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Doctoral dissertation in theory of science, University of Gothenburg, 2024-02-23

Parts of the work presented in this thesis is drawn from a project that has received funding from FORTE under grant 2018-0051.

ISBN 978-91-8069-447-6 (print)
ISBN 978-91-8069-448-3 (digital)

Cover design: Isabella Pistone
Printed by: Stema, Borås, 2023

Distribution:
Institutionen för filosofi, lingvistik och vetenskapsteori,
Göteborgs universitet

Abstract

This thesis is concerned with how to connect science and technology studies (STS) with evidence-based practice (EBP) through new forms of engagements. EBP is commonly associated with efforts to improve quality of welfare services. The principles and methods associated with EBP have been criticized for being reductionist. Such discussions pinpoint several challenges concerning principles for the production and utilization of evidence in EBP. At the same time, STS scholarship sheds light on informal practices that are often overseen in models and principles of EBP. In various ways, this research display mismatches between epistemological assumptions underpinning EBP and empirical epistemologies at work when EBP is enacted by professionals in daily practice. In this thesis, I explore how such STS insights can be put to work for developing EBP. The thesis comprises five papers that work with different operationalizations of the guiding question: *How can sensibilities from STS contribute to developments of EBP knowledge practices?* The papers explore several domains of welfare where EBP principles have been adopted. Drawing on various sources of data such as interviews, observations, scholarly literature and situated experiments, these papers offer a diverse set of explorations into the current shapes of EBP and experimentation with how STS research can contribute with generative developments. Collectively, these papers challenge and expand the boundaries of EBP, offering a perspective that moves beyond narrow ideals of formalization and pre-set knowledge hierarchies. Instead, they emphasize the dynamic interplay between various forms of knowledge necessary when EBP is to be realized in daily practice. Based on these papers, I outline characteristics for an epistemological reconceptualization of EBP that challenges the conventional usage of EBP as a descriptor for standardized interventions. I discuss how the experimentation with STS approaches renegotiates roles, positions, and engagements of STS-researchers. I conclude by showing how the engagements in this thesis contribute to an expansion of boundaries; not only boundaries around EBP, but boundaries around STS scholarship as well.

Svenskspråkig sammanfattning

Avhandlingen behandlar hur man kan koppla samman forskning inom fältet teknik- och vetenskapsstudier (STS) med olika satsningar inom evidensbaserad praktik (EBP) genom nya former av engagemang. EBP är vanligtvis förknippad med ansträngningar att förbättra kvaliteten på välfärdstjänster genom standardiserade insatser baserade på forskning från kontrollerade studier. Principer och metoder associerade med EBP har kritiserats för att vara reduktionistiska. Sådana diskussioner pekar på flera utmaningar när det gäller principer för produktion och användning av evidens inom områden där EBP tillämpas. Parallellt har STS-forskning länge varit intresserad av att utmana dominerande ideal om kunskapsproduktion och användning. Sådan forskning belyser informella praktiker som ofta förbises i modeller och principer för EBP och visar en diskrepans mellan epistemologiska antaganden som ligger till grund för EBP och empiriska epistemologier som är verksamma när EBP utövas av yrkesverksamma i deras daglig praktik. I denna avhandling utforskar jag hur sådan forskning kan bidra till en ökad förståelse för EBP och också bidra till dess utveckling. Avhandlingen är en sammanläggning av fem artiklar som på olika sätt arbetar med en operationalisering av frågan: *Hur kan insikter från STS-fältet bidra till utvecklingen av kunskapspraktiker inom EBP?* Artiklarna utforskar olika välfärdsområden där principerna för EBP har använts. Genom närgående analyser baserade på data från etnografiska intervjuer och observationer, vetenskaplig litteratur och situerade experiment, utforskar dessa artiklar olika operationaliseringar av EBP och hur STS-forskning kan bidra med utvecklingar av dessa. Sammantaget utmanar och utvidgar dessa artiklar gränserna för EBP genom att erbjuda perspektiv som går bortom snäva ideal om formalisering och förbestämda kunskapshierarkier. I stället betonar de behovet av dynamisk samverkan mellan olika former av kunskap som är nödvändigt när EBP ska sättas i bruk daglig praktik. Baserat på dessa artiklar skisserar avhandlingen fram konturerna för en epistemologisk omformulering av EBP som utmanar en mer konventionell syn på EBP som en beskrivning av standardiserade insatser. Vidare diskuterar jag hur avhandlingens normativa användning av STS-ansatser omförhandlar traditionella roller, positioner och engagemang inom STS-fältet. Denna avhandling bidrar därmed till att utvidga gränserna inte bara för EBP, utan också för STS-forskning.

Acknowledgements

This thesis carries my name on the cover, yet it is, in many aspects, the outcome of a collective effort. Behind this single-authored work lies a complex web of relationships and connections that collectively form its foundation. Attempting to acknowledge everyone who contributed would inevitably fall short of recognizing the actual extent of their influence. Nevertheless, I will attempt to express my gratitude to them here.

My explorations of systematic reviews for the Swedish Public Health Agency marked the genesis of this academic journey. Over the years, it evolved into a comprehensive doctoral project, comprised of various interconnected endeavors. I am profoundly grateful for the opportunity to dive headfirst into new projects and I have been fortunate that many of these connections were with my supervisor Morten Sager. Working together with Morten has been a rare privilege, as he is not only a dedicated scholar but also an inspiring person. Without Morten, this thesis would neither have begun nor reached completion. Our shared experiences in numerous projects in Swedish welfare have been some of the most motivating professional encounters I've had.

Allan Lidström, my colleague and friend, has made the time spent on this thesis all the more engaging. Our discussions touching upon everything and nothing in particular, during endless phone calls have offered a safe place for developing proto-theoretical ideas and deepened empirical and theoretical analyses during intensive writing periods.

Collaborating with professionals in my empirical fields has been invaluable. Our interactions, marked by an inspiring mix of interests, experiences, and knowledge, have been pivotal for my scholarly development. I'm sorry that I cannot acknowledge many of these persons by name having promised them anonymity. Fortunately, my longstanding collaborations with Thomas Schneider at Bräcke Diakoni and Christer Mattsson at the Segerstedt Institute are exempt from anonymity. I appreciate their contributions and the interesting experiences from our collaborations.

There are many others without whom the thesis would never have been completed. I thank Lena Eriksson for her support and motivation, both through dialogue and by providing feedback on earlier drafts of this work. She has continuously encouraged me to explore the implications of my 'cross-fertilization' of STS and EBP. I thank Ingemar Bohlin for challenging conversations and feedback that contributed to the deepening of my research, especially in aspects where we ultimately draw different conclusions. Teun Zuiderent-Jerak has significantly influenced my thinking about the role of STS scholars in relation to their empirical fields. His inspirational work on STS making & doing has become

crucial in my understanding of my own research. He also showed me how to move from a conceptual understanding of situated interventions to practical engagement in such interventions. I thank Thomas Andersson for his intriguing perspectives on managing and post-NPM when writing our joint paper. Göran Sundqvist's feedback on an earlier draft of the thesis has been very valuable and has significantly contributed to the refinement and development of this work. Harris Wiseman's excellent editing greatly enhanced the clarity and readability of the thesis.

The work significantly benefited from conversations and seminars with my colleagues in Theory of Science at FLOV, including Helena Lagerlöf, Johan Söderberg, Jakob Lundgren, Dick Kasperowski, Doris Lydahl, Annika Linell, Niclas Hagen, Jack Wright, Maria Paulsson, Filippa Werner Sellbjer, and Christopher Kullenberg.

Lastly, I want to thank those who come first in so many ways – Johan, Ines, and Otto. Ines and Otto, my little sources of inspiration, who continuously remind me of what truly matters. Johan, my best friend, and life partner, thank you for exploring every facet of life together with me.

Appended papers

Paper I: Sager, M. & Pistone, I. (2019). Mismatches in the production of a scoping review: Highlighting the interplay of (in)formalities. *Journal of Evaluation of Clinical Practice, 25,* 930–937.

Paper II: Pistone, I., Lidström, A. & Sager, M. (2022). Formaliseringar och bedömningar i manualbaserade metoder: en symmetrisk vetenskapsteoretisk analys [Formalisations and Judgements in Manual-Based Treatments: A Symmetrical Analysis]. *Fokus på familien, 2,* 91–112.

Paper III: Pistone, I., Andersson, T. & Sager, M. (2023). We need to talk about knowledge! Rethinking management and evidence-based practice in welfare. *International Journal of Public Administration, 27*(3), 37–56.

Paper IV: Pistone, I., Lidström, A., Bohlin, I., Schneider, T., Zuiderent-Jerak, T. & Sager, M. (2022). Evidence-based practice and management by knowledge of disability care: rigid constraint or fluid support? *Evidence & Policy, 18*(4), 651–669.

Paper V: Pistone, I. (*in print*). Enactments of evidence-basing: Integrating layers of care. In D. Lydahl & N. C. Mossefeldt Nickelsen (Eds.), *Ethical and Methodological Dilemmas in Social Science Interventions*. Springer Nature.

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List of abbreviations

EBM: Evidence-Based Medicine

EBP: Evidence-Based Practice

FLOV: Department of Philosophy, Linguistics, and Theory of Science

GRADE: Grading of Recommendations: Assessment, Development, and Evaluation

JAMA: Journal of the American Medical Association

NBHW: the National Board for Health and Welfare

NICE: the National Institute for Health and Care Excellence

NPM: New Public Management

RCT: Randomized Controlled Trials

SALAR: the Swedish Association of Local Authorities and Regions

SBU: the Swedish Agency for Health Technology Assessment and Assessment of Social Services

STS: Science and Technology studies

1 Introduction

An overarching challenge in welfare services can be encapsulated in the following seemingly simple question: *How can we make use of the best available knowledge when making decisions?* This is also the central challenge that the concept of evidence-based practice (EBP) is supposed to tackle (the Evidence-Based Working Group, 1992; Sackett et al., 1996). At its core, the primary issue that various investments in EBP aim to address is how professionals in welfare practices can access and use the latest and best knowledge when making decisions in their daily practice. It is difficult to argue against such an ambition, as most of us undoubtedly desire the best available knowledge when seeking assistance in welfare matters. This desire might explain why EBP, since its introduction in the medical domain in the 1990s, rapidly gained widespread acceptance, becoming a concept that professionals in welfare, policy, politics, and academia must engage with in different capacities. This is evident in the robust knowledge infrastructure established for EBP in medicine and healthcare, as well as its extension into nearly all other welfare domains, including social services, education, and public health. This broad adoption signifies strong backing for the concept as a solution to the challenge of how we can make use of the best available knowledge when making decisions in welfare. In this regard, EBP seems to be an appealing concept that provides clear answers to a pressing question.

However, things soon start to get tricky. If we return to the seemingly simple question about how we can make use of the best available knowledge when making decisions, we find that it hides two fundamentally important issues that need to be handled. The first issue has to do with the *best* available knowledge. This presupposes some kind of valuation regarding what exactly constitutes the 'best' knowledge. The second issue has to do with *how we make use of* this best available knowledge. This becomes a question about how knowledge spreads and how welfare practices can gain access to, and integrate, the best knowledge into decision-making.

Things become yet more complicated when these issues are addressed by a very specific definition of what constitutes best knowledge and of how professionals are supposed to use this knowledge when making decisions. In 1992, a group of 31 researchers and general practitioners launched the concept of evidence-based medicine (EBM) as a 'new paradigm' with the following words: "Evidence-based medicine de-emphasizes intuition, unsystematic clinical experience, and pathophysiologic rationale as sufficient grounds for clinical decision making and stresses the examination of evidence from clinical research" (Evidence-Based Working Group, 1992, p. 2420). As I will show in Chapter 2, the work of this group became one important starting point in what has been

called the 'evidence movement' (Bohlin, 2011), and the more overarching term EBP. Within the original definition on EBM, it is possible to discern a skepticism towards professionals' intuition and experiences as valid grounds for decision-making. Instead, the argument posits that decisions should rest upon robust evidence derived from a specific type of clinical research—namely, results from controlled studies, and preferably, the aggregated findings from numerous controlled studies. This notion triggered a range of initiatives. International organizations and agencies like Cochrane and the Joanna Briggs Institute, along with national bodies such as the National Institute for Health and Care Excellence (NICE) in the UK, and the Swedish Agency for Health Technology Assessment and Assessment of Social Services (SBU) in Sweden, were all quick to operationalize the ideas and principles of EBP.

These institutions subsequently regarded their primary mission to be the gathering and synthesis of evidence in order to evaluate the effectiveness of interventions through systematic reviews of existing research. Today, we observe a plethora of these institutionalized EBP knowledge practices wherein EBP principles have been integrated into rigorous knowledge infrastructures. These infrastructures are built on the premise that evidence is centrally produced and rigorously assessed. It is subsequently disseminated to local operations and professionals through various means such as practice guidelines, manuals, and recommendations. Together these efforts seek to prevent harmful practices caused by individual professionals' arbitrary judgments. Within these institutionalizations of EBP knowledge practices, the role of the professionals' knowledge is downplayed, with emphasis being placed instead on standardization efforts based on evidence from controlled studies. In this rendering of EBP, the answer to the seemingly simple question posed above thus becomes very concrete*: Professionals should follow practice guidelines, manuals, or recommendations, based on evidence from controlled trials, provided by institutional EBP bodies when making decisions.*

While adhering to this ideal of EBP has become a significant benchmark for quality in many welfare areas where EBP principles have been embraced, there have been vigorous debates regarding the appropriateness of EBP and how its principles can be practically applied in their respective fields (Bergmark & Lundström, 2011; Johansson, Denvall & Vedung, 2015). EBP has been criticized for being reductionist from both within, and outside of the areas where its principles have been adopted. The responses to EBP in fields such as social work, education, and healthcare share common themes, primarily about the narrow definition of what qualifies as evidence in EBP and concerns about the standardized knowledge infrastructures associated with it. This critique of EBP raises concerns over the problems of applying the standardized methodologies and techniques to more complex issues that extend beyond questions about cause-effect relationships in medical treatments (Biesta, 2007; Bergmark &

Lundström, 2011; Greenhalgh & Papoutsi, 2018). One long-standing debate surrounding the EBP concept highlights conflicting viewpoints of what counts as valid knowledge for decision-making in welfare areas (Lin, 2023). A growing body of literature claims that the concept of EBP is skewed towards a narrow epistemology building on a one-size-fits-all idea of knowledge production and use (Cartwright, 2007; Greenhalgh & Papoutsi, 2018; Goldenberg, 2009). These critical accounts thus complicate matters further by raising some fundamental issues with how this particular concept of EBP answers the seemingly simple question about making use of the best available knowledge in decision making. Taken together, these critiques suggest that the EBP concept may be more constraining than helpful for professionals tasked with making decisions in their operations.

The concept of EBP, and the ways it has been operationalized in different knowledge practices, have also interested scholars within the humanities and social sciences. EBP has become a popular topic for analysis among philosophers, theorists of science, sociologists, and other scholars. Philosophers studying EBP similarly voice several concerns with the models of EBP and their epistemological basis (Engebretsen & Baker, 2022; Cartwright, 2007; Goldenberg, 2009; Greenhalgh & Papoutsi, 2018; Wieringa et al, 2018b). They point out the need to combine evidence standards with a range of other knowledge sources at the point of application in the everyday work itself (Howick, 2011). Professional judgment is emphasized as a nexus for this integration.

Other scholars argue that the narrow definition of what counts as valid knowledge in EBP excludes many other valid and necessary ways of knowing (Wieringa et al, 2018a; Engebretsen et al., 2016). Not only does EBP, so-conceived, exclude professional expertise but entire research traditions are excluded too. It is argued that one of the limitations of the isolation and controlled environments required by this study design is that the same results are hard to achieve once applied in the messiness of real-world settings, and on more heterogenous populations (Cartwright, 2007; Cartwright & Hardie, 2012). In relation to this, Cartwright (2007) argues that there is no universal best method for gaining knowledge. Rather, gold standard methods should be the ones that provide the information you need in a reliable manner "from what you can do and from what you can know on the occasion" (2007, p. 11).

Taken together, this literature stresses the fallacy of applying the limited epistemological framework inherent in models and techniques associated with the EBP concept to address the full spectrum of issues EBP is intended to resolve. This adds some more nuances to EBP's answer to the initial question about how we can make use of the best available knowledge when making decisions. The critical literature argues for a more inclusive view of what counts

as valid knowledge to support decision-making. It also highlights the important role that professionals play when different sources of knowledge are to be integrated in decisions in daily practices. These are aspects that, they argue, the current models and techniques associated with EBP fail to pay enough attention to.

Another type of critical analysis is provided by way of empirical studies from the interdisciplinary field of Science and Technology Studies (STS). This scholarship adds important ingredients to the theoretical critique posed by philosophers of EBP. Researchers within STS have long been interested in challenging dominant images of knowledge production and utilization (Latour & Woolgar, 1979; Bloor, 1976; Timmermans & Berg, 2003; Bowker & Star, 1999; Downey & Zuiderent-Jerak, 2021). A solid body of STS studies relating to the evidence movement have explored the dynamics of standardization in EBP (Timmermans & Berg, 2003; Zuiderent-Jerak, 2007); the interplay between formalized methods and professional expertise (Bohlin, 2016; Helgesson, 2011); and, issues that occur when a specific definition of evidence is privileged in guideline development and use (Timmermans & Berg, 2003; Timmermans & Mauck, 2005). These approaches have shed light on informal practices that are often overlooked in models and principles of EBP, as well as in the related critique of these models and principles.

Such STS studies show how the competence and creativity of professionals result in solutions and prevention of errors in the messiness and unpredictability of daily practice (Mesman et al., 2019), as well as how EBP standards and techniques are dependent upon this kind of creative work and tinkering by professionals in order to function (Timmermans & Berg, 2003; Zuiderent-Jerak, 2007; Knaapen, 2014).

Collectively, research from the vein of STS that studies EBP standards shows how the theoretical critique of the epistemic homogeneity in EBP's models ignore how actual EBP practices "have always relied on diverse forms of evidence and knowledge, albeit informally and largely invisible to outsiders" (Knaapen, 2014, p. 832). This research thereby highlights mismatches between ideal EBP standards and the contingencies of practice (Timmermans & Berg, 1997; Petty & Heimer, 2011; Linell, Bohlin & Sager, 2021; Knaapen, 2014). These descriptive accounts thus challenge commonly held theories and ideas about knowledge production and use within EBP.

However, the descriptive character of this STS research does not attempt to answer the initial question: How can we make use of the best available knowledge when making decisions? Instead, it reframes it into something like: *How ~~can we~~* ***do we in actuality*** *make use of ~~the best available~~ knowledge****(s)*** *when making decisions?* STS research on EBP does not purport to offer normative recommendations on what

constitutes the best available knowledge or how welfare professionals should incorporate it into their daily decision-making. Instead, it transforms this issue into an empirical question, focusing on describing real-world enactments of EBP in specific contexts, without adhering to pre-established theoretical models or predefining what EBP should be in advance.

1.1 Framing the agenda

The above introductory remarks take us to the center of my thesis: the challenges of EBP and how STS research can be activated in efforts to develop constructive approaches in meeting them.

The ambition to base decisions on the best available knowledge, which is at the heart of various EBP endeavors, is difficult to find fault with, at least in the abstract. However, both those working within the EBP paradigm and scholars dedicated to its critical examination argue that there are fundamental challenges in how this concept is manifested in models, how it is institutionalized in national and international bodies, and how it is upheld through knowledge infrastructures within the welfare sector.

Writing a thesis about EBP presents its own set of challenges, mainly because EBP is a phenomenon, a set of principles and ideas, which are enacted in different forms in different contexts. As a broad narrative in the welfare and societal context, it constitutes the base for models, methods, and techniques, it is an explicitly articulated goal within welfare organizations and institutionalized in knowledge practices within welfare and academic knowledge infrastructures and in scholarly critical accounts of EBP efforts. EBP is enacted by different actors within welfare, academia, and society in large.

In this thesis, I explore how the EBP, as a phenomenon, object, and concept, is rendered within several of these contexts. One approach might have been to focus only on how EBP is enacted in one specific context. However, a broader focus[1] enables me to delve into a more fundamental issue: the perception of what constitutes reliable knowledge in the dominant conceptualizations of EBP.[2] This perception is based on epistemological assumptions. Epistemology relates to processes of knowing including how we produce and use knowledge. Further, epistemological assumptions involve beliefs or principles that underlie the way actors approach knowledge, shaping their perspectives on what constitutes

[1] This broader focus necessitates that I sometimes treat EBP as a singular object without explicit reference to any one specific context or enactment.

[2] For increased readability, while analytically problematic, I will sometimes use the term 'EBP's', for example: 'in EBP's models'. What I refer to in these cases are operationalizations of the principles and ideas associated with EBP.

knowledge, how it can be obtained, and the criteria for evaluating its validity. In EBP efforts, epistemological assumptions, explicitly or implicitly underlie various actors' assessments of which methods and formats should be used, which systems and infrastructures should be established, and ultimately, which decisions should be made in the everyday work of professionals. More specifically, I address in this thesis the challenges that occur when certain sources of knowledge are privileged in different EBP knowledge practices, and, the consequences of an excessively linear understanding of knowledge production and use – these challenges, I argue, are common denominators inherent in the many different forms of EBP.

The literature from empirical studies in STS reveal a mismatch between the epistemological assumptions underpinning EBP efforts and the actual epistemologies at work when EBP is to be realized by professionals in daily practice. In this thesis, I experiment with how to make visible, and bring into view, the empirically grounded epistemologies that are often overlooked, or invisible, in representations of EBP. What is at stake here, I argue, is that the narrow boundaries that are drawn around EBP through models and theories and upheld by institutionalized EBP knowledge infrastructures, complicates rather than facilitates the realization of EBP in practice. In this thesis, I therefore make use of STS approaches to contribute to a broadening of these boundaries and a reconceptualization of EBP that includes, and better aligns with, how professionals produce and make use of different knowledge sources to arrive at their decisions.

Though I situate my own research within STS scholarship, the sort of findings that are often an analytical endpoint in descriptive STS studies, I want to use as starting points in this thesis instead, in order to explore possible modifications of EBP. Traditionally, this normative role has not been assumed by the STS researcher. However, the increased demands on social sciences to be, not just academically, but practically relevant have spurred a plethora of interesting developments where STS researchers experiment with ways to be actively engaged in their studied fields (Bruun Jensen, 2007). This thesis constitutes yet another such experiment: How can research from a descriptive STS tradition be put to use in developments of EBP? This research agenda thereby involves a move from descriptive STS into the territory of normative contributions – a move that is currently explored within the emerging subfield 'STS making & doing' (Downey & Zuiderent-Jerak, 2017; 2021).

STS making & doing comprises projects that transform sensibilities from STS into actionable contributions in the studied fields. This involves a variety of interventionist approaches where researchers use STS creatively to respond to frictions encountered in their studied fields. The common thread running through these projects is that they convert insights and sensibilities from STS

into practical contributions within the fields being studied (Downey & Zuiderent-Jerak, 2021). This strand of STS work experiments with *knowledge expressions* and *knowledge travel* in ways that "expand and challenge the boundaries around the notion and practices of STS scholarship" (Downey & Zuiderent-Jerak, 2021, p. 2).

1.1.1 Aims and research questions

The concept of EBP offers a straightforward answer to the normative question about how we can make use of the best available knowledge when making decisions. However, there seem to be several challenges with how EBP operationalizes that answer through principles, methods, and models. I argue that descriptive STS research holds untapped normative potential that could enrich how EBP addresses this question. To do so, it requires analyses of specific EBP cases together with situated transformations of STS research into normative contributions. Against this background, the research conducted in this thesis is guided by the question: *How can sensibilities from STS contribute to developments of EBP knowledge practices?* In relation to this overarching question, the thesis has two entwined aims.

The first aim is to make use of sensibilities from STS research to challenge and redraw boundaries around EBP. To that end, the thesis focuses on exploring and explicating professionals' epistemologies i.e., professionals' understanding, utilization, and production of knowledge in their daily practices. By such an exploration, the thesis aims to contribute to a reconceptualization of EBP and challenge common assumptions about what EBP is and what it is not.

The second aim is to explore how research from the field of STS can be remolded to fit with these normative and practical intentions of the thesis. I explore how such experimentations with STS reframe traditional ideas of STS by renegotiating roles, positions, and engagements of STS researchers and I will show how the research conducted in this thesis contributes to actively expanding, not only boundaries around EBP, but boundaries around STS scholarship as well.

1.2 Local context

The thesis is written at the Department of Philosophy, Linguistics, and Theory of Science (FLOV) at the University of Gothenburg, in Sweden. Theory of science was established as an independent subject area in 1963. Theory of science is a so-called 'meta-subject,' concerned with the production, interpretation, and use of academic knowledge. Within my department, theory of science is highly oriented towards the international STS scholarly field and its emphasis on empirical descriptive investigations. However, it is also influenced by other

scholarly veins such as philosophy of science, history of science, and cultural and policy studies of knowledge and science.

In 2013, a new Master's program was established in the subject area in the department. The Master's program '*Evidence-Basing: Practice, Theory and Context*' aimed to combine evidence-based practice (with its theories and practical methods and techniques), with perspectives on EBP from the extended field of STS and modern theory of science. I was a student on the Master's program the first year it was given at the department, and the second student to graduate with a Master's degree in EBP and theory of science. I later became one of the first 'EBP students' at a doctoral position in theory of science. The hybrid nature of the Master's program with its focus on both evidence-basing and theory of science was not an obvious, nor an entirely comfortable fit in the subject area. The combination of evidence-basing and theory of science meant that students would have to learn to be 'actors' within evidence-basing and develop practical skills in assessment and synthesis of research according to systematic review techniques, guideline development and evidence-based quality improvement of welfare practices. Simultaneously, students were also supposed to be 'analysts' and study these evidence-basing activities as empirical objects, applying perspectives mainly from the field of STS.

The experimentation with both EBP and STS to build this hybrid competence among the students has resulted in the testing and development of a variety of approaches, where STS insights are reshaped into tools that could be applied to specific EBP-related issues to give students new perspectives and, sometimes, facilitate doing EBP differently as well. This thesis could be seen as an extension of these ambitions and comprises several different projects where I have both been an 'actor' in EBP activities, such as systematic review projects and building infrastructures to combine EBP and quality improvement, but with the ambition of combining these endeavors with perspectives from STS and other research conducted within the subject area theory of science at my department. The thesis summarizes and elaborates on central issues concerning how EBP and STS can be cross-fertilized and how this necessitates evolving new forms of doing them.

1.3 Outline of the thesis

This thesis comprises five papers as well a synopsis which summarizes and synthesizes them. The compiled papers use approaches and previous findings from STS to contribute to developments of EBP by responding to actors' problems with different EBP endeavors. Paper I and II both focus on two central EBP techniques: Systematic reviews and manual-based treatments. The first paper is a reflexive investigation of a systematic review project I was involved in with a Swedish government agency. The second paper is a conceptual analysis

concerning how professionals could relate to manual-based treatments in their daily work. In Paper III, I develop a conceptual model that builds on the critique of, and recent developments of EBP methods, and propose a reconceptualization of EBP's epistemology. The lessons from these three papers are then put to use in a research project where I was embedded with a social care provider in Sweden, experimenting with building EBP infrastructures within their operations. Papers IV and V report results from this experimental project.

Regarding this thesis, the synopsis serves as a common thread that connects and integrates the diverse contributions of the papers. While the individual papers address specific issues and make distinct arguments, the synopsis provides a framework that ties them together and highlights their collective significance. The lessons learned from each individual paper are analyzed and synthesized into a whole to fulfil the two entwined purposes of the thesis: To explore how insights from STS can support the evolution of EBP; and to investigate how such experimentation with STS reframes traditional ideas of STS research by challenging relations between researcher and research objects, moving from description to intervention, and engaging in knowledge travel practices between STS and other audiences.

The thesis is organized into eight chapters. Following this introduction, the second chapter gives context to the world in which I seek to intervene by describing the establishment and maintenance of the EBP paradigm. In the third chapter, I review literature from scholars engaged in critical analyses of EBP from the field of STS and neighboring fields such as philosophy, theory of science and sociology. I end this chapter by formulating how I use STS sensibilities to contribute to the evolution of EBP. The fourth chapter describes research settings, research processes and the methods that are used in the compiled papers with accompanying ethical considerations. The fifth chapter introduces, and summarizes, the five papers included in the thesis. In the sixth chapter, issues and themes that cut across all the papers are discussed and synthesized, and I provide suggestions for what a reconceptualization of EBP could constitute. Chapter Seven explores and summarizes the process and outcomes of the reshaping of STS to fit the purpose of the thesis. The final chapter provides an overall conclusion to the thesis.

2 The establishment and maintenance of an EBP paradigm

In this chapter, I delve into the ideas, principles, and institutionalizations of EBP. This includes tracing the origin of the EBP concept and its evolution. I further describe some of the efforts made to formulate evidence rules and criteria for its production. I will show how these efforts came to have an immense impact shaping the institutionalizations of EBP within various welfare areas. Following this, I contextualize EBP within the Swedish context, exploring its relationship with international EBP practices and its position within academic discourse. While EBP has gained widespread acceptance as a means to enhance welfare practices, it has also faced scrutiny and criticism from scholars and other stakeholders. I distinguish three main challenges associated with how the concept of EBP is operationalized in both theory and practice. I conclude the chapter by relating these challenges to the overall ambitions of this thesis.

2.1 The advent of a new 'paradigm'

Evidence-based practice is, in its original sense, about incorporating knowledge from research into clinical decision-making. The idea originates in the medical field, there called EBM. In this section, I will give a brief summary of the launch of EBM and its original intentions.

In the early 1990s, EBM was launched as a new paradigm within medical education and practice (Guyatt 1991; The Evidence-Based Working Group, 1992). The term was introduced in 1991 by Dr Gordon Guyatt, a young McMaster University Internal Medicine Residency Coordinator, when he initiated a new curriculum for the residency program (Guyatt, 1991). The EBM curriculum was built on David Sackett's previous work on a bedside teaching method that built on applying critical appraisal techniques in medical training. One year after the initial launch of the term, the Evidence-Based Working Group, a group of 31 researchers and medical practitioners led by Gordon Guyatt, published a paper in the *Journal of the American Medical Association* (JAMA). In this paper, EBM is introduced, not only as a new approach to teaching the practice of medicine, but as a paradigm shift for medical practice. The group there argued that the foundation of this shift lies in the development of how clinical research itself is conducted, development that had been going on for over 30 years.[3] The

[3] See Bohlin (2011) for an in-depth discussion about the evolution of EBM.

group argued that it is time to properly make use of these developments by putting them to use in medical practice.

The developments in question include two methodological advances that had rapidly gained ground in medical research. First, randomized controlled trials (RCT) which demonstrated great potential as a method that could determine the effectiveness of new drugs, surgical therapies, and diagnostic tests. Second, meta-analysis, which had gained increased acceptance as a method of pooling the results of a number of randomized trials. These two techniques, they argued, have great potential for setting treatment policy (The Evidence-Based Working Group, 1992). The new 'EBM paradigm' was thus launched as an appeal to the medical field to make use of these new scientific developments in medical practice.

The previous paradigm, the group argued, was based on the assumption that unsystematic observations from clinical experience, the study of mechanisms of disease and pathophysiologic principles, and a combination of traditional medical training and common sense, provided a sufficient base from which to generate valid guidelines for clinical practice. The new EBM paradigm instead meant that clinicians should regularly consult original clinical research, and critically appraise it, when solving clinical problems. The group also provided guidance as to how this new approach was to be realized in clinical practice. The key elements consisted in "precisely defining a patient problem, and what information is required to resolve the problem; conducting an efficient search of the literature; selecting the best of the relevant studies and applying rules of evidence to determine their validity" (The Evidence-Based Working Group, 1992, p. 2421). Thus, the idea of EBM suggests a de-emphasizing of clinical expertise and mechanistic reasoning in favor of more systematic knowledge about the effects of the interventions used in clinical practice.

The work done to establish EBM "as a new philosophy within medical practice and teaching" (The Evidence-Based Working Group, 1992, p. 2421) involved keen engagements from the McMaster Group, with Gordon Guyatt and David Sackett as front figures. These engagements involved, for example, the writing of textbooks for teaching the principles of EBP (e.g., Sackett et al, 1991). Above all, it involved the publication of a vast number of research articles describing approaches that clinicians can use to keep up with the latest clinical research by conducting their own database searches (e.g., Haynes et al., 1986). The articles also critically appraised this research for methodological rigor (e.g., The Evidence-Based Working Group, 1992) and graded the level of trustworthiness of the existing research evidence (e.g. Sackett, 1989).

The group also conducted a number of controlled studies to evaluate the effectiveness of the techniques for directing EBM that were now rapidly taking

form (e.g., Bennett et al., 1987; McKibbon et al, 1990). Taken together, both before the official launching of the term EBM, as well as after its introduction as a new paradigm, considerable efforts were made by the McMaster Group to develop and refine methods, approaches, and criteria for the critical appraisal of clinical research that was to be used in clinical practice. These efforts came to form the main basis for all the following institutionalizations of EBP that rapidly came to follow this evidence movement. Before I continue with describing the character of these institutionalizations of EBM, I will attempt to summarize the ambitious work done early in the history of EBM to set criteria for what constitutes evidence and what counts as valid techniques for its production.

2.2 Rules of evidence and procedures for its production and use

In this section, I show how the McMaster Group played a significant role in outlining some of the key principles and techniques that have become emblematic of EBM, and later also the many adoptions of EBM into other areas. I start by introducing the hierarchy of evidence, which is a ranking system that categorizes study designs based on their perceived capacity to yield internally valid results. Additionally, I discuss the efforts made to establish criteria for assessing the trustworthiness of such evidence. Lastly, I describe early strategies for implementing EBM in clinical practice.

2.2.1 Creating an hierarchy of evidence

The principles of the hierarchy of evidence, coupled with the grading system, are crucial for comprehending the driving forces behind the foundation of EBM. In the literature derived from the McMaster Group and affiliated researchers, these principles are described as key to achieving a transition away from a medical practice rooted in authority, intuition, and common sense, towards practice founded on decisions derived from evidence obtained through RCTs, which were regarded as a novel and superior methodology (The Evidence-Based Working Group, 1992; Sackett et al., 1991; Sackett, 1989).

In a textbook for medical teaching, Sackett et al. (1991) devised tables to illustrate the respective strengths of the study designs that were commonly applied in clinical research at the time. In these tables, RCTs are placed at the top, followed by cohort studies, case-control studies and case series and single case studies, in descending order. This outline of an hierarchical system for evidence thus clearly proclaims RCTs as the most authoritative source of evidence. Sackett et al. (1991) recognize that in many cases, using the other study design is the only option, however, they argue that each of these study designs introduces bias that could be eliminated through RCTs. The RCT has its origins

from British agricultural research in 1930s and was gradually established within medicine from the 1940s. However, the status of RCTs as the most trustworthy source of evidence is largely owed to the McMaster Group through this hierarchical evidence ranking system (Bohlin, 2011).

The reason that the RCT study design is perceived as the most appropriate form of evidence is its suitability for evaluating effectiveness of interventions or treatments. The randomization reduces bias and enables a rigorous examination of causal relationships as it balances characteristics between intervention and control groups. The randomization thus allows causal attribution of differences in outcomes between intervention and control groups to the specific intervention applied, which is not perceived as being possible with any other study design (Hariton & Locascio, 2018). The fact that the RCT is guided by a predefined study protocol including a hypothesis formulated before conducting the study, taken together with a blinding procedure where neither study participants nor researchers know who is getting intervention/treatment and placebo is usually regarded as a thorough way of reducing the risk of subjective biases affecting the study, thus increasing the objectivity of study outcomes. As such, Sackett (1989) argues that if a RCT is well-conducted, it constitutes a superior source of evidence.

Early efforts were also made to create a set of principles that professionals could use when critically appraising the strength of evidence. In a research article published in 1989, Sackett describes his work on "what rules of evidence ought to apply when expert committees meet to generate recommendations for the clinical management of patients" (Sackett, 1989, p. 2s). Therein, he introduces a system for grading the trustworthiness of such recommendations. The grading system included three grades, depending on the level of evidence used to generate them. The highest grade, grade A, according to this system, should be given to recommendations based on large RCTs with clear-cut results and low risk of errors. Recommendations based on small RCTs with uncertain results and moderate to high risk of error should be given grade B and the lowest grade, grade C, should be given to recommendations based on results from non-RCTs. The grading system further reinforced the principles of the hierarchical evidence system.

The evidence hierarchy, often visualized through a pyramid (Figure 1), was later slightly revised as it was recognized that systematic reviews, preferably including meta-analyses of results, of several well-conducted RCTs could constitute an even more trustworthy source of evidence due to its ability to statistically aggregate the results from a series of RCTs (Guyatt, 2000). Even in the original proclamation of EBM, this new technique for aggregating research from RCTs was already mentioned as a key source of evidence (The Evidence-Based Working Group, 1992). As the systematic review method was refined, it

was formalized into a series of steps. Because of this formalization, systematic reviews came to be regarded as a very reliable source of evidence. As such, that they were placed on top of the hierarchy of evidence, above individual RCTs.

Figure 1: The hierarchy of evidence. Source: http://ebp.lib.uic/nursing/node/12

2.2.2 Approaches to achieving EBM in practice

In the McMaster Group's proclamation of EBM as a new paradigm, the individual professional is given a pronounced role as the central actor responsible for searching for, assessing, and drawing conclusions from the existing evidence, as well as for using these conclusions as a base for making clinical decisions (The Evidence-Based Working Group, 1992). Sackett et al. (2000) outline this process in five steps:

> *Step 1: converting the need for information (about prevention, diagnosis, prognosis, therapy, causation, etc.) into an answerable question.*
>
> *Step 2: tracking down the best evidence with which to answer that question.*
>
> *Step 3: critically appraising that evidence for its validity (closeness to the truth), impact (size of the effect), and applicability (usefulness in our clinical practice).*

> *Step 4: integrating the critical appraisal with our clinical expertise and with our patient's unique biology, values, and circumstances.*
>
> *Step 5: evaluating our effectiveness and efficiency in executing steps 1–4, and seeking ways to improve them both for next time (Sackett et al., 2000, p. 3f.).*

In this early conceptualization of EBM, Sackett et al. emphasized that these steps should be considered as being a part of "a process of life-long, self-directed learning in which caring for our own patients creates the need for clinically-important information about diagnosis, prognosis, therapy, decision analysis, cost: utility analysis and other clinical and health care issues" (Sackett & Rosenberg, 1995, p. 622). In these initial ideas, EBM is thus described as a means for professional learning.

In the 'critical appraisal' approach, much responsibility is put on the individual professional to manage the rigorous rules of evidence and the techniques necessary for critically appraising quality and trustworthiness of evidence. This is evident in the following quote from Gordon Guyatt and colleagues:

> *Clinicians need to be able to distinguish high from low quality in primary studies, systematic reviews, practice guidelines, and other integrative research focused on management recommendations. An evidence-based practitioner must also understand the patient's circumstances or predicament; identify knowledge gaps and frame questions to fill those gaps; conduct an efficient literature search; critically appraise the research evidence; and apply that evidence to patient care. (Guyatt, et al. 2000, p. 1290)*

While the Evidence-Based Working Group (1992) argued that criteria for assessing methodological rigor have to be few and simple, so it was not overwhelming for the novice, what came to follow was comprehensive and rigorous development of the criteria for assessing internal validity and the risk of many different sources of bias. These criteria are described in various 'user guides' published in journal series, methodological handbooks, and textbooks.

Early literature on EBM, such as that produced by the Evidence-Based Working Group (1992) and Sackett (1989), mentioned the potential of producing and using clinical practice guidelines and recommendations based on solid evidence as a promising approach to implementing EBM in clinical practice. Over time, the 'guideline approach' gained traction as it became evident that individual professionals lacked the time, skills, and motivation to search for and critically appraise the best available evidence to address their information needs in daily interactions with clients or patients. Consequently, the production and

utilization of clinical practice guidelines were increasingly seen as a practical solution to this challenge. Guyatt et al. (2000) encouraged groups of experts to provide pre-appraised evidence in the form of systematic reviews or practice guidelines based on such evidence summaries.

The so-called guideline approach builds on the idea that steps 2-3 in the critical appraisal process should not be tasked to individual professionals. Instead, research is supposed to be critically appraised, synthesized and summarized into guidelines and recommendations by trained experts. At this point in time, several evidence-producing bodies such as Cochrane, the Campbell Collaboration and networks of health technology assessment (HTA) centers were already adopting the principles of EBM. They were both producing evidence through systematic reviews and simultaneously refining the methods for searching, appraising and synthesizing research according to these principles. Through this institutionalization of EBM, the role of the professional thus shifts from a central figure in a learning process to an executor of actions prescribed in centrally produced evidence guidelines and recommendations.

The rules of evidence and procedures for its production and use elaborated in this section collectively form the foundation of what came to constitute EBM. These developments, during the early years of EBM, came to have a significant impact on the efforts made within the diverse landscape of evidence-producing bodies worldwide. In the following section, I will focus on the adoption of EBM within various welfare areas and how its rules and procedures have been put into practice by a diverse array of evidence-producing bodies.

2.3 The 'evidence movement'

The idea that professionals should base their decisions on rigorous knowledge from research rather than unsystematic experience and their own judgment have had a substantial influence outside the medical field and has spread with remarkable rapidity across countries and professional areas, including other healthcare segments, social services, education, and public health (Bohlin, 2011). The efforts being made to ensure that evidence is produced and used in professional work is often referred to as 'the evidence movement.' The movement and its efforts are expressed in the initiation of a wide range of organizations, governmental as well as non-governmental, and in academia.

There exist several field-specific labels to describe these efforts. In social services, 'evidence-based social work' is the term that is often referred to (Gambrill, 1999), which advocates the expression 'evidence-based public health' within public health use. Likewise, in the field of education there are references to 'evidence-based education' or to schools based on 'scientific ground' (Biesta, 2007). However, the broader term 'evidence-based practice' (EBP) has come to

span all these field-specific labels with its general reference to efforts towards achieving an evidence-based *practice*. Throughout the thesis, I will now use the term 'evidence-based practice' as an umbrella term encompassing various related terms like evidence-based medicine, evidence-based policy, evidence-based social care, and evidence-based psychology. I will reserve use of the more specific term EBM for references to the work substantiating the EBM ideas conducted by the McMaster Group.

Taken together, the term EBP has come to describe a heterogenous complex of evidence-producing organizations, their ideas and knowledge practices (Hansen & Rieper, 2009). An intriguing question that occurs in relation to the evidence movement is why and how the ideas and principles of EBM came to have this huge impact on so many societal domains. As I have shown, EBP has its origins in highly domain-specific ideas arising in an internal medicine residency at McMaster University. Thirty years later, EBP has been institutionalized in various forms by different knowledge-producing entities worldwide. Today, there is a widespread expectation that welfare organizations should adopt EBP as an approach to enhance and ensure the quality of their services. While delving further into the question about how EBP came to be such a dominating goal is beyond the scope of this thesis. Rather, I will provide additional context on how the ideas of EBP have been institutionalized through international and national knowledge-producing bodies.

2.3.1 Institutionalization of EBP knowledge practices

The principles and ideas of EBP have come to be institutionalized globally through the concerted efforts of research organizations, educational institutions, accreditation bodies, and policymakers. The shared overarching ambition of these efforts is to ensure that decision-making processes in various areas are informed by evidence to improve the quality and effectiveness of services and interventions. Worldwide, there are numerous research institutions, universities, government agencies, and non-profit organizations dedicated to producing evidence. Efforts to synthesize and disseminate evidence have involved dynamic work among these evidence-producing bodies.

There is a plethora of international organizations, research networks and collaborations all working to produce evidence. One example of such collaboration is Cochrane, which was one of the earliest organizations established to work with producing evidence and making it available to professionals within healthcare. Cochrane comprises an international network of researchers that produce synthesized evidence, preferably from RCTs, but also from research conducted with other study designs, to a lesser extent. Since its establishment in 1993, researchers working with Cochrane have developed

rigorous systematic methods to gather, critically assess, synthesize, and grade the trustworthiness of existing research on specific topics within healthcare.

Another important evidence-producing organization outside of the healthcare area is the Campbell Collaboration, founded in 2000. Its primary mission is to create and utilize systematic reviews evaluating the effects of social, behavioral, and educational interventions. Like Cochrane, the Campbell Collaboration follows a rigorous methodological framework, with knowledge derived from RCTs serving as the primary source for inclusion in systematic reviews. This methodological framework is thoroughly outlined in these organizations' respective methodological handbooks (see for example, Higgins et al., 2022), where one can find several of the evidence rules and criteria for its production that were formulated early in the formation of EBM.

Many countries, especially in a European context, have established national or regional bodies responsible for developing clinical guidelines based on evidence. For example, NICE in the UK has as their primary responsibility the production of evidence-based clinical guidelines within the healthcare area. Often, such organizations are governmental bodies responsible for fulfilling political goals to realize EBP in welfare sectors. These establishments commonly work according to the same principles and methods as the evidence-producing organizations mentioned above, i.e., they critically appraise and synthetize existing evidence on specific topics.

In addition to this, these organizations also have a responsibility to provide recommendations according to the existing evidence. The aim of evidence-based practice guidelines is to produce recommendations that prescribe where, when, and how professionals should act in specific situations (van Loon et al., 2014). The recommendations in these kinds of guidelines are based on an integration of best available evidence (preferably from research synthesis methods, such as systematic reviews) with other seemingly relevant knowledge that needs to be considered in relation to the targeted issue. Evidence-based guidelines thus differ from systematic reviews because they usually incorporate more aspects than merely best evidence, aspects including ethical principles, laws and regulations, professional experiences and patient values and preferences. This means that they do not only produce evidence, but they also weigh this evidence together with other important considerations such as how applicable it might be in particular care systems.

To rate the certainty of evidence and strength of recommendations, a system known as Grading of Recommendations: Assessment, Development, and Evaluation (GRADE) has been developed (The GRADE Working Group, 2023). GRADE incorporates a systematic and transparent process where groups of guideline developers are encouraged to considers a series of consecutive, well-

defined criteria. These criteria consider the balance between potential harms and benefits of different approaches, the quality of available evidence, resource and cost implications, and the variation in individual values and preferences (Schunemann et al., 2023). The GRADE approach is described as a systematic and explicit approach to making judgments (The GRADE Working Group, 2023) and provides a means for making the necessary judgment recommendations transparent and more readily subject to critical scrutiny. The GRADE system also provides a standardized approach for assessing the strength of recommendations in terms of their strength and weakness (Schunemann et al., 2023). The GRADE approach has been adopted by more than a hundred organizations globally (Bhaumik, 2017), and is now considered 'the' standard for organizations working with guideline development (The GRADE Working Group, 2023).

Within this evidence movement, accreditation and certification bodies in welfare have also incorporated EBP standards into their criteria. Healthcare institutions, educational programs, and professional associations often require operations and individual professionals to demonstrate proficiency in EBP to maintain their credentials or accreditation. Accreditation bodies frequently use performance metrics and quality indicators to assess healthcare organizations (Rushforth et al., 2015). Some of these indicators may be directly related to EBP, such as the percentage of patients receiving evidence-based interventions for specific conditions. Accrediting agencies may also expect organizations to have processes in place for reviewing and implementing evidence-based clinical guidelines (van Zelm & Lockwood, 2021).

To these various efforts to operationalize EBP in welfare, you can add several governmental and non-governmental initiatives that seek to facilitate the uptake of evidence into practice. These initiatives include efforts such as translating evidence into easily accessible formats for professionals, policymakers, and the public (Lavis et al., 2005), as well as for designated knowledge brokers who are supposed to work as intermediary links between evidence and local practices (Ward et al., 2009).

In conclusion, EBP has been institutionalized through the concerted efforts of research organizations, educational institutions, accreditation bodies, and policymakers. In these institutionalizations, the principles developed during the early formation of EBM are echoed through methods, handbooks and continues through both implicit and explicit references to the specific evidence rules formulated during this time.

2.3.2 Sweden and EBP

Since my empirical case studies included in the thesis are situated within a Swedish EBP context, I will focus on describing how EBP has been

institutionalized in a Swedish context within healthcare, social care, and public health. Sweden was an early adopter of the ideas of EBP and was early in infrastructuring these ideas within the welfare sector. In this sense, Sweden can be considered to be a critical case of the institutionalization of EBP knowledge practices.

Sweden has a longstanding tradition of centralized bureaucratic initiatives aimed at ensuring the safety and effectiveness of welfare service interventions. In recent decades, the notion that public welfare services should be managed based on sound knowledge has given rise to a regulatory framework known as 'kunskapsstyrning' in Swedish (Statskontoret, 2023), often referred to internationally as 'management-by-knowledge' (Kalkan et al., 2015; Sandberg et al., 2019; Jacobsson & Meeuwisse, 2020). The term 'management-by-knowledge' refers to a centralized infrastructure designed to provide local welfare service providers with access to knowledge. The principles of EBP have significantly influenced the endeavors associated with this regulatory structure, with its ultimate goal being the attainment of 'evidence-based practice' (Fernler, 2011). This framing of management-by-knowledge can be viewed as a political and administrative institutionalization of the ideas and principles of EBP (ibid.)

The 'management-by-knowledge' system comprises an organizational network involving national, regional, and local actors, each assigned distinct responsibilities related to evidence production, management, and utilization. In a simplified representation of this system, the primary responsibility for generating evidence lies with several national government agencies. These governmental bodies are tasked with managing and supporting the efforts of regional actors within their respective domains of expertise. Among these agencies, one of the most influential in evidence production SBU. SBU, founded in 1989, three years before the official launch of EBM, swiftly adopted evidence rules that emphasized RCTs as the gold standard and took up internationally established methodological criteria for conducting systematic reviews. SBU played a pivotal role in the early operationalization of EBM as a methodology for evaluating the effectiveness of health interventions in Sweden (Sager, 2011). SBU's responsibilities encompass evidence production within healthcare and social services.

Another key agency, the National Board for Health and Welfare (NBHW), has a broader mandate, which includes generating guidelines and recommendations based on the evidence produced by SBU. The Public Health Agency of Sweden is responsible for the public health and social sustainability sectors, with its primary mission being the generation of knowledge, particularly concerning the impacts of various interventions and strategies. Their methodological handbook emphasizes a scientific foundation for their work, with an emphasis on the production of systematic reviews (Public Health Agency

of Sweden, 2017). The methodological steps outlined in their handbook closely align with those at SBU (see: SBU, 2020) and correspond with international scholarly literature that discusses and refines the methodology of systematic reviews to better suit public health and other domains beyond the medical field'

At the regional and municipal levels of the 'management-by-knowledge' system, one primary objective is to support the implementation of evidence-based practices in local contexts. The Swedish Association of Local Authorities and Regions (SALAR) serves as an employers' organization and represents and advocates for local government throughout Sweden. All municipalities and regions in Sweden are members of SALAR (SALAR, 2023b).

SALAR holds a national responsibility for coordinating regional and municipal activities related to the production, support, and advancement of robust knowledge within the "management-by-knowledge" infrastructure. The organization has played a central role in launching various projects aimed at strengthening knowledge-driven management at this level. For example, SALAR has been instrumental in implementing the political aspiration to introduce EBP in social services (SOU 2008:18; SALAR, 2017; Karlsson & Eriksson, 2016).

Within the healthcare sector, several projects have been initiated to establish standardized national initiatives across 26 distinct program areas, including mental health, acute care, infectious diseases, among others (Kunskapsstyrning, 2023; SALAR, 2023a). These projects aim to standardize healthcare practices based on the best available knowledge using methods associated with EBP. These endeavors have been notably influenced by the principles and methods of EBP and are closely tied to accreditation efforts like quality indicator registers, enabling continuous evaluations. A central aspect of these initiatives involves the development of practice guidelines founded on the latest evidence.

The local level encompasses the various state welfare operations responsible for ensuring that their practices adhere to the latest and best knowledge in a safe and equitable manner. As illustrated in the description of the 'management-by-knowledge' system, this system is imbued with the principles of EBP, with local actors ultimately expected to align their work with the evidence produced by actors at other levels of the 'management-by-knowledge' structure.

While these remarks provide a simplified overview of the relationship between Swedish welfare and the evidence-based practice movement, it underscores how EBP principles and methodologies have been institutionalized into a statewide knowledge infrastructure, where evidence assumes a prominent role.

In addition to the political and administrative institutionalization of EBP within Swedish welfare, there has been a significant scholarly engagement with the evidence-based practice movement. This engagement is evident in Swedish journals like *Läkartidningen*, where discussions about the concept of EBM have

been active since the mid-1990s, and in *Socialvetenskaplig tidskrift,* where debates regarding EBP within social services have occurred since EBP became an explicit goal within social services. Moreover, the teaching of EBP to students has become an explicit goal in undergraduate and Master's programs related to welfare.

The institutionalization of EBP in Sweden largely mirrors many international EBP efforts discussed in previous sections. However, as with other countries characterized by robust welfare states, EBP in Sweden is likely to be more firmly rooted in governmental initiatives as compared to countries with weaker welfare systems.

2.4 Actors' critique of EBP

Within many of the welfare areas where the ideas of EBP have been adopted, there have been animated discussions among scholars and professionals in different positions within EBP knowledge infrastructures. These discussions for the most part take place in scholarly literature and in governmental reports. Within this literature, concerns are frequently voiced regarding the applicability of EBP principles and the practical realization of EBP concepts within their respective domains of expertise. The reactions to EBP in areas such as social work, education and healthcare share many similarities and concerns regarding both what gets to count as evidence in EBP as well as the centralized knowledge-driven management often associated with EBP. As argued by Knaapen (2014), EBP has garnered widespread support since its inception, as evidenced by the rigorous institutionalization of EBP knowledge practices on a global scale. Nevertheless, it is crucial to acknowledge that the principles and methodologies linked to EBP have also faced substantial scrutiny and occasional harsh criticism from scholars engaged in welfare sectors where EBP has gained prominence.

2.4.1 Problems with the definition of 'evidence'

A frequent criticism of how EBP is modelled is that it is too dominated by a single form of research: effectiveness studies such as RCTs (Hammersley, 2001). Actors in EBP claim that RCTs can provide trustworthy answers to questions of causality by eliminating threats to the internal validity of empirical findings, but that they are less suitable for explaining the mechanisms that produce this causality, i.e., addressing questions of how things work, for whom and under what circumstances (Lavis et al. 2006; Munn, Lockwood, & Moola, 2015). Critics of the 'what works' discourse built into EBP have addressed the lack of relevance and usefulness of RCTs and of systematic reviews for answering the complex issues that professionals are faced with in everyday practice, as well as for meeting policymakers' knowledge needs in decision-making processes. Marcus Lauri

(2016) points out that the centralized bureaucratic demands of EBP have resulted in changes to ways of working that have created a gap between client and professional. This is because rigorous research methods have been given priority over more flexible and holistic approaches.

The usefulness and appropriateness of evidence from RCTs, systematic reviews and treatment manuals have also been much debated, especially within social services. Early proponents of EBP argued that those seeking social work services had a right to receive empirically evaluated treatment, and that not to use such evaluated treatment is unethical (Myers & Thyer, 1997) While many supported this idea, others have objected with the argument that the kind of evidence that is advocated in the models of EBP is not appropriate for handing the complex problems that social workers encounter (Witkin & Harrison, 2001; Wampold 2001). Similar discussions are also visible in education (Linell, Bohlin & Sager, 2022; Bohlin 2018) where critics argue that the kind of research favored in EBP is not suitable for the educational field due to the latter's complexity and need for contextual professional judgments (Biesta, 2007). Another argument that has been put forward is that people from marginalized and oppressed groups are often not included in the kind of empirical evidence that EBP emphasizes (Drisko & Grady, 2012).

2.4.2 Implementation problems

Even assuming that knowledge from RCTs or systematic reviews is the best available knowledge, then there still remains a challenge in getting professionals motivated enough to actually use this knowledge in everyday practice. This could be described as an implementation problem (Hasson & von Thiele Schwarz, 2017). The core of the implementation problem is that generalized knowledge from systematic reviews, RCTs, guidelines and treatment manuals are supposed to work in local practices and that the model of EBP has not put enough focus on how to get this evidence to work in local practice, i.e., how to bridge the gap between research and practice (Avby, 2017). Scholars point out that the process of integrating a guideline, or results from a systematic review or a treatment manual, often demands several adaptations from the general evidence to the local practice in order to work (Hasson & von Thiele Schwarz, 2017). Fidelity to and adaptation of evidence is already a much discussed topic, especially in mental health areas where the increasing use of treatment manuals in EBP has led to debates about the appropriateness of adapting treatment manuals to contextual circumstances in local practices (Norcross, Beutler, & Levant, 2006; Sundelin, 2013). Responding to the criticism that EBP becomes a 'cookbook' concept forcing professionals into simple rule-following, Sackett et al. argue that implementation "requires a bottom up approach that integrates the best external evidence with individual clinical expertise and patients' choice,

it cannot result in overly submissive or cookbook approaches to individual patient care. External clinical evidence can inform, but can never replace, individual clinical expertise" (1996, p. 313).

2.4.3 EBP as a centralized top-down bureaucratic project

One common critique of EBP in welfare sectors outside of medicine is that it has been operationalized as a top-down bureaucratic project that risks disrupting local care practices by demanding they work with specific methods or interventions (Bergmark & Lundström, 2011). Some scholars argue that EBP is strongly interconnected with ideas of new public management (NPM) in their goal to control local practices, and that EBP therefore can be seen as a NPM strategy (Johansson, Dellgran, & Höjer, 2015). Pease criticizes EBP for its "hidden managerialist agenda" (2007, p. 10) which is aligned with a search for greater efficiency and improved accountability. In line with this thinking, Johansson, Dellgran and Höjer (2015) argue that EBP relies on standardized measurement tools and effectivity measures that replace professionals' quality judgments in their local practices. They argue that these tools are a part of new public management strategies to create a market logic with focus on effectiveness and profitability in welfare sectors. They argue that these changes in welfare practices, such as healthcare, school and social care, risk removing professionals' knowledge and autonomy. By extension, this risks affecting the best care of clients, patients and pupils. Johansson, Denvall and Vedung (2015) evaluated the efforts by the Swedish national, regional and local governments to introduce and implement EBP in frontline public social welfare practice since 2007 and concluded that the "the evidence wave tends to structure the field from a social science methodology point-of-view, not a client- oriented or a professional practitioner point-of-view" (2015, p. 73). Furthermore, they argue that this top-down EBP push within social care resulted in a vanishing client perspective and a power asymmetry caused by top-down managing based on knowledge from RCTs at the expense of professional knowledge and client values.

2.5 EBP in continuous evolution

While there is a tendency to view EBP as a static concept, perhaps due to the strong emphasis on formalizations in techniques, models, and methods, the concept of EBP and its related operationalizations seem to be in a state of continuous change. EBP approaches evolve as scholars, professionals and others recognize and respond to problems associated with its practical application. As Sackett et al. observed in the early development of EBM: "evidence based medicine remains a relatively young discipline whose positive impacts are just beginning to be validated, and it will continue to evolve" (1996, p. 313). There

have indeed been many practical responses to the issue of how to balance the different knowledge sources in EBP such as various 'co-creative' approaches that focus on models to include both clients and professionals in EBP knowledge production and implementation (Metz et al., 2019; Nicholas et al., 2019).

Similarly, within the field of systematic reviews there have been many developments of formats that incorporate other kinds of quantitative study designs (beyond RCTs), as well as qualitative studies. The field of systematic reviews in EBP is constantly evolving (Smith & Duncan, 2022), therefore, and there is now a plethora of methodologies for conducting systematic reviews (Sargeant & O'Connor, 2020). Both internationally and in a Swedish context, the EBP organizations and government agencies responsible for efforts associated with EBP, are continuously responding to the critique by refining and developing their methods for compiling and assessing the best available knowledge as well as their strategies for enabling the uptake of their knowledge products in local welfare operations. In a Swedish context, this has included efforts to avoid top-down directives from national agencies. Instead, focus is put on how to support, rather than manage, local operations with evidence-based knowledge (SOU 2018:48).

2.6 Conclusions

In this chapter, I have provided an introduction to EBP. I have traced its origins to the work conducted by the McMaster Group in launching EBM as a new paradigm in healthcare. The chapter describes how these early ideas were adopted by various other welfare areas, a phenomenon that is referred to as the 'evidence movement'. This evidence movement has resulted in a plethora of different institutionalizations of EBP, engaging many different actors within state welfare, non-governmental organizations, academia, and political arenas.

Whereas professionals played a pivotal role in the early conceptualization of EBM, the following institutionalizations of EBP knowledge practices have predominantly concentrated on establishing structures for evidence production and related methodological advancements, encompassing systematic reviews, practice guidelines, and recommendations. The emphasis has not been on how professionals utilize evidence in their practical work. While there now exists a rigorous network of evidence producing bodies worldwide, less attention has been given to structures for supporting professionals with integrating all this evidence in local practice. This is apparent in the critique against EBP, which I have summarized as having to do with problems caused by a narrow definition of what gets to count as evidence, and problems with implementing evidence in local practices as well as problems associated with the operationalization of EBP through centralized top-down infrastructures.

However, the critique and continuous developments made by actors working with EBP have mainly been methodological and infrastructural ones remaining within the frames of EBP. When problems and solutions are primarily presented as methodological challenges and not also considered in epistemological terms there is a risk that these efforts will remain confined within the narrow epistemological boundaries defined by the principles of EBP. This, in turn, carries the potential risk that efforts to address the challenges of EBP may continue retracing the same paths repeatedly.

In this thesis, the ambition is to contribute to these developments of EBP by approaching the epistemological dimensions of these problems and suggested solutions. To this end, the next chapter will provide a review of a large body of literature from STS and neighboring fields within the humanities and social sciences.

3 Perspectives on EBP

In the previous chapter, I summarized the main critiques of EBP as having to do with problems of a too narrow definition of what gets to count as evidence; problems with implementing evidence in local practices; and problems associated with the operationalization of EBP through centralized top-down infrastructures. The previous chapter thus presented how actors address challenges *within* the boundaries of EBP. In this chapter, I will review literature that analyzes and challenges these very boundaries by addressing epistemological issues. I will show how this literature adds components to actors' critique of EBP that could contribute with generative developments of EBP.

This chapter is organized into three sections. In the first section, I will present literature that analyzes the epistemic principles in models and techniques in EBP. This literature critiques the epistemic principles underpinning how EBP is rendered in the dominant models and techniques. It also offers several epistemological reasons for broadening these narrowly defined principles. However, this approach for analyzing EBP has a potential blind spot: how EBP standards are actually produced and put to use in professionals' daily practice. To address this, in the second section, I present literature from empirical STS studies on EBP standardization practices. This literature adds interesting ingredients to the theoretical critique of the epistemic principles of EBP as it provides insights into empirically grounded epistemologies that are often unnoticed in representations of EBP. In the final section, I discuss the strengths and possible shortcomings of the above two strands of literature. I will show how a combination of this literature can work to reconfigure fixed epistemological understandings of EBP and contribute to generative developments. The chapter ends with an outline of how the insights from this literature, taken together, form my theoretical point of departure by providing a set of sensibilities that I put to work when studying EBP.

3.1 Epistemic principles in models and techniques in EBP

In scholarly analyses of EBP, much attention has been given to the epistemic principles on which these standards and formalizations are based. While some scholars argue that the evidence hierarchy is the best ranking system for the production and use of evidence (Howick, 2011), others seek to question the legitimacy of EBP's epistemological foundation on which the evidence hierarchy is based. In this section, I have chosen to sort these perspectives into three categories: 1) The need to recognize practice-based knowledge in EBP models;

2) Calls for more inclusive knowledge ranking principles; and, 3) Challenging the gold standard.

3.1.1 The need to recognize practice-based knowledge in EBP models

One set of critiques of EBP stress that the dominance of these epistemic principles undermines humanism by discounting individual patients or clients in favor of population statistics (Brody et al. 2005; Barratt, 2008; Rogers, 2002). The emphasis on the epistemic principles that rank RCTs and systematic reviews as being at the top of the models of EBP risks suppressing other sources of knowledge that are necessary when integrating evidence into clinical practice (Lambert, 2006). This kind of perspective on EBP points to the shortcomings of prescribing a standard course of action based on evidence that assesses outcomes on a population level, when the uniqueness of individual patients or clients demands variation in treatments, services, and ways of caring (Greenhalgh & Papoutsi, 2018). In a philosophical analysis of EBP, Jeremy Howick (2011) concludes that RCTs, and systematic reviews of RCTs, are rightly positioned at the top of the evidence hierarchy because of their reliable methods for evaluating the effectiveness of interventions. Howick argues that it is right to place expert opinions at the bottom of the pyramid because "a vast body of evidence, backed up by a strong theoretical rationale, indicates that using expert judgment when strong evidence exists results in poorer outcomes" (Howick, 2011, p. 188).

However, Howick stresses that professional expertise plays other equally important roles: "EBM requires clinical expertise for producing and interpreting evidence, performing clinical skills, and integrating the best research evidence with patient values and circumstances." (2011, p. 188). Engebretsen et al. (2015) argue that there is a lack of models and concepts that make explicit the interpretational work that is needed to integrate evidence in professionals' daily practice. Therefore, they argue, these interpretational operations are poorly understood. Further, if the principles for this interpretational work are not discussed as part of the EBP models, the process, and results of how professionals interpret and make use of evidence in daily practice will remain invisible. This perspective points to the need to integrate evidence with professional expertise and patients' or clients' preferences and unique situations.

Cartwright and Hardie (2012) have elaborated extensively on the role of evidence from RCTs in policymaking. They argue, that while an RCT is an excellent method to assess the efficacy of a clearly defined intervention and to answer the question of 'what works' (Cartwright & Hardie, 2012), extrapolation from this kind of evidence to an actual policy or for improving practices is less straightforward than is often recognized (Cartwright & Hardie, 2012). This critique of EBP does not concern the very definition of evidence as proposed by

the evidence hierarchy but focuses on the need to integrate evidence with the diversity of kinds of knowledge needed in everyday clinical decision-making.

3.1.2 Calls for more inclusive knowledge ranking principles

The second perspective on the epistemic principles in EBP models is concerned with how the classification of what counts as valid evidence excludes many other ways of knowing as 'non-evidence'. Not only does the evidence hierarchy exclude patients' values and downgrade professional expertise, but it also excludes knowledge produced from entire research fields, such as knowledge from anthropology, sociology or other qualitative research from nursing, social care or education. From this point of view, it is not surprising that the spread of EBP to areas such as social care and education has been met with skepticism among scholars within the connected research fields. Their knowledge base is questioned by the epistemic principles embodied in EBP standards.

Greenhalgh, Thorne and Malterud (2018) point out that there exists an hierarchy of secondary research evidence that generally places systematic reviews above narrative reviews. They argue that this epistemic hierarchy is wrong because systematic and narrative reviews serve different purposes and thereby should be viewed as complimentary. Similar concerns have been raised within social care. Boaz et al. (2002) argue that traditional systematic review methods may misrepresent the value of different research methods for understanding complex interventions by favoring results from RCTs. Goldenberg (2009) proposes that the fixed evidence hierarchy is guilty of being the source of EBP's "questionable epistemic practices" (Goldenberg, 2009, p. 171). Greenhalgh and Papoutsi (2018) elaborate on this issue by pointing to the failure of the evidence movement to handle complexity within healthcare and (as the title of their editorial in the journal *BMC Medical* makes clear) they argue for the need to radically change some of the basic epistemological ideals within EBP: "*Studying complexity in health services research: desperately seeking an overdue paradigm shift*".

A similar view is taken by Wieringa et al. (2018b) where they point to the links between the hierarchy of evidence, the attempt to reduce bias, and Modernist truth ideals. Within the evidence movement, a lot of effort has been put into detecting and eliminating sources of biases that potentially risk severing knowledge-seekers from 'the truth'. While the concept of truth within the Modernist project has been problematized from many angles, it continues to operate albeit in partly hidden manner, through the corollary concepts of 'bias' within EBP (Engebretsen & Baker, 2022).

The evidence hierarchy is a paradigmatic example of a standard developed to help actors to avoid scientific biases. Against this background, Greenhalgh and Papoutsi (2018) argue that research within health care services should have a complexity-informed approach that emphasizes the role of emergent causalities

where multiple interacting influences account for a particular outcome, but none can be said to have a fixed 'effect size'. Their argument is that the assumed model of causality within traditional RCTs in EBP is linear, cause-and-effect causality, and that this narrow model of causality is not adequate for researching health services. They thereby propose a change in what should constitute good research when studying health services. In a complexity-informed approach, the goal of research should be to explore tensions, generate insights and wisdom and exposing multiple perspectives. These goals then need another definition of what characterizes good research: flexible methods, pragmatic adaptation to emerging circumstances and contribution to generative learning (Greenhalgh & Papoutsi, 2018).

To sum up this perspective: EBP standards that favor RCTs exclude other valuable knowledge. The epistemic values embodied in the principles of EBP lead to a politics of evidence that favor interventions that are easily studied with the techniques of RCTs and neglect interventions for which outcomes are harder to study using these techniques. Taken together, these scholars argue for an expansion of the hierarchical ranking of evidence to include other kinds of knowledge too. They thus call for a more inclusive ranking standard.

3.1.3 Challenging the gold standard

A third perspective visible in the scholarly literature not only calls for a more inclusive evidence ranking standard, but focusses on questioning the epistemic criteria that give the RCT design its gold standard status in EBP in the first place. By pointing to some of RCT's limitations, this literature challenges the methodological and epistemological limitations of the RCT design (Cartwright 2007; Goldenberg, 2009). This approach is apparent in the following quote by philosopher Nancy Cartwright:

> *There is no gold standard; no universally best method. Gold standard methods are whatever methods will provide (a) the information you need, (b) reliably, (c) from what you can do and from what you can know on the occasion. Often randomized controlled trials (RCTs) are very bad at this and other methods very good. (Cartwright, 2007, p. 11).*

The high standard of evidence awarded to the RCT design has to do with its high level of internal validity (Goldenberg, 2009). A high level of internal validity assures that the results of the experiment represent the truth, that is, that the experiment has not been distorted with factors that might bias the results. However, it is not rare that high internal validity is achieved at the cost of external validity. External validity concerns how generalized the outcomes of a study are to the real world. Scholars have pointed out that the replicability of outcomes

produced under a strict RCT design are restricted to the highly specific conditions achieved in the experimental conditions (Cartwright, 2007; Cartwright & Hardie, 2012). Such outcomes show the comparative effectiveness of treatment for an average randomized participant because RCTs deliver population-average outcomes. A positive result shows that a treatment causes an outcome in at least one subgroup, but as Cartwright (2007) argues "it could produce exactly opposite results in other subpopulations" (2007, p. 16). It is to be noted that these are subpopulations representing significant clinical features as severity of illness, symptoms, and co-morbidity (Goldenberg, 2009). Added to this is the observation that participants in RCTs are not 'average' but most often form a homogenous group of participants, a kind of subgroup of their own. This is done in order to be able to control for confounding factors that could risk biasing the outcomes. This is an effort to increase internal validity of the experiment by purposefully narrowing variation in the participant group.

Cartwright (2007) emphasizes that in order to decide what lessons to draw from the conclusions of a rigorous RCT, that is, how to establish external validity, people have to discuss, debate, look at past practice and use good bets. To make an RCT externally valid, there are no rules, checklists or detailed protocols. There is nothing that lives up to the rigor demanded inside the experiment. In relation to these issues, Cartwright concludes that there is "no a priori reason to favour a method that is rigorous part of the way and very iffy thereafter over one that reverses the order or one that is less rigorous but fairly well reasoned throughout" (2007, p. 19). These problems of generalizability thus call the reliability of rigorous evidence into question (Goldenberg, 2009).

Again, whereas the perspective in the previous section questioned the evidence hierarchy as a valid knowledge ranking system by calling for a more inclusive view on what counts as valid evidence, the literature just recounted questions the hierarchy altogether. It shows the fallacy of the evidence hierarchy by questioning the generalizability of results from RCTs and thereby unsettles its claim to being the gold standard for objective evidence.

Altogether, the perspectives provided by this literature point to the fallacy of adopting the narrow epistemology embodied in the hierarchy of evidence for the whole range of domains for which EBP is supposed to offer guidance as to best practice based on best evidence. According to this literature, the epistemology built-into the principles and methods of EBP seems to be an important source for the multitude of problems that professionals report when faced with demands of working in an evidence-based manner. The literature presented in the section is concerned with the theoretical principles and models associated with EBP efforts. Then, I will approach perspectives on EBP offered from STS scholarship that studies how EBP is done in practice.

3.2 EBP in action: producing and using standards in practice

The agnostic stance in STS research emphasizes the need to approach means of knowledge production and utilization without making assumptions about their inherent goodness, neutrality, or determinism. This agnostic stance in STS encourages critical and open-minded examinations of the complex relationships between research, technology, and society without preconceived ideas. Instead, STS approaches enable investigations into how research and technological developments are influenced by and, in turn, influence society. A subfield within STS that is often referred to as 'sociology of standardization' (Timmermans & Epstein, 2010) has shown interest in the empirical study of the dynamics of standardization with this agnostic stance. While the literature in the previous section is explicitly oriented toward EBP specifically, research within the sociology of standardization is directed towards theorizing about standards and standardization more generally. Given the pivotal role of standards and standardization efforts in the operationalization of EBP, many of these STS studies have consequently focused on studying standards associated with EBP.

Bowker and Star (1999) show how exclusion and reduction are inherent qualities of formal classification. According to Knaapen (2014), the formal classifications within EBP, such as the evidence hierarchy, aspire to create unambiguous rules. This "purposefully hides the 'complexity and messiness' of the clinic from view." (2014, p. 282). The development and maintenance of standards are critical to most of our knowledge producing practices. However, the dimensions of standards used to control practices are idealized in the sense that "they embody goals of practices that are never perfectly realized" (Bowker & Star, 1999, p. 15). The practices of standardization are not static and automated but characterized by dynamic processes (Timmermans & Berg, 2003) as well as pragmatic achievements (Latimer et al, 2006) that draw not only on formal criteria but rely on situated and diverse kinds of knowledge (Bowker & Star, 1999; Timmermans & Berg, 2003; Timmermans & Epstein, 2010).

While standardization often connotes a dehumanization and suppression of individuality, Timmermans & Berg (2003, p. 23) point to the paradox of standardization as a "dynamic process of change". While this process aspires to create stability and (new) order, any order is an achievement that is hard-won and necessitates the work of diverse actors (Timmermans & Epstein, 2010). These aspects of standards and standardization practices have urged scholars within STS to empirically analyze the 'universal' as a set of complex constructs and to analyze local achievements by emphasizing the local and contingent in the

production and use of standards (Timmermans & Berg, 1997; Zuiderent-Jerak, 2007).

STS work has made visible just how much work is required by professionals in order to make such "universal" standards work in the real world of daily practices (Sismondo, 2010; Timmermans & Berg, 1997; Zuiderent-Jerak, 2007). So, while the kind of procedural standards common in EBP could be perceived as a shift from trust in professional expertise to trust in rule following (Porter, 1996), STS scholarship has shown how following standards requires situated judgments, local knowledge, and creativity from the individuals using the standard. In relation to EBP, these kinds of insights alter the view of the working of standards in EBP by showing how "EBP's actual knowledge base" (Knaapen, 2014, p. 828) already includes much more than what the EBP models recognize as evidence.

3.2.1 Formal rules and local contingencies in the everyday work of clinical trials

STS-research that has empirically studied practices of clinical trials have shown how the formal rules that form the clinical trial design, such as study protocols, are more flexible in practice than they appear in written form (Timmermans & Berg, 1997; Smolka, 2022; Helgesson, 2011; Petty & Heimer, 2011). The written demands of a study protocol need to be aligned with the already existing local practices within organizations (Petty & Heimer, 2011). This demands configuration of both the existing practices in which the trial is carried out as well as tinkering with the study protocols to fit with local contingencies, such as skills of professionals (Helgesson, 2011), existing material resources (Petty & Heimer, 2011) and patient trajectories (Timmermans & Berg, 1997). The work of aligning practices and getting the right actors to follow the prescribed rules requires negotiation. Successful managing of clinical trial protocols is also, therefore, a political process (Berg, 1997). Keating and Cambrosio (2007) draw attention to another dimension of the working of protocols: "they are not just impositions of a new order of practice, the new order implies the creation of new things or entities (DNA profiles, markers, disease categories, patient categories, etc.) and new ways of acting" (Keating & Cambrosio, 2007, p. 203). In line with this thinking, study protocols do not just involve reordering existing practices and entities – they can also create new objects.

Hauskeller et al. (2019) demonstrate how standardized rules in clinical trials must be brokered against cultural expectations and practices in international multi-center trials. For example, they show how standardized information sheets are not simply adopted without modification in new countries. Their content needs to be adjusted in accordance with local ethical expectations, such as insurance issues. Also, when patients are eligible for a given trial but do not speak

any of the languages represented in the standardized information sheets for informed consent, the local clinics must solve these ethical approval-related issues in the everyday trial work. Accordingly, each clinical team must find its own way of achieving 'universality' through local tinkering.

Helgesson (2011) is interested in the everyday local practices of clinical trials because this everyday work is seldom referred to in discussions about the method's strong position as gold standard in EBP. By observing how an RCT is conducted, Helgesson explored aspects of this everyday clinical trial work. He highlighted two aspects that increase the trustworthiness of RCTs, but which are seldom recognized, because discussions about trustworthiness are reduced to an axis between formalization and bias due to self-interests. Helgesson (2011) stresses that one consequence of this reduction is that trustworthy results can only be explained by displaying that formal rules and procedures have been followed to the letter.

Helgesson shows how daily 'data washing' is a part of the local clinical trial practice. For example, on one occasion there were contradictory notes on which arm a blood pressure had been taken on a patient. In this case, the responsible research nurse made the notes consistent, even though it was unclear that this change corresponded to the real circumstances. This kind of 'data washing' was not an attempt to purposefully distort data to affect the outcomes of the study. Instead, striving to eliminate oddities in data shows that, in the daily practice of the clinical trial, precision in the reporting of data was simply prioritized above complete exactness. In other words, a given RCT may very well be trustworthy for any number of reasons, but because the gold standard is only concerned with these formal rules, such reduction does not give a rich enough picture of the trustworthiness of the RCT in question – neither in its favor nor against it.

The study by Helgesson (2011) thus points to how the focus on formal rules in the reporting of RCTs make these kinds of "repairing" activities invisible. The discrepancy between how results of RCTs are reported and the great number of deliberations demanded in daily trial work to identify and correct errors in daily notes to transform them into the data needed in the RCT, leads to a lack of insight about the importance of these 'repairing' activities when interpreting the results of an RCT in relation to a new local practice. Helgesson draws the conclusion that data which have been arranged and made verifiable travel far more conveniently than the knowledge about how it became just arranged and verifiable (Helgesson, 2011, p. 92).

Using a similar approach, Smolka (2022) studied how a clinical trial of mindfulness and compassion meditation was conducted. She found several contradictions between multiple epistemic goods in the clinical trial, one of them resulting in a tension between internal validity and social relevance. In RCTs, it

is important to follow a predefined study protocol that contains detailed sequence prescriptions of how to proceed in each step of the trial. The protocol is supposed to minimize the risk of bias distorting the results, assuring internal validity. However, in the trial process that Smolka observed, the predefined English language training intervention in one of the randomized study groups was too hard for two of the participants to manage. The inclusion criteria for the study had been set to create a homogenous group of participants with similar levels of prior knowledge in English. However, during the RCT, it became apparent that the criterion 'does not speak English fluently' had been interpreted in ways that led to a more heterogenous study group than expected. According to Smolka, this leeway resulted in two of the participants not being able to keep up with the intensive English training and wanting to drop out. In order to keep the participants in the study, project leader reinterpreted the study protocol, instead of "following the rules foolishly" (Smolka, 2022, p. 13). The protocol that defined the intervention was reinterpreted so the participants did not have to keep up with weekly classes but could do the study material at their own pace. This reinterpretation both increased the social relevance of the intervention (made it work for those who wanted to participate) and increased the internal validity (because dropouts introduce uncertainties in evaluating the effectiveness of an intervention). Smolka concluded that "enhancing social relevance thus fostered internal validity through reinterpreting the study protocol" (2022, p. 13).

Petty and Heimer (2011) argue that conducting clinical trials should be seen as organizational accomplishments. This is because heterogeneous practices are always already in place in the settings where clinical trials are carried out (Timmermans & Berg, 1997; Smolka, 2022). In the process of producing outcomes, clinics work out new routines, acquire new technologies and hire new staff to make the trial work in the local practice. In this sense, a clinical trial has local organizational effects. When Timmermans & Berg (1997) studied the use of an oncology research protocol they found that the protocol functioned as both "means through which 'facts' can be *produced*", and also as "a crucial part of the networks through which the facts can be *performed*" (1997, p. 297). In line with Petty and Heimer's (2011) idea of clinical trials as organizational achievements, this suggests that in clinics that have been re-made to be able to conduct research, this re-making eases the implementation of the outcomes of that research.

A common study theme in STS studies on clinical trials is to study how the practice of research shapes the practices in existing local clinics by re-making the organizations where both everyday clinical work and clinical trials take place (Petty & Heimer, 2011). Petty & Heimer (2011) show how such re-making could consist in changes in material equipment necessary for enabling local clinicians to follow the study protocol. This includes adjustments of equipment, e.g.,

researchers in a multi-site RCT finding the need to provide pap smears and viral load tests essential for carrying on with the research in a local clinic in Thailand (ibid.). Petty and Heimer draw the conclusion that "how institutions organize care and research is consequential because the more care and research overlap, the more each is altered in the course of double-fitting the clinic and research protocol" (2011, p. 355). However, as Helgesson argues, these kinds of activities tend to disappear in the distance that is created by the relocation of locally produced data in the process of refining, analyzing, and reporting research results. We can thus expect that data is delocalized when they are relocated and thereby detached from knowledge about how they were produced (Helgesson, 2011, p. 77).

Timmermans and Berg (1997) show that in the use of an oncological research protocol in clinical practice a recurrent theme is that practitioners tinker with the protocol's written demands to make them workable in practice which could result in (re)articulation of the protocol's formal prescriptions to fit better with the trajectories of heterogenous actors. For example, they show how the protocol is tinkered with to better fit with the trajectories of cancer patients. The chance of cure by the specific treatment studied is relatively small, which motivates the patients to preserve quality of life, who then try to adjust chemotherapy appointments to their convenience or skip parts of the protocol when "they no longer see meaningful links between their own future and the protocol's trajectory" (Timmermans & Berg, 1997, p. 288). In this literature, the strict, detailed prescriptions of protocols are shown to be considerably loosened in the everyday work of clinical trials. However, making this visible is not supposed to be a critique showing the limits of clinical trials standards in practice. Rather, it clarifies that "tinkering, having the leeway to adjust the protocol to unforeseen events and repair unworkable prescriptions is a prerequisite for the protocol's functioning" (Timmermans & Berg, 1997, p. 293). In short, adjustment of the RCT's protocol is intrinsic to its enactment in practice and so, such adjustments need to be considered as part of the RCT's knowledge production itself.

3.2.2 The role of formalizations and judgments in gathering and summarizing evidence for everyday practice

Originating in the medical domain, the systematic review method was introduced within the evidence movement and developed into a rigorous method. The method is characterized by its systematic way of identifying, gathering, and compiling research through a highly formalized approach. The method is often stipulated in a list of *a priori* steps that reviewers are supposed to follow to ensure systematicity, transparency and minimize personal judgments and hence bias (Higgins & Green, 2022).

As elaborated in previous sections, this method has been criticized on the basis of its epistemic principles (Greenhalgh, Thorne & Malterud, 2018; Biesta, 2007). Excessive criticism, however, risks hiding valuable nuances and thereby contributing to a gap between simplified EBP and complex everyday practice. Empirical STS approaches have been used to go beyond such polarized views and focus attention on how universal standards and particulars such as situated judgments are intertwined within evidence standards (Sager & Zuiderent-Jerak, 2021). By using insights from the sociology of standardization, Linell, Bohlin and Sager (2022) show how two systematic review processes within the field of education are permeated by informal 'back-stage' configurations where the formal rules necessitate professional judgment in an iterative process.

In relation to criticism regarding the formalized procedures, Linell, Bohlin and Sager (2022), summarizing research within EBP, show how this criticism seems to be directed to the ideal image of the formalized practice rather than the actual review process. In an ethnographic study of a systematic review process in healthcare, Tiago Moreira (2007) discovered how the knowledge construction in secondary research is focused on attempts to extract data from milieus where they are commonly found, such as databases and texts, and to re-qualify the value of those data in relation to the specificities of the secondary research aim. He shows how these attempts structure the formal steps of a systematic review in a "continuous dynamic interrelation between mutually dependent locally situated activities" (Moreira, 2007, p. 194).

Much attention has also been given to the practice of production of evidence-based guidelines (Lagerlöf, Zuiderent-Jerak & Sager, 2021; van de Bovenkamp & Zuiderent-Jerak, 2015; Knaapen, 2013; Moreira, 2005). Systematic reviews are a foundation of guideline development with a narrow focus on compiling high quality evidence. In contrast, guideline processes usually also consider a diverse range of contextual factors such as resources, ethical values, prerequisites of targeted organizations as well as professional and patient trajectories (Wieringa et al., 2018a) in addition to assessing best available evidence.

In line with the trust placed in standards in EBP, the development of evidence-based guidelines is formalized in meta-standards – guidelines for guidelines. Within these meta-standards, much attention is given to the role of evidence according to the evidence hierarchy. However, STS studies on guideline development point to the insufficiency of these evidence-basing tools for fully regulating practice, by making visible the diversity of knowledge needed for assessing comparability between evidence from reviews of RCTs and targeted settings (Knaapen, 2013). These studies show how evidence is just one part of the rules, distinctions and justifications in the production of evidence-based guidelines (Knaapen, 2014; Moreira, 2005; Lagerlöf, Zuiderent-Jerak & Sager, 2021). Lagerlöf, Zuiderent-Jerak and Sager (2021) show how tensions occurred

between public health knowledge and the tenets of EBP in the work of producing evidence-based national guidelines of lifestyle habits. They found that conflicts between this public health knowledge and the format of national guidelines had to be constantly negotiated. Both had to yield on certain points.

Moreira (2005) observed how guideline development groups draw on a diversity of knowledge forms when producing evidence-based guidelines. He divides this social organization of knowledge into four different *repertoires* of evaluation. In addition to a *robustness* repertoire in which the groups construct robust arguments based on evidence, Moreira (2005) identifies three other criteria needed to justify the evidence-based guidelines: (political) *acceptability*; *usability* in practice; and methodological *adequacy* of the guideline process. These four repertoires of evaluation show the dynamics of guideline development processes and give insight into the many considerations that must be made when developing evidence-based guidelines for practice.

As such, in guideline development, you cannot rely solely on evidence. This is obvious in Loes Knaapen's (2013) study on how the absence of evidence is defined and managed in an evidence-based guideline project. She finds that guideline developers themselves consider their own products as significantly different from evidence synthesis. They instead see their main goal as answering clinical questions. Evidence constitutes an important means to achieving that goal. Often, there is an absence of evidence to inform guideline development processes. In these cases, guideline developers need to rely on expert judgment, research classified as 'non-evidence' and other forms of reasoning. Knaapen (2013) shows how guideline development is, thereby, not driven only by a repertoire of robustness of evidence. There is also a 'process' repertoire where the procedures of searching for evidence (and, in the absence of evidence, to make non-evidentiary justifications formal and visible) play a significant part in evidence-based guideline development. These empirically based insights show that EBP "has not created a positivist, objectivist medicine, these findings assuage the fear of critics and threaten the (supposed) dream of proponents" (Knaapen, 2014, p. 829).

3.2.3 Using evidence standards in everyday practice

The endpoint of the rigorous chain of evidence-based activities outlined above is the practices in which welfare services are provided daily. STS scholars have empirically studied what standards and guidelines do in everyday work: What role do they have? How do professionals use standards in their work? Timmermans and Berg (1997) conclude that EBP, as a 'massive standardization movement,' has focused much attention on creating procedural standards, such as guidelines to clinical practice, but that these guidelines have either little effect on daily practice (McGlynn et al., 2003), or at least not the effect that one might expect

when thinking of procedural standards (Timmermans & Berg, 1997). As Greenhalgh et al. (2008) found, clinicians relied heavily on tacit knowledge from accumulated experience to supplement, adjust or dismiss patients' 'scores' in standardized outcome measures in neurorehabilitation. These insights highlight the limits of standardized assessments within everyday practice and reveal that such assessments "can support, rather than determine clinical judgement" (Greenhalgh, et al. 2008, p. 183). Lydahl (2021) shows how nurses tinker with assessment protocols to make them work in encounters with the specificities of individual patients.

Moreover, it can be challenging to produce procedural standards in a way that satisfy diverse interests (Timmermans & Epstein, 2010). The settings in which new standards are supposed to be implemented are already populated with other standards, tools, people, and routine practices (Timmermans & Berg, 1997). Sometimes new standards are not compatible with these existing local particularities. Anna Mann (2021) shows a case in which the prominent standard for assessing quality-of-life was abandoned and forgotten. The quality-of-life assessment tools were in these practices deemed useless and unnecessary. In other words, for a new standard to take hold in the targeted setting, it must be embedded within the many particularities of existing practices. In this process, "not only is the practice standardized but the standard is localized" (Knaapen, 2014, p. 830). To get standardized guidelines to work, therefore, you need a close understanding of how professionals reach their daily decisions (Timmermans & Epstein, 2010).

Scholars in STS have taken these insights to study the so-called 'implementation problem' of evidence-based guidelines (Zuiderent-Jerak, 2007). Gabbay and Le May (2004) argue that successful implementation of evidence requires understanding of the processes of how explicit and tacit knowledge from different sources are negotiated, constructed, and internalized in local routine practice. In contrast to much of the research within the sociology of standardization, Gabbay and Le May do not take a specific standard as a starting point for their investigation. Instead, they examine how primary care professionals form their healthcare decisions. In their 2004 ethnographic study, they found that the individual professionals did not go through the steps that are traditionally associated with the linear diffusionist model of EBP. During the two years of observations, the professionals did not read the many evidence-based guidelines available to them in their routine, everyday work. The professionals could turn to guidelines if they were faced with an unfamiliar problem. However, once they were familiar with the procedure, they would rarely look at the guideline again. Instead of a strong reliance on guidelines, the professionals' daily work was informed by brief readings of evidence in different forms, but mainly by their own and colleagues' experience, the interaction between them, patients,

and a range of other sources of tacit knowledge. The professionals relied on "'mindlines' – collectively reinforced, internalised, tacit guidelines" (Gabbay & Le May, 2004, p. 1). These mindlines were iteratively negotiated with key actors in informal interactions and mediated by organizational demands and constraints (ibid., 2004). Gabbay and Le May's (2004) findings highlight the potential (and importance) of making use of the existing formal and informal networking that contribute to professionals' mindlines for conveying evidence into practice.

In sum, research from the sociology of standardization sheds light on informal practices often overlooked in EBP models and principles, as well as in related theoretical critiques of these models and principles.

3.3 Conclusions: towards a theoretical point of departure

In this chapter, I have reviewed literature that provides several perspectives on EBP, that gives substance to and add nuances to actors' critique of EBP. In this conclusion section, I summarize the perspectives on EBP provided in the two above sections and formulate how I will use them as a theoretical point of departure in the thesis.

Scholars that have analyzed the epistemic principles in EBP point out several concerns with these principles and criticize the models of EBP and their epistemological basis (Cartwright, 2007; Goldenberg, 2009; Greenhalgh & Papoutsi, 2018; Wieringa et al, 2018a). Such scholars argue that the evidence hierarchy, as a classification system for what counts as valid knowledge, excludes many other ways of knowing that are sorely needed when handling the variety of issues that methods of EBP are applied to (Wieringa et al., 2018a; Engebretsen et al., 2015). Others conclude that there is no universally best method, instead gold standard methods should be the ones that provide the information you need in a reliable manner (Cartwright, 2007), whatever form they take, RCT or not.

A strength of these perspectives on the epistemic principles in EBP is that they point out the fallacy of applying the same narrow epistemology embodied in the hierarchy of evidence as if it were a template that could be simply applied directly to the whole range of potential issues you seek knowledge about. Another strength of these perspectives is that they address and give substance to the problems that actors acknowledge regarding EBP. A possible shortcoming of this theoretical critique is that it builds on an idealized view on knowledge production. Within this idealized view lies the assumption that such epistemic principles actually dictate action and thereby cause problems which arise out of assuming a too homogenous view of how knowledge is produced in EBP.

The agnostic STS studies on the actual production and use of EBP standards show how the theoretical critique of the epistemic homogeneity of EBP ignores that actual EBP practices "have always relied on diverse forms of evidence and knowledge, albeit informally and largely invisible to outsiders" (Knaapen, 2014, p. 832) by highlighting mismatches between the ideal standards and the contingencies of practice (Timmermans & Berg, 1997; Petty & Heimer, 2011; Linell, Bohlin & Sager, 2021; Knaapen, 2014). Such empirical studies show how following EBP methods, guidelines and protocols require situated judgments, local knowledge, and creativity. That is so, whether it be regarding RCT study setting (Helgesson, 2011; Smolka, 2022; Petty & Heimer, 2011), conducting systematic reviews (Moreira, 2007; Linell, Bohlin & Sager, 2022), or practice guidelines (Moreira, 2005; Knaapen, 2013). Studies from STS also point to the need to reframe the so-called implementation problem from being a problem of non-adherence to pointing out the fallacy of the linear idea of knowledge use (Gabbay & Le May, 2004; Zuiderent-Jerak, 2007). Such studies suggest a move away from the idea that evidence use has to imply instrumental rule following towards recognizing the need for a more "dynamic interaction between various knowledge practices" (Zuiderent-Jerak, 2007, p. 312).

A strength with the studies that investigate the workings of EBP in practice is that they show how professionals enact empirical versions of epistemology that are much wider than recognized in the principles, methods, and models of EBP. This is done by showing how EBP's actual knowledge base includes much more than what the EBP methods and models are willing to define as evidence. These conclusions could thereby be used to dislocate dichotomous positions in EBP debates because they "assuage the fear of critics and threaten the (supposed) dream of proponents" (Knaapen, 2014, p. 829). On the other hand, a possible risk of the perspective offered from such studies could be that these descriptive accounts could work to preserve a status quo by a kind of 'romanticizing' of the interplay between standards and professional judgments. Striving to add nuances to simplified understandings of standards risks taking the steam out of actors' potentially justified critique of them. Too much focus on describing the interplay between EBP standards and situated local knowledge neglects whether the EBP standards have been designed to formally incorporate professional expertise and other research designs, not solely relying on RCT research, they might have offered professionals alternative guidelines and diverse forms of knowledge to engage with.

From my hybrid position as both an actor in EBP and an STS scholar, I see how these different perspectives on EBP offer an interesting dynamic. Together, they can be put to work to release EBP from an epistemological straitjacket. These perspectives might, at first glance, appear incompatible. However, I believe that these perspectives complement each other and that a combination

of them could have generative potentials for evolving EBP. The scholars interested in analyzing the epistemic principles of EBP are explicitly engaged in discussions within EBP (contrary to STS research that are often rather detached from those discussions) and point out the need to integrate evidence standards with a range of other sources at the moment of application in the everyday work. They emphasize the role of the professional as a nexus for this integration. They have several suggestions for how to get to grips with the problems associated with these narrowly defined principles of what counts as good knowledge by pointing out the need for more inclusive knowledge standards (Cartwright, 2007; Goldenberg, 2009; Wieringa, et al., 2018a). They are thus committed to changing these epistemic principles in EBP. I share these commitments. What STS research adds to this theoretical portfolio is that it highlights a discrepancy between the concept of EBP in theory and what it becomes in the hands of professionals in real world settings. Together, this STS research can be seen to challenge two dominant views of knowledge in EBP: it challenges the view on epistemic homogeneity through standards; and it challenges the linear idea of knowledge use.

I mostly situate this thesis within the field of STS. Nevertheless, the combination of literature provided in this chapter altogether provides me with a broader set of sensibilities about EBP and how this phenomenon can be approached, an analytical toolbox, that I make use of in different ways in my exploration of the current shapes and future possibilities of EBP. I will use these sensibilities to further explore professionals' epistemologies and turn these explorations into actionable contributions committed to expanding the boundaries around EBP by approaching its epistemic principles.

4 Methods

In this chapter, I present the projects from which my empirical material is derived and explain my methods (Table 1). The thesis draws from a collection of cases and situations that have to do with issues concerning EBP within these projects. These address the central issues being investigated here.

4.1 Overall research approach

The thesis is built upon an iterative, and at times unpredictable, research process that seeks to explore and experiment with the integration of EBP and STS. It encompasses various projects, including smaller contract work, like a systematic review project and a sustainability/public health initiative; as well as a larger research project conducted at a social care provider. This diverse range of projects adds breadth to the thesis but also presents challenges in terms of summarizing the methods, analytical resources, and data in a cohesive manner within the method section.

The idea of jumping into new projects when given the opportunity, in the course of undertaking my doctoral research, was a conscious and deliberate choice, an approach that corresponds to central ideas within the emerging subfield of STS making & doing (Downey & Zuiderent-Jerak, 2021). As Zuiderent-Jerak put it, when accused of being naïve and courageous for accepting an invitation to be part of evidence-based guideline development as a sociologist of science: "I guess the biggest risk is that I will learn something" (2021, p 199). The collective label STS making & doing includes projects that, alongside knowledge production, focus on situated experiments with STS knowledge expressions and knowledge travel to audiences beyond the field of STS.

These projects share a common thread in that they convert ideas and sensibilities from STS into actionable contributions within the studied fields. STS making & doing approaches involve reflexive, multi-directional learning. Through collaboratively experimenting with new ways of ordering practices, professionals and researchers engage in mutual learning. STS making & doing projects thus offer scholars "means to enable professionals to engage with their own practices in new forms that provide ways to redefining problems, problem spaces and timely solutions" (Mesman & Carroll, 2021, p. 163). At the same time, such experimentation also generates 'learnings' from the interlocutors and settings in which you work (Downey & Zuiderent-Jerak, 2017).

The different projects of which I have been a part have enabled me to explore the current empirical shapes of EBP within these local practices. The

collaborative nature of the projects has also resulted in several practical experimentations with new ways of doing EBP within these practices.

4.1.1 Experimenting with attaching STS-sensibilities to knowledge expressions

Downey and Zuiderent-Jerak (2021) describe how the flow of STS knowledge into and out of empirical arenas often occurs through the application of 'STS-sensibilities'. These sensibilities refer to observable instances of knowledge expressions that embody the content of STS knowledge, even without explicit reference to formal linguistic formulations. In other words, the travel of STS knowledge occurs through the practical application and enactment of STS perspectives, concepts, and approaches, rather than solely relying on explicit articulations of STS theory (Downey & Zuiderent-Jerak, 2021). This could mean that, as a scholar, you can "offer your interlocutors something new to inflect their understandings of themselves and possible future actions, accepting the challenge to theorize in situated, localized, and material terms" (Downey & Zuiderent-Jerak, 2017, p. 225). This also challenges you to learn from these knowledge travel practices. Unlike 'diffusion', which suggests a passive spread of in uniform concentrations, the term 'travel' implies active transport of knowledge through specific practices that are distinguishable and traceable. It also avoids the connotation of an external force causing collision, which is associated with the term 'impact', instead it highlights the dynamic and interactive nature of knowledge exchange (Downey & Zuiderent-Jerak, 2021).

As outlined in Chapter 3, the toolbox of theoretical resources applied in this thesis constitutes a combination of insights from STS and neighboring fields within the humanities and social sciences. In the projects I have been involved in, attaching these sensibilities to knowledge expressions have often taken the form of *situated theorizing* – a form of theorizing that occurs in discussions and reflexive sessions with my collaborative partners where I respond to empirical situations by using my perspectives as an STS-researcher. Other knowledge expressions informed by STS-sensibilities have taken the form of reports and PowerPoint presentations, as well as being part of more experimental practices such as building knowledge infrastructures. While these informal activities are not visible in the compiled papers, they nevertheless form a crucial part of my research. These informal activities have constituted the basis for configuring problem spaces, data gathering, doing theoretical and analytical work, and learning about EBP more broadly. The compiled papers constitute attempts to make these learnings also travel in an academic context. In Chapter 7, I provide a more in-depth discussion about this overall research approach, as well as how my ambition to actively contribute to the reshaping of EBP, by remolding STS

knowledge expressions, also raises interesting questions about knowledge production in STS.

4.2 Research settings

The thesis is a compilation of five papers from four different projects that touches upon different aspects of EBP within welfare areas outside of the medical field that have adopted or seek to adopt the ideas of EBP. In this section, I describe the projects from which the papers derive.

Systematic review project for the Public Health Agency of Sweden

Paper I derives from a research project which was a collaboration with the Public Health Agency of Sweden. I was contracted to conduct a systematic review about educational interventions for the prevention of suicide. During the process of conducting the systematic review I recognized aspects of the review process that would be interesting to analyze deeper and publish a paper about.

An invitation to provide perspectives on manual-based treatments

Paper II is the result of an invitation to give perspectives on manual-based treatments for a special issue in a journal about family therapy. The guest editor had come across what we were doing on the Master's program in evidence-basing and had become interested in the perspectives on formalizations and judgments from STS applied to manual-based treatments.

'Evidence-basing researcher' in a social sustainability/public health initiative

Paper III is an outcome of a regional social sustainability/public health initiative which I was invited to as an evaluator and researcher in evidence-based practice. The aim of the initiative was to increase the number of pupils in school completing their studies by focusing on prevention of bullying in schools: "Increasing completed studies *through safety and a calm study environment*".

Experiments in evidence-based practice with a social care provider

Papers IV and V report insights from a project aimed at exploring what evidence-basing could become in social care. The research project was a collaboration between a group of researchers within the fields of STS, improvement science and evidence-basing, and a non-profit social care provider in Sweden. The manager of the quality department at the provider was also a researcher within the field of improvement science, affiliated with a University in Sweden. These

prerequisites constituted a solid ground for a collaborative transdisciplinary research project that allowed for different research questions associated to the exploration of what evidence-basing could become in the setting of social care practice. The research project had three main research foci: (1) To develop useful knowledge reviews within social care practices at the provider; (2) To explore the potential of what EBP could become in social care, considering the experimentation at the provider; and, (3) To examine how the concepts and theories within the sociology of standardization can be challenged and elaborated on by experimenting with combining standardization and expertise.

4.3 Methods applied in the appended papers

Paper I draws on situations and experiences from the process of conducting a scoping review within the systematic review project with the Public Health Agency of Sweden. The paper aims to contribute to the ongoing developments of scoping review methods by drawing on the lessons learned from the project. The empirical material derives from a combination of notes from meetings, mail correspondence between persons within the research project and internal documents, taken in combination with the memories and experiences from my colleagues and me.

Paper II aims to contribute to discussions about the use of manual-based treatments within family therapy and uses conceptual analysis. The conceptual analysis draws on scholarly literature about the use of manual-based treatments and combines this literature with a theoretical apparatus developed from insights derived from the field of sociology of standardization as well as studies conducted on forms and types of objectivity. This analysis allows me to conceptualize how professionals could relate to the use of manual based treatments in their daily work in a way that goes beyond the common either/or discourses in discussions about manuals in EBP.

The purpose of Paper III is to contribute to new ways of thinking and doing management and EBP of complex welfare issues. This is done by increasing the epistemological understanding of these concepts. To fulfill this purpose, the paper provides a conceptual analysis informed by data from scholarly literature on EBP and NPM combined with theoretical insights about formalizations and heterogeneity of expertise. Through conceptual analysis, an analytical model is developed, the potential uses of which are illustrated by using data from the empirical case explored in the social/sustainability project (described above). The data from this project derived from ethnographic observations of meetings within the initiative, interviews with key actors as well as official and internal documents.

Paper IV, which aims to contribute to a discussion about EBP management-by-knowledge infrastructures within social care, draws on a combination of interviews with social care workers, ethnographic observations at two daily activities units within disability care and document analysis of governmental reports and regional procurement documents. The data collection focused on mapping the infrastructures of management-by-knowledge and its consequences at national, regional, and local care levels. This sampling was chosen to capture a whole chain of management-by-knowledge in the specific case of "increasing client participation in disability care". The case was chosen for its "strategic importance in relation to the general problem" and is considered to be a "critical case" (Flyvbjerg, 2001, p. 78).

Paper V seeks to contribute to discussions about the emerging engaged forms of STS by developing an understanding of how a combination of 'Care in STS' (Lindén & Lydahl, 2021) and 'STS making & doing' (Downey & Zuiderent-Jerak, 2021) can be turned into a generative mode of knowledge production. I do this by reflecting on my own experiences of carefully experimenting with EBP. This paper thus constitutes a meta-reflection based on the same data described in paper IV in combination with my own experiences of the research process in relation to scholarly discussions about engaged forms of STS.

Table 1: Summary of data collection applied in the appended papers

	Study type	**Methods**	**Empirical material**
Paper I	Empirical	Ethnographic meta-reflection	Notes, e-mails, documents, experiences from my own research process.
Paper II	Conceptual	Conceptual analysis	Scholarly literature.
Paper III	Conceptual with empirical case	Conceptual analysis	Scholarly literature, observations, documents, interviews.
Paper IV	Empirical	Ethnographic case study	Observations, interviews, documents.
Paper V	Empirical	Ethnographic meta-reflection	Observations, experimentation, interviews, documents, own experiences.

4.4 Analytical work

The analytical procedure applied varies in each of the papers. This can be attributed to variations in scope, study type, and data used for each paper (which is described in detail in the individual papers). Nonetheless, there are some commonalities that are consistent across the analytical work in all the papers. In

the following sections, I will elaborate on these overarching characteristics of the analytical process.

The analytical work conducted in the thesis has relied on an abductive approach holding both participatory and interactive commitments within the collaborative projects in which I have been involved. Tavory and Timmermans (2014) describe abductive analysis as a creative process of generating empirically-based theories. They argue that abductive analysis "provides a way to think about research, methods and theories that nurtures theory construction without locking it into predefined conceptual boxes" (Tavory & Timmermans, 2014, p. 4). The approach depends on iterative processes of working with empirical materials in relationship with theoretical literature, with a special attentiveness towards unexpected findings that can contribute to developing theory (Timmermans & Tavory, 2012).

Abduction is thereby framed as an alternative to deductive and inductive approaches as it involves moving back and forth between the empirical realms and different concepts and theories. In fact, it is more than an alternative to those approaches. By drawing on the work of the pragmatist philosopher C. S. Peirce, Tavory and Timmermans (2014) argue that the traditional division between induction and deduction does not accurately capture how empirical discovery occurs in reality. Instead, discovery and justification are to be seen as inseparable moments. Following this reasoning, abductive analysis provides an epistemological position that brings into view, and stresses, the intertwined relationship between theory, method, and observation.

Noortje and de Rijcke (2020) argue that abductive analysis also holds a participatory commitment as it approaches the perspectives of actors, and exchanges with them, as valuable sources for interpretation and theorizing. Doing analytical work with a participatory commitment means that actors are explicitly engaged in informing the process of interpretation (Noortje & de Rijcke, 2020). Such participatory commitment within an abductive analytic approach simultaneously implies letting go of reproducing the role of the researcher as a detached analyst and instead recognizes the researcher as a form of engaged expert. With respect to these diverse kinds of collaborative projects in which I have been involved, the analytical work has been characterized by participation. This characterization was given by those I have collaborated with, and much of the analyses have been undertaken, or at least started, together in reflexive sessions, meetings and workshops where empirical situations have been discussed in relation to different theories and concepts. Below, I summarize some of the common traits of the analytical processes in my papers. There are three central points:

'Situated theorizing on the go': In the collaborative projects in which I have been involved, I have been encouraged consistently to engage in what can be described as 'situated theorizing.' This means that I've been prompted to reflect on empirical situations from my perspective as a researcher. This form of situated theorizing has occurred during reflexive sessions, working group meetings, and workshops. These dynamic interactions gave rise to numerous theoretical hunches and proto-theoretical ideas (Tavory & Timmermans, 2014). Among these, certain ones caught my attention as particularly intriguing, prompting me to explore them further through more rigorous scholarly analysis.

Management of data: During each of the projects, I have been diligent in taking field notes, transcribing interviews, and recording meetings, reflexive sessions, and workshops. After deciding to explore a proto-theoretical idea further, I gathered and managed the relevant data needed for a systematic analysis of the phenomenon. For the empirical papers, this often included transcribing the meeting recordings, interviews, and observations. For the conceptual papers this meant gathering relevant scholarly literature.

Systematic analysis of initial theorizing: After defining the phenomenon of interest, I conducted a more rigorous analysis to explore the proto-theoretical ideas through:

- Reviewing relevant literature to understand the context to which I want to make a scholarly contribution.
- Iteratively shifting back and forth between data (literature, transcripts, field notes, documents) and theory, viewing them in light of each other, and discussing the findings with research partners and continually gathering more data where needed.
- Challenging the analysis by subjecting it to contrasting logics and defamiliarization strategies, such as adopting diverse perspectives and encouraging discussions with research partners for alternative interpretations and heightened reflexivity of my own personal beliefs and values (Creswell & Miller, 2000; Tavory & Timmermans, 2014). Such strategies included thinking counterintuitively, creatively, being open to finding surprises in the interpretation of collected material, as well as having continuous discussions with my research partners who variously supported, played devil's advocate, and challenged my interpretations.
- Organizing analytical insights into themes or categories to create a coherent scholarly output linking prior research to the empirical findings and new theoretical contributions. In my experience, the process of academic writing enhanced the analysis by exploiting weaknesses in the analysis, identifying gaps in the argument, and highlighting the need for alternative theme/category structures.

Validation of analysis: One technique used to ensure credibility of the analysis was to continuously share and discuss the results of my analyses with my collaboration partners during the production of the scholarly outputs (Creswell & Miller, 2000). This procedure worked to increase the credibility of the analysis because it enabled me to examine multiple perspectives on a theme or category. It also functioned as a check, ensuring that the empirical data was rendered correctly. Other validation procedures include the peer review processes of the compiled papers as well as discussions of my texts at internal seminars at the FLOV Department at Gothenburg.

4.5 Ethical considerations

Whenever research involves human beings, human tissue, or sensitive personal data, the researcher needs to apply for ethical review (Swedish Ethical Review Authority, 2023). The purpose of the ethical review is to protect individuals in society against physical and psychological harm, undue intrusion into their living conditions, humiliation, and violation of their rights (Swedish Research Council, 2017). It is the responsibility of the ethical review authority to assess whether the benefits of the research outweigh the potential risks for the research participants.

One specific task of the ethical review authority is to ensure that risks are minimized to the greatest extent possible without compromising the benefits of the research (Swedish Ethical Review Authority, 2023). These basic requirements for protecting individuals in research can be summarized in four main principles: 1) the information requirement; 2) the consent requirement; 3) the confidentiality requirement; and 4) the utility requirement.

When doing research on social care practices, ethics are of great importance since one often encounters sensitive personal information. Therefore, ethical approval was obtained from Swedish Ethical Review Authority for the ethnographical and experimental studies at the social care provider. The other research projects did not require formal ethical approval. This, of course, did not mean that ethical considerations were not undertaken during those other projects as well. On the contrary, I have continuously engaged with the ethical aspects of the various choices encountered during the research projects. In every new meeting I have attended, I have introduced myself as a researcher, explained why I attend the meeting and asked for consent to use the notes from the meetings in my research. When using empirical material gathered from these projects in my papers, I have been careful to selecting cases that do not expose any personally identifiable details of specific individuals.

5 Summary of papers included in the thesis

In this chapter, I briefly summarize the papers included in this thesis. I relate them to the projects they are a part of, and their contribution to the overall purpose of the doctoral project. The papers are also summarized in Table 2.

5.1 Paper I: Mismatches in the production of a scoping review

This paper was written after my first systematic review project done collaboration with the Swedish Public Health Agency. For this project, I had an idea to try combining systematic review methods with insights from STS to develop the EBP technique. In the course of pursuing the project, I was not familiar with the emergent experimental vein of STS and did not have the resources to put words to what I was doing or for describing what kind of 'animal' this project was. An early draft of the paper was written in a more traditional STS ethnography format. During an informal conference the draft was presented. A well-established STS researcher was critical of that approach and said that doing an ethnographic study of my own systematic review practice threatened the trustworthiness of the study findings. After this conference, I realized that I had to change the format of the paper because it would (and perhaps rightly so) not be accepted as a valid paper in its current form. This was the starting point of what was to become an exploration of different practical forms for this kind of hybrid-project. It was also an exploration of different ways of producing knowledge from these sorts of project, generating learnings, and increasing my self-understanding of what kind of knowledge production I am making and doing with the actors I was in collaboration with.

As such, this first paper is a tentative attempt to write about the insights from my hybrid projects. It was published in the *Journal of Evaluation of Clinical Practice*, a well-known journal for actors that discuss issues related to EBP. In the paper, I ask what could be learned from my empirical case of conducting a scoping review and the possible implications for future development of scoping review methods. The paper is directed at a potential problem I had observed in relation to the development of scoping review methods.

The concept of a scoping review was first described by Arksey and O'Malley in 2005 and has since then been widely adopted in EBP practices. Arksey and O'Malley describe a framework for scoping reviews that aim to map the literature on specific topics in order to identify key concepts, gaps in research and sources

of evidence to inform practice, policy makers and research. The growing popularity of scoping review methods within EBP led to a movement towards a more formalized and uniform methodology of scoping reviews according to the epistemic principles underpinning traditional systematic review methods. The epistemic principle I refer to in this case is the idea that formal rules prevent human judgments that result in personal biases. Formal rules thereby assure objectivity and validity of the research findings.

Empirical study of the production of knowledge within STS and other fields has shown that formalized methods help create a canonical view of general and objective scientific knowledge. However, the actual practices of science are highly particular and informal. In our systematic review project, these informal practices had been a profound part of our work and we wanted to share these insights so as to bring into view the practices that are made invisible in the formal methods of systematic reviews as well as in the current development of scoping review methods. What I am trying to do in the paper is to propose a broadening of the epistemology of EBP by showing how objectivity and validity of scientific knowledge can be achieved (and most often are achieved) through more than strict following of methods, formal rules, protocols etc., and that informal practices of reflections, discussions and negotiations play an indispensable part in achieving objective and valid scientific knowledge. Highlighting mismatches between formalizations in public settings and the role of informalities in the actual practices within scoping reviews may serve to create more realistic expectations about the methods, the validity, and the potential of these endeavors as well as avoiding unnecessary disappointments when informalities are uncovered.

In the paper, I make use of the insights from the STS subfield *sociology of standardization*. Timmermans (2015) shows how formalities do not oppose informal expertise, but rather exist in a dynamic and creative interplay. That is, standards do not entirely control actual practices since experts adjust standards and adapt situations in different ways according to the perceived needs of the practices. Insights from the sociology of standardization could accordingly be described as a "dance of (in)formalities" where the exact roles of standards and expertise in this dance vary, but never disappear.

In addition, Sismondo (2010) suggests that in practice, rules are not strictly followed but serve as a jointly accepted goal, which is also a type of rule. The formal rules then serve the function of goals to be achieved. Sismondo's reference to rules as goals to be achieved emphasizes the interplay of (in)formalities. Whereas studies of the interplay reveal how standards do not determine behavior, as it were, 'on their own,' Sismondo adds a component that is seldom made explicit. This view highlights standards as goals to be achieved rather than rules to be followed. Standards are intended to prescribe what should

be done in each step of a process, but according to Sismondo, standards may also be used to visualize what will make the final product valid.

In the paper I draw on empirical situations from my scoping review project to show how the formal methodological steps in the review process both a) supported decisions continuously during the process; but, b) were in constant interplay with informal iterative practices wherein we reflected, discussed, and revised the scoping review. To build on the lessons learned from this reviewing process, I suggest that scoping review method could benefit from making the informalities of reviewing practices more visible. In the conclusion I state: "For good epistemological reasons, deduction is attractive, but mismatching reproduction of this ideal will at best hide, and at worst disturb, good reviewing practices and the need for iterative adjustments of the scoping review" (p. 936). In doing so, I am being outspokenly normative - something not typical for the STS environment in my department.

5.2 Paper II: Formalisations and Judgements in Manual-Based Treatments

Manual-based treatments, and the ideas of EBP in general, have been the topic of heated debates for several decades within social care. These debates have at times led to polarized views and dichotomous positions. While much attention has been given to these debates, the more nuanced views tend to be ignored. This paper is written for a special issue focusing on manual-based treatments in *Focus På Familien*, a journal about family therapy research. I was invited to write about perspectives on manual-based treatments based on research relating to the dynamics of standardization that carried out at my department.

I approached this as an intriguing challenge to do STS research in a way that made sense for the main reader group of this journal - scholars and professionals in family therapy. How could the insights from the sociology of standardization help professionals to make sense of manual-based treatments beyond polarized views? And how could this be expressed in a more accessible way that makes sense to people outside of the field of STS? These were questions that had concerned me for some while. I was as much intrigued by STS research as I was bothered by the lack of actionable contributions resulting from these scholarly descriptions. This invitation meant that I could put STS findings to work on the actual problems that had been formulated by scholars and professionals. This is contrary to another common approach within STS which uses empirical cases to develop theoretical insights relevant for other STS scholars.

In the paper, I argue that approaches to manual-based treatments are served by conceptual analysis, and that a modern theory of science influenced by STS

insights offers relevant perspectives for such analysis. I use a conceptual apparatus of formalization and objectivity as central concepts for analyzing different views on manual-based treatments visible in the scholarly literature. A point of departure in the paper is that manual-based treatments can be understood as a kind of formalization. The discussions about these manuals can thereby be understood as different views on the suitability of these formalizations and their perceived constraint on professional judgment.

However, empirical studies from STS show how formalization and judgment should not be seen as opposing forces. Rather, they are in constant interaction when formalizations are put to use in practice. The paper discusses possible ways out of an unfavorable polarization between dichotomous positions by focusing on how formalizations and judgments can go hand in hand. As I learned through analyzing the discussions about manual-based treatments, this nuanced view of the potential of such formalizations already exist in the scholarly literature. However, this viewpoint tends to get drowned out by the attention given to the loud debates about the very existence of manual-based treatments in family therapy.

Paper II can thus be viewed as an attempt to strengthen a more nuanced view on formalizations. By combining the concepts of formalization with the work on objectivit*ies*, the study suggests that the concept of *dialectical objectivity* is a suitable epistemological ideal when working with manual-based treatments. By dialectical objectivity attention is drawn towards the interaction between formalizations and judgments. Making this interaction explicit is not to say that all combinations of formalizations and judgments are suitable for all purposes. Instead, the epistemological ideal of dialectical objectivity puts focus on the need for thoughtful analysis on consequences and benefits of different combinations of such interaction. As such, this approach to manual-based treatments thus requires a large degree of empirical openness. Not all combinations of formalization and judgment are appropriate for all purposes.

5.3 Paper III: We need to talk about knowledge

Paper III is the outcome of the regional social sustainability/public health initiative to which I was invited to as a researcher in EBP. There were already researchers (in management and organization) connected to the initiative as evaluators when we entered the project. However, the project team wanted to discuss their initiative in relation to EBP as well, and they invited me as an evaluator of sorts (however, I think *interlocutor* might better describe my role). The initiative's way of managing and using research was distinctively different from the evidence standards within the models of EBP. It took a great amount of effort for me to figure out how their way of working related to EBP. I saw

how they continuously worked to incorporate different forms of research but how this was done without strong formalizations. They worked so far beyond 'evidence-implementation-fixed' ideas of EBP that I almost disregarded the initiative as not being EBP.

After many discussions with others connected to the initiative, I started to realize that this way of working could be interpreted as another version of EBP, perhaps a very good one at that. Together with Thomas Andersson, one of the other researchers connected to the project, I decided to conceptualize this different way of doing EBP as *post-EBP*. Thomas Andersson had come the conclusion that the initiative was organized in ways that corresponded to what the management scholarship have conceptualized as post-NPM.

Post-EBP entails a broadening of the narrow epistemology enacted through the models and infrastructures of EBP. The paper constitutes an epistemological analysis of the literature about EBP and the problems and solutions described by different actors. These literatures all describe problems with EBP that are connected to the observation that its models and techniques are not well suited to handle the complexity of many welfare issues. The solutions offered by these scholars could be considered as apprehending a broader epistemology by recognizing that there are more ways to achieve valid and objective knowledge than the stricter models of traditional EBP allow.

As with Paper I, I make use here of the insights from sociology of standardization. This time these insights are combined with research on post-normal science and its focus on heterogeneity of expertise to build a two-dimensional analytical model that aims to make visible the many epistemic combinations that a broadened epistemology of EBP could incorporate by providing an 'epistemological map.' By applying this analytical model on the subregional initiative, I show how the initiative could be understood as enacting components of post-EBP.

5.4 Paper IV: Evidence-based practice and management-by-knowledge in disability care

This paper is the first publication from my involvement in the project 'Shaping rapid reviews in the nexus of evidence, stakeholder involvement and professional trust'. The project was a transdisciplinary collaboration with researchers from three universities and a social care provider in Sweden. The aim of the project was to draw on the emergent STS-interventionist approaches to do situated interventions with EBP with the provider. The overall aim of the project was to experiment with producing a kind of rapid review. Rapid reviews are a less comprehensive version of systematic reviews (like I had previously conducted

and reported on in Paper I for the public health agency). They are often conducted to provide rapid and brief overviews of research for a specific policy or practice issue (Tricco et al. 2015). Rapid reviews had also been used to contextualize findings from systematic reviews and could therefore be understood as having developed out of a critique of the systematic review method's insufficiencies in handling complex issues, answering questions relevant for practitioners and providing timely reviews (Khangura et al, 2012).

EBP in social care had been widely debated and proved difficult to achieve according to its traditional methods and techniques. In this project, we wanted to explore how we could work with rapid reviews, or knowledge reviews as we came to call them, and integrate them in social work at the provider in a way that was supportive rather than discouraging or obstructive. I started by getting familiar with two disability care units at the provider by ethnographic observations and interviews. The purpose of this initial phase was to explore the current shapes of EBP and to understand how these units worked. This was needed to be able to do *situated* experiments with knowledge reviews later in the project. One critique of EBP is that the models used in their efforts for general and universal knowledge fail to create knowledge that encompasses the local and situatedness of everyday care practices. Research from STS has generated many insights on the relations between generalized and local knowledges and we wanted to put these insights to work.

During the observations and interviews at the disability care units, I was struck by the mundane everyday practices conducted without tensions or drama. Instead, the practices seemed well-functioning, very unaffected by any kind of EBP attempts, and driven by knowledge from staff and clients (not dominant standards, guidelines, or protocols obstructing everyday work as described in scholarly discussions of EBP in social care and a common topic within STS as well).

Paper IV started with the debates about EBP in social care and claims regarding various forms of epistemic injustices[4] imposed on both staff and clients by demands to use EBP in social care. Epistemic injustice has been used as a valuable theoretical resource and applied to the case of EBP in disability care. Thus, the choice to work with the concept of epistemic injustice was made

[4] The concept of epistemic injustice was coined in Miranda Fricker's 2007 book *Epistemic Injustice: Power and the Ethics of Knowing*. The term refers to a specific form of injustice "done to someone specifically in their capacity as a knower" (Fricker, 2007, p. 1). The concept has been widely used in research within social science and the humanities, including STS research.

because it had been used previously in studies that critique EBP for impinging oppressively on practitioners and patients or clients.

The concept has also become a very popular resource in STS studies in recent years. Inspired by an epistemic injustice framework, analytical attention is given to the dynamics of *epistemic interactions* in the different levels of management-by-knowledge. Specifically, epistemic injustice is used as a guiding notion to sensitize our analysis to power dynamics between evidence, social workers, and clients, within the knowledge practices of management-by-knowledge. Are these practices (for example, methods, guidelines, routines, and daily care practices) including or excluding important sources of knowledge from professionals and clients? How are professionals and clients recognized, or going unrecognized, as credible knowers?

In Paper IV, I analyze three levels of management-by-knowledge by EBP: Centrally produced knowledge reviews from NBHW; regional level procurement processes and surveys; and everyday practice at the two disability units. I conclude that the parts of EBP that were examined do not support the most dire warnings from social work scholars. The methodologies and practices examined in this case do not seem to impose epistemic injustice on either social workers or clients. These findings challenge a widespread image of power imbalances between management-by-knowledge through national EBP infrastructures and knowledge from social workers and clients on which EBP works oppressively, causing injustices.

An earlier draft of the paper was more focused on the concept of epistemic injustice and the risk of losing the analytic symmetry or agnosticism that characterizes STS work. The argument in this earlier draft focused on the importance of approaching any phenomenon with the empirical curiosity emphasized by the analytical symmetry in STS before calls for epistemic injustices. In this draft, the examined case served as an example of why you should not accept a widespread idea of EBP as something excessively dominant and powerful. Instead, you should empirically explore how EBP and management-by-knowledge could come in many different shapes, not all of which are so oppressive and inflexible.

In the final version of the paper, I briefly make the above observation in a discussion section where we reflect on the notion that a framework based on epistemic injustice theory carries the potential risk of adopting value-laden presuppositions regarding injustice from the outset of the study that could bias the analysis. The framework of epistemic injustice risks prejudicing from the outside the way in which one investigates the practices. Furthermore, as I mention in the paper, the arguments made therein risk being hijacked by narrow proponents of EBP for their own purposes. Overall, however, as we discussed

in the research group, the argument should ideally contribute to nuancing the more heated debates of EBP in social care, rather than fueling one particular side of this unhelpfully polarized debate, thus seeking to contribute to moving the field of social care beyond such limited either/or debates.

5.5 Paper V: Enactments of evidence-basing

Paper V forms a chapter in the edited volume *Ethical and Methodological Dilemmas in Social Science Interventions*. The purpose of the edited volume is to develop the understanding of 'careful engagements' as a generative mode of knowledge production taking place between researchers and their research fields. Engagements in STS are part of a long running discussion that has enjoyed renewed attention with the increased focus on the usability of social sciences. Care in STS, and STS making & doing, are two emerging movements that put a strong focus on the relations between researchers and their research fields. In this chapter, I explore my own engagements and relations to the studied field in the research project at the social care provider (described in Paper IV) by combining sensibilities from care literature and STS making & doing approaches. The paper seeks to develop the understanding of how a combination of care and STS making & doing can be turned into a generative mode of knowledge production.

In Paper V, I describe how I collaborate with professionals at the social care provider to experiment with new forms of evidence-based practice by conducting knowledge reviews and integrating them in ongoing improvement work at the social care provider. I show how this experimentation challenged me to rethink what constitutes *evidence* when EBP is to be situated at a local social care provider. In this particular case, it meant abandoning rigorous EBP methods and hierarchies of knowledge. I also learned about subtle forms of evidence uses which made me reconsider what counts as *basing* evidence in this practice.

In the paper, I focus on the manner in which navigating how to care in intervention-oriented STS demands continuously reflecting on the relations between myself, the staff at the provider and the experiment being performed. This kind of navigation has been described in STS making & doing as 'sorting attachments', and in care literature as 'speculative commitments.' These two concepts are similar ways of handling issues of normativity versus agnosticism connected to engagements in STS. I add to these concepts by showing how this navigation is characterized by discomfort and an array of anxieties, showing how navigating how to care in intervention-oriented STS is affective labor.

The chapter also seeks to extend the idea of two layers of care as described by Martin, Myers and Viseu (2015), who propose that care comes with a dual focus or involves two layers: 1) care as a self-reflective element among scholars; and,

2) care as circulating among actors in the practices we encounter. However, when I reflected on this distinction it seemed insufficient to describe the engagements with making & doing knowledge reviews with the staff at the provider. What I had experienced during this research project was that our roles and relations were more fluid than acknowledged in the distinction between two different layers of care. This distinction draws on the ideal of a separation between researcher and study object, and during my collaboration with the staff at the social care provider I had reflected on the fact that this separation is complicated by our collaboration and joint effort in experimenting with EBP. As such, in Paper V, I elaborate on the two layers of care by showing how combining STS making & doing with care sensibilities can result in the *integration of layers of care*.

This paper is the first contribution that is directed to the scholarly discussions within STS. Since my whole doctoral period had been filled with different projects where I collaborated with different researchers and practitioners, these engagements have resulted in co-authored papers. Through these co-authored publications I have been challenged to work with different approaches and theories which have enriched my learning process in many ways. However, the chapter that makes up Paper V is single authored by myself, and during this writing process I had time to reflect on what kind of knowledge production these different 'EBP meets STS' projects generate and to attempt to put words to these processes.

Table 2: Summary of papers included

	Paper I: Mismatches in the production of a scoping review	**Paper II: Formalisa-tions and judgements in manual-based treatments**	**Paper III: We need to talk about knowledge!**	**Paper IV: Evidence-based practice and management-by-knowledge in disability care**	**Paper V: Enactments of evidence-basing**
Type	Empirical study in 'lessons learned' format	Conceptual study	Conceptual study with empirical examples	Empirical case study	Methodological study of STS knowledge production
Empirical field	Scoping reviews in public health	EBP in family therapy	EBP in welfare practices	EBP in disability care	STS making & doing and EBP
Theoretical resources	Sociology of standard-ization	Sociology of standard-ization Objectivities	Sociology of standard-ization Hetero-geneity of expertise	Epistemic injustice	Care in STS STS making & doing
Main contribution to EBP	Highlighting the informalities in scoping review methods may create more realistic expectations of the methods, the validity, and the potential of scoping reviews.	Contribute with a conceptual toolbox that professionals could use as a resource in their reflections and approaches to manual-based treatments.	Increasing the understand-ing of the epistemo-logical ideals of EBP and proposing a broader epistemo-logical ideal.	EBP does not have to be achieved through strict control but can be realized through fluid support and nudging.	Show how EBP can be enacted in situated and mundane ways if you let go of preconceived ideas of what EBP is and what it is not.
Main contribution to STS	How STS insights can be used to respond to frictions within the studied sites.	How STS sensibilities can be turned into practical tools for professionals.	How STS sensibilities can be turned into practical tools for profession-als.	How the concept of epistemic injustice may introduce biased presupposition s about injustice, potentially influencing the analysis.	The role of affect in STS knowledge production. The relations between researcher and studied fields are not fixed according to traditional ideals in experimental STS.

6 Moving EBP forward

In this thesis, I have set out to explore how STS sensibilities can contribute to the evolution of EBP. I have done so by exploring the current shapes and future possibilities of EBP beyond simplified views of its potential. In the process, I have had the opportunity to learn about what EBP become in various specific local settings, to put STS sensibilities to work on issues encountered in the specificity of these situations, and to use these situations as 'testing beds' for situated experiments. Chapter 6 highlights the shared themes that are present in the compiled papers. Despite being published in journals aimed at diverse audiences and utilizing various theoretical and analytical frameworks, when examined in the context of the overarching purpose of the thesis, these common themes become evident. One overall such theme running through the compiled papers is that they challenge and expand the boundaries around the notion of EBP in different ways.

The chapter is organized into three sections that each highlight and discuss three distinct ways that the results of the compiled papers contribute to the overall theme. As I discovered during the production of this chapter, the compiled papers (which are dissimilar yet related), when taken together, develop a kind of 'line-of-argument'. The first section addresses two important problems discussed in scholarly literature on EBP: 1) the strong reliance on standards for dictating actions; and, 2) the homogenous view of what gets to count as valid knowledge in EBP. I discuss how the insights from STS studies regarding the dynamics between formalization and judgment could be used for widening the epistemological understanding of standards within EBP and continue by highlighting the need to flatten pre-set hierarchies of evidence. Taken together, these ways of widening the epistemological grounding reconceptualize the notion of EBP.

The second section explores the empirical implication of such reconceptualization by showing how a widened epistemology opens up routes for articulating more mundane versions of EBP that risk being invisible in dominant understandings of what EBP is and what it is not. In the third section, I argue that it is not enough to widen and expand boundaries around EBP without providing pointers to what such a new conceptualization contains. In the fourth section, I build on the insights from the previous three sections to propose an unfolding understanding of EBP – moving away from the idea of EBP as a static and fixed approach towards acknowledging it as a continuously developing 'process of inquiry'. In the concluding section, I summarize the overall suggestions put forth in the previous sections of this chapter.

6.1 Widening epistemological ideals

One of the critical worries about EBP is a fear that other ways of knowing – ways seen as equally important for the possibility of providing good care – get overpowered (Lin, 2023). There are two principal reasons for such concerns. The first is that EBP standards are supposed to prescribe actions, leaving little room for professionals to adapt them to the contingencies of their local practice (Drisko & Grady, 2015). The second reason is that standards, according to the hierarchy of evidence, should be based solely on RCTs (Wampold & Imel, 2015). In combination, these fears speak to a misalignment between a commonly held view about what constitutes good knowledge in local care practices and the conceptualization of knowledge in EBP. In the following two sections I approach these concerns by widening epistemological ideals connected to the notion of EBP. I end the section by summarizing the implications of this widening and describe how it contribute to reconceptualizing EBP.

6.1.1 Broadening narrow ideals of formalizations

In this section, I approach the first concern regarding the trust place in, and emphasis of, strong formalizations that are connected to ideas of EBP. I do this by using resources from the sociology of standardization. In Chapter 4, I argued that such insights could work to release EBP from its epistemological straitjacket and thereby open up possibilities to contribute to reframing EBP's conceptualization of knowledge. This is what I have tried to do in Papers I-III.

Within the models of EBP, formalized knowledge tends to be highly valued, and studies have shown that these formalizations are sometimes in conflict with professional judgment in local care practices (Mann 2021). In Paper II, I elaborate on possible ways of avoiding an unfavorable polarization between EBP standards, on the one side, and professional knowledge on the other (Engebretsen et al., 2016; Lin, 2023). I do this by focusing on how formalization and judgment can go hand in hand in the use of manual-based treatments. Recognizing the necessity for professionals to 'work around' standards to make them fit with the contingencies of everyday practice (Timmermans & Berg 2003; Bowker & Star, 1999), Paper II points out how the shape and balance of knowledge is not always predictable, which necessitates a continuous interplay between formalizations and judgments.

Both Papers I and II could be seen as attempts to widen the epistemological belief that strong formalizations are what should be used to dictate action, ideals that many professionals carry when relating to EBP standards. The papers stress the need for a high degree of professional attention towards *both* the risks and possibilities associated with formalization and judgments in every new empirical situation. The risk of a naïve trust in formalization is that it renders invisible,

underdeveloped, and unreachable that which is necessary but which is not formalized (Engebretsen et al., 2015). Anything that is not explicitly formalized gets ignored as a valid course of action. Pointing out the necessity of professional judgment to get standards to work also provides epistemological reasons for including experiential, subjective, and situated ways of knowing in EBP's definition and conceptualization of what constitutes 'good' knowledge (Lin, 2023; Wieringa, 2018a).

Examining the interplay of knowledge sources in standardization practices (Timmermans & Berg, 2003; Bowker & Star, 1999) and subsequently concluding that EBP is not as uniform as either proponents or opponents often assume (as pointed out by Knaapen in 2014) carries a potential risk. While critiquing the prevailing image of how standards are produced and utilized, that kind of criticism does not necessarily impact the current standard knowledge production processes. This, in turn, may hinder recognition of the challenges that professionals and scholars still face due to the inherent uniformity within the evidence hierarchy and its associated methods.

Equally, the commendable effort to challenge rigid, either/or positions, we must consider whether these conclusions could inadvertently bolster staunch EBP proponents. On the other hand, a notable strength of these descriptive studies is that they have the potential to disrupt established notions of EBP and thereby create new opportunities for advancement (Zuiderent-Jerak, 2007). In line with this thinking, a possible shortcoming with Paper I and II could be that, while they challenge the dominant understanding of formalizations, they are simultaneously suggesting that a solution to professionals' problems with standards is that the professionals merely change their own assumptions about the potential of the standards rather than questioning the standard. For example, Paper II identifies a need to support professionals in how they can relate to ideals of strictly following manual-based treatments. By releasing professionals from the ideal of strict rule following to achieve an objectivity that is realized through restricting subjective judgments, the normative suggestion is that the concept of dialectical objectivity could be an appropriate ideal for professionals' epistemologies. As I argue in Paper II, this concept puts focus on the interaction between formalization and judgment. This necessitates a high degree of empirical openness, followed by careful analysis of potential consequences and benefits of different combinations of such interaction. However, by giving professionals support in how they can relate to these EBP standards, the paper preserves as intact the EBP standard without questioning the very suitability of basing treatment-manuals on only RCT evidence or the suitability of basing family therapeutic treatments on manuals in the first place.

In Paper III, I demonstrate how proposed advancements within EBP methods incorporate a more nuanced and explicit role for professional expertise

(Cartwright & Hardie, 2012; Hasson & von Thiele Schwarz, 2017). These advancements include different tools to adapt formalizations to contingencies of local practices. Building on these insights, Paper III suggests that the insights gathered from the sociology of standardization, taken together with the developments from researchers within the field of EBP, speak to a necessary expansion of the epistemological ideal of strict formalization of problems and solutions. What is proposed is an epistemology that recognizes the whole formalization spectrum at hand when trying to integrate external knowledge into local welfare practices: a spectrum ranging from strong formalization of problems and solutions, to low formalization and a high degree of professional discretion in handling problems and solutions – all depending on the specifics and particularities of the situation at hand.

Together, the normative suggestions from these papers could be seen as attempts to prevent the risks associated with 'mere' descriptive STS studies by playing active parts in redrawing boundaries around what gets to count as EBP. However, these advancements do not address the issue of homogeneity in the content of EBP standards. This homogeneity is rooted in a rigid ideal of what constitutes the 'best available knowledge,' as demonstrated by the evidence hierarchy (Goldenberg, 2009). This issue will be the subject of the following section.

6.1.2 Flattening pre-set knowledge hierarchies

The previous section was concerned with how the ideal of strong formalization can restrict subjective judgments. This section will address another, but related, concern regarding homogeneity of knowledge in EBP. This concern has to do with what is taken to be the 'best available evidence' in the first place, as expressed in the evidence hierarchy (Goldenberg, 2009).

The appropriateness of standardized interventions based solely on knowledge from RCTs has been criticized since the very beginning of EBP (Feinstein & Horwitz, 1997), particularly when EBP was adopted by other fields outside the medical domain (Biesta, 2007; Otto & Ziegler, 2008). Almost three decades ago, Feinstein and Horwitz worried that "The laudable goal of making clinical decisions based on evidence can be impaired by the restricted quality and scope of what is collected as 'best available evidence'" (1997, p. 529). Interestingly, at a similar point in time, the founders of EBP were highlighting the importance of not turning EBP into a set of mere 'cookbook' approaches. Sackett et al. write: "external clinical evidence can inform, but can never replace, individual clinical expertise" (Sackett et al., 1996, p. 72). In the same paper, they also proclaim how "Evidence based medicine is not restricted to randomized trials and meta-analyses. It involves tracking down the best external evidence with which to answer our clinical questions" (1996, p. 72). In this early paper, Sackett et al.

provide important nuances on the potential for EBP by delineating what it is *not*. EBP is not meant to be a one-size-fit-all solution. Even at this early stage, the importance of flattening those pre-set knowledge hierarchies which had put RCTs on top, independent on the issue at hand, had been stated (Zuiderent-Jerak, 2021). How can it be that we still, after 25 years, are struggling with the same kind of issues?

In Paper III, it is suggested that the epistemological assumptions that underpin the comprehensive work that have been put into building knowledge infrastructures for EBP bear some responsibility for this struggle. These epistemological assumptions, I argue, underpin actors' valuation of which methods and formats should be used in the operationalizations of EBP. The paper is therefore an attempt to foster epistemological reflections on these assumptions. In the paper, we focus on significant methodological developments within EBP. These developments show an increased awareness of the shortcomings of applying the principles of the hierarchy of evidence to answer all questions that need to be handled in the messiness of local practice (Wieringa et al., 2018a; Cartwright, 2007). The methodological developments try to solve the tricky need to involve knowledge from both professionals and service users in the production of evidence through different 'co-creative' approaches (Metz et al., 2019; Braye & Preston-Shoot 2005; Stewart et al., 2020).

Other developments involve attempts to include knowledge derived from study designs other than RCTs (Pawson, 2006; Gough, Oliver & Thomas, 2017; Rycroft-Malone et al., 2002). However, one risk of focusing too much on knowledge infrastructures without also formulating these developments in epistemological terms is that they get caught in the same epistemological trap as earlier versions. One reason for this could be that these methodological developments have to justify themselves in relation to the limited ideals that are hardwired into many actors' ideas of what constitutes valid knowledge, and this will continue to lead these new methodologies to dead ends (Zuiderent-Jerak, 2021).

The crux of these scholars' proposals could be interpreted as attempts to broadening the epistemic homogeneity of EBP models by incorporating alternative modes of reasoning and while still remaining scientific. Specifically, they argue that the evidence movement must recognize the plurality of perspectives that exist in order to effectively address the diverse array of issues encountered in practice (Goldenberg, 2009; Greenhalgh & Papoutsi, 2018; Wieringa et al., 2018a). These developments can be seen to move EBP from a homogenous view of expertise (from RCTs) to include a spectrum of epistemic expertise that moves EBP away from a narrow methodological focus towards including heterogeneous expertise and accepting methodological pluralism.

There are many similar suggestions in the scholarly literature on EBP that correspond with this suggestion. For example, Wieringa et al. (2018a) argue that the development of EBP guidelines is a dynamic process that requires a range of knowledge and experience, including, but not exclusively limited to, knowledge from RCTs. Lin (2023) points out the need for epistemological pluralism to encompass the multiple sources of information, such as empirical, experiential, situated and generally garnered information, to answer the practical questions that EBP are supposed to deal with.

I started this section by highlighting a misalignment between a commonly held view about what constitutes good knowledge in local care practices and EBP's conceptualization of knowledge. Collectively, the discussions presented above offer an epistemological reconceptualization of the concept of EBP that could do away with such a misalignment. Wieringa et al. (2017) suggest that the epistemological assumptions underpinning EBP are a consequence of the "modernist agenda to 'purify' reality into a dichotomy of objective 'evidence' from nature and subjective 'preferences' from human society and culture." (2017, p 964). Taken together, Papers I-III constitute attempts to foster epistemological reflections regarding these assumptions. The recent methodological developments aim to distance themselves from the narrow perspectives of traditional EBP and pave the way for a more comprehensive understanding of EBP. As Wieringa et al. (2017) argue, these developments seem to represent the demise of the Modernist dichotomization of knowledge and display a growing recognition about the shortcomings of such a dichotomy. However, this recognition is still too undertheorized. What Paper III adds to this literature is a reconceptualization of the notion of EBP which it visualizes in the form of an analytical model. This model makes it possible to see a broader epistemological map beyond the narrow knowledge ideals associated with traditional EBP. The purpose of this model is to support professionals and scholars that want to make sense of their own work in relation to ideals of EBP.

6.2 Articulating mundane versions of EBP

In the previous section, I described how the compiled papers expand the epistemological assumptions underlying EBP. In this section, I will explore how this reconceptualization of EBP can bring to light more ordinary empirical manifestations of EBP, challenging the conventional usage of EBP as merely a descriptor for standardized interventions (Thyer & Myers, 2011). I will discuss how studying welfare practices without preconceived notions of what EBP is, or is not, can reveal neglected empirical versions of EBP. By framing these practices as empirical expressions of EBP, this section expands the boundaries around the

concept of EBP, aiming to align it more closely with professionals' epistemologies found in the realm of actual practice.

Research within the subfield sociology of standardization brings to light the fact that EBP is actually based on much more heterogeneity of expertise than recognized in dominant views of EBP standards (as discussed in Chapter 4). The focus on standards, however, could hazardously fall into the trap of reproducing the standardization fetishism that they accuse EBP of. A risk with challenging the 'dominant image' of EBP's standards is that you simultaneously become an active producer of that same image (Zuiderent-Jerak, 2021). The critique of EBP keeps on reproducing the idea of EBP as rigorous top-down infrastructures dominated by standards that prescribe action.

In the same way, the meticulous interest in EBP's standards by STS scholarship is, in a sense, also performative of the idea of EBP as a standardization project. The risk of having too fixed a set of preconceived ideas of what EBP is, is that you will miss important aspects of what EBP becomes 'in the wild'. For example, when Gabbay and Le May (2004) studied how healthcare professionals make their everyday decisions, they found that instead of a strong reliance on guidelines, the professionals' daily work was informed by brief readings of evidence in different forms, but mainly by their own and colleagues' experience, the interaction between them, patients, and a range of other sources of tacit knowledge. If Gabbay and Le May (2004) had opted to examine how professionals utilize a specific standard, their study would have risked missing out on the mundane version of EBP that they found because it would have attributed the standard greater significance than its actual role in the practice showed it to have.

Mesman and Carroll's (2021) research is founded on the notion that exploring the ordinary aspects of everyday practice is valuable, as these aspects are often overlooked or undervalued in traditional EBP discourses (Mesman & Carroll, 2021). These studies have highlighted how the expertise and innovative thinking of practitioners lead to effective solutions and the prevention of errors within the complex and unpredictable nature of daily practice (Iedema, Mesman & Carroll, 2013). These studies indicate that not taking a specific EBP standard (such as guideline recommendations, manual-based treatments or protocols) as a starting point in exploring the workings of EBP in practice could reveal unexpected mundane versions of EBP in everyday practice that go beyond the fixed idea of EBP as primarily a standardization project.

At least, that is what I learned when entering two of my empirical fields: the initiative in the subregion in western Sweden (Paper III) and the disability care units at the social care provider (Papers IV-V). These empirical cases are far from dominant understandings of what EBP is, and within both projects I had to

struggle to make sense of these practices in relation to my preconceived notions of what constitutes EBP (Paper V). This, I argue, is because of the excessively strict boundaries that are drawn around what EBP is and is not. These are boundaries that are upheld both by strong proponents of a narrow definition of EBP, but also by critical scholars.

The descriptions of the empirical cases in both Papers III and IV correspond with an STS engagement aimed at exploring and articulating invisible and neglected everyday practices (Iedema, Mesman & Carroll, 2013; Puig de La Bellacasa, 2017). In the papers, I describe these cases as being two instantiations of EBP in practice. However, these are not neutral descriptions. By describing these cases as mundane versions of EBP, the papers are simultaneously legitimizing them as EBP practices and thereby widen the boundaries for what gets to count as EBP. This could be seen as a kind of counter-image to what I describe above. Rather than reproducing EBP as standardization it is reproducing EBP as mundane, careful practices.

Depending on of how I create the object of my research, I simultaneously create images of EBP. For example: A common idea is that a centrally driven EBP through management-by-knowledge means simple rule following (Drisko & Grady, 2015) through methods and guidelines that are unable to encompass the complex nature of situations in everyday practice (Witkin & Harrison, 2001). This rule following is then said to work oppressively on both professionals and clients (Johansson, Denvall & Vedung, 2015). However, Paper IV illustrates how EBP through management-by-knowledge can be realized through a tacit, fluid support. At first, we found few traces of traditional EBP products in the observed local units. Nevertheless, when we mapped the organizational support structures around these units, we saw how they enabled a dynamic interaction between external knowledge and knowledge within the local practices.

It is not at all obvious that these mundane interactions between various forms of evidence and professionals' and clients' own knowledge and experiences should be regarded – and thus confirmed or legitimated – as a version of EBP. Many would probably argue that they are not. However, when situated within these practices, I became convinced that they were enacting versions of EBP that are simply unrecognized in the dominant understandings. These cases represent versions of what EBP becomes beyond dominant discourses. Pointing this out is not to say that these mundane practices had no room for improvement. Rather, I found that these units could be strengthened by a more systematic gathering and integration of external knowledge in locally situated ways (Paper V).

Again, when taking standardization as a starting point for relativizing dominant views on standardization practices, there is a risk of unintentionally reinforcing EBP as a standardization project. However, the risk may initially

seem more serious than it actually needs to be. There are benefits to providing a more empirically nuanced understanding of standardization within EBP. On the other hand, starting from a greater openness that is willing to include 'non-standardized' practices allows us to explore, and learn from, mundane practices that may not appear as typical versions of EBP at first glance. However, there is also a risk associated with this openness, as it may inadvertently legitimize harmful practices. Such risk can be mitigated by identifying and addressing such weaknesses in each particular case, while also providing suggestions for improvement.

In a widened view of what constitutes EBP, both these perspectives, i.e., the standardization-driven and the mundane, are likely necessary. Importantly, they should not be viewed as competing viewpoints. Instead, both routes offer potential versions of EBP that align with the epistemological expansion of EBP. In the realms of practice, EBP can and already does exist both as a standardization project and a mundane, unpredictable practice. Recognizing this ontological multiplicity constitutes yet another attempt to redraw the boundaries around the notion of EBP so it aligns better with the plurality of empirical versions you come across in practice. This alignment is necessary in order to avoid developing EBP methods and tools that build on a castle in the air, in the sense that they build on an idealized view of the potential of EBP.

6.3 EBP as a 'process of inquiry'

In Chapter 3, I described how the descriptive accounts from STS studies open up a window towards releasing EBP from an epistemological straitjacket by showing how EBP in practice involves the use of a plurality of kinds of knowledge in dynamic non-linear processes (Timmermans & Berg, 2003; Helgesson, 2011; Zuiderent-Jerak, 2007). In the above sections, I have provided pointers to what EBP could become beyond previous limited conceptualizations. The risk, however, with proposing a widened epistemology together with articulating situated mundane versions of EBP, is legitimizing of an 'anything goes' approach. As I will show in this section, that is not my intention and is not a necessary or appropriate consequence. Thyer & Myers (2011) argue that it is a misuse of the term EBP to refer to specific interventions or assessment methods as 'evidence-based'. Instead, they stress that EBP should be thought of as a "process of inquiry" (2011, p. 8). Similar conclusions are drawn by Engebretsen et al. (2016) stressing a redefinition of EBP that acknowledges it as an endeavor, a process of inquiry, that involves concrete acts of knowing or 'evidence-basing' rather than thinking of EBP as a descriptor for simply following a guideline or protocol.

This conceptualization of EBP is intriguing as it evokes the ideas of curiosity and investigation as needing to be present during the unfolding process of seeking knowledge and making use of it in new situations. It also corresponds to STS insights about the EBP in practice being a dynamic, non-linear process. Building infrastructures that support professionals' ability to use EBP as a continues process of inquiry, rather than demanding welfare services *be* evidence-based, have been highlighted in previous studies on management-by-knowledge in a Swedish context (Garpenby & Carlsson, 2014). Thinking in terms of EBP being a process of inquiry emphasizes the need to create conditions for local practices to search for, receive and integrate external knowledge as well as for them to be able to develop their own knowledge and ongoing evaluations of the consequences of their operations (Thyer & Myers, 2011). I argue that this is the very opposite of accepting an 'anything goes' attitude.

In Paper V, I explore how improvement practices can become a part of the infrastructures of an unfolding understanding of EBP. For this purpose, I found that the improvement program run by the social care provider could work as a testing bed for such experimentation (Paper V). I wanted to explore if the two disability units I had studied and described as enacting mundane versions of EBP (Paper IV) could be strengthened by a more systematic gathering and integration of external knowledge. While the improvement program had structures that nurtured, challenged, and developed the local knowledge from professionals and clients, other structures that supported integration of external knowledge in this process were underdeveloped.

It should be borne in mind, as Avby (2015) argues, that calls for working with EBP could result in an increased complexity of work for professionals. In line with that thinking, it is reasonable to question the extent to which these units can effectively accommodate and manage 'new' knowledge, rather than assuming what specific knowledge the practice requires. In this case, situating EBP in the context of improvement work meant abandoning rigorous EBP methods and hierarchies of evidence and focussing on how to best provide external knowledge so that it becomes easily accessible and not overly verbose to the professionals that have neither the time nor competence to read academic texts. To achieve some kind of integration of external knowledge at all, the knowledge reviews had to be very easily accessible and be able to answer a plurality of questions that professionals might face during the course of improvement work, all this without dictating beforehand what knowledge the professionals 'should' use and how they should use it.

The results of the experiment with knowledge reviews (Paper V) show how the professionals did not use the external knowledge from the knowledge reviews in the instrumental way that is commonly portrayed in 'evidence – implementation – fix' models of EBP (Jerak-Zuiderent, 2015; Avby, 2015). Paper

V shows how the external knowledge from the knowledge reviews were tacitly interwoven in the ongoing improvement work in ways that exceeds the idea of EBP as strict 'rule following' (Drisko & Grady, 2015).

The experimentation described in Paper V displays an example of what EBP, conceived of as a process of inquiry, could entail. In this case, it meant taking the particularities at the local units as a starting point for constructing knowledge reviews that could be used for integrating external knowledge with local contingencies within ongoing improvement work. For other issues, where there are strong regulative standards to adhere to, the experimentation could perhaps be focused around taking the EBP standard as a starting point for a dynamic process of change instead (Zuiderent-Jerak, 2007). In either case, there is still a need for recognizing EBP as a process of inquiry rather than a static and fixed approach.

I propose that the move towards understanding EBP as a 'process of inquiry' is probably necessary when we accept that there are no simple one-size-fits-all solutions to either knowledge production nor getting knowledge standards to work in new situations and contexts. This is supported by the large body of literature revealing the dynamics of knowledge production and use in practice (Timmermans & Berg, 2003; Bohlin & Sager, 2011; Knaapen, 2014; Zuiderent-Jerak, 2007). Such an interpretation of EBP also aligns better with the professionals' epistemologies I have articulated in the thesis and described in relation to other literature in the last three sections. This process of inquiry interpretation focuses on the continuous experimentation that is necessary to produce and make use of external knowledge in new contexts (Zuiderent-Jerak, 2021).

The overall conclusion drawn from this section is that this reconceptualization of EBP stresses the importance of considering the specificity of local care practices as the foundation for exploring how to identify needs and solutions in ways that align with the contingencies of those practices. Also, this approach involves being receptive to the possibility that the outcomes may result in more ordinary or everyday versions of EBP than are typically portrayed in the prevailing narratives.

6.4 Conclusions: from straitjacket to 'process of inquiry'

One of the purposes of this thesis has been to challenge and expand the boundaries around EBP. This have been done by releasing EBP from its epistemological straitjacket, suggesting a widening of the epistemological basis of its models and expanding the boundaries of what EBP is and could become.

Questions that follow this contribution are: what justifies this widening of EBP's epistemological basis, and what are the risks? As mentioned above, one risk of focusing excessively on building an epistemology based on observations of how professionals currently operate is that it may end up legitimizing an 'anything goes' attitude. This concern is worth taking seriously and how to concretely answer these questions will depend on the particularities of the situation. This situational dimension is also what justifies a widening of EBP's epistemological basis. For example, in Paper V, I describe how I was uneasy about legitimizing the version of EBP that I was encouraging at the social care provider I collaborated with. However, through closely observing how they worked with continuously evaluating and improving their operations, I gained confidence that this version of EBP that I proposed to them was at least worth trying out, learn from and adjust if needed.

For other issues, in other situations, strong formalizations based on RCTs may be both valuable and necessary. This is well worth stressing because I do not want to suggest that EBP should consist in merely bottom-up changes and shunning RCTs altogether. These modes of using evidence carry the risk of turning EBP upside down which just creates an alternative and contrary set of problems – before the return swing of the pendulum back to strong formalizations and RCTs (Paper III). The point is to negotiate a middle ground that makes use of the best available knowledge without closing our eyes to the necessity of responding to the situational particularities of each case, which, as I have shown, is something that happens anyway.

By widening the concept of EBP to better align with professionals' epistemologies 'in the wild', a whole epistemological landscape opens up. Contrary to equating this with an 'anything goes' approach, I have argued that this demands even more from professionals involved in EBP endeavors. Working proactively, being situationally aware, and acting independently, all require competent professionals and well-resourced operations. In one sense, the hierarchical knowledge classification system, together with the high trust in strong formalizations, offers rather straightforward and simple solutions. These solutions, of course, are not seen as a constraint in the cases where such solutions are appropriate. Moreover, such solutions can also serve as 'window dressing,' allowing professionals to meet managerial expectations of 'evidence-based' work without needing to make significant changes to their actual practices. The notion of EBP can be seen and experienced as the opposite of a straitjacket.

Realizing that solutions must depend on the character of the problem means abandoning pre-set knowledge hierarchies. Following this insight, our definitions of what constitutes good knowledge will have to change depending on situation and the issue at hand. Instead of attending to pre-set solutions, this demands a continuous empirical openness to new situations and an array of possible

epistemic combinations for solving emerging issues. (Re)interpreting EBP as a process of inquiry calls for knowledgeable and competent professionals that are willing to learn from situations and put these learnings to work in new situations.

In Figure 2, I have formulated some epistemological sensibilities that could be useful for such endeavors. Intriguingly, these conclusions seem close to proposing a reintroduction of Sackett and Rosenberg's early conceptualization of EBP as "a process of life-long, self-directed learning in which caring for our own patients creates the need for clinically-important information" (Sackett & Rosenberg, 1995, p. 622). To nurture lessons from the last three decades of putting into effect EBP that have followed this definition would be to move beyond the idea of EBP as a straitjacket towards building infrastructures that recognize EBP practices as experimental laboratories in which professionals' learning are challenged, nurtured, and developed through continuous experimentation.

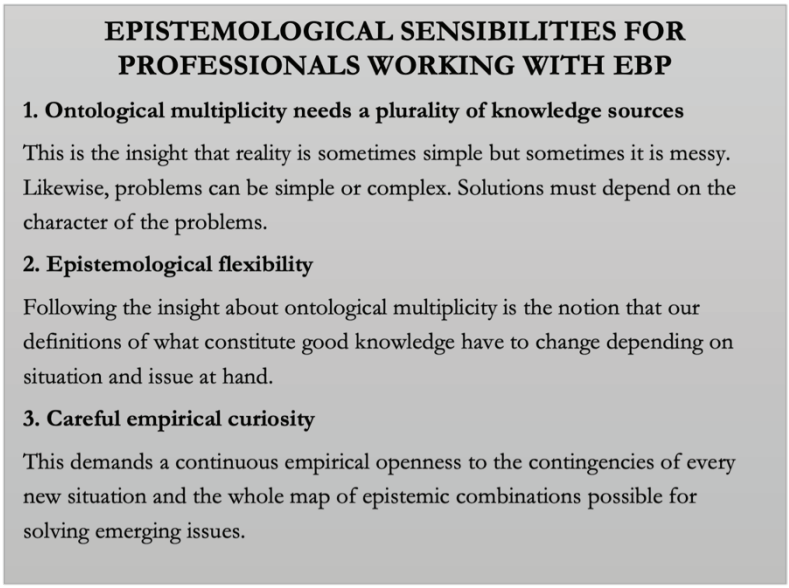

Figure 2: Epistemological sensibilities for EBP as a 'process of inquiry'

7 Moving STS forward

During this doctoral project, I had time to reflect on my own knowledge production in relation to the field of STS. My interest in how I can make use of insights from STS to contribute to developing EBP has led to continuous experimenting with both EBP and STS. In the previous chapter, I summarized and elaborated on the insights that the thesis has generated relating to EBP. In this chapter, I will summarize and reflect on the insights that the thesis has generated for STS. In the first section, I introduce STS discussions about changing terms for STS research with the increased focus on 'practical usefulness.' The three following sections are devoted to discussions about the experimental approach undertaken in the thesis, approaching some of the tensions that it provokes in relation to more established ways of conducting STS research and bringing to bear the learnings in relation to wider discussions in the field. The final section provides a conclusion wherein I summarize the overall conclusions from this chapter.

7.1 Changing terms for STS research and new landscapes to explore?

Recent discussions within STS have shown increased interest in how to 'get real,' i.e., how to achieve not only academic, but also, practical relevance and usefulness outside of academia (Bruun Jensen, 2007). These discussions have added new fuel to old debates about engagement in STS (Lynch & Fuhrman, 1991; Collins, 1991; Martin, Richards & Scott, 1991; Bijker, 1993); promoted continued self-reflection about its own knowledge production as well as the expression of such knowledge, within the field (Ashmore, 1989; Woolgar, 1988; Mol, 2002); in relation to the fields we study (Woolgar, Coopmans & Neyland, 2009); and, the extended society of which we are a part (Latour, 2004; Puig de la Bellacasa, 2011). While some researchers argue that close engagement with the studied field compromises 'neutral' positions, others caution that maintaining too much distance can hinder the understanding and improvement of problematic conditions.

The ongoing debates surrounding the engagement of STS researchers with their fields of study and the implications of such engagement are not confined to esoteric academic discussions. On the contrary, these debates reflect a broader societal interest in the practical relevance of the social sciences and humanities (Nowotny et al., 2001; Bruun Jensen, 2007). This move signifies a recognition of

the potential value that social sciences and humanities can bring to addressing real-world challenges and informing decision-making processes.

STS researchers' aspirations to engage more actively and contribute to practical applications of their research are encouraged by the increasing requirements in research grants to form partnerships with non-academic actors and requests for the development of methods to establish links between research and other domains of society. Simultaneously, STS researchers are increasingly invited into empirical arenas where they are encouraged to engage or intervene in different forms.

STS researchers have a history of approaching research objects as outsiders (Jensen, 2012), depicting themselves as powerless investigators of large and powerful scientific research fields (Latour & Woolgar, 1979; Bloor, 1976). The new forms of engagement and intervention, such as consultant work, evaluations or other 'contract work' as well as collaborative research projects, extend this STS repertoire so as to include approaches that 'study with' actors as STS researchers are increasingly invited to engage in discussions and decisions (Jensen, 2012). Such increased calls for engagements in the form of practical usefulness outside the domains of core STS scholarship have encouraged new innovative approaches that focus on experimenting with knowledge practices that facilitate travel of STS insights into other arenas (Downey & Zuiderent-Jerak, 2017; 2021). Calls for such engagements have not only resulted in inventions of new ways to collaborate outside the boundaries of STS. They have also put increased focus on the nonlinear knowledge travel work already existing *alongside* 'core STS' research. Practices that have not been visible in traditional academic venues, but which are gradually being pulled inside the boundaries of what counts as STS scholarship (Downey & Zuiderent-Jerak, 2021).

One potential risk in discussions about the shift towards doing STS in practically relevant ways is the creation of an image that portrays STS before this shift as static and homogenous – an account I want to avoid (re)producing. Instead, a more generous account acknowledges that STS has always embraced challenges and continuously explored the expression of its own forms of knowledge. STS has a rich history of engaging with diverse perspectives, methodologies, and contexts, adapting and evolving to address new questions and societal concerns. By recognizing the dynamic nature of STS, we can appreciate its ongoing capacity for self-reflection and innovation in knowledge production. In this sense, the heterogenous field of STS offers a plasticity that keeps it from becoming static – STS invents and reinvents itself continuously in order to stay relevant as well as simultaneously discuss the terms of its own knowledge production. Downey and Zuiderent-Jerak (2021) argue that STS has long provided intellectual and institutional space for projects that explore practices related to knowledge travel in empirical fields.

However, such projects have not always found their way into traditional scholarly venues that typically represent STS research. Calls for engagements in STS have not only resulted in inventions of new ways to collaborate outside the boundaries of STS. It has also put increased focus on the nonlinear knowledge travel work already existing *alongside* 'core STS' research. The increased societal focus on establishing links between research and practice can thus be seen as a challenge to explore 'informal' projects that have not counted as STS research, bringing them to the forefront and making them accessible for further development and theorizing. At the same time, these efforts have also stressed the exploration of how to navigate new forms of collaborative projects, 'contract work' or other projects that require researchers to embody multiple identities as well as being able to work within multiple research approaches. This opens the door to some fresh challenges to explore how we can produce research in this new landscape of opportunities.

The projects that the compiled papers result from are typical products of the increased focus on establishing knowledge exchange between research and practice through collaborative projects. The projects span from contract work to collaborative research projects. When I started the doctoral project, I knew that I wanted to do both EBP and STS and that I wished to combine them so as to play a part in addressing well-known problems with EBP and how it is operationalized in Swedish welfare. My approach throughout this process has been to get involved in many different projects in order to learn more about EBP from as many positions as possible. Throughout I was convinced that STS, with its long history of studying knowledge production and use, could help to contribute to reconceptualizing some ideas in EBP that many perceive as problematic. However, to make STS relevant for the issues I wanted to address, I found it restrictive to align with the descriptive tradition of STS which commonly builds on long engagements in ethnographic observations in a specific setting and publish results in academic journals to be part of the conversations going on there. How can I make use of STS in order *to be a part of* conversations taking place right in the middle of EBP operationalizations?

Papers I and II are attempts to participate in such conversations, mainly through addressing issues with EBP and publishing in journals where these discussions are taking place. In the project from which Paper III is derived, I had the role of an interlocutor and evaluator, and was invited into their discussions and conversations about how to operationalize the social sustainability initiative. Papers IV-V describe the process and outcomes of a transdisciplinary research collaboration between researchers from three universities and a social care provider in Sweden. In this project, I tried out the situated intervention approach (Zuiderent-Jerak, 2015) by working with staff at the quality department to build

infrastructures for integrating EBP in their existing quality improvement program.

When presenting some of my research from these projects at a seminar, one question that was raised was: Is this really research? Is this not what theorists of science do *on the side* of our primary business of STS research? While this could be interpreted as a rejection of the research I presented, I was encouraged to explore the view of knowledge underpinning of such a question. The emphasis on the phrase 'on the side' suggested a separation between 'real STS research' and the other activities that we undertake besides that, a separation that I was not fully comfortable with accepting. We can turn STS learnings about how 'we have never been modern' (Latour, 1993) onto STS itself. STS should not just challenge dominant images of others' knowledge production and use, but we should also be reflexive about our own knowledge production. STS should not be complicit in upholding and reproducing its own dominant images of its own knowledge practices without challenge.

From my point of view, the most interesting learnings came from these kind of participatory projects, and it did not make sense to exclude them as non-research. Woolgar et al. stress the multifaceted, indeterminate character of STS and "the many different ways in which 'application' might be understood" (2009, p. 21). They argue that "what counts as STS, the mode of application and the target are all local contingent interpretive matters". While most STS researchers would probably align with the view put forth by Woolgar et al. (2009), I nevertheless believe that the view of STS that is mirrored in the proposition of my research being something that we do merely *on the side* of our real research is an idea that many of us still carry with us, a view that is institutionalized, upheld and reproduced by our academic infrastructures and publishing formats.

In the following, I will shift attention to the move away from agnostic descriptions towards actionable contributions undertaken in this thesis: *What does it mean and what's at stake?* I will describe how such engagement has implied a mobilization of STS notions to work on specific issues that I have encountered in the specificity of each such project. In relation to this engagement, and in light of the increased focus on exploring new landscapes in STS, I will focus attention on three recurring themes that gets accentuated in relation to the approaches undertaken in this thesis: 1) the oscillation of roles and methods in collaborative research projects; 2) the nurturing of core STS sensibilities of 'keeping open' while staying relevant to the issues discussed in the empirical arenas; and, 3) questions about whether this kind of engagements risks eviscerating STS knowledge production and theory.

7.2 Oscillation of roles and methods in collaborative projects

In this section, I will discuss my role as an STS researcher in relation to the changing researcher positions that the collaborative nature of my research projects has required. Discussions about the role of the STS researcher is not a new theme. The long tradition of doing ethnographic fieldwork has prompted continuous discussions about the separation of 'insider and outsider.' When Latour and Woolgar (1979) entered the laboratory, they were worried that they did not have enough of the *anthropological strangeness* that they thought were crucial in order to do their ethnography. When Collins (1984) wrote about participant comprehension, he distanced himself from the view that a sociologist should always think as a social scientist in order not to 'go native.' Instead, he argued that the ideal form of sociology is when the sociologist thinks and acts as a native, but consciously and deliberately. Later, both Woolgar and Latour explored the idea of a subject/object divide by exploring reflexivity and its implications for ethnography (Woolgar, 1988; Latour, 1988).

The shift away from the idea of the STS researcher as the 'strange outsider' studying and theorizing about others' scientific knowledge production toward the researcher being encouraged to 'study with' actors in collaborative projects entails yet another challenge for how we relate to researcher identities, as well as to our traditional research methods. Mesman (2007) shows how the positions of 'insider' and 'outsider' are challenged when STS researchers are encouraged to operate in close collaboration with professionals in the empirical arenas where they have previously been doing distant observations. The dichotomy is challenged by the multiple roles and responsibilities that come with such engagements. Throughout the work involved in this thesis, I have been involved in projects where I am invited to *explicitly* affect practices. This necessarily changes the agenda from being a 'fly on the wall' study towards overt work with actionable contributions. This is what I have explored within the frames of this thesis and by accepting the invitations to be a part of different projects. All of this has motivated me to move beyond a more established view of the STS researcher's role for doing research in empirical arenas.

Initiatives to 'study with' other actors in collaborative projects not only challenges fixed researcher roles, but it can be said to result in an *oscillation* between the poles of description and intervention. The outcome of the strange outsider position was often to produce descriptive accounts from a distance (Jensen, 2012). However, situations where STS researchers engage in discussions and decisions envisage the STS researcher as an active participant, intervening in the situation as well. Discussions within the field of STS have emphasized that

doing ethnography is not just a matter of describing practices but inevitably involves intervening in them as well (Winthereik & Verran, 2012; Vikkelsø, 2007). This recognition has led to the increased awareness that description and intervention are not distinct but interwoven practices (Mesman, 2007; Vikkelsø, 2007). As Winthereik and Verran argue: "ethnographic stories have in them a capacity to re-present the world in ways that are generative for the people and practices that the stories are about, as well as for the authors and their academic collectives" (2012, p. 37). To add to such thinking, 'studying with' actors in collaborative projects places a heightened emphasis on the knowledge travel activities required to get descriptive accounts to intervene in empirical arenas and thereby go beyond linear perspectives on simple knowledge diffusion from a scholarly core. It thus recognizes the need for active engagement, dialogue, and co-production of knowledge between researchers and actors in different domains (Downey & Zuiderent-Jerak, 2021).

7.2.1 Ambiguities about how to manage multiple roles

In Paper I, I was invited as an actor who was knowledgeable about systematic review methods in EBP. This invitation could be understood as a strategy by the Public Health Agency of Sweden to fulfill their role. They are responsible for EBP through management-by-knowledge and the production of EBP products such as systematic reviews which are to be made accessible to actors within public health areas. This contract work positioned me very much as an insider, I was an actor who was restricted to following the formalized principles of systematic review methods.

Accepting this challenge, however, gave me insider experiences of this empirical arena. I then made use of these experience in order to theorize about the process of conducting the systematic review in relation to insights from STS regarding the interplay of formal rules and contingencies of practice. Thus, I embodied different roles, both as an actor in EBP and an STS researcher with ambitions of responding to the frictions encountered when visiting this empirical arena. In different phases of the project, I was an 'insider,' an 'outsider within' and an 'outsider' – and sometimes simultaneously.

However, the answer to how these roles should be managed was ambiguous. In the process of conducting the systematic review, I felt uncomfortable for two reasons. First, I had to follow the method without significant deviations because it was expected of me by the government agency which had to show credibility as an actor in the management-by-knowledge infrastructure. Second, I became uncomfortable realizing the high potential for the systematic review to become a 'paper tiger' – a merely bureaucratic exercise that would never be used outside of the government agency.

So, while this engagement was a great opportunity to contribute with insights from the sociology of standardization so as to be part of the discussions about increased formalization of systematic review methods (Paper I) it resulted in the recognition of a new set of frictions that caught my attention, that I got the opportunity to explore further and respond to in the coming projects (Papers III-V).

7.2.2 Instability of roles and agendas

In Paper III, I was invited to the subregional initiative to engage in reflections and discussions about how to lead the initiative forward. In this project, I got the chance to be an interlocutor in the working group and be a participant in their process of realizing the initiative. This allowed a combination of observations to be made in the different meetings that were held within the initiative. Added to this were the active reflections about what we researchers connected to the initiative saw through our 'theoretical lenses' and joint discussions about the implications of our contributory observations. They were interested in our reflections about how their approach to realizing the initiative in schools could be understood in relation to EBP and our STS-perspectives on EBP.

In the reflexive sessions the participants had different competencies but were united by a joint commitment towards a shared goal – we were all engaged in how to increase the number of pupils in school that complete their studies by focusing on prevention of bullying in schools. In the reflexive sessions, we are all subjected to the situated forms of theorizing that such circumstances prompt. In contrast to the idea of presenting an outsider's assessment report, my position in the project meant "acting from within to make a difference" (Mesman, 2007, p. 281). In 'acting within' we all failed to have full control of our professional roles, authorities and performativities (Mesman, 2007).

In collaborative projects, the dynamics of collaboration are conditioned by mutual expectations and requirements. In my case, it was made clear that if I did not provide the desired support, I risked being removed from the project. This implied a need for me to stay relevant and meet their expectations in order to maintain my involvement. On the other hand, I had the freedom to publish academic papers using the empirical material from the project, thereby becoming a critical outsider - especially if I encountered frictions that would make me want to reposition myself from being an 'outsider within' to a 'critical outsider.' However, I did not encounter such challenges, as we were apparently working towards a shared goal and had aligned commitments.

Collaboration of this nature becomes possible when there is a sense of compatibility between the parties involved. If our goals had been incompatible, the collaboration would not have been feasible. The specificities of each collaborative project thus shape the roles, positions, and engagements of

researchers, introducing an element of instability in their roles and agenda. This goes beyond predetermined notions of researcher responsibility and agenda. In these collaborative endeavors, the nature and outcome of the collaboration are influenced by the relational dynamics and attachments established within the project. The researcher's engagement is influenced by the specific context and the relationships forged within it, further highlighting the importance of understanding the complexities and dynamics of collaborative projects (Mesman, 2007).

Carroll and Mesman (2011) contend that research is now enmeshed as a complex network involving universities, external funding bodies and industry, and that this entanglement offers fresh challenges to research practice such as ethnographic research, which is a methodology built on a tradition of long-term engagement in the field of study. Today's collaborative networks require that researchers not only embody multiple identities but also enact multiple ways of doing research. In the research project I was involved in with the Swedish social care provider, I made use of traditional ethnographic methods to explore the workings of two disability care units. Yet, these initial observations were mainly conducted to inform further interventions with knowledge reviews for quality improvement professionals aiming to integrate external knowledge into their practices. For a long time, it was unclear to me if and how the conducting of these knowledge reviews could be seen as somehow related to expressions of STS.

Initially, I held onto the idea that STS was primarily focused on descriptive and textual modes of knowledge production. This perspective influenced how I interpreted and made sense of my involvement in the project. I maintained a conceptual separation between my actions as an 'actor' in the project, on the one hand, such as conducting knowledge reviews and contributing to the development of EBP infrastructure within the social care provider; and, on the other hand, my actions as an 'analyst' which involved conducting observations, participating in research workshops to engage with other researchers in the team, and theorizing about interesting findings in the empirical material.

In Paper V, I delve into the awareness that this separation was merely a construct influenced by my preconceived notions of what constitutes STS research. It became apparent that such a rigid distinction was unnecessary and limited my understanding of the knowledge produced in the project. I began to question the boundaries and assumptions I had imposed on my own role and engagement, recognizing that my activities as an 'actor' and an 'analyst' were intertwined and mutually informing. By challenging these preconceived ideas, I embraced the idea that STS research can encompass a range of activities beyond traditional descriptive and textual approaches. This realization allowed for a more nuanced understanding of my own role and the contributions I made

within the project, transcending traditional divisions and embracing the dynamic nature of STS research.

As discussed in this section, the different engagements that comprise this thesis have required me to take on many identities and responsibilities, such as EBP-expert, STS interlocutor, evaluator, intervening actor and outsider observer. This shows how roles and methods multiply beyond the 'outsider – insider' axis or the 'description – intervention' dichotomy when actually doing collaborative work. Such fixed positions are complicated by knowledge travel practices that entail joint commitments in caring, engaging and the plurality of ways of which this can be done – resulting in an oscillation of both researcher identities and approaches. They involve researchers navigating different identities and approaches, which can vary and evolve over time.

By recognizing the value of these practices and the need for their exploration and analysis, questions multiply: At what point does compromising and adapting to others' needs and expectations pose a risk to one's own aims? How can we be relevant without compromising our core STS-sensibilities? These questions do not lend themselves to simple or definitive answers. Rather, they bring to light the inherent need for researchers to reflect on the situatedness of their own position and the diverse array of strategies that open up when you accept the challenge to 'study with' the empirical arenas into which you get invited. In the next section, I will reflect upon how I have handled those questions in my projects.

7.3 'Keeping open' while staying relevant: reflections on normativity

In this section, I will reflect upon how I have navigated the move from descriptive accounts towards actionable contributions and discuss this navigation in relation to similar discussions in the field.

The changing landscape of collaboration outside of academia provides opportunities for STS researchers to explore their own knowledge production and use which have spurred discussions about if and how STS should engage, and how such intervention should come about (Bijker, 2003; Collins, Weinel, & Evans, 2010; Puig de la Bellacasa, 2011; Latour, 2004; Stengers, 2005). One main theme in these discussions is how to combine the very core of STS research – the descriptive agnostic or symmetrical approach which strives to abstain from normative claims – with actionable contributions within the empirical arenas we study. Some argue that researchers risk losing their descriptive power by engaging in interventions. Other fears that researchers either risk losing their agnostic sensibilities and will start intervening with a preset agenda or that they will

function as consultants, possibly becoming tools on behalf of influential actors in the studied field (Vikkelsø, 2007). On the other side, it is argued that the STS agenda has been 'largely agnostic as to the normative and political issues related to the application of STS insights' (Bijker, 2003, p. 445) and that these issues deserve more attention in STS.

What seems to be at stake in these discussions is the worry that "sociologists are either too detached or too involved" (Zuiderent-Jerak, 2015, p. 14). However, rather than framing the issue of engagement as a spectrum between two opposing and undesirable positions of partisanship and neutrality, scholars have (in STS-informed terms) insisted on closer examination of how engagement by interventions happens in specific cases, thus making intervention an empirical question (Zuiderent-Jerak & Bruun Jensen, 2007). Such investigations have opened up the dualistic view of agnosticism versus normativity and showed how they can be turned into a dynamic interplay during our engagements (Zuiderent-Jerak, 2007; Bruun Jensen, 2007; Puig de la Bellacasa, 2017).

One strength that characterizes STS research is that it involves a methodological relativism. Analytically, this agnosticism enables descriptions that are more empirically detailed and, in this sense, are more realistic than normative. This means they offer symmetrical accounts. Symmetry is thus used to avoid the reproduction of dominant and fixed notions of knowledge production. Unfortunately, after symmetrical analyses, the risk is that actors are left with the deconstruction of knowledge claims, but without little guidance on how to use such insights. As is increasingly recognized by scholars in the field, it is possible and desirable to engage in interventions in the studied field while nurturing STS-sensibilities of methodological relativism and agnosticism. Jerak-Zuiderent (2020) argues that attending to such core STS-sensibilities can help us cultivate ways of intervening in our fields of study as an open question, i.e., we can be responsive to the contingencies in the empirical field without intervening with a preconceived agenda.

Bruun Jensen proposes that 'sorting attachments' could provide a sensibility for handling the dynamic of agnosticism and engagement; sorting being the "practical activity of figuring out how to engage," where attachments stresses "that no such engagement is innocent" (2007, p. 239). Puig de la Bellacasa (2017) offers a similar response for handling engagements by attending to 'speculative commitments': commitment "because it is indeed attached to situated and positioned visions of what a liveable and caring world would be" and speculative "by not letting a situation or position […] define in advance what is or what could be" (ibid., 2017, p. 60). Both these suggestions are concerned with how to be engage by "non-strategic and still non-detached scholarly methods" (Zuiderent-Jerak, 2016, p. 76).

In Paper V, I theorize about my engagement in situated experiments by reflecting on the research process in the project at the Swedish social care provider. In the paper, I show how my interventions at the two disability care units involved a constant navigating of how to carefully experiment with conducting knowledge reviews in a way that cultivated STS-sensibilities of 'keeping open' while putting them to work in my normative contributions. In this case, such a dynamic between agnosticism and normativity enabled a reconceptualization of EBP and its potential when situated at this social care provider as they were put to work and expressed through the knowledge reviews.

This dynamic represents a common thread throughout the thesis: I have made use of STS insights to provide a set of sensibilities and questions to audiences within EBP which runs contrary to the type of problem-solution-fix type of answers that are often associated with normativity. With one foot in STS and the other in EBP, the move from detached description to actionable contributions has felt like a natural continuation in taking care of the insights from STS, making them travel into the realm of EBP. In the following, I will theorize about what characterizes these actionable contributions.

What characterizes such actionable contributions?

The compiled papers constitute my attempts to get the insights from these different projects to make their way into established academic venues, thus making use of the insights from the kind of projects that many researchers might consider to be mere 'consultant work' or 'on the side of' their ordinary research. Yet, for me this work has to be considered as offering excellent opportunities to be situated where the action happens and to learn from it. However, the diversity of these projects poses challenges regarding how to express the learnings in a way that journals and reviewers would regard as sufficiently valid. The papers are, in this sense, also experiments in how to make research from these kinds of projects, occurring in a changing landscape with increased focus on collaboration between disciplinary boundaries, achieve knowledge travel between academia and empirical arenas.

The focus on knowledge travel in my case has entailed leaving aside self-referential conversations and dense theorizing in papers directed at an STS audience. Instead, it has required some situated theorizing performed together with professionals, leaving behind overly complicated formulations in academic publications and expressing STS knowledge in more accessible ways. It has also meant leaving the academic textual forms of knowledge production and experimenting instead with expressing STS through situated techniques and infrastructures.

As Downey and Zuiderent-Jerak (2021) point out, expressing STS knowledge for other audiences can become quite complex and pose significant theoretical

challenges. Such challenges can be related to how to frame knowledge claims that are taken for granted in STS communities but perhaps not so easily understood or accepted in other fields. According to Downey and Zuiderent-Jerak (2021), STS making & doing is about expressing STS knowledge through STS sensibilities. STS sensibilities are, in this context, "observable instances of knowledge expression that enact STS knowledge contents but without necessary reference to their formal linguistic formulations" (2021, p. 246). In this aspect, my research can be positioned within this subfield to a very large degree.

Downey (2021) describes how one outcome of situated interventions through STS making & doing approaches can result in techniques, devices and infrastructures that become kinds of 'STS practitioners' in themselves. These have the potential to "inflect stabilized knowledge forms and practices and, thereby, activate STS analysis" (2021, p. 223). This is an intriguing way to think of the materialized knowledge expressions that are often the outcome of STS scholars' engagements in situated experiments. It suggests that core STS-sensibilities are maintained but expressed in other forms that enable them to be activated in other situations and to other audiences. As I will suggest in the examples provided below, this corresponds to this thesis' focus which implies the activation of STS sensibilities in the form of tools or concepts which require allowing that their form and content will be changed by the empirical issues they encounter.

In Paper II, the concept of dialectic objectivity is suggested for professionals who seek to reflect on and develop their approach to manual-based treatments. The concept encourages professionals to sharpen the attention paid to the combinations of formalizations and judgments in empirical situations and that no conclusions can be drawn *a priori* in any particular case before the empirical situation. The concept of dialectical objectivity encapsulates the sensibilities from the sociology of standardization and provides a tool that opens up fixed notions regarding their suitability in social care. However, the concept is developed and expressed in a textual form that is more accessible and understandable for someone not used to reading dense theoretical texts.

In a similar way, Paper III provides an analytical model as a tool for transforming stabilized epistemological understandings of EBP and for providing a new conceptualization of EBP. In this analytical model, the sensibilities from sociology of standardization and heterogeneity of expertise are expressed in a visual form that moves beyond their original textual expressions. This model is thus made to be a tool that activates STS analyses in the empirical arenas of EBP.

The project reported on in Papers IV-V used these tools to experiment with a materialized situated version of EBP in the form of knowledge reviews and

spread the results in a short video directed to social care professionals (link to the video: https://www.youtube.com/watch?v=Xkx5UTg1Xdg). Through these tools, I active STS-sensibilities that challenge the homogeneity of EBP principles and the linear view of knowledge use in EBP models by experimenting with ways to reconceptualize EBP through new forms of doing knowledge reviews and integrating them in local practices.

Together, these all forms attempt to remold STS into knowledge expressions that enable activations of STS analyses in other empirical arenas. The learnings from the work with these STS knowledge expressions is that travel is not about diffusion from a scholarly core (Downey & Zuiderent-Jerak, 2021) – it is about nonlinear work to activate STS sensibilities on issues where they can make a difference. As Mesman and Carroll argue, approaches in STS making & doing "offer us as STS scholars a means to enable professionals to engage with their own practices in new forms that provide ways of redefining problems, problem spaces and timely solutions" (2021, p. 163). In this thesis, I have activated STS-sensibilities in different tools that could work to support and strengthen professionals' epistemologies in EBP.

A question that might follow such engagement is this: *What's in it for STS?* In a societal context with increasing interest in the usefulness of social sciences, calls for applicable forms of STS raise concerns about the risk of actors in empirical arenas shaping the scope and impact of STS research (Vikkelsø, 2007) and thereby limiting the diversity of approaches within STS and undermining the transformative potential of such research (Zuiderent-Jerak, 2015). It also highlights the risk that what might be assumed to be mere applications of STS could result in the evisceration of STS knowledge because of the assumed lack of knowledge flows into the field of STS from such projects. In the following section, I will address such concerns by reflecting on how knowledge travel practices are not mere applications of STS knowledge to other audiences, or at least do not have to be, so long as we accept the challenge to learn from them.

7.4 STS for STS scholarship or STS for others?

The notion of knowledge travel to other audiences might seem to imply a unidirectional path from STS to other audiences. This may trigger questions about whether STS research should be conducted for STS scholarship or if STS research is for those arenas where we as researchers engage? Such questions can stimulate reflexive discussions about our own knowledge production, but it can also construct an unproductive dichotomy. To think of knowledge travel activities as a one-way route from STS to others would be to discount the nonlinearity and reflexivity of the learning involved in such activities. Downey

and Zuiderent-Jerak (2021) display how practices of reflexive learning often head in multiple directions including modes of STS theory.

As I have shown in this thesis, attaching STS sensibilities to explore, process and be a participant in reconceptualizing EBP is not only a mode of knowledge travel, but also simultaneously a mode of knowledge production. I have shown how each project has involved both responding to frictions and achieving knowledge travel, while simultaneously sensitizing me towards other frictions and cultivating further understanding of the STS-sensibilities I have made to travel. For example, by attaching a sociology of standards lens on EBP (Paper I-II) I learned about how such a lens could (re)produce the idea of EBP as a standardization project. On the other hand, putting STS-sensibilities about neglected or mundane practices to work in order to reconceptualize EBP so as to include a greater openness to 'non-standardized' practices carries the risk of inadvertently legitimizing harmful practices (Papers III-V) (as elaborated on in Chapter 6, p. 70). Together, the insights from the different projects sensitized me towards the fact that: Depending on how I as an STS researcher create the object of my research, I simultaneously create images of EBP.

In Paper V, I theorize about these insights, their connections to the situated interventions at the social care provider and how they can be perceived as an outcome of a mutual reflexive learning between me, the other researchers in the project and the professionals at the social care provider. In the paper, I thus show how this situated experimentation is not a simple case of 'contribute some well-needed STS-sensibilities to a challenging task' (Paper V, p. 10). Rather, such experimentation provides a space for generative knowledge production. In this space, our collaboration enables us to learn and act on those learnings together towards a shared goal. The knowledge reviews in this project are products of our joint sensibilities from learning together about EBP. When encouraged to reflect on this project in a chapter in an edited volume about careful engagements in STS, I realized that the learnings from this project do not only inflect and reconceptualize stabilized knowledge forms in EBP, but they also simultaneously modify and renegotiate the relationship between STS research and the practices that we study.

In the collaborative and experimental nature of the project, our scholarly sensibilities were at times integrated with those of the professionals, and it was within this integration that knowledge travel was possible. By theorizing about these issues in Paper V, this renegotiation of relations is conceptualized as a mode of 'integrating layers of care.' These examples demonstrate how knowledge travel practices are not to be seen as a simple application of STS insights in other fields, instead they are opportunities for multidirectional knowledge production. They thereby render the question of 'STS for STS scholarship or STS for others?' obsolete because STS experiments with knowledge travel include modes of

knowledge production that yield insights for both STS scholarship and others. Zuiderent-Jerak (2015) emphasizes the importance of being part of strong STS practices within academic infrastructures to prevent STS interventions from becoming sedentary, i.e., interventions conducted without nurturing and developing new learnings. Recognizing this, however, gives rise to new inquiries about how our scholarly infrastructures can be further developed to foster insights and cultivate the learnings from interventionist STS research in ways that prevents this.

7.5 Conclusions

In this chapter, I have provided reflections on the approach taken in this thesis in light of discussions in the field of STS. I have discussed the growing emphasis on researchers actively engaging with non-academic actors and seeking connections between their research and various societal domains. I have related these developments to my own projects and explored the tensions that arise when considering these approaches alongside more traditional methods of conducting STS research.

In summary, the changing landscapes of STS research highlight the need for greater recognition and understanding of the diverse roles and methods that STS adopts in collaborative research projects. Engaging in such collaborations, whether through invitation or initiation, outside the boundaries of academia prompts reflections on how to maintain STS sensibilities of agnosticism while actively participating and intervening. In my own experience, this has led to a reconfiguration of STS into practical tools that activate STS analyses in other empirical arenas (Downey, 2021). These actionable contributions thus deviate from the conventional idea of normative claims. Each project I have been involved in has entailed addressing frictions and facilitating knowledge travel, while simultaneously sensitizing me to other frictions and deepening my understanding of the sensibilities I bring to the table. I have thus demonstrated how knowledge travel practices can foster generative modes of knowledge production in both the empirical arenas where STS researchers engage and within the field of STS itself (Downey & Zuiderent-Jerak, 2017; 2021).

What are the lessons learned from this reflexive exercise?

First, accepting invitations into others' domains requires letting go of control. We are not there as researchers on our own terms, we are there for collaborative purposes which means that we will have to depart from our comfort zones. The traditional view of a separation between researcher and the studied field implies clearly delineated roles, also. The analytical distance that is supposed to be upheld by the researcher is a rather comfortable place to be in. To achieve mutual knowledge travel, this simultaneously necessitates exposing yourself to an

oscillation between such roles. Such oscillation produces ambiguities, an array of different expectations, confusions, and surprises (Mesman, 2007). Navigating these challenges and opportunities entails maintaining a critical and reflexive stance, constantly questioning and re-evaluating roles, methodologies, and the implications of such engagements. By doing so, STS can continue to evolve and contribute to both academic knowledge and practical applications, while preserving its distinctiveness and transformative potential.

Second, as we increasingly recognize, these collaborative projects are opportunities for research. Including them as integral parts of STS research rather than activities done alongside our 'real' STS research stresses the benefits of building STS infrastructures that encourage us to share and theorize about the experiences, challenges, and findings arising from these projects with the wider STS community through publications, conferences, and collaborations. This would contribute to enriching and expanding the knowledge base of STS as a whole.

Finally, starting out from a position where I considered my research to be somewhere in the margins of the boundaries of STS, I have come to realise that these boundaries are constantly being redrawn and that I currently find myself right in the center of STS knowledge production. In relation to this, after having reflected much throughout writing this thesis on the question about my research being something we do 'on the side' of our 'real,' my response is that the compiled papers are certainly not about activities done outside 'real' STS research. They are products of an experimentation in what STS can become when accepting the challenge to express STS knowledge so as to make it travel into empirical arenas beyond the boundaries of the field.

8 Overall conclusions

This thesis has been concerned with exploring ways of connecting STS and EBP through new forms of engagement. I opened the thesis by posing the seemingly simple question: *How can we make use of the best available knowledge when making decisions?* This is a question that has been at the core of different EBP operationalizations in welfare. Challenges with how such operationalizations of EBP answer that question have multiplied as the ideas of EBP have come to be institutionalized in almost all corners of welfare. To address the challenges that various actors recognize with EBP, I made use of research from STS and neighboring fields to formulate the guiding question: *How can sensibilities from STS contribute to developments of EBP knowledge practices?* This question carried a dual commitment, signifying an exploration of new forms of both STS and EBP practices. In the two previous chapters, I have summarized and concluded the lessons learned from this endeavor. In this final chapter, I will take some time to address aspects I consider particularly important in relation to these conclusions.

Some might question why I keep holding on to the term EBP at all, whether my expansion of the boundaries of EBP does not dilute the concept and thereby transform it into something completely different. I have two main reasons for holding on to the term EBP. The first is that I align with the telos of EBP and want to contribute with generative developments of its principles and models. By exploring professionals' epistemologies related to EBP endeavors, I have shown what EBP becomes beyond dominant images of knowledge production and use, insights I believe are important in future developments of EBP. Second, given the reality that many actors in welfare face with different demands of adopting EBP principles, i.e., for those positioned within an 'EBP paradigm,' calling it something else would carry the risk of creating an unnecessary alienation. My ambitions to work within EBP practices to achieve generative transformations would be much harder if seeking to reject the EBP term altogether. In short, EBP is already a reality in the world institutionalized in a variety of ways, and so it is better to widen the term and work within the constraints of paradigm than attempt to get rid of it and call for some entirely new approach altogether. The latter approach is neither feasible, constructive nor necessary since EBP already allows the relevant latitude in its practical expressions anyway, as has been shown throughout this thesis.

Throughout this thesis, I have challenged various epistemological assumptions in EBP. This engagement has simultaneously come to challenge epistemological assumptions in STS as well. My learnings about knowledge production and use in EBP in this regard show many parallels to my learnings about knowledge production and use in STS. I have focused attention on

informal knowledge travel practices within STS that are often seen as something we do beside 'real' STS research. Not only have I made visible such informal practices, but I have also experimented with ways of developing them into generative modes of knowledge production.

Lynch (2009) suggests that, as researchers, we have the opportunity to exchange knowledge with actors in our empirical arenas through local-interactional spaces. Throughout my involvement in the different projects included in this thesis, such spaces have enabled me to develop proto-theoretical ideas through engaging in situated theorizing and engaging through experimenting with knowledge expressions that exceed the academic text. Callum Gunn suggests that "organizing transdisciplinary processes as temporary shared epistemic spaces allows for experimentation with new forms of knowledge production through collective learning and action" (2023, p. 190). Thinking about the potential of such informal practices in terms of shared epistemic spaces – spaces in which STS and EBP can connect in new forms of engagement – is intriguing and resonates with the overall conclusions in this thesis. In relation to this, I suggest that organizing epistemic spaces where STS and EBP connect through experimental action could facilitate generative learnings for both EBP and STS. Such epistemic spaces could also put the theoretical reconceptualizations provided in this thesis to work in joint experimentation with knowledge practices and infrastructures.

Finally, the hope is that the work initiated in this thesis could provide some sensibilities into how to approach the question that we began with, *how we can make use of the best available knowledge when making decisions?* as a shared concern, experimented with through joint engagement.

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Appendix