

CONCEPTIONS OF TRUTH IN EVIDENCE-BASED PRACTICE

“I believe...that objective truth is a value -
that is, an ethical value, perhaps the greatest value there is...”

Karl Popper (1984)
In Search of a Better World:
Lectures and Essays from Thirty Years

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Abstract

Evidence-based practice, EBP, is the purposeful search for current best evidence in the evaluation and decision making process as a basis for the implementation of practices and policy. Rarely however is the foundation of what underlying epistemological value EBP strives for in this pursuit of 'best available evidence' either analyzed or conceptualized. One possible contender is truth. Truth is often assumed as the foundational aim of science and epistemology and thus extrapolating truth to EBP, as an extension of the scientific project, seems poignant.

This thesis analyses truth in relation to EBP through the ontological and epistemological foundations of truth as exemplified through common concepts of truth, views of truth in science and philosophy of science and ultimately through the point of view of contemporary notions of truth in EBP. By contrasting three contemporary depictions of truth within EBP to traditional truth concepts, such as correspondence, coherence, semantic, deflationist and pragmatic theories of truth, a depiction of the fundamentally different perspectives of truth, and underlying ontology, permeating EBP emerges.

The aim is to evaluate truth conceptions within EBP and establish their foundations as truth explicators. The discussion centers the foundation of these truth conceptions - if they relate truth to some foundational notion based in truth theory or if truth is understood as something constructed or defined based on pragmatics, context or purpose. One suggestion drawn from the analysis is that a semantic as well as conceptual conflation exists whereby truth concepts within EBP do not explicate truth per se, as per truth theory, neither in the ubiquitous, ordinary language sense, nor in the conception drawn from the scientific sphere, but rather truth as perspectivalist. Truth is thus understood through context and pragmatics, rather than through objective being as seen in a realist ontology and manifested in the reflection of a truth-maker. The worry is that truth conceptions within EBP inherently allows for such realism which may have repercussions on the implementation of policy and the general understanding of science.

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1. Introduction

Evidence-based policy, EBP, is commonly described as the current best standard for empirical evaluation of what to base policy implementation on (Hjorland 2011). In other words: what policies should individual practices or a society as a whole choose based on analyses of available empirical evidence? The practice of evidence-based policy becomes part of a substantial apparatus involving organizations and government bodies designed to, or invested in, implementing or promoting various societal policies, campaigns, or actions. Ideally, all available evidence, i.e. various forms of research studies, expert and practical knowledge and experience, is pitted against a hierarchical evidence pyramid and evaluated as per its perceived empirical relevance (Wieringa et al 2017). Evidence-based practice is the 'conscientious, explicit and judicious use of current best evidence' (Sackett et al 1996 p.71) in the evaluation and decision making of the implementation of practice and policy.

Rarely however is the foundation of what these strivings for 'best evidence' actually entail discussed - most likely it is an assumed consensus. There is of course a broader agreement as to what this evidence should be composed of technically, but not what actually constitutes 'best' in either epistemological or ontological terms. The underlying uncertainty is thus whether, and if so in what capacity, truth is expressed within EBP.

1.1. Background

When EBP, or any scientific or teleological process, is either discussed or put into action, identifying the underlying goal, and in extension what comprises its epistemological as well as ontological foundation, is provident. Without such a basis the very idea of EBP is moot; similar to the epistemological question of what justifies valid belief, determining what justifies a label of 'evidence-based' is a solid starting point. Merely going through a process without a stated, defined and understood goal of what said process should lead to amounts to not much more than an empty process. Simply adhering to a strict hierarchical idea of what supposedly amounts to 'better' evidence, even if it may be shown why that likely is the case, does not explicate the underlying epistemological or ontological goal of the evidence analyzing process. There must be a validating there there. If that 'there' is deemed to be satisfied with the term 'truth', the follow-up question then becomes what that truth entails.

The understanding of truth is most often described by epistemologically founded theories or concepts of truth: truth can be semantically and epistemologically understood depending on underlying metaphysical worldview and ontological interpretation. Individual truth concepts connect to particular metaphysical worldviews in a reciprocal manner. These truth concepts are thus embroiled in wider theoretical discussion of the world including ideas of for example realism and materialism, constructivism and idealism. The correspondence theory for example is a realistic theory whereas the coherence and pragmatic theories lean towards constructivism. Deflationary truth theories are realistic as well but not materialistic. Truth perspective is consequently based on foundational, widely encompassing, ontological beliefs.

Crucially, most metaphysicians recognize that their work has to rely on some sort of epistemic foundation which in turn relies on ontological assumptions: what is there to know anything about? Such foundation lies in the deductive method from a priori reasoning, as distinct, say, from induction or from abduction. In other words, metaphysicians ever since Thales of Miletus¹ and later Aristotle, reason much like mathematicians and logicians: they begin with certain axioms, or assumptions, and logically deduce the consequences of such axioms. However, not all hypotheses can be empirically deduced: certain foundational matters remain convictions or beliefs, albeit more or less stringent and plausible. Conversely, some matters which can be and have been empirically and objectively deduced nonetheless remain treated, in certain areas, as subjective beliefs. To what extent, or in what ratio, beliefs should function in establishing requisite metaphysical foundations, as opposed to empiricism and science², and in extension what role these dichotomous attitudes have in regards to notions of truth, remains unclear.

EBP is rarely, if at all, explicitly focused on queries of truth, neither at the actor or analytic level, but rather on the process, or study, of relating relevant empirical knowledge to specific queries. For this purpose, truth is seemingly either assumed to be superfluous to the goal at hand, or as a concept it is implicitly accepted and understood based on its common usage in ordinary language³. As with any scientific strife, work, studies, and life in general, keeping to what is truthful in regards to source material, methodology as well as analysis is normally assumed, and is likely so on part of the researcher or EBP practitioner as well. It is however unclear whether there exists a further understanding of truth within EBP, distinct from either a commonsensical notion, or from ideas of truth within the scientific endeavor, or if truth is at all relevant to EBP.

1.2. Aim

This thesis analyses truth in relation to EBP through the ontological and epistemological foundations of truth, common historically developed concepts of truth, views of truth in science and philosophy of science and ultimately through the point of view of contemporary notions of truth in EBP. The discussion centers truth concepts and truth ideas emanating from within EBP in relation to truth- and truth-maker theory within a wider framework of ontological persuasion and its real world ramifications.

¹ Thales of Miletus suggested that the world and its components are all, ultimately, made of water. This was a metaphysical, as opposed to an empirical claim, based on ontological beliefs of what there is. Aristotle assumed there existed a set of 'first principles', axioms, which cannot be deduced any further.

² See for example two diametrically opposed contributions to the debate: 'Metametaphysics: New Essays on the Foundations of Ontology' (Chalmers et al 2009) and 'Scientific Metaphysics' (Ross et al 2015).

³ Philosophical problems are to a great degree linguistic problems. An ideal language can be said to represent the world as accurately as possible (Parker-Ryan N.D.). It is the goal of philosophical investigations to understand what we mean by any given term and the phenomena it represents. This is not easy however, hence the need for epistemology and metaphysics. Ordinary language represents the common, traditional or folkloristic use, the everyday use, which has not been subjected to philosophical inquiry, to any greater degree. As this paper examines different conceptions of truth, idealized versions of truth, albeit differing, until this section has been reached and the concepts of truth explicated, any reference to truth falls under the ordinary language use, such as people commonly use truth in their private life, at work, in art, in places of worship etc.

A general aim is to examine philosophical notions of truth and relate them to truth notions stemming from within EBP. A specific aim is to ascertain if there is sufficient foundational grounding to truth notions within EBP to warrant claims of being truth explicators.

Through evaluating truth ideas within EBP and establishing their epistemological aspirations and by relating these truth ideas to the underlying ontological and epistemological narrative, the analysis aims to discern whether they are tantamount to truth concepts as per epistemological truth theory, or if they remain purposeful constructions. The worry is that a conflation, not just of terms, but of essence, exists whereby the truth concepts within EBP do not explicate truth but something else.

1.3. Method

This thesis analyses truth in general and in relation to EBP in particular. By contrasting three contemporary propositions of truth within EBP to traditional philosophical ideas of truth such as the correspondence, semantic, deflationist, pragmatic and coherence theories of truth, a depiction of the fundamentally different perspectives of truth permeating contemporary EBP emerges. The subsequent analysis is grounded in truth theory and the idea of truth makers as presented in chapter 4. The understandings of truth depicted will be analyzed as per what their ideas of truth depict truth as, how truth is considered determined, and what wider episteme truth is based on. A significant question is if these truth understandings relate truth to some foundational notion based in truth theory or if truth is understood as something constructed or arbitrarily defined based on pragmatics or will, situation or purpose. The discussion will center the divide between understanding truth as either foundational or constructed and relate it to the epistemic evolution of truth and metaphysics within philosophy of science and Science and Technology Studies, as they have come to form the basis for EBP.

Three articles on variations of truth were selected due to their epistemological analyses of EBP: all three contrast their conception of truth with traditional concepts. In addition, the articles relate their understanding of truth to contemporary practice within EBP. The three texts depict their specific idea of truth in EBP, in varying depth, to an epistemological foundation and relate it and EBP to the scientific endeavor at large. This enables an analysis of the articles' versions of truth to classical theories of truth and to epistemological and ontological foundations and truth theory.

Whilst all three articles approach truth from the point of view of EBP, they do so from varying perspectives, which provides the analysis with a comprehension of the view of truth across multiple perspectives within EBP, hopefully representing a greater population, than were all articles coming from the same point of view.

The three texts were chosen as they actually discuss truth as a concept directly related to EBP and to the question of what such a concept entails. Very few texts do so, which the articles themselves notice and discuss. Even the three articles chosen correspond to the criteria at varying degrees. The difficulty in finding articles concerned with the concept of truth as

understood in EBP, clearly demonstrates the need for an analysis of the correlation between EBP and truth. The search narrowed the selection down to the following texts:

Sayer, P. (2020) A New Epistemology of Evidence-based Policy.

Wieringa, S., Engebretsen, E. Heggen, K., Greenhalgh, T. (2018) Rethinking bias and truth in evidence-based health care.

Thoun DS., Kirk M., Sangster-Gormley E., Young JO. (2019) Philosophical Theories of Truth and Nursing: Exploring the Tensions.

1.4. Ethical Concerns

No ethical issues⁴ pertaining to the research per se or in regards to the research in relation to others were laid bare in the work with this dissertation.

Ethical aspects relevant to truth concepts, ideas of truth within EBP and truth in general are touched upon at varying points. Two aspects of the analysis in regards to truth must be discerned: the first concerns why truth is important and the other what truth is.

The ethical aspects of a unifying truth conception in regards to matters ranging from medical to political to personal is one issue. It is the impetus for this study: that truth be treated respectfully in order for society to make the best possible use of EBP and science in general. Hence truth matters ethically. That said, this thesis is not a study of ethics. Ethical implications of bad science, conspiracy theories, agnotology, fake news etc. are extremely important, but a deeper discussion of these matters is not the focus of this thesis, merely the root of the subject matter. Ethical concerns are important in their own right and studies of such issues can be found in, amongst other areas, practical ethics, ethics of belief, and virtue epistemology. Ethical aspects are however mentioned throughout to frame the context within which truth exists and to propose reasons as to why a unified conception of truth is important, especially in relation to those truth conceptions which do aver that truth is, in varying degrees, constructed rather than essential.

Ethical aspects pertaining to the understanding, use and consequences of various truth interpretations is not integral to theories of truth. They matter but do not form or shape truth. Thus conceptions of truth are separate from why they matter. Of course certain conceptions of truth, as will be made clear throughout, are based on normative stances, but as will be argued that is not relevant to a realist based conception of truth nor to a common sense language interpretation nor a deflationist nor correspondence or truth-maker based conception of truth. It will be argued throughout that truth is what it is, regardless of what we may want it to be and why and regardless of the implications of specific truth conceptions. The foundation of truth is not dependent on its ethical implications but on its inherent status as truth. This paper's aim is to analyze what truth is understood as within EBP and contrast that to truthmaker theory which

⁴ I.e. standard ethical considerations were considered such as minimizing the risk of harm, obtaining informed consent, protecting anonymity and confidentiality, avoiding deceptive practices and providing the right to withdraw but were deemed non relevant to this work.

asserts that truth is entirely separate from perception, desires, beliefs or usage: truth so understood is not dependent on the ethical implications of adopting other truth conceptions or on perceptions of reality. Truth is ontological as well as epistemological in nature, truth, it is argued, is not based on what result different truths may or may not lead to (even if those ethical implications are significant) but on what is, regardless of our sentiments.

1.5. Disposition

Section one introduces the theme, clarifies the methodology and announces the disposition. Section two is devoted to the perceived ontological and epistemological foundations of EBP, Philosophy of Science, Science, and Science and Technology Studies. Thereafter the text centers common, traditional philosophical ideas of truth per se, what they are understood to depict and what constitutes truth according to each theory. The discussion includes an analysis of the respective ontological underpinnings of distinct truth adherences,

The fourth section introduces truth- and truthmaker theory, which advocates for grounding in being, asserting that there has to be something beyond ambiguity or perspectivalism to warrant claims to truth. The section analyzes the previously introduced truth concepts against the epistemologically grounded truth- and truthmaker theory.

The fifth section focuses on the contemporary discussion of truth in a philosophical-sociological context, as understood and utilized in the theoretical discussion as well as practical implementation of EBP. The section is devoted to an analysis of three different understandings of truth in EBP and how those truth conceptions relate to the philosophical foundations as sketched out in previous sections.

The penultimate section contains a discussion of the proposed arguments and derived conclusions from earlier sections, set against the backdrop of the previously introduced ontological and metaphysical concepts relating to epistemology. In light of these ontological and consequent epistemological positions, the discussion centers the essence of the truth concepts depicted in the texts concerning truth within EBP. The contention that truth-makers of truth concepts cannot be constructed or contextualized is formalized as is the suggestion that the three contemporary perceptions of truth in EBP may border on relativism in their perceptions of what constitutes truth. It is consequently asserted that their proposals of truth do not depict objective truth, but rather what the author's understanding of how truth can best fit the goals and pursuits of EBP: hence such understanding of truth tends towards the normative rather than solely the descriptive. The argument suggests that even beyond the philosophical discussion, truth may be understood to rely on correspondence with an underlying reality and representation of a factual basis, or there is risk that EBP will face ambiguity. The final section concludes.

2. Evidence-based Practice & its Foundations

The terms evidence-based practice and evidence-based policy, EBP, are often used interchangeably, even if they have slightly incongruent meaning where the former largely refers to evidence-based policies which are implemented based on underlying empirical evidence and the latter mainly refers to implementing and utilizing evidence-based practices in clinical work. Both refer to the policy of utilizing best available (scientific) evidence for decision making in relation to methodology for implementation, be it in a broader societal sense or in a more narrow practical setting (Loversidge 2019).

EBP can be traced to the medical field and the now mainstream, ubiquitous, evidence-based medicine, EBM⁵. EBM, is the explicit and systematic use of current best evidence in all decision making processes involved in patient care (Sackett 1996). In its most charitable form EBM integrates practitioners' individual practical knowledge with best current evidence, i.e. for the purpose best relevant applicable research (Sackett 1996). EBM viewed this way should integrate external research and practitioners expertise as well as patients' concerns and preferences.

EBP has evolved to become an umbrella term which encompasses EBM and various subfields such as evidence-based nursing, midwifery, social work, education etc. (Loversidge 2019). They share common epistemological underpinnings through their shared commitment to the adoption of practices based in evidence - the hows and whys may differ, but do so independently of subspeciality. The borders between evidence-based policy and evidence-based practice are hazy at best and for the purpose of this paper the abbreviation EBP refers equally to both as well as and to the overarching general spirit of evidence-based efforts found in all forms of scientifically influenced public life including medical subfields.

Commonly both EBP and EBM are interpreted as using policy that 'works' which in turn can best, by some accounts only, be found through randomized controlled trials, RCTs (Cartwright & Hardie 2012). Negative views of EBP stem from this either uncharitable notion or misconception of EBP as a detached, truth seeking methodology that only looks at the numbers and at what is empirically proven to work and thus coldly discounting human experience (Buts et al 2021). This is a narrow interpretation which does EBP a disservice by not recognizing its inherent wider goals. The confusion is partly due to the neoliberal implementation of New Public Management, NPM, which is often mistaken as an expression of EBP (Bornemark 2018). However EBP is purportedly basing its processes on scientifically derived material, whereas NPM is political and explicitly ideologically motivated. EBP may of course also be ideologically motivated as per individual researchers situated experience, convictions and prejudices. However, in a charitable view of EBP, as it is often understood by its adherents, RCTs constitute but a part of a top-down, hierarchical, empirical evidence basing process (Johansson et al 2015) forming the so-called evidence pyramid. Above RCTs, forming the spear head, are systematic reviews and meta analysis (of mainly RCTs). Beneath RCTs, forming the literal, as well as metaphorical base, are

⁵ Evidence-based medicine is largely replaced by the term evidence-based health care, EBHC, however when quoting from others' work I use the term used in said work.

observational studies (cohort studies, case control studies, case series and reports etc.), and eventually expert- and practical, field knowledge (Wieten 2018). In addition, lived experience, situational factors, and other significantly contributing factors should take part in rigorously, well performed EBP (Cartwright & Hardie 2012).⁶

The aim of EBP is to enable and facilitate the founding of our decisions on the best possible scientific evidence where evidence is understood as the sum of existing contemporary research based knowledge (Hjorland 2011). In and of itself that seems to be quite a trivial statement, which no-one with pure intentions can reasonably fault. Of course any action that has consequences for others must be based on the 'best' evidence! The alternative would be either the 'worst' evidence, 'somewhat decent' evidence, no evidence at all or even no reasoning or justification whatsoever. With the presupposition then that no-one would disagree with the premise that EBP seeks the best evidence possible, it seems prudent to ask what 'best evidence' actually entails. The concept of 'evidence' does not seem problematic: evidence equals supporting knowledge, factual backing, statistical significance and the like. This simply implies that policies should be based on knowledge rather than the opposite, i.e. no knowledge, or perhaps guesswork, hunches or what feels good. 'Best' is wherein the problem lies. To say simply that 'best' is constituted of the most significant research papers,⁷ most suitable scientific findings or most agreed upon information is inadequate as those wordings presuppose 'best' in themselves.

Substituting the value adjective does not help. Perhaps the term 'scientific' holds a clue to what is meant by 'best': if we, for now, interpret scientific as entailing a positive in and of itself, the presupposition that the most reliable scientific information equals the best evidence, would mean that 'best' simply signifies most accurate and reliable science. So the most accurate, reliable science is a key, whereby if we equate those identifiers to 'best' science we have a potential solution. However, best science presupposes, just as with 'best evidence', that there are certain preconceived notions inherent to what is perceived as science: first that there is such a thing as 'best' science as opposed to various stages of less good science, and second what science is, that it is a good of some sort that somehow, magically, or more pedestrian, methodologically, brings us closer to 'best evidence'. In addition, this solution presupposes not only that science is a good of sorts, but a good of such dignity that it should be allowed to dictate our actions. If none of these premises hold, if science is not a good, and does not contain some sort of inherent magical dust to verify its status, we can not use any of it to ground 'best evidence' and we must look elsewhere, to the foundations.

⁶ Historically there have been various models of evidence evaluation and factorial weighing regarding EBP. The degree of emphasis on expertise and on other factors making up the evidence pyramid vary. The consensus from an analytical perspective especially seems to be that rigid focus on only the most stringent, top tiers is insufficient and that it is often necessary to broaden the evidence base and include additional contributing factors beyond the confines of the evidence pyramid. (Marks 2002, Wieten 2018, Cartwright & Hardie 2012).

⁷ As is often construed as accepted by the top-tier journals, such as Nature, The Philosophical Review or Annual Review of Sociology (Ghosh 2021).

2.1. The Complexities of the Relation between Science and Truth

What exactly constitutes science and its accompanying qualia is studied both within Philosophy of Science and STS⁸. Philosophy of Science focuses on the epistemological and ontological aspects of Science: what constitutes knowledge and what is the metaphysical reality (or not) and constraints of knowledge and its normative manifestations. STS is usually focused less on where science fits in a normative epistemological framework, and more on the making of, activities, implementation and role of science: culture, context, methodologies, social goals, the role of researchers and the 'construction' of knowledge and even facts (Sismondo 2009 p.57). Both have notions of what science is, but arrive at conclusions from entirely different perspectives: STS stems from sociology, philosophy of science is essentially philosophical in nature (Moreno & Vinck 2021⁹). STS differs from the metaphysical and metascientific endeavors of philosophy of science and (natural) science respectively and their aim of explicating the science itself in that STS' aim is on explaining science from an externalist point of view (Kutrovatz 2005).

STS can mainly be traced to Kuhn's (1962) pivotal book *The Structure of Scientific Knowledge*, which for many reshaped the traditional view of science. It shifted the omnipresent truth-seeking, modernist idea of science, as a slow and methodological, linear accrual of knowledge towards a constructivist idea of the world with science as an human made endeavor, based on ideas of knowledge and truth not as explanatory categories, but as what is acceptable or useful (Bird N.D. p. 11, Horgan 2012). It enhanced the already strong general societal *stimmung*¹⁰, which brought with it acceptance of subjective knowledge, replacing notions of objective knowledge, to be found, somewhere 'out there'. Like the postmodernist thinkers,¹¹ Kuhn distanced himself from grand narratives and perennial problems (Bernstein 2007 p. 19) in favor of situational, constructed knowledge, meaning that humans shape knowledge within our social groups and within everchanging scientific paradigms with perpetually changing understandings of *veritas*. Within STS, it is sometimes argued, science can nonetheless be understood and utilized as a moral compass, even if it cannot be rationalized or shown to be grounded in an objective truth (Collins & Evans 2017). The distinction between the normative and the descriptive, ought and is, is thus neither taken for granted nor hailed as an axiom within STS.

Within philosophy of science the focus has remained on, not necessarily the presupposition, but at least the relevance, of understanding or identifying, underlying foundations of science and on theories of explanation. Popper's (2002, p.312) quest for a solid demarcation between the scientific and the pseudo scientific is bequeathed to contemporary philosophers, as is the

⁸ STS is in turn sprung out of SSK, the Sociology of Scientific Knowledge (Moreno and Vinck 2021).

⁹ See Moreno and Vinck (2021) for an overview of the developments, similarities and discontentions between SSK and STS and philosophy of science, especially chapters 2 and 4.

¹⁰ Heidegger referred to the permeating mood of the era as 'stimmung', which Bernstein utilizes when describing the advent of postmodernity, (Bernstein 2007 pp. 10-13).

¹¹ See Bernstein (2007), especially chapters 1 and 2, where he discusses the articulation of postmodernism from, amongst others, Heidegger, Derrida, Lyotard, Foucault, via Kuhn and Feyerabend to Rorty and MacIntyre. Not all of which necessarily agree to succumb to the label of 'Postmodernist', but whose work to varying degrees fit the spirit of the era and the shift from modernity to postmodernity.

eternal question of truth versus falsehood and the normative idea of the necessity of a functional, ubiquitously accepted truth concept, to inform and steer scientific inquiry. For Popper there is such a thing as an objective truth and science is the methodology by which it may be discovered. However Popper stops short of ever identifying science with truth, but rather explains scientific progress as equating higher degrees of verisimilitude than its predecessors or rival theories (Thornton 2021).

The idea of truth has two philosophical vistas: one is epistemological and relates to what constitutes truth and accompanying theories of truth, and to the discussion of epistemologically objective versus subjective truth (Steup & Ram 2020, Glanzberg 2020). The other is ontological and relates to the questions of whether truth actually exists - if there is such a thing as an ontologically objective truth or not. The ontological discussion can be grounded in a metaphysical one relating to notions of the world as we perceive it: at two extremes the world is either based in realism or in anti-realism. The first allows for an objective truth, the latter does not: if reality is not real, as it were, then neither is truth. Anti-realism can be partnered with constructivism, the idea that everything in our world is constructed by humans, through our understanding of it, at one end of the spectrum, only artifacts such as language, norms and institutions are constructed, at the other end of a sliding scale everything is constructed as in universal constructivism, there is no wholly independent or material foundation (Hacking 1999 pp.24, Baghramian and Carter 2021, Lee 2012, Murphy N.D.).

Constructivism, much like any worldview, is not unitarian in expression. For example there is a distinction between social constructivism and radical (or universal) constructivism. Social constructivism focuses on the collective as determinant, whilst radical constructivism entails that individual minds construct meaning. Much like strong constructivism encompasses a wider array of aspects to be included under the broader term, as opposed to weak constructivism which limits its range, constructivism is varied in its claims of reach. That said, the general esprit of the term, within philosophy of science and epistemology, refers to the understanding that the scientific realm and truth questions are human and thus (social) constructions. Humans are the arbiters of what falls under those domains and in what capacity. This paper focuses on epistemic and social constructivism as seen in STS, not the ubiquitous weak constructivism (See Goswick N.D., Chakravartty 2017, Sismondo 2009, Lee 2012, Golinski 2005, Boghossian 2007). The focus is on constructivism within the sciences as metaphysically understood: i.e. are facts and knowledge representative of what is, or are they made by the scientist? Within STS and the sociological subjects in general the latter is the predominant disposition whereas in philosophy of science there is normally a range of competitive and mixed understandings. Jasanoff (2022) avers that all knowledge is social and socially dependent: it would not exist separate from its construction within its given social parameters. In extension truth too is a 'social production' (Jasanoff 2022). Metaphysical constructivism (concerning epistemological questions and the essence of reality) is not to be confused with methodological constructivism: the former does not entail the latter but the latter often encompasses metaphysical convictions. Epistemic constructivism means simply that knowledge is created by human understanding and perception whereas social constructivism focuses also on the social interactions and

relationships involved in the 'making' of knowledge. (Baghranian and Carter 2021, Knorr-Cetina 1981, Hacking 1999).

Constructivism in the sciences, in regards to both scientific knowledge and knowledge itself, falls under 'social constructionism' which entails the understanding that nature, as scientifically studied, is not made up of finished scientific facts, 'out there' to be discovered through empirical endeavor in a Platonic sense, but rather that scientific knowledge is made, constructed, by the scientists collectively¹². Scientific knowledge is formed through heuristics, through various phenomenological interpretations and manipulations based in existing, sanctioned, social norms and institutions (Baghranian and Carter 2021). Scientific facts thus emerge from agreed upon social conventions within the scientific community and are inevitably shaped by them which leads to the possibility of various different understandings, depending on the process, context, situated experience and interest of the scientists (Knorr-Cetina 1981, p.226). Thus there are no facts or knowledge independent of, or unformed by, the social- and theoretical frameworks currently reigning within any given paradigm.

Fallibilism dictates that historical context and development of instruments, understanding and reach influence the furthering of scientific knowledge in so far as certain understandings and beliefs are provisional and eventually become obsolete in light of more current findings. Thus methodological aspects influence knowledge, implying that knowledge is indeed relative: relative to evolution and accumulation of knowledge. Feyerabend argued that knowledge is entirely dependent on how a society interprets and interacts with the world, how well scientists advocate for their theories and findings, and thus cannot be ultimately determined as more valid than any other understanding: knowledge in this non-deterministic view can be both relative and constructed (Baghranian and Carter 2021). However this view accepts that there is not a more accurate, correct, understanding of any given issue based in realities beyond social cognition and that all other interpretations are incorrect. Non-relativist, non-constructivists, argue that indeed there are more valid findings based on what is, not what is perceived, irrespective of situated interpretation of any social group and consequently that science, facts and knowledge cannot be relative, nor (wholly) socially constructed. That social interactions and norms and conventions influence research to some degree or in certain aspects is undeniable: constructivism in the sciences then depends on degree, in which regard and how much something is considered to be socially constructed as opposed to something 'determined by the nature of things and inevitable' (Hacking 1999 p.6).

The suggestion that a distinction exists between social facts and raw facts layers this discussion: natural, raw facts underlie and thus ground any social facts which humans jointly form (Searle 2010). Without raw facts, there would be nothing on which to base social facts: supposing nonetheless that everything were socially constructed, all inference would culminate in an infinite regress. Constructivism can per this analysis not indulge notions of an absolute,

¹² Theoretical social constructivism in regards to the metaphysical are often roughly divided into three accounts where properties are either constituted, response-dependent or conferred. The first entails that properties are epistemically recognizable - they are discoverable, independent facts, the second that humans confer properties unto things or each other and the third implies a causal relationship between the physical and the property, where the physical creates a property (Asda 2018, pp. 9-13).

objective, mind independent truth (Boghossian, 2007, Guba and Lincoln 1994, Lee 2012, Fuller 2016, Murphy, N.D.). Truth, as everything else per such strong metaphysical construction, is constructed or even fictitious: "*All our truths are in a sense fictions - they are stories we choose to believe*" (Lawson in Zhengkun 1992, p.266).¹³ This of course implies that truth is not just subjective, but also individual, and can be created, as well as disputed. Truth becomes not just phenomenological, but also relativistic (Baghramian and Carter 2021), i.e. relative to individual beliefs, and perspectivalist, i.e. each view of truth in regards to a phenomenon becomes entirely dependent on individual perspective. Truth becomes synonymous with perspective, not with any traditional or common sense notion of truth¹⁴, be it one we know in ordinary language, or within a set parameter of a given endeavor, such as science.

Granted, perceptions are indeed framed by our perspectives. Perspectivalism¹⁵ negates the Nagelian 'view from nowhere' in favor of 'the human point of view' and allows science and history of science to include influences from human activities and practices (Massimi & McCoy 2020). Perspectivalism is not incompatible with realism and the fact that underlying individual points of view there exists an objective reality, which is what it is regardless of subjective viewpoints. Perspectivalism also allows for pluralism about science, for a plurality of viewpoints, approaches and even conclusions, even if pluralism does not mandate perspectivalism. However, from such an acceptance of pluralism in regards to methodology and even epistemic goals, does not follow constructivism of facts: it does not change the ontology or allow for ontological pluralism (Massimi & McCoy 2020, Lee 2012).

Pluralistic understanding does not suggest that relativism¹⁶ necessarily, or at all, follows. Relativism, despite its inherent meaning of viewing 'truth and falsity as dependent on convention, or contextual framework' (Baghramian and Carter 2021), i.e. that certain properties or supposed facts are not simpliciter but relative to a situation as dependent on a variety of possible assessments, is often taken to be relative itself in meaning. No matter of fact can, as per relativism, ever be established as superior to another. Depending on context, in philosophy especially, relativism is discussed under various subcategories: cultural, contextual, alethic, moral and epistemic relativism. For the purpose of discussions regarding episteme and scientific knowledge and development, epistemic relativism is applicable. Epistemic relativism entails that determinants of what is knowledge, or deemed rational or justified to believe to be so, is dependent on and can consequently differ depending on system of context and framework of reference. Epistemic relativism thus entails that facts and knowledge does not (necessarily) entail any universality and that there exists, simultaneously several equally valid epistemic systems in relation to any given question of knowledge. Facets of STS, especially the school of thought known as SSK, Sociology of Scientific Knowledge, are sometimes centered in discussions pertaining to epistemic relativism (Kutrovatz 2005, Hansson 2020). Both in

¹³ All our very ideas of a worldview, our worldviews, are in this sense constructions. Not just constructivist understandings but also realist ones: our metaphysical axioms cannot be otherwise as there is not, yet, evidence to the contrary and the narratives must spring from somewhere, i.e. from human construction.

¹⁴ 'Common sense ideas of truth', as such we simply understand by using our senses whereby no further explanandum is necessary can be heralded to Thomas Reid's (Ryan and Jaffe 2021) 'common sense philosophy', but also of course to GE Moore's realism (Moore 1959).

¹⁵ Perspectivalism or perspectivism are used interchangeably in the literature (Massimi & McCoy 2020).

¹⁶ See Schantz and Seidel 2012 for further discussion of relativism in the context of science and Collins (1989).

response and standalone, Collins (1981, 1989) amongst others has proposed 'methodological relativism' or 'non-doctrinal' relativism, similar to that of methodological symmetry. Methodological relativism does not explicitly advocate for epistemic relativism nor as ontological position, but for the use of relativism as a tool in sociological study for the "impartial assessment of how knowledge develops" (Collins 1989). The interlocutors of the debate however rarely accept that such a distinction is possible and aver that relativism of any form in epistemic matters inevitably lead to epistemic relativism (Bricomont and Sokol 2001). In 'Why democracies need science' (2017) Collins returns to relativism and more vividly differentiates between methodology and epistemics. Collins distinction is clearly beneficial to the discussion by arguing that a distinction between relativism as a tool, and epistemic relativism, is indeed necessary and taken seriously. One distinction could be made between philosophical and sociological usage of the term relativism, where the former is epistemological and ontological and the latter some form of methodological (with or without doctrinal elements). This paper uses relativism to mean relativism within the areas discussed, i.e. epistemology and science.

Relativism blends ontological subjectivity with epistemic subjectivity: perspectives are deduced from ontological subjectivity, which indicates perspectivalism and in turn pluralism, but that does not entail that a phenomenon viewed from an individual perspective is either ontologically subjective or epistemically subjective. Regardless of subjective ontological or epistemological interpretations, epistemically objective statements about both epistemological and ontological questions are possible and necessary: communication hinges on the fact that humans interact with some for, of implicit preconception of an ordinary, realist idea of objective truth, without which there would be no basis for understanding (Searle 2015). "*Truth is out there whether we like it or not*" (Wikforss 2021) may not be an amongst scientists or philosophers of science universally accepted axiom, but scientific practice nonetheless functions based on its presupposition to some degree. The understanding that empirical accuracy is equivalent to, or at least attains to equate to, truth and that there de facto exist a dichotomy between truth and untruth, science and pseudoscience, seems very much a non question for many practitioners within the medical and natural sciences (Custers 2019).

2.2. Trivial Realism of Science

Regardless of one's personal ontological vista, one thing is certain: everyone acts and reacts in the world presuming realism, with certain a priori acceptances from which to proceed. Even entertaining thoughts of anti-realism presupposes some kind of realism in which to locate and facilitate anti-realistic arguments: philosophes and scientists alike use computers to write down arguments, Zoom to interact with students and airplanes to get to conferences. Of course all those tools are thoroughly constructed by man, as is the language used to convey ideas of

them¹⁷. Nonetheless, apart from intrepid skeptics and solipsists, we acknowledge that we interact with some form of reality.

The Putnam-Boyd transformation refers to a refiguration of realism to 'real realism' (Blackburn 2005, p. 176). Without the acceptance of scientific progress, theories would not be successful and survive. Scientific progress is self explanatory: it works. Philosophy of science is perhaps then superfluous when empirical evidence and technological advances show us what works and we need not analyze what constitutes it. Theories do not truth make¹⁸, success does, be it in mathematical conjectures proven right, or space crafts landing safely. What works is self explanatory and what is proven to work in the world explains the world (Blackburn 2005 p. 178). Popper held that hypotheses which survived falsification amounted to nothing more than the current best knowledge - they too could potentially be falsified, which would be the mark of real science. Such theoretical viewpoints may be conceded for theoretical work, but leaves little room for the world in which we actually move about. Surely, and trivially, there is something else beyond the theories and hypotheses themselves, which enable their existence, an ontological reality from which we find, appraise and evaluate theories which will become 'science': if not what is the point? This conviction of realism about science is sometimes presumed just as magical as belief in the supernatural, but it differs significantly in that we can empirically experience its output. EBP is output derived from science. EBP is real insofar as it is tangible and has a purpose and use outside of the constructed parameters and norms set up to regulate it. There is something there which we strive to get out of our EBP performances: truth perhaps?

2.3. Truth, Science and EBP

It is evident from the discussion so far that perspectives of truth are based on metaphysical worldview and in extension on ontological ideas of what exists, or not, independently of humans as well as what we do when we perform science (or EBP). Truth is generally either thought of as somehow representing reality, something real, or of human construction. Historically, the Whiggish idea of science, that science will eventually lead to truth through a linear and cumulative evolution, as truth trumps the errors of the past, dominated the narrative (Golinski 2005 p. 4, Hacking 1992 p. 38, Sismondo 2010 p.12). This simplistic view of science as involved in a continuous forward march towards truth, has often come under fire through the realisation that obsolete and even harmful beliefs were not surrendered despite scientific advances. Such questioning led science, for some, away from truth as a direct goal (Massimi 2019). Unfortunately this purge of truth as a commitment to science, led to its own mistakes and similar sectarianism. A nuanced view can of course contain both perspectives: that science does move towards ceaseless progress whilst still understanding the necessity of applying regular checks and balances from within, questioning the nature of the game itself and its achievements.

¹⁷ Susan Haack's (N.D.) 'Innocent realism', poignantly describes the interaction between constructivist elements and the realist backdrop where "*The world — the one, real world — is independent of how we believe it to be*". Human artifacts, institutions, language, fictional works etc. are all social constructs which exist in a heterogeneous world of natural kinds and events, and they too are real, as in existing, but as opposed to the underlying reality of the world, they do not exist independently of us. The explanations behind scientific theories and facts are true, fictitious characters are not, social explanations or subjective interpretations may fit together with the real world, but are in themselves not necessarily true.

¹⁸ For a similar discussion, if with different conclusions see Hacking (1992 esp. p. 57-59).

Whether science aims at, or should aim at, the truth and whether science actually does reveal and can be expected to reveal truth is thus inevitably dependent on ontological understanding of the world and its accompanying definition of truth.

Scientific realism holds that scientific theories should and do aim at truth.¹⁹ Anti-realists claim it cannot, in either capacity. Relativists believe truth is relative to many things, scientist, observer, material and so forth. The equation of material matters with normative ones, has contributed to a pronounced distrust in science as a possible arbitrator of truth, similar to the distrust in cognitivist notions of truth in moral matters, where belief rather than scientific understanding guide epistemic authority and actions.²⁰ Only the presupposition of some form of realism can entail truth claims, but certain facets of constructivism inherently reject objective facts as true and may this be considered on the fence regarding realism as a basis. It should be noted that constructivism, as most philosophical positions, come in degrees. For example, global, strong or Neo-Kantian constructivism reject a greater degree, and at one end all, realistic claims to material and immaterial facts, whereas local or weak constructivism reject relatively fewer aspects. Commonly weak constructivism, as in the understanding that artifacts, language, culture etc. are human constructions tend to be widely accepted even among realists (Goswick N.D., Sismondo 2009 p.68, Golinski 2005).

Rejection of truth is often accompanied by the questioning of the value of truth. Kuhn, who rejected relativism and described himself as a 'fact lover and truth seeker', nonetheless questioned the value of imagining objective truth and rejected the pursuit of truth normatively as well as pragmatically: science should not and does not reveal truth (Massimi 2010), but science (adequately) solves puzzles. Such views were earlier espoused by the American pragmatists, James in particular, who viewed truth as a means rather than an end, where the notion of truth is useful even if it does not objectively exist (Legg 2008). These pluralistic ideas of truth have aided science through supplying a plurality of perspectives, which in turn have aided in the aggregation of scientific knowledge and in allowing science to do its job. That said, perspectivalism does not in itself explain truth, even if perspectives can contribute to an understanding.

Representative ideas of truth tend to focus on science as in pursuit of an objective truth, whereas constructivist theories focus on scientific endeavors as equally constructivist, i.e. the goal is dependent on circumstance and context or perspective. This is where the metaphysical discourse sways off course, often landing in a normative idea of what science should do, rather than of what it inherently does. Normative ideas are found in either camp, but again, these too are tainted by underlying ontology. Discussions of truth are hence extremely difficult to navigate: even despite claims of an objective reality in where truth resides, concepts of truth ultimately come down to belief in or conviction of said reality. The ultimate question remains, if disputing

¹⁹ That truth is often unattainable or unknowable does not impact the search, but the scientific endeavor must often settle for knowledge, verisimilitude, in the place of a tangible truth. The fallibilism inherent to the progress of the scientific project entails a realistic acceptance that 'truth' now, is but the current best knowledge and likely the highest attainable level of verisimilitude. It is a pragmatic approach, not to be confused with the ultimate truth seeking goal.

²⁰ See, amongst others, (Navin 2013, Hansson 2021, Fackler 2021, Doppelt 1986, Schantz and Seidel 2012, for further discussion.

truth, what is then the aim of science and consequently EBP? It seems that being committed to science and to the foundational elements of EBP, presupposes some form of at a minimum trivial reality and realism and a normative adherence to the idea that science is on the quest for truth. As ideas of truth are grounded in ontology and there clearly exist discrepancies between ontology and truth and the practice of science and EBP, it seems necessary to understand what foundation various theories of truth rely on in order to evaluate their truth claims.

Sackett et al (1996) emphasize that EBM cannot be restricted to randomized trials and meta-analysis, something most theorists of EBP agree with today: there is more to doing EBP well than merely looking at the statistics. EBP includes many viewpoints: heuristic, positivist, empirical, rationalistic and also a more pronounced goal where good EBP strives for an understanding of the core of any given issue. EBP strives for a deeper understanding, for knowledge comprising all possible relations to the issue and for solving real problems for real people (Wieringa et al 2017). What is that if not first a scientific pursuit, and in turn, the quest for something more, something beyond the technical, or mechanical: it may go by many names but the truth as understood colloquially is if nothing else a complete representation of what is perceived as factual and thus, hopefully, representative of reality. The query is then what this strife for holistic knowledge, as identified within the sciences and EBP, and based on varying ontological foundations, translates to epistemologically and in regards to a truth concept.

3. Truth Concepts

Truth concepts, or truth theories, aim to answer what constitutes the nature of truth (Glanzberg 2020). This presupposes that there is such a thing as truth, and in extension that truth is contrasted with falsehood. It does not in and of itself presuppose anything about the nature of truth or reality: an anti-realist for example may reject the bivalence on the grounds that truth does not exist per se, but accept a weaker binary presentation of truth versus falsehood as a construction which fills a distinct purpose. Classical truth theories are unambiguous in that they do not contest the existence of such a dichotomy, only the nature of the truth itself, what makes truth truth, if truth can be attained, if it is ever absolute. Truth concepts either crave epistemic justification or belief, i.e. proponents of a certain truth concept can either propose that truth can be verified epistemically or accept that truth is no more or less certain than anything else and hence belief-based.

Truth concept theory constitutes a foundational part of epistemology and normally accords with distinct metaphysical worldviews. The correspondence theory of truth associates with metaphysical realism, coherentism and pragmatism with idealism, relativism or anti-realism. Deflationism is more ambiguous in regards to metaphysical base by its semantic nature and for example one proponent, Quine, was realistically as well as anti-realistically inclined as by his holistic approach to knowledge (David 2020). Davidson concluded that truth cannot be defined and hence that all and any attempts at defining truth is 'folly' (Davidson in Glanzberg 2020) whilst simultaneously embracing the idea that truth is a basic concept with an inherent content-bearing nature (Glanzberg 2020).

The ambiguous situation, explication and evaluation of theories of the nature of truth and accompanying heated discourse reflect the necessity of further exploration. Ideas of truth inform all philosophical inquiry and discourse whereby it should be evident that the defense and eventual determination of a singular truth concept is a necessity for epistemic endeavors (Blackburn 2018). A strong truth theory constitutes a solid foundation of not only epistemology and philosophical programmes, but in extension scientific methodology and as such of course spilling over to EBP: the scientific venture is, if not informed, at a minimum understood, by philosophy of science, which is in turn informed by metaphysics and epistemology, and in extension, EBP is informed by science. Truth concepts explicate the very foundation of scientific pursuit by acting as truth definers, applicable to individual propositions: a uniquely qualified truth concept signals not only purposefulness of inquiry but also epistemic righteousness.

The correspondence, semantic, deflationary, coherence, and pragmatist truth theories are to date the most epistemologically prominent, 'umbrella' theories and will consequently be analyzed and contrasted to the contemporary EBP propositions of truth. These historically figured theories have evolved and divergent offsprings have materialized, but the esprit of their contemporary iterations do not depart hugely from the basic tenets of each theory (Dowden & Swartz N.D.). The intention is to determine the basic understanding of what a truth concept explicates, what truth is according to each theory. Extensions of basic truth concepts do not sway far from the fundamental ideas whereby details of subtheories are not uniquely pertinent to the discussion. The discussion will focus on the main common tenets of the mother theories.

3.1. Pluralist Theories of Truth

That what is taken as true mathematically differs from what is held as true morally or aesthetically is seldom disputed. A linguistic interpretation simply takes this to mean that the word 'true' is used differently for different areas of discourse: normative moral utterances fall under the domain of metaethics, qualia utterances relate to aesthetics, socially situated interpretations are sociological or anthropological and so on. Such truth utterances are then not truth utterances per se, in that they do not agree on a conceptual definition of 'truth' but rather use 'truth' in a qualitative and subjective, even personal manner. Contradictory, this could also be interpreted to mean that truth is pluralistic, that not all truth related declarative utterances are true in a coherent way but must be understood via different theories (Pedersen et al 2018). Pluralistic theories of truth are opposed to truth monism, the view that there is but one truth property that is held by all true declarations, regardless of area of investigation.

Pluralist theories of truth contend that there exists a multiplicity of truth concepts (Pedersen et al 2018) which are not cross-disciplinary, but rather discipline specific. A monistic theory of truth affirms but one all-encompassing truth property. Pluralistic theories are based in metaphysical narratives which tend to confirm to specific truth concepts, it is thus possible to adhere to a certain truth concept in one area and not in another, to be realist about truth in scientific queries but anti-realist metaphysically (Dowden & Swartz N.D.). Hence, what is considered true in one area is not necessarily so in another by the same alethic. Nonetheless pluralistic as well as monistic theories remain committed to concept specific truth within each ontological inquiry.

3.2. The Correspondence Theory

The correspondence theory of truth in essence proposes that truth is that which corresponds to reality, or with (a) fact(s). This entails that truth is necessarily, to some degree, related to reality, to the way the world is (David 2020). The nature of truth lies in a truth-proposition's relationship to an underlying fact of the matter, to a truth-maker. The notion of truth-makers depend on the idea that truth depends on existence, not on semantic claims in and of themselves (Asay N.D.). The relationship can be described as an agreement, accordance, picturing, reference, or identity and the corresponding reality as facts, conditions, states of affairs, properties etc. The correspondence theory is hence not a semantic theory, but wholly ontologically realist. The variation in explanatory verbiage does reflect differences in interpretation, but does not impact the essence of the theory: truth is that which corresponds to reality (David 2020).

The correspondence theory goes back to Plato as well as Aristotle, the latter who in the *Metaphysics* exclaimed: *"To say of what is that it is not, or of what is not that it is, is false, while to say of what is that it is, and of what is not that it is not, is true"* (Ross N.D.). Truth here is realist but can also be construed linguistically, truth is the opposite of falsehood, falsehood is the opposite of truth. This simplicity of reasoning has led to accusations of circular reasoning, as that which is true is false and which is false is not true, and is but a platitude. The critique would be more poignant but for the very essence of the theory: correspondence. To refute claims of circularity we must look to the existence of an underlying correspondent, the truth-maker. Circularity is only a valid critique if the theory was indeed semantic, without claims of being grounded in realism and with a representational, grounding, truth-maker.

The correspondence theory is thus essentially ontologically realist - something tangible must exist to correspond to the proposed truth statement. Popper for one realized the need for a truth concept in support of characterizing science as essentialist and in search of truth, a truth concept was necessitated as was a realistic worldview. Popper eventually settled on a correspondence concept (Healy N.D. pp. 1, 3) with influences from Tarski (see section 3.3). Russell had also accepted this rationale, asserting that the existence of mind independent facts make up a "first truism" (David 2020).

The multifarious descriptions of 'correspondence' point towards an underlying ambiguity in practice, not just semantically. The meaning of the concept itself is of significant importance for understanding as well as identification of the base of the theory. The *raison d'être* of truth theories is to explicate truth - if the concepts are conceptually ambiguous they may fail to elucidate the theory. However, such critique can and is aimed at all philosophical theory, it is not singular to correspondence theory and the concept must be taken at face value and understood in relation to the theoretical discussion. The problem of fallibilism is also necessarily applicable to correspondence theory: how is the correspondent determined, and can it ever be determined to be ultimately correct? Allowance for fallibilism is thus problematic for the correspondence theory.

3.3. Semantic Theory

The Semantic theory of truth is simultaneously an extension and a reduction of the correspondence theory and often seen as the latter's successor (Dowden & Swartz, N.D.). Facts and correspondence are eliminated in favor of semantic poignancy. Semantic truth propositions hold truth as a property of language where the propositions themselves are the truth-bearers (Hodges 2018). Tarski's 'semantic conception of truth', the 'Convention T' by this view, admits no philosophical implications of truth beyond what the proposition itself conveys. The semantic truth theory is in line with the overall linguistic turn in philosophy at the beginning of the 20th century and diverges from prevalent convictions that propositions or belief has bearing on truth itself.

The semantic theory effectively arrests the purely philosophical discussion of what constitutes truth: it adheres to pure logic, not to content. However, it is of note that Popper 'converted' in full to the correspondence theory only after accepting Tarski's Convention T (Haack 1976). Popper integrated the purely logical with the ontological thereby claiming to overcome the aforementioned problem of 'correspondence' (Haack 1976).²¹ Tarski defined truth as 'satisfaction' which is achieved through the relation between expression and sequence of objects. Tarski's definition of satisfaction is clearly similar to the traditional concept of correspondence. However, as Haack (1976) points out, it seems more plausible that even if Tarski referred to synthetic as well as analytical truth, it seems less plausible that he embraced the notion of analytical truth as actually consisting in correspondence to facts. Accepting Popper's view of Tarski strengthens the correspondence theory considerably, as does in fact accepting Haack's weaker version. Both points of view in tandem show how the semantic notions of Tarski combined with truth-bearers of the correspondence theory give credence to truth as representing facets of reality, be that purely analytically or synthetically.

The symbiotic relationship between the semantic and correspondence theories is beguiling, however, correspondence maintains an affinity for a concrete philosophical resolution, rather than a purely semantic one. The semantic perspective relies solely on the logical use and expression of language of a semantic entity, whereas correspondence aims to clarify the epistemological and ontological essence of the underlying content of the proposition, beyond logic. The semantic theory is thus found at the surface of the analysis - correspondence theory at the depth. Critiques may aver that it is correspondence theorists who remain superficial in their analysis - but structural obtuseness or semantic intricacies of a theory is no guarantor for truthfulness. In conjunction however, the two may, as Popper believed, show truth for what it really is (Haack 1976).

²¹ Popper (1976) claimed that Tarski's theory was in fact a correspondence theory, not a semantic theory. In a response to Haack, who claims the reverse, Popper quotes Tarski as having stated that "we regard the truth of a sentence as its 'correspondence to reality'". Tarski's theory is in the philosophical literature mainly considered a hybrid, settling in somewhere between correspondence and deflationary theories. Tarski's convention T can by this view be used as Popper does, to strengthen the correspondence theory by overcoming the problems of what 'correspond' actually entails. Haack (1976) refutes this interpretation of Tarski, nonetheless Tarski was ambiguous as to which camp, the semantic or the correspondence, his theory belongs.

3.4. Coherence Theories

Coherence theories base the truth of a proposition on how it relates to other propositions. The truth of any given proposition depends on the relationship between it and related contextual propositions, which in turn are similarly dependent on surrounding propositions. This interdependency allows for a systematic evaluation of propositions where their acceptance or dismissal, or truthvalue, depend on if the propositions are supported and fit into an existing knowledge-narrative (Dowden & Swartz N.D.). Coherence theories, as opposed to correspondence and semantic theories, do not depend on the presupposition of anything objective supporting a truth claim, but on contextual interpretation. The validity of a claim is determined by which set of claims it relates to and the subsequent interrelation between coherent propositions: truth then depends on the combined validity of this underlying set of propositions and how the initial proposition coheres to this set. The coherence that determines truth value is made up of our previous beliefs, knowledge, and intuitions but also those of others' - experts, colleagues, friends etc. (Glanzberg 2012). Varying versions of the coherence theory places differing emphasis on the underlying set of propositions and their relation: a proposition coheres with underlying propositions if it is consistent with them, a proposition is coherent if it is entailed by the underlying set of propositions, or coherence is based on mutual explanatory support between proposition and support propositions (Young 2018).

Coherence theories ostensibly rely on what is perceived as the most reliable set of propositions to ground a given proposition in. However the criteria for identifying the 'most reliable set' may differ from person to person or situation to situation. Ambiguity of exact criteria for coherence, exposes coherentism to criticism of relativism; what is true for one person may be false for another. Such ambivalence violates logic and laws of non-contradiction (Dowden & Schwartz N.D.) but also, taken verbatim, would diffuse the impossibility of dialetheism²². Rationalistic coherentism however argues that a proposition should be logically consistent with all other propositions, and some such as Putnam and Dummett go further claiming that a proposition is true if and only if it logically entails all supporting propositions (Dowden & Swartz N.D.).

3.5. Pragmatic Theories

The classical American pragmatists', most prominently Pierce, Dewey and James²³, unifying principle was the rejection of absolutism and in extension that truth is a function of outcome, rather than based in realism.²⁴ Pragmatic philosophers tended to embrace theory of knowledge, and the theory of truth, as 'first philosophy', affording it similar gravitas as to the metaphysics of Aristotle (Koskinen & Pihlström 2006). The common trope states that pragmatism is 'what

²² Dialetheism refers to statements of true contradictions, i.e. statements which are both true and false.

²³ The three, most notably Pierce, diverged more on what pragmatism per se entailed than what pragmatism as it is perceived today acknowledges. Pierce held monist views about realism which the others rejected (Legg & Hookway 2021). Other contributing early pragmatists include Addams, Royce, Mead, DuBois, Locke, Lewis. Later pragmatists include Quine, Putnam, Brandom, Rorty, Haack, Misak, West.

²⁴ Rorty's embrace of pragmatism was based in his rejection of the idea that thoughts and language 'mirror' reality and led to the neo-pragmatic movement. For the purpose of this essay it is not necessary to differentiate pragmatism and neo-pragmatism, rather I outline their commonalities (Legg & Hookway 2021).

works', another that truth equals what is 'useful to believe'. Pragmatist theories of truth ground truth not in realism but in utility: what use, relevance, practicality or meaning is found in a proposition. Contemporary pragmatism tends to alethic pluralism about truth: if a proposition pragmatically aids in achieving a desired outcome it is considered true. The flexibility of the pragmatic truth concept lies in the wish to bridge strict logicism with a hermeneutically and humanistically inclined interpretation of what can be considered truth (Weed N.D.). There remains considerable ambiguity in definitions of pragmatic truth concepts as evident in the discrepancy between Peirce's view that truth is what "*is fated to be ultimately agreed to by all who investigate*" and James's idea that truth is "*the expedient*" (Capps N.D.) but also "*what is verifiable*" (Glanzberg 2020). In contemporary pragmatic theory focus is on the relationship between truth and which epistemic practices can ultimately and assertedly meet a set of criteria relevant for the discourse at hand.

Pragmatic theories rely on rationalism, scientific methodology and a weak verification of sorts, as does the correspondence theory, but also on the sum of contextualized beliefs as a coherent set, more in accordance with coherence theories (Glanzberg 2020). The definition is focused on rationally defining practicality, expediency, and usage rather than on establishing a truth concept per se (Legg & Hookway 2021). What can ultimately be defined as truth-makers in pragmatic truth theory is consequently as diverse and multifaceted as a given corresponding project whose truth is to be defined (Schwartz 2012, p. 102).

Quine famously claimed that "*any statement can be held true, come what may, if we make drastic enough adjustments elsewhere in the system*" (Quine in Gregersen & Koppe 1988). Pragmatic views of truth thus converge to coherentism as per Quine's holistic view that 'warranted belief' is sufficient to make up knowledge and ultimately truth (Schwartz 2012, p. 113). Quine's 'Web of beliefs', where an interconnected web of supporting, yet interdependent propositions jointly build an overarching 'truth', is consequently essentially coherentist.

3.6. Deflationary Theories

Deflationary theories of truth are minimalist and reductionist: truth has no ontological significance in itself. There is no assumption of any external property to validate truthfulness (Dowden & Swartz N.D.) whereby deflationism is not reliant on any truth-maker. Truth is simply what is propositionally asserted to be true - claiming truthfulness equals truthfulness (Stoljar & Damjanovic 2014). By the most generous interpretation, it is a logical notion (Oh 2013). Deflationary theories thus do not rely on ontological realism or hinge on representation of facts. The allure of deflationism is its rejection of the metaphysical and commonsensical focus on semantics; there is no unreachable nature to understand or identify inherent to truth.

Deflationary theory stems from the redundancy of truth theory as first advocated by Frege at the dawn of the linguistic turn of philosophy (Blackburn 2018 p.51). Ramsey²⁵ later articulated the redundancy of conceptualizing truth in an attempt to extrapolate something more than what is original to the word by stating "*there is really no separate problem of truth but merely a linguistic*

²⁵ Ramsey did not himself actually hold views aligned with deflationism, he merely summarized them (Frappolli N.D.).

muddle" (Ramsey 1927 in Frapolli N.D.). Deflationary theory summarizes the views which hold that in regards to truth there is nothing to be gained from constructing something out of nothing; the truth predicate of any given statement is simply that which is expressed and is but a logical or grammatical one.

The minimalist redundancy theory states simply that 'For all p, if she asserts that p, then p.' (Glanzberg 2020). There is no correspondence or coherence or relation to any truth-bearer outside of a statement itself. Strawson's variant of a deflationary theory decries both the connection to an external truth-maker and the idea that a proposition holds some significant truthvalue in itself. Rather truth lies in a speaker's intention (Dowden & Schwartz N.D.). By proposing something a speaker endorses, suggests or performs that something, and thus asks, or permits, the listener to believe it. Strawson's so-called performative theory is criticized for turning the tables and placing the onus of truth on perception rather than expression of a proposition (Dowden & Schwartz N.D.).

Deflationism is a catch all phrase for a number of similar theories with slight variations such as the redundancy, disappearance, no-truth, disquotational, and minimalist theories (Stoljar & Damnjanovic 2014). All these versions of deflationism similarly decry external influence on truth apart from the propositions themselves. The common denominator is often the adherence to the formal feature of the truth predicate and the usefulness of such a predicate (as opposed to any underlying fact or property shared by all sentences denoting truth as understood by the correspondence or coherentist concepts). However, by some more stringently reductionist accounts, 'truth' itself is not a significant predictor, and even redundant. 'Truth' is merely a vessel for describing certain sentences. Even more reductionsitic: 'true' contains no essence in itself but merely expresses a property like all others (Kugler 2020, p.20). These variants all decry any base in reality or even anything deeper embedded in a sentence itself. The truth is what a sentence expresses in and of itself, truth must not be explicated or even defined. Some deflationists go further and argue there is no need for a truth concept at all since there is nothing to truth other than what is commonly known as folk practice (Kugler 2020, p.20): truth is what it is, there is no need to complicate matters.

4. Truth Theory

Having depicted various truth concepts it remains unclear how it is objectively decided if these truth concepts live up to what they implicitly claim to do, i.e. define truth. Epistemology is the study of knowledge through structured attempts at affirming how beliefs are warranted by reason, but also by ascertaining what lies behind claims of knowledge. Within epistemology there exist two polar approaches of warrant, foundationalism and coherentism (Steup & Ram 2020). Foundationalism avers that warranted belief must rely on something basic, i.e. something that does not in turn rely on another assumption for its veracity. Coherentist belief contrary claim that warranted beliefs must rely on other beliefs for its warrant. Belief, and in extension truth, relies on either a singular backing basic foundation or on a web of beliefs of some sort. This dichotomy clearly permeates the various truth theories, as shown above.

Epistemological truth theory attempts to clarify not just warrant, but what constitutes warrant, i.e. defining the truth-value of what a belief is based on. Claiming something is true is meaningless without an explanatory foundation: why and how that something is considered true. Musgrave (1993 pp.245-273) identifies two main approaches to truth: the first as a relation between belief and the outside world and the other as an internal property of belief, not attached or defined to the outside world. The first is an objective and the latter a subjective approach to truth. Truth- and truthmaker theory, advocates for an objective grounding in being, asserting that there has to be something beyond mere opinion to warrant claims to truth which sets truth claims apart from mere perspectivalism and subjectivism (MacBride 2020) which relates to the precious discussions of realism and constructivism, relativism and non-relativism. Truth theories can land somewhere on a scale from at one end strictly foundationalist and objective to at the other coherentist and subjective. Analyzing the previously introduced truth concepts, and later the from EBP emanating truth notions, against truth- and truthmaker theory may aid in determining if theories of truth can depict truth without a realistic foundation yet avoiding falling prey to relying on subjective and consequently arbitrary truth-makers.

4.1. Truth Dependence

The truth theories described all lay claim to defining truth, but with widely diverging explanatory foundations. Can they all simultaneously have the 'correct' answer to what truth is - can we accept a plurality of truth concepts, i.e. is truth ambiguous, as in relative to subjective belief? It is normally assumed that different truth theories are incompatible and rival, to each other but mainly to the correspondence theory (Ingthorsson 2019). This would entail that all truth theories hold congruent aspirations, utilize descriptive language equally, and hold unified views of ontology, and what a truth theory ought to describe. Revisiting the notion of ordinary language or commonsensical idea of truth, would perhaps allow for one unified conception of what a truth concept ought to define. However, as has been shown, no two truth theories rely on the same truth-making parameters, ontological or epistemological: consequently it does not follow that the theories necessarily aspire to the same goal.

The main contention between correspondence and the others theories lie in the relation to truth predicate (maker) where the former does depend and acknowledge the necessity of a truth-maker and the others do not. By this reasoning, the contention lessens - the claims of the various truth theories are not fully rival as they actually make entirely disparate claims, but with a singular name, truth.

Only a realist truth theory, the correspondence, actually claims to rely on reality and describe what is. Coherence theory aims at understanding individual truth claims, based on supporting claims, not on any singular material truth predicate. Pragmatic truth aspirations rely largely on practical usefulness, not on any explicit realist foundations, but purely on relation to a given subject matter. There is no assumed connection between the concept of truth and underlying fact of the matter in any truth theory but the correspondence theory. The remaining worry however is that the descriptive claims remain, i.e. that by conceding to the game of truth descriptions, all theories still lay claim to being predictive truth theories.

Any substantial truth theory includes metaphysical, epistemological as well as purely semantic, commonsensical, aspects. The contention then, with the majority of truth perceptions is found not in their individual pursuits, but in the purely semantic: they do not achieve what they purport to if that entails describing truth. They do achieve discourse or situation related closures (Lawson 2014) reliant on subjective, perspectivalist or relativistic beliefs about which claims are perceived as valid rather than on what actually is fact of the matter. The problem lies in the use of truth as a descriptor of a plurality of phenomena, rather than as a singular description of a truth per se. This brings the discussion back to the ontological distinction between realism and antirealism, materialism or physicalism and constructivism. Affirming or negating any truth theory is based on acceptance of either foundation. Objective foundational truth theories aver that truth-makers are the foundation of a reality based truth theory: they define what makes something true, they embody the essence of truth. Truth-maker theory defines what is true based on existence, not existence based on truth (Asay N.D.). Hence, a claim of truth has being²⁶ to fall back on, yet the claim of being may not be true.

4.2. Truth-makers in Truth Theories

Deflationary theories focus on the logical- and grammatical status of a proposition to ascertain truth value, whereas the correspondence, pragmatist, and coherence theories by some accounts aim to reflect properties of a truth-bearer (Glanzberg 2020). Truth-bearers can take various forms, tokens, judgements, propositions, they are representations of what truth is understood as (MacBride 2020). However, a truth-bearer is not necessarily a truth-maker - as a truth-bearer is necessary but not sufficient for objective, correspondence based truth. A truth-bearer can be, but mustn't be, man-made, fictitious, whereas a truth-maker is (hopefully) the objective ground upon which truth is established. A truth-maker is 'that in virtue of which something is true' (MacBride 2021).

What makes something true can by some accounts be a construction, a truth-bearer, which may or may not have a relation to a truth-maker. In constructivist truth theory, in pragmatic- and coherence theories, truth-bearers are per definition sufficient even when determined by the subjective human as by what is considered reasonable or adequate in context or fulfills some notion of utility which in any given moment can be construed as 'truth'. Hence a truth-bearer for these theories is not discovered and identified as such, but made. The very definition of a truth-bearer in constructivist theory contradicts the possibility of an independent value which should, per definition, be reflected in a truth-maker. Consequently constructivist truth theories cannot be assumed to contain truth-makers: their 'truth' is not necessarily either objective or realist based.

According to truth-maker theory, a truth theory must rely on truth-makers equal to a foundational non-subjective, non-context dependent fact of the matter, state of affairs, event or logical value,

²⁶ Being of course can be understood very variably, as per for example Heidegger's or Parmenides more obscure, perhaps existentialist, accounts or through Aristoteles metaphysical 'Being qua being' with its realist connotations. Being in the context of the current discussion denotes de facto existence.

as determinant of a particular proposition's truth value (MacBride 2020). Only the correspondence theory wholly, and the semantic and deflationary theories in parts, fulfill this particular requirement. The correspondence theory claims that truth value is found in correspondence to reality as made tangible through a truth-maker. An objective truth-maker may not be identifiable, but it is nonetheless a requirement, which correspondence theory uniquely accepts. The subsequent analysis of the three articles on proposed theories of truth in EBP will include a search for truth-makers to gain an understanding of whether the conceptions of truth contain a common understanding and grounding beyond the subjective.

Both the assertion of facts and the idea of correspondence are criticized aspects of the correspondence theory (Dowden & Swartz N.D.). Are facts undeniably ontological entities or merely assertions of belief and how do we characterize and validate facts as in fact, facts? The critique is valid, and not specific to the correspondence theory, but to philosophy in general. Lawson (2014) critiques realism and the insistence on truth as semi-, if not wholly, tantamount to religious belief. Denying such accusations are impossible: either one adheres to notions of objective truth based in reality or one does not, asserting either without further physical evidence is futile and amounts to mere insistence: acceptance of truth conception then does amount to belief or opinion.

The notion of coherence is difficult to pinpoint: interpretations of what constitutes sufficient coherence is to some degree individualistic as exact criteria can impossibly set for all possible scenarios. Inconsistent sets of beliefs are also problematic: self-contradictory beliefs fail in achieving coherence, and would not only lack truth value but also contradict the 'principle of the excluded middle'²⁷ (Dowden & Swartz N.D.). Coherentism avers that truth is asserted rather than discovered: that truth is not inherent to any one proposition or truth-maker, but rather that truth value is reliant on context and sets of external factors. Nothing can thus be either entirely true or false in and of itself, whereby a proposition can have no objective truth-value as per this truth theory.

The lack of grounding in anything external or anything concrete beyond ambiguous perception is a significant departure from the correspondence theory and its strong reliance on realism, or the logic of deflationism. It may well be an attempt at avoiding the critique of both the latter of reduction to platitudes and circular reasoning or a deeply held anti-realistic belief - there really is no truth. The error lies in defining coherence theory as a theory of truth when it arrives at no such conclusion. Russell denounced the coherence theory on these very grounds in the 'Bishop Stubbs's refutation'²⁸ by proving that asserting the truth from a set of supposedly coherent propositions invariably fails if any assumed included proposition is false (Griffin N.D.).

²⁷ The principle or law of the excluded middle tautologically states that for every proposition, either this proposition or its negation is true.

²⁸ In the 1907 paper "On the Nature of Truth", Russell rallied against what he depicts as a coherence theory of truth. Russell argued that "it may be perfectly possible to construct a coherent whole of false propositions in which 'Bishop Stubbs was hanged for murder' would fit nicely. Of course Russell knew Bishop Stubbs was a perfectly respectable Anglican Bishop who died of natural causes - but his argument was that such truths could be obfuscated by sets of truth-bearers such as acceptable by a coherence truth theory. (Candlish & Damjanovic N.D.)

The evolution of pragmatic and coherent theories of truth both rely on something akin to a web of beliefs - and both falter when a foundation of truth, independent of contextual interpretation, is lacking. The pragmatic theory lacks an omnipresent truth definition whereby pragmatic truth may surrender to 'what works' in any given situation, but that does not equate with truth as per the distinct lack of a non-ambiguous, objective truth-making foundation.

5. Concepts of Truth in EBP

Within EBP truth theories are rare, but unanimity does not necessarily follow from rarity. To illustrate the differing understandings of truth within EBP, three varying notions of truth are presented. The pursuing analysis contrasts them to traditional truth concepts and ontological grounding. The worry is that a conflation, not just of terms, but of essence, exists whereby these truth concepts do not explicate truth but something else entirely.

5.1. Wieringa et al: Ideal Limit vs. Pluralistic Theory

Wieringa et al (2018) propose a pluralistic understanding of truth, based on the idea that facts are not absolute but the result of bias or interest on behalf of the researcher or practitioner. This is a naturalistic approach to the common foundational thesis claiming that EBP²⁹ is normally and inherently more focused on bias than on truth (Wieringa et al 2018 p.931). Wieringa et al (2018 p.931) concur with the proposed premise that truth in EBP usually tends to be accepted as given and unproblematic, and contend that the lack of open discussion regarding truth and bias is detrimental to EBP whereby its current epistemological deficiencies warrant an extension of the current theories of truth in relation to EBP in particular.

Wieringa et al (2018) suggest that the current concept of truth implicitly embraced by EBP scholars amounts to an 'Ideal Limit Theorem' which holds that truth 'will reveal itself in the long run'. The Ideal Limit Theorem is here attributed to the American pragmatist Pierce as one of several truth concepts propagated by Pierce (Wieringa et al 2018 p.931). It is of note that even though Pierce coined the term 'ideal limit of inquiry' in relation to truth, it was not suggested as a stand alone truth concept per se but part of a wider pragmatic program: "*Truth is that concordance of an abstract statement with the ideal limit towards which endless investigation would tend to bring scientific belief*" (Pierce cited in Capps 2019). Pierce, in contrast to the other founding American pragmatists, brought strong credence to belief in conjunction with truth, as opposed to unanimity, or end of empirical inquiry, dismissing the correspondent theory as pointless in its ultimate indeterminability of truth (Capps 2019). A true belief for Pierce is simply one that cannot be disproved by further inquiry (Legg 2014).

Wieringa et al perceive the Ideal Limit Theorem, and in extension EBP, as inherently negative towards bias and that consequently and unavoidably EBP is truth distorting. Without such omnipresent bias, truth would be 'pure' and even attainable (Wieringa et al 2018 p.931). Alas,

²⁹ Wieringa et al's article (2018), 'Rethinking Bias and Truth in Evidence-based Health Care'. The authors use the term EBP intermittently but mainly EBHC (Evidence-Based Health Care). I will continue to refer to EBP on the aforementioned and discussed assumption that the foundational practices of EBHC do not differ in this regard from those of the more encompassing EBP.

bias confuses our perceptions and makes truth unattainable, despite the best intentions inherent to the EBP framework, i.e. research design, meta analysis, peer-review etc., established precisely to counteract bias. To counteract the problems of the Ideal Limit Theorem Wieringa et al (2018 p.932) rely on the understanding of bias as dualistic; one aspect taints research negatively, simultaneously one allows for understanding through biased questioning. This view was initially proposed by Stenger who also claims that nothing is true without vested interest, as reality does not exist independent of humans, but is brought into existence by a multitude of interests (in Wieringa et al 2018 p.932). Facts, Stenger avers, only become facts through investigation by subjective interest (in Wieringa et al 2018 p.932). By this view bias should be seen as a positive, not merely a hindrance, in EBP.

Wieringa et al (2018) conclude that the current Ideal Limit Theorem of truth is insufficient for five reasons: first it dismisses subjectivity (in its attempts to squelch bias), second it assumes the existence of objective, discoverable, facts, third the idea that truth will eventually reveal itself is a disservice to patients today, as they will not benefit from future understanding yet to be discovered, fourth the theory is deterministic in its assumptions of objective facts, and finally the Ideal Limit Theorem assumes that what is studied and practiced within EBP correspond to a real world, when it is in fact all subjectively constructed. The main issue however with the Ideal Limit Theorem, it is suggested, is its reliance on truth as discoverable by the group in lieu of the individual, whereby it cannot determine truth status in individual situations, but only reveal truth on a population or meta-study basis (Wieringa et al 2018 p.934). If the goal of EBP is, or at least includes, supporting individual practitioners, the Ideal Limit Theorem as sole arbiter of truth is woefully insufficient. The Ideal Limit Theorem, Wieringa et al propose (2018), is based on a chain of metaphysical unprovable and irrefutable assumptions culminating in the belief that truth will eventually and unequivocally reveal itself which cannot claim to provide a sufficient understanding of truth for EBP.

Wieringa et al (2018 p.934) cry out for a theory of truth that does not focus on truth in general, or truth as an omnibenevolent force, but which can be of practical use for individual practitioners in solving single case scenarios. Practitioners need a concept of truth that can “*deal with the practical problem facing him and his patients in the here and now*” (Wieringa et al 2018 p.935). Identifying such a concept within existing theories of truth is declared futile: correspondence to facts, assuming facts were real, cannot single handedly solve the problem as correspondence leaves out the less rational aspects of a single practitioner's job, such as heuristics, empathy, ethics, gut feeling. As do coherence or idealistic truth notions. Pragmatism understood as ‘what works’ is thus deemed equally unfit, as it is not straightforward to ascertain ‘what works’. From this reasoning Wieringa et al (2018 p.935) deduce that practitioners need to be able to utilize elements from multiple concepts of truth, based on contextual and varying philosophical positions. The Ideal Limit Theorem is too narrow and in order to navigate a post truth world, where differentiating truths from untruths is increasingly urgent, the only viable solution is to rely on multiple truth concepts (Wieringa et al 2018 p.236).

The Ideal Limit Theorem truth concept presumed inherent to EBP, as explained by Wieringa et al (2018), as well as their proposed replacement by way of the embrace of pluralistic theories of

truth, decry rationality as well as empirical methodology for a plurality of reasons. First, the assumption that the ideal limit theory is *the* theory of EBP, is but an assumption. It assumes a dominant theory of truth on behalf of the EBP movement, when such assumptions decidedly go against the very premise of EBP - there is no evidence on which to base them and no sources to verify such a distinct claim. Furthermore, the assertion that EBP's ideal limit theory of truth does not recognise subjectivity is based on a conflation of terms and misunderstanding of common theories of truth. The Ideal Limit Theorem as 'truth will reveal itself eventually' has its epistemological home: by its very definition it is part of the pragmatic - inherently subjective - set of theories, whilst the idea of objective truths based on a foundational, corresponding reality belongs to the correspondence theory. The Ideal Limit Theorem strives to account for both subjective interpretation and objective facts. Third, the notion that single practitioners are not aided by the Ideal Limit Theorem, if viewed strictly and only by the idea that 'truth will reveal itself' (eventually) whereby individual patients and practitioners in the now are not helped by the future as of yet unknown, is irrelevant to the understanding of a truth concept. Truth, as understood by a truth concept, encompasses truth regardless of time of discovery whereby what is not yet known does not impact a truth theory per se. Thus, arguing that the relevance of a truth concept is impacted by unreachability of future knowledge, has no bearing on what a truth concept purports to: the truth concept remains the same even if truth content is yet to be revealed. The main objection thus seems platitudinous - practitioners are not helped by what they cannot yet know. That is a fact of the matter, and remains so irrespective of truth-concept and is in no way particular to the Ideal Limit Theorem, or pragmatic or correspondence theories for that matter.

If one does assume there is truth, an assumption Wieringa et al do not object to, and if one adheres to the idea of a truth theory as defining *the* truth rather than perspectivalistic, contextual interpretations, then the constitution of that truth would be the same for individual practitioners as well as for any one group or area of practice as a whole. Adding a plurality of truth theories, whose determinants all rely entirely on construction through subjective interests, does not reveal or explicate truth, but merely adds additional perspectives. This showcases the lack of discussion of what de facto constitutes truth: the discussion entails neither truth-maker nor truth-bearer, or proposed idiosyncratic suggestions to fulfill such functions, but relies solely on vested interest (Wieringa et al 2018 p.932). The proposed plurality of truths suggests that we embrace a multitude of notions of truth, assuming doing so would contribute positively, yet do not explain what would arbitrate between conflicting notions of truth nor explicate what distinguishes between mere opinion and grounded knowledge.

Assuming, as the authors do (Wieringa et al 2018 p.933), that adopting various situation dependent truth concepts, or pluralistic notions of truth, counters post-truth and helps in separating truth from untruth, is inherently contradictory. If there is no agreed upon concept of truth, of truth-maker or truth-bearer, or ontological presuppositions, nor any certainty of underlying correlation to a proposition, then the presupposition that additional truths would aid in suppressing the rise in either post-truths or accompanying bias, is wishful at best as truth is taken as arbitrary and wholly subjective.

5.2. Thoun et al: Truth-tension vs. Coherence

Thoun et al (2019), much like Wieringa et al, critique the presupposed current idea of truth, the regulative ideal, within nursing and EBHC in particular and EBP in general, and prescribe a change, in this case towards a more coherent view of truth. Nursing relies on regulative ideals, composed of explicit and implicit objectives towards which the practice should strive, such as knowledge based care, compassion, client-centered care, personal choice, but also the presumption of an, unspecified, truth (Thoun et al 2019 p.43). Which distinct epistemology a regulative ideal of truth is based on can instead be traced back to individual practitioners' worldview which in turn influences practitioners' philosophy of nursing practice, both which are grounded on personal values (Cody in Thoun 2019 p.43). Truth theories are thus, despite jointly articulated regulative ideals, personal, not the property of, or in the realm of, EBP or science or material reality whereby individuals of any profession may arrive at their own value based conclusions of truth.

Correspondence theory, by Thoun et al's account (2019 p.45), whilst accounting for the practical use of data and facts which are, most often, agreed upon within the profession, and based on a supposed reality that holds observable, objective facts, lacks an account of best practice, personal experience and clinical expertise. The pragmatic theory of truth is explained by Thoun et al (2019 p.45) as James's version; described as the sole pragmatic purveyor of a truth theory. James considered matters true only insofar as they were instrumental, that is useful, practical or expedient, in regards to particular instances: what works equals the truth. Acknowledging that personal beliefs must be consistent with the beliefs of the wider community, James insisted that his truth theory was consistent with the facts (Thoun et al 2019 p.45). Thoun et al (2019 p.45) interpret this instrumentalist version of pragmatism as a version of correspondence and reject it for its strict adherence to guidelines and regulation based on a preponderance of data, theory and outside expertise. With arguments strengthened by examples of practices within the medical community which were initially deemed 'to work' or factually consistent, but later proven inconsistent or unhelpful, Thoun et al (2019) dismiss the pragmatic and correspondence theories: neither theory accounts for best practice or consider practitioner and patient values or beliefs in addition to facts.

Quite contradictorily to their account of the idea of multiple, individual and value based notions of truth, Thoun et al (2019 p.44) contend that even if various theories of truth may support the nursing profession or individual practitioners' convictions, only the coherence theory is sufficiently holistic to account for human experience and respect '*conflicting statements about reality*'. Most notably, coherentism does not constrain truth based on reality, as "*truth is relative, constructed mind-independent and internal to a system of beliefs*" and determined by the coherence of individual beliefs in shaping our worldview (Thoun et al 2019 p.46). It is asserted that coherentism is necessarily 'true', as the tenets of the theory inherently confirm the theory itself. Conceptualizing truth as coherentism is thus validated by the belief in coherentism - i.e. it is only possible to claim truth based on a framework of beliefs supporting said claim. The coherence theory relies itself on a framework of beliefs, supposedly, albeit circularly, proving its own assumptions, and truthfulness. The idea that truth is coherently based is allegedly the

truth-bearer, but no truth-maker can be identified, as that would demand identification of which concrete entity makes something true, which coherentism unavoidably fails to achieve.

Granted, multiple claims to truth can by the notion of coherentism be truthful simultaneously, when individual beliefs, in lieu of objective reality or facts, are granted truth status. Thoun et al (2019 p.46) propose that practitioners make professional judgments based on *beliefs* in individual perceptions of systems of knowledge, such as EBP, not on the system of knowledge itself. The coherence theory thus provides justification for multiple ontological and epistemological views. There exists no independent 'dominant truth or standard for practice or policy' (Thoun 2019 p.46), as belief in a coherent set of ideas, not facts, not reality, not evidence, determines what is to be understood as knowledge. Such coherentism is utterly relativistic: it contains not just pluralistic ideas of truth but accepts individual judgment to be the arbiter of truth and provides space, safe space I presume, for "*scholars who do not align with the dominant scientific discourse*" (Thoun et al 2019, p.47).

Assumptions that each coherent system of belief can be equally compatible with empirical evidence and with an equal claim to truth (Thoun et al 2019 p.47) are neither realistic nor practical, and certainly not compatible with the official role of EBP. Granting belief the status of sole arbiter of truth would impact all facets of EBP. By such reasoning, anti-vaccination views convinced that the MMR vaccine, despite all empirical evidence to the contrary, causes autism, may consequently be considered a valid belief as long as the claimant can point to a coherent set of beliefs in support. By all other parameters this supporting evidence would be considered not just faulty, but rubbish; nonetheless avering its truthfulness would be 'correct' by this naive version of coherentism. Granting all belief systems equal status ostensibly leaves no way around relativism or the post-truth claims which will undoubtedly follow and claim legitimacy by this interpretation of 'truth'. The authors emphasize and embrace the most relativistic aspects of coherentism, those which do not dismiss a wide range of beliefs, thereby ignoring their enabling of alternative interpretations of just everything, all immediately visible dangers. This naive coherentism lacks foundation, explanatory truth-makers, and is but a naive attempt at inclusiveness, of establishing a society where 'diversity is honored' (Thoun et al 2019 p.47) disregarding the dangers such reasoning around truth enables.

5.3. Sayer: What Works vs. Error Avoidance

The assumed discourse of 'what works' as an underlying principle of EBP is often criticized for its alleged reliance on positivistic underpinnings. However these assumptions are based on an imprecise understanding and use of positivism, whereby Sayer (2020 p.241) suggests a new, more precise understanding of the epistemological base of EBP through the concept of 'process reliabilism'. Process reliabilism affords the quality of belief justification by whether or not beliefs were reached through epistemically reliable process(es) (Sayer 2020 p.242).

The dictum 'what works' is by Sayer (2020 p.241) assumed positivistic. Criticism of that assumption has been proffered within STS, avering that within the inherently socially constructed sciences, no clear distinctions can be drawn between values and facts, and

consequently the supposed objectivity inherent to positivism and in turn EBP suffers (Sayer 2020 p.242). The insight that EBP most likely cannot lead to unbiased evidence-based policies or practices has led to attempts at reaching a more encompassing understanding of what actually constitutes EBP: that EBP includes epistemological and political concerns (Sayer 2020 p.242). The continued reliance within EBP on the mantra 'what works' and the reliance on the hierarchical evidence pyramid, does, per Sayer (2020), EBP a great disservice by allowing only certain forms of 'evidence' to form part of said 'what works' as the current form is exclusionary rather than inclusionary, despite mounting criticism.

Sayer attributes the 'what works' dictum to the difficulty of asserting best practice in the social sciences as opposed to the natural sciences. The systematic introduction of a hierarchical system of research evaluation based on study format rather than content or result, consequently allows simplistic notions of 'what works' to take the place of more rigorous, objective evaluation (Sayer 2020 p.244).

The 'gold standard' of EBP is understood as RCTs, which supposedly embody the best evidence possible. All other forms of evidence, beneath RCTs, in this rigid hierarchical division of evidence are less and less supported the further away from quantitative studies they land. Such inflexible views of evidence, set already before any EBP analysis has been performed, undermine the very idea of EBP by discounting what could very well be equally strong evidence or provide complementary understanding. Nonetheless RCTs are more often than not implicitly as well as explicitly equated with the most beneficial manner of determining policy through the idea of 'what works' (Sayer 2020 p.245).

Sayer's (2020 p.245) proposed solution to the failings of EBP, attributed to the blind allegiance to 'what works', of strategic process reliabilism has grown out of analytic philosophy to aid in better understanding and eventually found the evolution of a more reliable framework for evaluation of the various components of the EBP process; the main problem with EBP is thus not the focus on evidence seeking per se, but on the forms and evaluation of them. Currently political interest has too significant an influence in setting the criteria of what amounts to good or bad evidence, vis à vis the scientists or practitioners within EBP (Sayer 2020 p.243). In light of this dichotomy of influence, reframing EBP towards avoiding error in the place of truth seeking would, as per Sayer, possibly provide a stronger epistemological foundation of EBP (Sayer 2020 p.243).

Inherent to the accusation of EBP being positivistic is a misappropriation of the term through a conflation between realism and positivism, according to Sayer (2020 p.246). Firstly, positivism does not necessarily include the ontological stance of realism, i.e. belief that there exists a human experience independent of reality. Second, Sayer (2020 p.246) decries the use of the term positivism with EBP as it is clearly misunderstood and value laden with negative connotations which are inherently harmful to EBP. This confusion is why Sayer (2020) proposes distancing EBP from its current equation with both positivism and 'what works' towards process reliabilism: such an alternative epistemological underpinning of EBP should focus on the pursuit of establishing how the evidence production process is best performed to reliably reach and

reveal the truth. Reliabilism is thus focused not on the evidence per se, but on the process: the justification of belief lies externally to humans, reliability is an objective feature of the methodology and there is a 'fact of the matter' which certain methods have greater chance of discovering (Sayer 2020 p.248). Inherent to process reliabilism is skepticism towards the assumed reliability of the omnipresent EBP evidence pyramid. A more holistic approach to what constitutes evidence and how it can be amassed should consequently take the place of the narrow focus on RCTs, as a cohesive set of contributing pieces of evidence would form a better understanding on which to shape policy (Sayer 2020 p.249).

Contemporary EBP is, according to Sayer (2020 p.250), all too preoccupied with the focus on hierarchical evidence in order to predict what policy will work best, but accuracy in regards to evidence does not necessarily lead to better practical outcome. Solving that conundrum requires value-added perspectives not currently allowed within the truth seeking common perception of EBP (Sayer 2020 p.250). Thus a normative gap must be bridged - to align the norms in seeking best policy with the normative view of what amounts to best EBP (Sayer 2020 p.251).

Sayer (2020 p.251) suggests that existing assumptions claiming that it is directly necessary to maximize the total number of justified true beliefs and that EBP, as it is practiced today, does that best, are unsubstantiated: by applying the idea of process reliability to the claims we can at least begin to justify them. Reliable methods will produce the most factual, true, beliefs which can epistemologically ground policies. Thus true beliefs are a prerequisite to act with justification whereby true beliefs ought to be valued higher. This reasoning suggests that the norms best suited for EBP entail utilizing the best methods to gather true knowledge on which to base policy decision making (Sayer 2020 p.252). It follows that the current system of 'what works' is not sufficiently substantial to justify decision-making and that the current system of ranking evidence with only implicit notions of what is 'best', without regard for contextual reliability, and thus ignoring what could be vital aspects of the knowledge gathering process, is not methodologically reliable. Sayer's (2020 p.253) conclusion avers that seeking to avoid error, by maximizing the efficiency, scope and thus reliability of the evidence gathering process, is more likely to be fruitful than the current privileged idea of truth seeking as goal of EBP.

Sayer does not do away with realism, as a supposed 'fact of the matter' or even truth, as it clearly remains the focus of process reliabilism, despite Sayer's claims to the contrary. Even as Sayer questions the assumed pursuit of truth within EBP, and recommends the pursuit of error avoidance in its place, he nonetheless uses the word 'truth' as an inherent part of process reliability, i.e. he presupposes the existence of a human independent fact of the matter which can be identified through correct methodology. Attached to this assumption, is the assumption that truth can be found through a reliable methodology, or process, and that there exists some form of truth-makers which unassailably establish the truth of a matter. Truth seeking should be replaced with error avoidance Sayer argues, but he neither explicates truth, nor error avoidance, whilst expressing increasing frustration with the flimsy accounts of evidence. It is problematic to dismiss truth as redundant, whilst not explicating what exactly is supposed to be redundant or why it could not form part of the problematic notion of evidence. In fact, error-avoidance could

be part of a correspondence truth concept: what is believed correct in error is not true, it does not correspond to facts, which is but a linguistically inaccurate dialetheic turn of Sayer's argument. Sayer's comprehensive description of process reliabilism is compelling, but would be more compelling without the vagueness of truth, and rather an elucidation of both truth seeking and error avoidance.

6. The Postmodernist Inheritance

Coherence theories reject the idea of truth as an objective absolute, instead truth is understood contextually. The postmodernist idea of truth is by this definition coherentist (Dowden & Swartz N.D.). Postmodernism is broadly a rejection of the Western Enlightenment narrative, a discontinuity of the blind adherence to a widely accepted, and today often disputed in parts and in whole, hegemonial worldview as evolved through the modernist project (Bernstein 1998). This rejection includes an antinomian rejection as well as analytical demystification of attitudes, sociocultural life, religion, metaphysics etc. In academia and philosophy this manifests in a distrust and incomprehension of ontological metanarratives, and proclaimed 'Grand Narratives', of which the belief in objective truth is one aspect. Postmodernism ushered in a noticeable shift in academic pursuits towards fragmentation through the study of groups, minorities, and societal interaction (contextualisation) over foundational work or aims at overarching metaphysical understanding (Bernstein 1998). Postmodernism brought a shift from realism to anti-realism, from truth seeking to relativism, from scientific methodology to heuristics (Bernstein 1998 p.200). Kuhn's 1962 'The Structure of Scientific Revolutions' initiated a parallel definitive change in philosophy of science, and eventually in broader society, moving away from empiricism to constructivism, and from positivism and subsequently from Popper's critical rationalism, to idealism and the various points of view embedded in the postmodernist analysis: deconstructionism, fragmentation, poststructuralism, relativism (Agbo 2015, Fuller 1992, Kielkiewicz 2013, Kuntz 2012). This was likely more than anything a result of interpretations of Kuhn's work, rather than his own points of view: the 'post Kuhnian tradition' (Sager N.D.) adopted and developed within STS is one interpretation and not necessarily the explicit tradition of Kuhn (Horgan 2012). Postmodernity's rejection of (objective, absolute, graspable) truth allowed for new approaches, including an openness to relativism, epistemic relativism in particular, as witnessed in the relativistic axiom "*there are no bare facts, only interpretations of facts*" (Baggini 2017 p.70)³⁰. The postmodern dictum suggests that acceptance, context, and consensus construct truth as defined by man, not by an objective reality - the subjective and the objective points of view are intertwined. Thus STS, in tandem with other contemporary schools of thought in the postmodern era, if not explicitly postmodern, embraced and benefited from the new era's allowance for perspectivalism. New approaches, new ways of conceptualizing and understanding society, science and knowledge allowed for new comprehensions of truth as well. As Jasanoff (2022) describes it, the very essence of STS was the chutzpah to claim that "*truth isn't just out there. It's not just a Platonic thing and we try to approximate it*" and instead understand truth as a 'social production.' The shift from modernity to postmodernity brought with it a shift in what was construed as knowledge and the expectation that knowledge was made rather than found: this insight is one of STS' most significant, paving the way for alternate

³⁰ Originally stated of course by Nietzsche as part of his perspectivalist outlook.

conceptions of truth within an epistemic framework as well. As Hacking (1999) analyzes in “The Social Construction of what”, what was previously taken for granted as set and being just so, could with these new analyses, be understood as flexible, changeable and improbable when understood as constructed rather than given thereby allowing for an openness to a plurality of understandings.

6.1. Relativism & Truth

Relativism entails the conviction that ‘truth and falsity are dependent on convention, or contextual framework’ (Baghrarian and Carter 2021). This means that certain properties or supposed facts are not simpliciter but relative to a situation as dependent on a variety of possible assessments. No matter of fact can, as per relativism, be established as definitely superior to another. Traditionally in philosophy of science relativism³¹ was accepted only in regards to internal phenomena related to judgments, such as regarding morality or aesthetics. Metaethical questions however were often included in external realism - moral judgments and actions have tangible effect on the world and others, necessitating cognitivism about morality in a realist or naturalist setting. From Kuhn on, these issues went through a paradigmatic shift: relativism was no longer particular to subjective, pure value judgments but included the world and how we perceived it enabling external relativism and relativism of external phenomena (Zovko 2018). Scientific theory and methodology thereby allowed for relativistic: judgement and perception became the new arbiter of theory (Dennett 1998). As hinted earlier this paradigmatic shift led to a division in philosophy of science in particular and philosophy in general. A new dichotomy of perception arose between realism and constructivism in all areas of philosophical study, where one decried epistemic relativism and the other allowed for it, albeit in varying degrees. Branches of philosophy of science, together with mainly sociology, evolved into STS and adopted to a large degree a constructivist, and relativist, viewpoint. Realism remained behind in areas of analytic philosophy and philosophy of science. The split was significant not just for theory but for practical application resulting from new areas of academic study, such as EBP.

The study of the outcomes and processes of science and EBP falls within STS (Sismondo 2010). Theoretical frameworks, methodology and general esprit remains loyal to its founding principles, arising from postmodernist methodological skepticism and Kuhnian tradition. Relativism is not per definition absolute - few relativists would adhere to the notion of ‘anything goes’ and that all ‘scientific’ results, regardless of methodology, are on par (Kusch 2021). The literature of STS focuses to a large degree on questions of the validity of subjectivity, issues which naturally arise relating to relativistic theory. There is, adherents argue, a demarcation between acceptable relativism and post-truth or relativism and subject centered research where mild relativism would be defensible (Kusch 2021).

The issue for a discussion of truth theories is not whether such theories of determinant of truth are successful per se, as in if what they actually determine is in fact useful or coherent, but whether the purpose of an epistemological truth concept is fulfilled. Truth concepts search to

³¹ See footnote 16 regarding the term ‘relativism’.

determine truth-makers. Truth-makers are absolute, not relative to a proposition, fact or event. Truth-theory explicates what constitutes truthfulness founded on truth-makers, like being, actual events or material properties, not on ambiguous perception. As such, regardless if relativism is weak, as in more stringent in methodological approach, or strong as in closer to the 'anything goes' accusation, it is evident that relativistic truth theories are not compatible with truth theory. They do not identify concrete truth-makers or explain what in the relationship between a proposition and the perceived (context-based) truth-bearers would de facto make it a truth-maker.

Truth cannot, as per truth-theory, be extrapolated from a subjective idea of what may make something true. Adherents of relativistic truth concepts often defend their position by appealing to the difficulty, if not impossibility, of knowing if one has reached or understood 'the' truth. However, not being able to identify an objective truth does not mean it does not exist. Kant differentiated between the phenomena and noumena, and accepted the impossibility of knowing the thing in itself. Kant recognised that this divide did not impunge existence but merely reflected the limits of human cognition (Stang 2021).

Realist, truth-maker reliant, truth cannot be extrapolated from a pluralistic, contextual or subjective idea of usage or agreement. Relativistic approaches to knowledge, belief, morals and in turn truth does not include the idea of a singular, definable truth in relation to any one proposition (Blackburn 2005 p.175). Of course perspectivalism only equates with relativism if it equates all or numerous individual perspectives of one phenomena to truth, but relativism does accept pluralistic, person, context or use subjective, contradictory, depictions of truth in relation to one phenomena. Realism, contradictorily, does not accept subjectivity, but does accept pluralistic, representational influences on a unifying truth, if those influences are in fact corresponding. Thus insisting that truth must correspond, does not preclude either context or coherence, but does not accept either without representation. Haack refutes the relativistic notion of truth stating clearly that there exists 'one truth, but many truths': within the realm of one unambiguous, non-relative truth concept fits multiple, various true propositions (Haack 2005, p.88). Each singular proposition is thus still either true or false as per a unitarian correspondence truth concept. Realism does not allow for rival truths or diametrically opposed truths related to one truth making proposition or semantic word games of dialetheism (Lee 2012).³²

Pontus Pilati famously asked Jesus as Jesus faced crucifixion 'What is truth?'. Pilati did not provide an answer as the question was rhetorical as well as ironically intended: who knows what truth is? Relativist truth theories, coherence, pragmatic, or the Ideal Limit Theorem, equally do not hold the answer. They describe a construction of practical application and subjective belief. Deflationary and semantic theories reformulate and reduce the question to the logic of language use. The correspondence theory is criticized for resorting to platitudes, naivete (Blackburn 2005 p.58) and question begging. Just because discovering truth is inherently difficult and in some

³² The Liar Paradox: If a liar states that she is lying, if she is indeed lying she is telling the truth, but that means the liar lied. Such dialetheism claims there are true truth contradictions, but per the correspondence theory they are mere semantical constructions.

cases unattainable, does not make equating truth with utility or context or reformulating it to 'a linguistic muddle' (Ramsey in Frápolli, N.D.) less problematic.

6.2. Meaningfulness of Truth Concept in EBP

As truth theories are so bountiful, and so disparate, it is questionable if they answer anything of substance: does a definition of the constitution of truth actually aid the discourse if there is no agreement on the definition? As truth theories rely on ontological beliefs, it is debatable whether truth theories answer anything beyond what questions of belief respond to. The problem then lies in the ontological, and not in the truth theory - in the notion that ontology is perspectivalistically founded.

The correspondence theory, as we have seen, is taken as platitudic in nature, as circular: what does 'truth corresponds to reality' actually mean? Adherents of the correspondence theory also subscribe to realism and the correspondence theory thus becomes self-evident, as in neither theory can exist separately, they are entirely co-dependent. Non-adherents will not be convinced of the correspondence theory if they reject realism. Of course there are variants of realism which adhere to constructivism, such as Carthwright and Hacking's Entity Realism, which claims that belief justification can be grounded in interaction with all kinds of entities and use them to intervene in other phenomena (Chakravarty 2017). This study nonetheless works from a premise of naive realism which is incompatible with strong constructivism whereby stressing the relevance of a platitude will not convince, unless they accept an underlying materialistic and realistic ontology. The discourse becomes circular. An adherent of scientific realism will aver that the answer lies in the accumulation of scientific knowledge: we know all of this, how can anyone possibly reject it?

A pragmatist or coherentist may not accept all facets of the realistic outlook, but nonetheless basing truth, or scientific facts, on what has been shown to work, on the contextual and combined evidence, seems inherently closer to realism than anti-realism. As with all theories there are absolutist views and more flexible adaptations of a theory: it is clear from the articles on EBP and truth that there is no outright rejection of reality. There is however a great deal of language games belonging to STS and to EBP (as of course to all nomenclature). The construction of fields of inquiry create bubbles of 'knowledge', esoteric concepts and accepted truisms. In STS, and for the study of EBP, the linguistic nomenclature includes concepts such as closure, incommensurability, paradigm, boundary objects, controversy, symmetry etc (Sismondo 2009). These words in themselves create a 'realism' within a subdiscipline. The assumption in many disciplines is that of accepting not just the terminology but the attached assumptions. Latour, the father of Actor Network Theory, an early constructivist within sociology of science, recently offered a mea culpa of sorts (Kofman 2018), realizing the effects relativism has for society, especially in regards to climate change denialism, and thereby adopting a scientific critical realism of sorts (Flatscher & Seitz N.D.).

Understanding that science, in theory and in clinical work equally, is subjected, if not permeated by subjectivity in the form of prejudice, values, convictions, beliefs is vital (Alves 2020).

Integrating that understanding into theory and evaluative research work to counteract such biases is necessary to counteract not only inequality in scientific practice and reach, but also willful instrumentalization of science. This understanding however does not legitimize the voluntary nature of the shift towards the increase in subjectivity that relativism enables. There is no separation of power between relativism as a believed 'good' and 'bias' as a 'negative', but the two are intertwined. Relativism, regardless of what good inherent to it, risks enabling negative interpretation affecting the public understanding of science with ramifications for public values and in extension democracy.

The notion, as adopted most evidently by Thun et al's version of coherentism, that truth is an entirely open question to be answered individually, and thus subjectively, becomes political rather than epistemological: the truism 'everyone has the right to their opinion' does not equate to the right to be taken seriously, to be believed, or even the right to, with the insistence of certain beliefs, practice within a certain profession.

The relativistic implications of truth selection, rather than truth discovery, is exemplified within the broader field of STS by Sismondo (2017) who states that "*Epistemic competition is as much about choosing which truths can be considered salient and important as about which claims can be considered true and false...*". Such openness taken to the extreme, as does Thun et al, risks doing away with foundations, which within for example nursing would also do away with any practical way for patients to be able to rely on the care they are afforded: is the care science based or belief based - is it anything goes? Thoun et al's naive coherentism is relativism at the extreme, including a disregard for not just objective truth-makers, but for the common foundations of a functioning society. The effects of this view of relativism, and in extension of aspects of STS, is debated within STS, where for example Sismondo (2017) refutes it, Fuller (2016) embraces not just relativism, but post-truth, and Collins et al (2017 p.12) suggest awareness, even caution: "*Unless we want to engage in post-truth activities ourselves we should not be pretending that our major contribution to this new understanding of knowledge – recognising the role of social and cultural factors in the creation of scientific knowledge – does not have the potential to give comfort to post-truth politicians and their supporters.*"

The discussion of truth concepts in the three articles come off as examples of individualism: the assumption of scientific realism lingers in the back whilst subjective freedom of interpretation reigns. Few theorists can be suspected to actually question the purpose and process of EBP and the underlying scientific method but too much openness to relativism infringes on the public space as well as the scientific project, sticking to an absolutist view of truth may be necessary to stave off post truth, alternative facts, vaccine denialism, pandemic mask-rejection, biological binarism, global warming refutation. The news that the flat earth association has, in its own words, 'gone global' is no longer fringe, nor that homeopathy's infinitely diluted substances cures Covid-19, but exemplifies why the notion that 'man is measure of all things' is a dangerous belief when set into practice.

6.3. Holistic EBP

The focus on a wider understanding of EBP than is found by blind adherence to the hierarchical evidence structure common with the theoretical and practical discussion of EBP and reflected in much literature, is not particular to any of the texts analyzed, but in fact a common trope bemoaning the lack of holistic thinking in applied EBP (Wieringa et al 2017). The critiques offered by these papers are similar, as is also their demand for a more holistic acceptance of what should be viewed as empirical evidence in determining best practices and policies. It is clear though that the three differ in what constitutes truth in the common interpretation of EBP and what the authors believe truth should be conceived as. Ontologically the beliefs vary in degrees of constructivism from wholly anti-realistic coherentism, via pragmatism as interpreted by the Ideal Limit Theorem to the realistically inclined reliability process. The first (Thoun et al) absconds entirely from truth - objective truth does not exist, it cannot be found and any perception of what constitutes truth is wholly subjective. The second (Wieringa et al) perceive truth as a pragmatic notion. The final paper (Sayer) is ambiguous in relation to truth, simultaneously resisting truth as the epistemological goal of EBP whilst still accepting that there are facts of the matter to be discovered, if only the process of uncovering them can become sufficiently reliable.

Neither proposed epistemology is advocating a revolutionary perception of truth, nor has this paper expressed one. However, the truth concepts suggested by Thoun et al and Wiering et al are not truth concepts per se if judged by and as adhered to truth-maker theory. Rather they are beliefs of what the authors perceive truth to pragmatically and contextually be: what works in EBP and what is useful in pursuit of best EBP. A truth concept, to fulfill the destiny inherent to the concept and truth-maker theory, ought to define truth in and of itself, and understand it as standalone, separate from what works, what seems legitimate, what fits a system of beliefs or what is mere opinion.³³ This reflects the plurality of ways truth conception, and epidemiology, can be addressed. Sayer's theory does not specifically define truth but merely identifies it as something inherent to and privileged in EBP, but does not explicate truth concretely.

If the idea of a concept of truth is to be taken literally, truth ought to be defined as what it is and what it can do. Truth, in ordinary language, is usually a non issue: it is the opposite of a lie, of false witness, of made up accounts, it is something that has happened, materially exists or represents what is known to exist. Truth in epistemology is contended, but still, only the deflationary, semantic and correspondence theories focus on semantic usage, and only correspondence on an explicit underlying realism. By the correspondence theory truth is correspondent to a fact(s) of the matter.

If the authors of the articles analyzed aimed at discussing what can be accepted as evidence, or understood as proof, or constitute sufficiently rigorously examined justification, then all articles are successful (to varying degrees). They arrive at coherent ideas of what many perceive as evidence, and they include multiple, contributing factors as possible understandings of evidence

³³ This might be conceived as a so-called 'Category Mistake' as discussed initially by Gilbert Ryle. The scope of the possibility of such a categorization falls outside this study but warrants further investigation.

and they analyze truth fruitfully in relation to EBP, taking possible pitfalls and complexities into consideration.

6.4. Pluralism is Truth Irrelevant

In analyzing scientific knowledge, Longino (2018) suggests that there exists a dichotomy between the social and the rational and that the chasm must be navigated and even mitigated, exemplifying the dichotomy with Popper's theory of scientific knowledge. Longino criticizes Popper for circumventing the social connection of science and inquiry as practiced, and thereby merely offering an epistemological ideal (Longino 2018 p.7). This critique exemplifies a general trend in STS which is brought to light by the proffered perspectives of truth in the articles analyzed: that there exists a problem in the division between descriptive and normative, between the practice of EBP and the objective theory of epistemology, when in reality they describe two different issues. Scientific practice and EBP cannot be wholly ideal, they are invariably social. Truth concepts, when based on truth-theory, however, are inherently ideal. Perhaps then, this is where the distinction is found: the articles aim at something else entirely, not a 'the truth', but at what can provide a foundational account of sufficiently rigorous EBP.

The argument presented contends that truth is truth as understood by correspondence, whereas the social, be it understood as pluralistic, perspectivalist, constructivist or relativist, aims at something else - and cannot as such not influence, change or nullify a realist based concept of truth even if it adds to the understanding of EBP and its various iterations. Conceptions of truth beyond its inherent state of representation are thus interpretations suited to the issue at hand. Their success then, depends not on objective truth value, but on purpose and use and 'best fit' with whatever the objective is.

7. A limited analysis

This thesis approaches truth as evaluated on the basis of truth theory, chosen due to its foundationalist and realist based perspective. There exists, naturally, a plethora of other conceivable approaches to analyzing truth conceptions, but this study chose to assume the one which bases its understanding of truth on foundational truth-makers in order to identify non-ambiguous, non-perspectivalist truth. Other pursuits might naturally be equally rewarding, but are not the focus of this study.

The analysis shows that it would be beneficial to reveal, through further study, certain aspects that this thesis has touched upon, but which due to their inherent complexities, and vast amount of material, have not been included in this limited thesis. The aim of the study has been to evaluate truth conceptions within EBP as exemplified by the three articles found explicitly discussing truth within EBP. However such an aim invariably touches upon many neighboring issues which undoubtedly influence any analysis. A few of the most poignant ones are discussed below as well as reasons for exclusion are provided and implications of adhering to certain limitations will be discussed.

7.1. Complex Tensions

One prominent issue would be the complexity of the tension between the normative and descriptive: the question is if either separates entirely from the other or if they are inevitably intertwined. This thesis treats them as separate entities where the purpose, the aim, of justifying truth position, is an ethical one. This simply means that positions taken in regards to truth have ethical implications. However the proposed truth position itself is descriptive in that it forms a descriptive clarification of truth perspective through the formulation of truth conception as what is. This too could however be understood as normative, if one approaches it from the perspective of ontology, and even epistemology, as also being unavoidably normative. This both is and is not problematic. Analytic philosophy aims at conceptual clarity, yet all major concepts are inherently value laden.

No person can entirely separate themselves from bias, preconceived conceptions, and beliefs whereas even issues within epistemology and science are firmly permeated by values and normativity: how we perceive and describe the world can in this sense be, to varying degrees, normative, even if the task is that of objective empirical description. Hence differentiating between the two, no matter how objective we observers believe ourselves to be, is impossible. Truth matters we say! That is normative. What that truth entails is, at least in aim, descriptive - but naturally any such description is in turn based on explicit as well as implicit biases, opinions and beliefs and hence, viewed in this way, inherently normative. This problem is omnipresent, it affects all studies, even the 'purely' empirical³⁴. The normative/descriptive discussion is one that would aid in the discussion of truth within both the sciences and STS. In this essay it mainly takes the role of an underlying assumption, as within any opinion based academic work, even if it is explicitly touched upon at times. The underlying ethical assumption is thus, as all too easily evidenced with the ramifications of, for example, misinformation, pseudoscience and bad science, that truth matters and has ramifications on all aspects of life.

7.2. Oppositional Standpoints

A second objection to the approach taken in this thesis might be that the oppositional standpoints, as perceived in the three articles analyzed and in STS in general, are in fact not really oppositional standpoints in regards to what truth 'is', but ought rather be conceived as what Ryle (2020) referred to as 'Category Mistakes'³⁵. The scope of the possibility of such a categorization falls outside this study but warrants further investigation. If it were so, that the discussions concerning truth examined simply refer to different categories rather than different conceptions within one and the same category, then the basis of this study, one could argue, is void. However, if this is in fact an issue of category mistakes, the question of what truth is, nonetheless remains to be answered, but may then be investigated under different premises. A discussion of whether this is in fact a category mistake has not been included, but it is not believed to be a conflation of categories based on the statements presented in the articles, which all explicitly relate their discussions to traditional truth concepts and epistemological

³⁴ For example the discussions of expectation bias in physics, medicine, even engineering. Jenga (2006).

³⁵ A category mistake, or category error, presents a proposition or statement (or in this regard issue) as belonging to, or having properties of, one category when in fact it belongs to another.

discussion of what constitutes truth. Of course, other perspectives of this too are abundant within both STS and Philosophy of Science.

7.3. The Fallibilism - Foundationalism strain

A third possible examination that is of relevance to most epistemological discussions of truth is the tension between fallibilism and foundationalism. As mentioned, Popper was not a foundationalist, but a fallibilist, as evidenced through his critical rationalist approach, exemplifying the very real possibility of viewing truth as corresponding whilst still accepting the pitfalls of fallibilism (Afisi 2017). This thesis has not focused on fallibilism other than in a couple of instances where it discusses it in regards to charges of truth being, in many instances, or even completely, unattainable or unknowable. This charge is extremely interesting and of course pertinent to the issue of what truth is. However, these are two distinct issues. It is entirely possible to discuss the essence of truth whilst still acknowledging that it is perhaps, even likely, unattainable. This circles back to the discussion of realism with its basic assumptions of what is, is, regardless of current knowledge or degree of verisimilitude of said knowledge. Fallibilism is thus inherent to the scientific project with the understanding that knowledge now, and in extension our perception of 'truth' now, is but the current best knowledge, and thus so is also what is understood as truth. However this in no way undermines what the truth actually is in a given matter. It is a pragmatic approach, of adapting to existing limitations, it ought not be confused with truth per se. This discussion is of course much more complicated than set out in these few sentences and within epistemology at large it is hardly resolved. Any investigation into truth will touch upon fallibilism. This thesis centered the truth conceptions of three conceptions within EBP. Fallibilism was not the focus of these texts, their 'main problem of truth' was consequently not found to be that of fallibilism. This thesis followed their lead and focused on the issues identified by them, leaving further discussions of fallibilism for future explorations.

7.4. Meaning

A final omission from the discussion is that of meaning in relation to the truth discussion. The basis of the thesis is truthmaker theory, i.e. that truth is based on something entirely separate from subjective interpretation (in so far as that is possible) leaving 'meaning', as per this conception, largely irrelevant. However, meaning is not irrelevant to those truth perspectives which are formed by understanding truth as based on context, pragmatics, understanding, ie in extension 'meaning'. This implies that meaning is subjective or at a minimum socially constructed: that truth is represented, depicted, manufactured or produced rather than set apart from a phenomena which, qua truth itself, is not subjective at all and actually contains no meaning other than through next level interpretation or use.

Questions relating to intersubjectivity, or the notion that all testing of a given hypothesis ought to arrive at the same conclusions in order to be, at least in theory, falsifiable could be applicable in relation to meaning, if meaning is so perceived. The reliability or possibility of intersubjectivity is of course also challenged by analysis of meaning. The discussions of truth as relative, subjective or contextually based does not discuss meaning per se, but argues that a wholly realist truth cannot be subjective, hence it has no meaning other than the meaning we place on

it after the fact. This 'meaning' however is ripe for further analysis, which would inarguably benefit and deepen any discussion of truth.

7.5. Further Studies Needed

The above mentioned areas, which have not been included in any deeper sense in the thesis, are ideas for further exploration. The aim has been to delineate the discussion of truth to what truth is and is understood as. The cue has been given by the three articles and their approaches to truth, they have invoked metaphysical and ontological claims which have been related to common truth concepts, thus this thesis has done the same. Their aim has been to understand truth in relation to EBP, what the conception of truth is, and how the articles suggest it ought to be. The discussions in this thesis has related to the same questions and unfortunately, as all discussions, have their limitations, omitting many challenging and fruitful discussions pertaining to truth and EBP beyond the scope of this thesis. It is suggested that these topics be further studied.

8. Conclusion

Notions of truth are ubiquitous, yet seldom explicit. Within EBP truth concepts are rarely expressed and consequently there is not an agreement on what truth is, nor what role it should play in EBP. Three contemporary conceptions of truth emanating from within EBP have been analyzed against the ontological framework and epistemological backdrop of common truth concepts and truth-maker theory. Sayer (2020) perceives EBP as based on a pragmatic idea of 'what works', spun from positivist ideas of science, knowledge and truth through an implicit underlying materialistic and realistic foundation of knowledge and facts as separate from us and independently discoverable. Sayer criticizes this common notion and rejects truth-seeking and suggests moving away from truth towards error elimination. Wieringa et al (2018) take a different approach and interpret EBP as working from an 'Ideal Limit Theorem'. They argue that facts are neither absolute nor entirely discoverable but interest based, and thus (in parts or wholly) constructed and draw the conclusion that existing truth concepts are insufficient to support EBP whereby 'more pluralistic understandings of truth' should be embraced. Thoun et al (2019) favor an 'inclusive view' or truth which captures and supports a diversity of views, an explicitly relativistic attitude. Much like Wieringa et al (2018) Thoun et al (2019) proposes a wider exploration of truth, leading to pluralistic understandings, but with an ontological presupposition of constructivism leading to a coherentist, relativist approach to truth.

None of the prominent truth theories, save the correspondence theory of truth, defines truth as in relation to what is. The remaining concepts suggest explanatory basis for what is deemed acceptable to warrant belief or for what may constitute truth based on a coherence of beliefs, what is useful to accept as truth, or of semantic expression. The difference is significant if the goal is to understand what truth represents according to truth-theory. The correspondence theory suggests an explanatory definition, which aims to mirrors what truth is, what constitutes truth per se, and reflects an ordinary language perception of truth. Coherentism and pragmatism set certain utility criteria for truth, and answer what we can accept, personally or communally, as

sufficiently 'true', whilst deflationism's reductionism remains at risk of being tautological. The acceptance of closeness to truth, of acceptance or instrumentalism, as exemplified by pragmatism and coherentism, achieve something outside of a truth concept as per truth-theory, which distinguishes them from the correspondence concept as well as semantic and deflationary theories.

The construction of parameters to embody truth mirrors the understanding of knowledge as, to varying degrees, constructed within STS. The truth theories found within EBP reflect this conception of truth. Thus, these theories do not arrive at a truth theory separate from, perspectivalist or pluralistic perceptions. Thoun et al's theory is thoroughly relativistic and hinges on a constructivist worldview, whereas Sayer relies on weak ontological realism which refutes the idea of truth as equivalent to being. The tendency towards pluralism and ambiguity and in turn relativism, is visible in all three theories, and in line with the shift in attitude allowed by the postmodernist openness to alternative points of view. The lack of a grounded, foundationalist based, truth theory emanating from the texts within EBP is in tune with the constructivist base of STS. The worry that such openness may lead to relativism concerns not the theoretical discussions, but practical application. In regards to epistemological truth definitions, their propositions remain theoretical propositions.

It has been argued that neither truth theory corresponds to a wholly realistic ontology nor to an explicit truth theory: all three articles lack non-ambiguous truth-making foundations found in a realistic approach to truth theory. For the purpose of defining an objective truth, it has been suggested that truth theories can not be suited to purpose, nor understood separate from a realist ontology or from tangible truth-makers. In order to be able to constitute a truth concept per se, a truth concept ought to depict an objective rather than subjective, general, idea of truth. The pluralistic interpretations of truth in EBP do not align with truth theory and in particular truth-maker theory. In extension the truth theories derived from EBP cannot align with realism but, wholly or only in part, relate to relativist ontological and epistemological interpretations.

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