EVIDENCE- BASED PRACTICE: THE SCIENCE OF CLINCAL PSYCHOLOGY

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Abstract

The evidence-based practice model has been subject to little theoretical examination. To bridge this gap, this thesis investigates the model's ontology, epistemology, guiding theory of scientific method, the notions of 'best evidence' this informs and how the model is translated in clinical practice. Doing so reveals number of limitations within the model. These include the privilege of empirical over theoretical and conceptual knowledge claims, a resultant focus on intervention research, and the failure to recognise the values-based nature of such commitments. These issues also pose a number of constraints when translated as a guide for professional practice. The Model of Clinical Enquiry (MCE) is offered as preliminary attempt to address these limitations and stimulate further theoretical development in the area. This methodologically orientated approach, highlights the different forms of knowledge and values operating throughout the clinical enquiry process, their relationship to the key stakeholders, and how they unfold across time.

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Chapter 1

Evidence Based Practice: A Review of the Literature

The History of Evidence-Based Practice (1.1)

For over a decade, the promotion of an evidence-based approach to professional practice has been central to most discussions about the nature and future of clinical psychology. "Evidence-based practice in psychology is the integration of the best available research with clinical expertise in the context of patient characteristics, culture, and preferences" (APA Presidential Task Force on Evidence-Based Practice, 2006, p. 273; also, see Spring, 2007). The evidence-based practice (EBP) movement predates instantiation in psychology and was first established in the medical field (Sackett Rosenberg, Gray, Haynes, & Richardson, 1996; Sackett, Straus, Richardson, W. S., Rosenberg & Haynes, 2000).

Evidence-based medicine (1.1.1). Evidence-based medicine (EBM) is understood to have originated from three separate branches. It is useful to understand the evolution of the EBM model, given its foundational role in the practice of EBP in clinical psychology.

The first branch of the EBM arose in the United States and was focused on practice variation and the need for standardisation. At the start of the 20th century, medical successes, like antiseptic surgery, vaccination, and public sanitation, made it possible to begin to differentiate between scientific medicine and less substantiated forms of treatment. Despite the scientific progress these developments were having little impact on the practice of medicine, which continued to be informed by tradition rather than scientific evidence. In response to this disparity, the American Medical Association (AMA) began documenting the gap between what research shows to be effective and what is done in usual clinical training and practice (Spring, 2007). This introduced the application of statistical techniques to therapeutic medical experiments, gradually transforming clinical research beyond the

typically uncontrolled and often haphazard experiments conducted in a wide variety of settings (Marks, 1997). By 1935, this movement had resulted in the closure of over half of the 155 medical schools operating in America (Beck, 2004) and heralded the shift towards greater standardisation of the medical curriculum i.e. One based upon science and rigorous clinical training.

Clinical trial methodology, which came from epidemiological research in the United Kingdom can be understood as the second key development in the origination of EBM. In the 1950s UK based epidemiologist Archibald Cochrane set new standards by demonstrating the feasibility of directly measuring entire populations. The teachings of Bradford Hill (1965) later exposed Cochrane to clinical trials methodology. He was convinced that the randomised control trial (RCT) methodology, which provided more reliable and unbiased information than other methods he had encountered, could vastly improve the British national health service. He later published his opinions (Cochrane, 1972), arguing that resources should be equitably and wisely divided as they would always be limited i.e. only spent only health care that that is proven in high-quality RCTs.

The third significant development in the origination of EBM is the 5-step EBM process and EBM pedagogical strategy created in Canada during the 1980s. Clinical epidemiologists at McMaster University began developing a method of addressing the automatic and unconscious decision-making biases present in the practitioner - patient interaction. This resulted in the 5-step EBM strategy: *Ask* (formulate questions), *Acquire* (seek answers by acquiring the evidence), *Appraise* (evaluate the quality, relevance, and clinical significance of evidence), *Apply* the results, and *Assess* the outcome (Sackett et al., 2000; Strauss et al., 2005). This approach, which sought to engage practitioners in an evidence-based process during the actual clinical encounters, also required a specific knowledge base and skill set. Training materials and a pedagogical strategy for teaching students and practitioners on how

to incorporate research results into the process of patient care (McCabe, 2006; Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996) concurrently evolved at McMasters University to address this need. In 1996 Sackett and colleagues collated these various developments and clarified EBM for the Institute of Medicine (IOM) as "the conscientious and judicious use of current best evidence from clinical care research in the management of individual patients" (Sackett, Rosenberg, Gray, Haynes & Richardson, 1996, p.71). In medical practice, this required the clinician to integrate overlapping "spheres" of knowledge in their decision making, research evidence, clinical experience, and patient characteristics (Sackett, Straus, Richardson, Rosenberg & Haynes, 2000).

The scientist-practitioner model (1.1.2). Paralleling some of these progressions in the field of medicine was the development of clinical psychology's own integrative approach to science and practice. In 1949 The Scientist-Practitioner model –which offered a unified approach to science and practice wherein each would continually inform the other- was introduced as the standard training plan for the majority of clinical psychology programs worldwide (Barlow, Hayes, & Nelson-Gray, 1984). The model demanded the development of interlocking skills to foster a career-long process of psychological investigation, assessment, and intervention, with the resulting scientist–practitioner psychologist embodying a research orientation in their practice and a practical relevance in their research (Hayes, Barlow & Nelson-Gray, 1999a).

The shift towards EBP (1.1.3). In the early 90s controversy surrounding the recovery of memories for childhood abuse (and of the countermotion of a "false memory syndrome") was generating political criticism and great public mistrust of the psychological field (Bryceland & Stam, 2005). EBP began gathering traction not long after these disputes in recognition of need for psychologists to provide interventions that could demonstrate empirically supported level of efficacy.

UK psychologists were the first to shift towards empirically based psychological interventions (Spring, 2007). Borrowed from the EBM practice of enhancing clinical experience with the explicit use of best evidence in making decisions regarding individual cases (Sackett et al., 1997), this initiative sought to keep clinicians up to date with summaries of expert research reviews for various therapeutic approaches. In this sense the psychological field's response to evidence-based medicine was initially focused on practice guidelines.

Developments towards EBP furthered progressed in the US when the American Psychological Association's Division 12 (Clinical Psychology) created a task force for defining and identifying information about empirically supported interventions. Appointed in 1993, the Task Force (on Promotion and Dissemination of Psychological Procedures) was also responsible for considering issues related to the dissemination of psychological treatments of known efficacy. In 1995, the Task Force released its first report (Chambless et al., 1995) which outlined selection criteria for empirically validated interventions, as well as providing a preliminary list of 25 treatments that met those criteria. Following an EBM approach this list offered a nomothetic conceptualisation of best evidence, by suggesting the best treatment approach for an 'average' client (Spring, 2007). Empirically validated interventions were later called empirically supported therapies (ESTs); those "specified psychological treatments shown to be efficacious in controlled research with a delineated population" (Chambless et al., 1998, p.7). The EST movement, which sought to compile lists of specific therapeutic techniques and their relative evidentiary support progressed rapidly in the US (e.g. Chambless et al., 1996, 1998) and the UK (e.g. Roth & Fonagy, 1996). By 1996 the inclusion of some EST training content had become part of the accreditation guidelines for doctoral -and internship- training programs in clinical psychology.

In August 2005, Sackett et al.'s (2000) model of evidence-based practice was unanimously adopted as policy by the APA Council (APA, 2005). This acknowledged the

pivitol role of EBP within the current health care regime[1], as well as the need for psychology to be part of its ongoing development (DiLillo & McChargue 2007). The definition of EBP adopted in this statement closely resembles the three-pronged model originally advanced by Sackett et al. (1996) and updated by Sackett et al. (2000).

What is Evidence-Based Practice? (1.2)

EBP is both an approach to clinical enquiry which seeks to integrate research, clinical expertise (CE) and client values and characteristics (CVC), and a conceptual model (Lilienfeld, Ritschel, Lynn, Cautin & Latzman, 2013). As a conceptual model, the research, CE and CVC components of EBP are traditionally presented as a 'three-legged stool' (Spring, 2007). The EBP conceptual model is currently operationalised in clinical practice as an intervention based problem solving strategy. This is referred to as the process of *clinical decision-making* (Lilenfeld et al., 2013; Spring & Neville, 2014).

Research (1.2.1). The research leg of the EBP 'three-legged stool' is composed of the best available research evidence as to whether or not a treatment works and why this is the case. Evidence is sought through question formulation, hypothesis testing, and the systematic collection of data through observation and experiment.

Three core sources of scientific evidence are contained in the *research* component including: A) *therapeutic efficacy*, which examines how well a therapy works in rigorously designed studies and research settings (Seligman, 1995), B) *therapeutic effectiveness*, which examines whether an intervention works as intended in actual clinical settings (Seligman, 1995), C) *basic psychological processes* applicable to psychotherapy (e.g. cognitive-schemas, arousal and regulatory processes, attentional and perceptual biases, early learning and attachment, behavioral reinforcement etc.)

[1] Psychology's adoption of EBP meant that all major health professions would now endorse the same model of evidence-based practice (Spring, 2007)

What constitutes the best research evidence is suggested to depend upon the question being addressed (Sackett & Wennberg, 1997). For example, for questions regarding the efficacy and effectiveness of treatments, the randomised clinical trial (RCT) is the research design least prone to error or bias. Whereas, for questions relating to etiology or prognosis, the optimum research design is often a longitudinal cohort study. However, since the ESTs movement predates EBP, a specific type of evidence (i.e. therapeutic effectiveness evidence) currently forms a significant portion of research component of EBP. This has meant that the RCT is commonly understood as providing the highest level of evidence.

This is evident in the EBP "philosophy" of best evidence which is frequently expressed in terms of a hierarchy. Here, data is positioned on the hierarchy according to its ability to minimise sources of error in clinical inferences (Lilienfeld., et al,2013). The apex of the hierarchy consists of data drawn from randomised control trials (RCTs), meta-analyses and systematic within subject designs (Ghaemi, 2009). High quality quasi-experimental studies then form the middle of the hierarchy, while correlational and uncontrolled case studies are located at the bottom (Thyer & Pignotti, 2011).

Clinical expertise (1.2.2). The CE leg of the of the EBP 'three-legged stool' is composed of clinical judgement and clinical experience (Lilienfeld., et al, 2013) and describes the rapid identification of a client's unique difficulties and diagnosis, as well as the risks and benefits of potential interventions to the individual (Straus et al., 2010).[2] This component of EBP details the way in which the clinician merges the aforementioned nomothetic research evidence with the more idiographic individual client characteristics, preferences, and values. If, for example, research evidence indicates that a particular therapy

[2] NB: Broader conceptualisations of expertise have also included systemic considerations and resources external to the clinician that are necessary to deliver treatment. For example, technological or financial resources and the institutional endorsement and agreement of relevant agencies (Spring & Neville, 2014).

may be suitable for a client, CE is necessary to establish how to best adapt that therapy for use with that individual client.

The skills encompassed in the CE component of EBP can be broken down into four categories 1) Assessment skills, 2) Practice process skills, 3) Communication and collaboration skills, 4) Engagement and intervention skills (Spring & Neville, 2014). *Assessment skills* pertain to the identification of client problems, characteristics, preferences, values, expectations and relevant environmental contexts. This also includes the clinician's unbiased assessment of their own practice. For example assessing their ability to implement the necessary therapeutic techniques required to address clients difficulties. *Practice process skills*, are the necessary competencies in the steps of EBP process. For example, asking well-formulated questions, using the best available research evidence (and applying evidence through shared decision making), as well as analysing client change and adjusting practice accordingly. This *CE* component also concerns the clinician's competency in case conceptualisation, as well as their planning of psychological interventions (DiLillo et al., 2007).

Communication and collaboration skills encompass active listening, clear and appropriate conveyance of information, and the ability to adjust and negotiate communication to achieve an understanding and agreement on a course of action. *Engagement and intervention skills* includes the capacity to motivate interest, constructive involvement and positive change from individuals, family/ whanau and other parties who may be affected by clinical decisions. This also describes core therapeutic skills such as developing a strong working alliance, effective problem solving and expressing empathy (Fraser & Solovey, 2007), as well a range of specific therapeutic skills necessary to implement empirically supported treatments (DiLillo et al., 2007). For example, if an EST, requires a social skills

training component, is exposure-based, or includes use of cognitive restructuring the clinician must be adept in the use of these various techniques.

These four categories also highlight the unifying role of the CE component in the broader process of clinical enquiry and the EBP conceptual model. In regards to the current operationalisation of EBP as a process of clinical decision-making, this refers to the integration of clinical skills and experience with ESTs and the values and individual characteristics of the client.

Client values and characteristics (1.2.3). The CVC leg of the of the EBP 'three-legged stool' EBP recognises the agency of the individual client, including their values, needs, characteristics, preferences, culture. The third component of model thus promotes client engagement and a shared approach to intervention, which ultimately encourages the client's self-management of their own recovery process (Spring, 2007). The CVC component is therefore critical to the process of collaborative decision-making and positive treatment outcomes.

This component of EBP also highlights the need to appraise evidence in relation to the particular circumstances at hand. Specifically, how the values, needs, preferences, characteristics and the culture of the client are likely to influence the acceptability, applicability and uptake of the supported evidence (Spring & Neville, 2014). In this sense, the CVC component can also be understood as a key set of contextualising factors that need to be taken into account when evaluating possible interventions (Spring & Neville, 2014).

Encompassing the CVC leg of the EBP model in clinical practice, therefore, requires the clinician to help the client clarify their individual values, characteristics and treatment preferences and then work to include these throughout the therapeutic process. It also requires the clinician to then decide how averaged research data is best applied to the client in response to these specific values and characteristics

A process of clinical decision- making (1.2.4). The 5-step EBM strategy has also been adopted and adapted as an intervention based problem solving strategy within clinical psychology (Buscemi & Spring 2015; Satterfield, Spring, Brownson, Mullen, Newhouse & Walker, 2009; Spring, 2007; Spring & Hitchcock, 2009; Spring & Neville, 2014; Steglitz, Warnick, Hoffman, Johnston, & Spring 2015). The key components of the clinical decision-making process are as follows: 1) *Ask* important questions about the care of the individuals. 2) *Acquire* the best available evidence regarding the question. 3) *Appraise* the evidence for validity and applicability to the problem at hand. 4) *Apply* the evidence by engaging in collaborative health decision-making with the affected individual(s) and/or group(s). 5) *Assess* the outcome and disseminate the results.

Evidence-based practice: a review (1.3)

It is now over a decade since the EBP paradigm entered psychological practice. During this time it has been widely discussed and examined and debates surrounding the nature and application of EBP are well documented across various academic journal articles and edited volumes on the topic (e.g. Gaudiano & Miller 2013; Goodheart, Kazdin, & Sternberg, 2006; Norcross, Beutler, & Levant, 2005).

Support for EBP (1.3.1). Whilst the notion that clinical practices should be supported by scientific evidence has intuitive appeal and definite utility (e.g. preventing the use of potentially harmful practices), the movement towards EBP in psychology has not been uncontroversial. That said, the majority of literature published on EBP has enthusiastically – and at times uncritically– endorsed psychology's adaptation of the EMB model. Psychology's endorsement of EBP in the academic literature predates the involvement of the APA Task Force and the instantiation of the model. For example, Sanderson (1998) -who was one of the first to raise concerns about EST- emphasised the role of empirical evidence in grounding psychological practice, as a necessity if psychological intervention was to

survive in the current healthcare environment. Despite his criticism of EST research (e.g. neglect for client therapist variability, the lack of generalisability of research to clinical settings, findings are limited to the treatment of DSM diagnoses), he suggested that many of the concerns aimed at the EST movement's reliance on *specific* forms of evidence may not apply to a practice that is simply grounded in evidence *more generally*.

Fonagy's (1999) somewhat narrower conception of EBP - a position more in line with the EST movement- was also advanced in relation to the use of manualised treatments. He proposed that the value of manualised treatment lay in the ability it gave to limit various iatrogenic factors in the therapeutic relationship.

Hunsley and Johnston (2000) provided a Canadian perspective on EBP around the same time in their review of the report of the Task Force report on ESTs by the Clinical Psychology Section of the Canadian Psychological Association (CPA). Although the article described the CPA's endorsement of EST and commended the APA's work in the area, it also advocated for a broader perspective of EBP than that put forward by Fonagy (1999). Specifically, the recognition that ESTs needed to be placed within the wider context of clinical practice.

Reynolds (2000) also gives a detailed discussion on the application of EBP and its core components, suggesting that psychology's adoption of EBP could cement its role in the healthcare system as well as facilitate the translation of research into practice. Barlow (2004) later endorsed the EBP movement and recommended that the title of "psychological treatments" should only be given to evidence-based treatments, as a means of distinguishing them from the more general category of psychotherapies. Later, Silverman (2005) aimed to dispel the myths that equate EBP with manualised treatments or ESTs, by advocating the broad applicability of EBP to alternate therapeutic orientations e.g. psychoanalytic psychology. She provided a brief preview of the stance of the Task Force, as well as

optimism towards an EBP approach that integrates evidence, CE, and client values and preferences.

Enthusiasm for EBP has grown following the publication of the APA Task Force (APA, 2005). For example, Brooke (2006) suggested that "something remarkable has happened" (p. 23) in his Task Force commentary, proclaiming that the document constituted the APA's official recognition of the importance of CE and client values and preferences. Anderson (2006) also detailed the benefits of EBP for psychology - as well as the broader benefits to the healthcare community more generally - suggesting that EBP built upon the IMO definition by deepening the examination of CE and broadening the consideration of CVC. Hunsberger (2007) was equally optimistic, viewing EBP as an explicit endorsement of the centrality of CE and subjective experience in psychological treatment. He was also hopeful that this endorsement could facilitate greater exchange of knowledge and experience between practitioners and researchers. Specifically, that EBP might bridge the gap between psychological research and practice, which he suggested had been created in the discipline through the neglect of subjective experience in psychotherapy. Spring (2007) also positively endorsed the extent to which EBP expands upon EST, as well as its potential as a transdisciplinary and idiographic approach that promotes lifelong learning.

These endorsements of EBP have since been moderated by more critical analyses, although most of this critique ultimately still supported the EBP movement. For example, Hunsley (2007) highlighted a number of challenges to EBP, not dissimilar to Sanderson's (1998) earlier criticisms of the EST movement. These included: the extent to which research participants can be considered representative of clinical populations; the challenges of translating nomothetic research into idiographic practice; the availability of adequate evidence to inform practice; and whether evidence-based treatments work in applied settings. His work provided research evidence for these challenges although he concluded -that despite

these challenges and need for much additional clinical research -the evidence that was currently available supported the use of EBP.

Kazdin (2008) also shared some of these concerns about EBP but concluded that it may provide a means to bridge the gap between researchers and practitioners that acknowledged their separate but equally valuable roles. Similarly, Anderson and Cuijpers (2009) developments of Barlow's (2004) proposal to separate evidence-based psychological treatments from general psychotherapy also demonstrates both critical analysis, and continued support for EBP. The authors suggested that this separation offers a valuable means of facilitating the dissemination of EBP, as well as psychology's integration into the broader healthcare system.

Critiques of EBP (1.3.2). Some of the first concerns raised about EBP detailed the potential implications for treatments that have not been evaluated, as well as the wider constraints this might place on the progression of the discipline. This issue was first raised by Shapiro (1996) who elegantly summarised the problem in stressing that "absence of efficacy evidence is not evidence for ineffectiveness" (p. 257). A number of authors followed suit (e.g. Gray, Plath & Webb, 2009; Bohart, 2000; Reynolds, 2000), expressing their concerns that the model's approach to evidence may impede the development of newer, innovative treatments as well as the research on longer-term treatments that may be less amenable to quick empirical results. Specifically, the potential exclusion of theoretically plausible treatments, those treatments that have not yet been studied extensively, and those treatments that have not yet been studied in controlled trials.

Similar critiques of EBP have come from proponents of Common Factors (CF) Theory (e.g. Beutler et al., 2012) who propose that clinicians' relational skills and their way of being in the therapeutic session are the main contributors to change within clients (Wampold, 2012). Indeed, a the large body of research exists, which demonstrates how "comparisons of

different forms of psychotherapy most often result in relatively nonsignificant difference, with contextual and relationship factors often mediating or moderating outcomes" (APA, 2013, p. 103). These findings inform skepticism in regards to the specific factor's approach of EBP research (e.g. RCT methodology), as well as debates surrounding the disproportionate research attention given to treatment outcome research, relative to research regarding the mechanisms of action of psychotherapies (Herbert, Gaudiano, 2005)

Critics also questioned the extent to which sufficient evidence exists to inform more routine psychotherapeutic practice, or what Bauer (2007) has referred to as, the neglected aspects of research in "rubber-meets-the-road" practice (p.686). For example, Addis (2002) has suggested that EBP is compromised by the lack of evidence for key aspects of practice and education. This includes a shortage of available evidence on a number of issues of clinical concern such as therapeutic process elements and the effectiveness of treatments, as well as EBP education at the undergraduate and post-graduate level.

Caution surrounding the overgeneralisation of evidence in support of a particular treatment has also been raised in regards to the EBP model. For example, King (1998) demonstrated how research data from large-scale RCTs typically require more in-depth interpretations than simple dichotomy judgments of efficacy. Using data from a large-scale study on the effectiveness of cognitive-behavioral therapy in the treatment of depression, he argued that favored research methodologies (i.e. RCTs) only allow for conclusions regarding the efficacy of a treatment "for very specific conditions under circumscribed conditions" (p. 87). Based on these findings, King went onto question whether the employment of such a term (as efficacy) may be a misleading rhetorical device.

Concern has also been directed at the inconsistent, or even contradictory elements of evidence that may make implementing EBP difficult (e.g. De Los Reyes & Kazdin, 2008; Messer, 2004; Westen & Bradley, 2005). Proponents of this view suggest that EBP is

ultimately challenged by the nature of outcome data in psychology, which is often contingent on, and/or varies with, the way in which outcomes are measured. Subsequently, alternate approaches to evaluating the evidence have been called for in order to negate the difficulties associated with varying or inconsistent data. For example, Westen and Bradley (2005) suggested that a more nuanced, multi-dimensional approach to evidence evaluation within EBP is needed. Likewise, De Los Reyes and Kazdin (2008) have also argued that a more complex approach to the evaluation of evidence is necessary, where evidential support is viewed as dimensional, rather than categorical. Other criticisms of EBP have been directed at the external validity of research. Specifically, the extent to which research evidence can be applied to an individual client and more diverse client groups, as well as the generalisability of research to applied practice.

Indeed, the distinction between nomothetic and idiographic perspectives on human nature (Maher, & Gottesman, 2005) has created much contention and confusion in clinical psychology (e.g. Dawes, Faust, & Meehl, 1989; Meehl, 1954). Hayes, Kaoholokula, and Watkins (1999b) first introduced this issue into the academic dialogue surrounding EBP. Because research usually provides nomothetic information, while individual treatment requires idiographic judgment, Hayes and colleagues (1999b) argued that the nomothetic nature of research challenges its applicability of research to clinical practice. On these grounds they suggest that the ability of the clinician to apply EBP is a function of the degree of convergence between the causal relations relevant to the client's difficulties and the causal relations targeted by the treatment.

The challenges of applying research to the individual have also been raised in relation to the validity of EBP treatments in more diverse client groups. Some authors (e.g. La Roche & Christopher, 2009) have focused on the improvements EBP has made to the EST approach with respect to consideration of client factors in the application of evidence. Other authors

(e.g. Bernal, Jimenez Chavey, & Rodriguez, 2009, 2009; Cabassa & Baumann, 2013; Ingraham & Oka, 2006; Muñoz & Mendelson, 2005) have raised concerns about the validity of treatments in more diverse client populations, given that much psychological research focuses on efforts to achieve uniformity in providing care to a broad base of clients. Proponents of this view criticise the culturally homogenous client groups in which the majority of research is conducted, as well as the resulting paucity of research evidence detailing the extent to which client diversity (e.g. variations in symptomology, comorbid conditions, cultural factors etc.) impacts on the ability to generalise efficacy of a given treatment. For example, Ingraham & Oka, (2006) have warned of the difficulties of implementing EBP with a client from an understudied demographic, given the scarcity of evidence regarding the manner in which treatment ought to be applied to such clients. Likewise, Bernal and colleagues (2009) review evidence which demonstrates how cultural and contextual factors impact on almost every aspect of the diagnostic and treatment process. They suggest that the outcomes of implementing EBP with a client from an understudied population is likely to be severely compromised. The reason for this being that the treatment -that has been developed in another ethno-cultural group- does not share the same language, and/ or cultural values.

A number critiques of EBP have also reflected on the differences between treatment research and most treatment settings (e.g., Bower, 2003; Franklin, Deacon, 2013; DeRubeis, & Westen, 2006; Tannenbaum, 2003; Westen & Bradley, 2005; Westen, Novotny & Thompson-Brenner, 2004). Specifically, the extent to which these differences might affect the applicability of research to clinical practice. For example, Bower (2003) argues that treatment in a research setting is more closely controlled and uniformly applied than can realistically be expected in a clinical setting. He also suggests that treatment research tends to differ in a number of significant ways to clinical practice. These include: client's selection or

referral to treatment; the types of treatments that are commonly used; and therapist factors, including their caseloads, experience, skill and treatment adherence (Bower, 2003). From a qualitative investigation of health professionals' views on EBP, Tannenbaum (2003) concluded that these differences in research practice create organisational barriers that make the actual implementation of EBP unlikely in an applied health setting. She suggests that the value of EBP lies primarily in its ideological and political potential, rather than in its practical utility. Westen and Bradley (2005) have also argued that research treatments tend to differ from the kinds of treatments commonly provided by clinicians, because they are typically attempting to treat discrete disorders briefly. They observe that research and clinical practice differ in significant ways, such as the settings in which treatment is delivered, as well as the uniform populations treated in research vs. the diversity of clientele treated in clinical practice.

A significant amount of the literature offering these critiques, also address the feasibility and potential obstructions to the dissemination and implementation of EBP. By and large, this literature assumes that widespread dissemination of EBP would be desirable. However, a number of factors that challenge the dissemination EBP -and may in turn limit its utility- are also highlighted. These include thee perceptions and misperceptions of EBP (Addis, Wade, & Hatgis, 1999; Bauer, 2007; Lehman, 2010; Lilienfeld et al., 2013, Lilienfeld, Ritschel, Lynn, Cautin & Latzman 2014; Pagoto et al., 2007; Wolfe, 1999), student and practitioner attitudes towards EBP (e.g. Aarons & Sawitzky, 2006; Borntrager, Chorpita, Higa-McMillan& Weisz, 2009; Luebbe et al., 2007; Pagoto et al., 2007, Stewart, Stirman, & Chambless, 2012), the challenges of establishing training in EBP (Hunsley, 2007a; Weissman et al. 2006; Caldwell, K., Coleman, Copp, Bell & Ghazi, 2007); organisational barriers and institutional support (Rosenberg, 2010); as well as the difficulties

of disseminating and implementing ESTs (e.g. (Herschell, McNeil & McNeil, 2004; Siev, Huppert & Chambless, 2009; Stewart, Chambless, & Baron, 2012).).

Lilienfeld et al. (2013) offers an in-depth review of a number of these barriers, discussing them as sources of resistance to EBP in clinical psychology and other allied mental health professions. Lilienfeld and colleagues (2013) argue that this resistance is to some extent rooted in misunderstandings about human nature and what EBP does and does not entail. They suggest that there are six sources underpinning this resistance toward EBP. These include (1) naïve realism, which can lead clinicians to erroneously conclude that client change is due to an intervention rather than a host of competing explanations; (2) misconceptions regarding human nature that can impede the adoption of evidence-based treatments (e.g. the causal primacy of early experiences); (3) statistical misunderstandings regarding the application of group probabilities to individuals; (4) erroneous allocation of the burden of proof on skeptics rather than supporters of untested therapies; (5) the widespread misinterpretations of what EBP entails; and (6) pragmatic, educational, and attitudinal obstacles (e.g. The discomfort some practitioners may have with evaluating therapeutic outcome literature.)

The majority of the above authors did not advance theoretical arguments against EBP but rather expressed concerns about its viability in clinical practice. Implicit in the critiques reviewed above therefore, is the assumption that EBP would be desirable if it were possible to somehow overcome a variety of practical matters outside the model itself. In this sense, the preponderance of EBP critique is not theoretically substantiated. A much smaller number of responses to EBP can broadly classified as theoretical in nature.

Because of the paucity of theoretical critiques *directly* pertaining EBP (and even fewer conceptual examinations) this literature will not be reviewed separately. Instead, the small

amount of that literature available on these issues will be integrated with, and built upon in the later examination of the epistemic assumptions of EBP (see chap. 3).

Chapter 2

Ontology

Questions of ontology ask what entities, or what kind of entities exist (Oppy, 2016). Ontological commitments can then be understood as a commitment, or series of commitments to these basic entities. In this sense ontology concerns both the existence of phenomena and the nature of phenomena deemed to exist (Oppy, 2016). In this section three ontological commitments of the EBP conceptual model, and some of the problematic assumptions they give rise to, will be examined: The conceptualisation of mental disorders currently subscribed to within the EBP model; the assumption of a medical problem-solving approach, which is ill fitted to the ontological demands of clinical psychological reasoning; and the privilege afforded to empirical phenomena over theoretical analysis within the *research* component of the EBP conceptual model. Finally, the ontological properties of the conceptual model itself will be detailed. Here, it is argued the three components of the model detail different types of entities and thus offer a conceptually confusing representation of EBP.

Conceptualisations of Psychological Difficulties (2.1)

Research methodologies prioritised within the EBP philosophy of evidence (e.g. RCTs, and meta-analyses) require large diagnostic groups in order to test hypotheses. Diagnostic and Statistical Manual (DSM; American Psychiatric Association, 2013) criteria have enabled these comparisons and provided the required 'consistency' in sample groups across different research programs, as well as the definitions of criteria used to determine group selection when comparing findings across different studies (Sinden, 2014). However, this reliance on DSM criteria as a means of conceptualising psychological problems within the EBP conceptual model has severe limitations given the compromised state of DSM diagnostic categories. Specifically, their lack of *construct validity*. DSM diagnostic categories do not

"carve nature at the joints" by picking out just one kind of condition with a distinctive etiology (Wakefield, 2013). They are better understood as purely descriptive labels that reflect the broader conceptualisation issues plaguing clinical psychology.

Throughout the last three decades, the nature and classification of mental disorders (MDs) has been subject to vigorous debate (e.g. Borsboom, Epskamp, Kievit, Cramer, & Schmittmann, 2011; Kendler, Zachar & Craver, 2011; Lilienfeld, 2014). Disappointingly, little progress has been made towards locating the underlying causes of psychological difficulties such as anxiety, depression and schizophrenia, which instead remain placeholders for future causal explanations. The validity of these models can be called to question in a number of ways. Namely, by the multitude of possible symptom presentations, the covariance within a particular diagnostic category (i.e., disorder heterogeneity), and the number of symptoms commonly shared by different disorders (i.e., symptom overlap).

In the context of psychological research, this lack of specificity might be apparent in the case of two participants who share the same 'diagnosis', yet present in decidedly different ways, or in two participants with similar symptom patterns which manifest from different causes. The adherence to DSM diagnostic criteria within the *research* component of the model is thus problematic. Here, the EBP conceptual model is vulnerable to the problem of a lack of construct validity inherent to the DSM-5 diagnostic criteria. Implicit in this use of DSM-5 criteria, is also the tacit support of these diagnostic categories and with it danger of 'buying in' to the reification of DSM diagnoses as objectively real. Here, the widespread publication and funding of EBP research which specifies participants based on DSM criteria could be seen as perpetuating a tautological relationship between classification and research methods.

However, DSM diagnostic criteria need not be the only approach to psychological difficulties promoted by the EBP conceptual model. Indeed, research that extends to include

participants with characteristics beyond DSM criteria looks to provide an understanding of core psychological mechanisms underlying psychological phenomena, as well as expanding understanding of the limitations and weaknesses of current classification systems. In this sense, the implicit support of DSM diagnoses evident in the research component of the EBP model currently provides an overly narrow conceptualisation of psychological problems. The disorder-specific emphasis in the research component of the model obscures the recognition that some psychological problems may be better conceptualized from a transdiagnostic perspective (Deacon, 2013).

Two recently emerged research initiatives- The *Research Domain Criteria* project (RDoC; see Cuthbert & Kozak, 2013) and the *transdiagnostic* approach (see Garland & Howard, 2013; Mansell, Harvey, Watkins, & Shafran, 2009)- may offer fruitful alternatives. In response to the lack of progress in the classification and conceptualisation of mental disorders, both of these initiatives argue that the best way to achieve theoretical and practical progress in the psychopathology domain is by detecting and describing the core psychological mechanisms underlying psychological phenomena. And once this has been achieved, to then discover what happens when these processes malfunction and/or perform in a suboptimal way. RDoC and transdiagnostic theorists address these issues from different investigation points. The former was initiated by the US National Institute of Mental Health (NIMH) and –using five domains of psychological processes and their instantiation in neurobiology– seeks to identify causal processes which constitute core psychological systems (Morris & Cuthbert, 2012). The latter gained momentum with psychotherapy theorists who were interested in the development of unified treatment protocols. These developments followed the observation that some psychological problems have responded to the same types of interventions and the subsequent speculation that they might have some causal processes in common (Garland & Howard, 2013; Mansell et al, 2009).

These initiatives are slowly altering the way researchers and practitioners approach both the classification and treatment of psychopathology. From transdiagnostic research, more is being learnt about symptom overlap, within category variability in clinical presentation, and therapeutic approaches to addressing high levels of comorbidity. While the RDoC project is set to provide the field with greater levels of detail regarding how normal psychological systems function and what occurs if they are faulty in some way. Integrating these initiatives may also offer a step towards addressing the significant knowledge gap apparent in the EBP literature. Specifically, the criticisms of the incompatibility between treatment efficacy research and clinical practice (see 1.3.2).

The prioritisation of DSM diagnostic criteria within the research component of the EBP model also has tangible implications for clinical practice in terms of the formulation of psychological difficulties and their treatment. Here, the overlap between the ontological position of EBP conceptual model (in terms of the conceptualisation of mental disorders), and DSM diagnostic criteria risks being misinterpreted/ misused by the evidence-based clinician. More specifically, DSM criteria risk becoming the EBP yardstick, whereby the clients psychological difficulties are understood in terms of diagnoses and change is measured via diagnosis specific symptom reduction (Bryceland, & Stam, 2005). This is problematic because this sort of medical problem-solving approach (i.e., one where psychological problems are conceptualised as well-defined entities to which standardised treatment can then be applied) is ill fitted to the ontological demands of clinical psychological reasoning.

The Differences Between Medical Problem Solving and Clinical Psychological Reasoning (2.2)

In medicine diagnosis is a biomedical causal explanation (Knotternus & Buntinx, 2008; Josephson & Josephson 1994). This is generally arrived at via a process of observation and

testing, and will often involve a complex combination of deductive, inductive, and abductive reasoning (Rodriguez de Romo, Aliseda & Arauz, 2008). This form of diagnosis is also based on an underlying physiological cause for a set of physical signs and symptoms. Here, a physical sign is something that can be observed directly via testing and/or physical examination and a physical symptom is a patient reported abnormality or discomfort. For example, the diagnosis of tuberculosis, a bacterial infection caused by *Mycobacterium tuberculosis*, is a biomedical causal diagnosis that makes use of both physical signs (e.g. a positive *M. tuberculosis* culture) and symptoms (e.g. coughing up blood): an *M. tuberculosis* infection is said to be the physiological cause of the physical signs and symptoms.

This example demonstrates how medical problem-solving also relies on tests which can conclusively establish the presence of causal mechanisms; which are rarely available in clinical psychology. Testing, and the subsequent knowledge of physiological causes allows the doctor to target causal processes. In turn, treatment will hopefully resolve the patient's discomfort. By contrast, when a diagnosis of Anxiety Disorder is made, all that can be reasonably posited is the existence of a particular pattern of symptoms. Unlike a medical diagnosis, there is no pairing between a DSM diagnosis and an underlying causal mechanism. The use of a medical problem-solving approach is therefore poorly suited to the cognitive demands of clinical psychological reasoning.

Alternates to the classification and conceptualisation of mental disorders are slowly developing (see 2.1). These represent a shift away from the purely descriptive understandings of psychological problems favoured by the DSM, towards causal understandings which detail underlying mechanisms. Whilst these alternatives may be better suited to clinical psychological reasoning, problematically they also challenge the nature of knowledge of psychopathology implicitly assumed within the EBP conceptual model.

EBP: The Nature of Phenomena (2.3)

Each component of the EBP model, research, CE and CVC refers to different types of phenomena which contribute to knowledge of psychopathology. While a significant component of the nature of psychological knowledge appears derived from the research component of EBP, the inclusion of CE and CVC components indicates that expertise of the clinician and the values and characteristics of the client also contribute as relevant phenomena.

Clinical expertise (2.3.2). Research is formative, but it can rarely be prescriptive in its application to an individual client (Reed, 2005). It is the role of the clinician to integrate nomothetic research phenomena derived from the research component with idiographic phenomena derived from the CVC component (see 2.3.3.) of EBP.

CE has been defined in terms of clinical experience and clinical judgement (Lilienfeld., et al, 2013) and refers to the skills necessary to perform these steps of the EBP process (see 1.2.2). This describes both the rapid identification of a client's unique difficulties, as well as identifying the potential risks and benefits of therapeutic intervention in regards to those difficulties (Spring & Neville, 2014). Phenomena referred to within this component of EBP can be understood as a emergent property of the clinician as an entity. This phenomena is that is also broad in scope and dynamic in nature. Problematically, idiographic phenomena within the CE component have often been over emphasised. This has meant that CE is frequently presented and/ or misconstrued as tantamount to opinion or unquestioned intuition (McFall, 1991; Meehl, 1973; Thornton, 2006). Given the 'values-free' perspective assumed at various locations throughout the EBP conceptual model (see chap 2) it is no surprise that the CE component has also generated greatest controversy within the EBP literature (Spring et al., 2005).

In an effort to clarify the construct the APA further defined the nature of knowledge

that constitutes CE in terms of certain competencies, specifically: (a) assessment, diagnostic judgment, systematic case formulation, and treatment planning; (b) clinical decision-making, treatment implementation, and monitoring of client progress; (c) interpersonal skills; (d) evaluation and use of research evidence; (e) understanding the influence of individual, cultural, and contextual differences; (f) understanding the influence of individual differences; and (g) having a cogent rationale for clinical strategies (APA Presidential Task Force on Evidence- Based Practice, 2006).

Whilst the APA definition outlines important skills for clinician phenomena and/ or knowledge within the CE component it remains difficult to define, assess, or aggregate as indicators of expertise. Moreover, it is unclear as to exactly how this knowledge guides the process of clinical decision-making the current operationalisation of the conceptual model refers to (see chap. 5). Implicit in the EBP conceptual model, therefore is the expectation that clinicians have the practical knowledge to conduct a systematic analysis of their clients' problems (Ward, Haig & Clack, 2016) as well as the supporting knowledge of scientific theory of method necessary to guide this process. This is an implicit assumption because while descriptions of EBP (e.g. APA Presidential Task Force on Evidence- Based Practice, 2006, Spring & Neville, 2014) emphasise the need to acquire and cultivate knowledge of *specific* methodological skills, they overlook the critical importance of using an explicit general method to guide the whole inquiry process (Ward, Haig and Clack, 2017; see 5.3)

Client values and characteristics (2.3.3). As with the nature of phenomena in the CE component of EBP, phenomena within the CVC component can be understood as an emergent property of the client as an entity that is dynamic in nature. For the purpose of this thesis, phenomena within this component of the EBP model is understood to concern both *self- knowledge* as well as the *anecdotal knowledge* offered by the client. Self- knowledge refers to phenomena related to client personal priorities, including their characteristics, needs,

values, and preferences. This includes the client's ability to report their own signs and symptoms (i.e. a first person perspective on their own difficulties, cognitions, behaviors, relationships etc.). Whilst the client can be considered the expert on phenomena pertaining to their own world-view, values, culture and preference, there are epistemic constraints operating within the self-report of their own psychological difficulties. Specifically, the reliability and validity of client knowledge may be compromised by a number of factors. For example, differences in meaning between the client and the clinician, or response biases and assumptions about the equivalence of internal dialogues and their verbal descriptions (Groth-Marnat, 2009). These limitations also apply to anecdotal knowledge reported by the client. The idea of *anecdotal knowledge* builds upon Bluhm and Borgerson's (2011) concept of anecdotal evidence which they develop in their discussion of the incorporation of patient values and characteristics in EBM. This refers to the common phenomenon where clients become part-time (unpaid) psychologists as they gather information online, devote time to careful consideration of their difficulties and solicit advice from friends and relatives. For the purpose of this thesis, anecdotal information is considered a highly relevant form of phenomena -encompassed by CVC component of EBP- since clients frequently offer information that is gathered anecdotally (Bluhm & Borgerson, 2011). For example, if a client's friend, brother or grandmother has experience with a similar psychological difficulty, or has offered the client advice on their own difficulties he or she will be much more likely to attach significant weight to this phenomena in detailing and understanding their own psychological difficulties.

The inclusion of client self and anecdotal knowledge within the CVC component represents an integrative addition to psychology's previous professional model, the Scientist-Practitioner model. Whilst this addition recognises client agency and has created space within the clinical enquiry processes for client related phenomena and understanding, there

still appears to be, at the very least, a tension between commitments to shared decision-making between the client and the clinician, and the broader assumptions of the EBP conceptual model.

First, as an examination of the phenomena referred to within CE component of the EBP model (see 2.3.2) states that it is the role of the clinician to "integrate" phenomena from CVC with phenomena from the research component of EBP to determine the best treatment approach. Implicit within the EBP conceptual model is thus the prioritisation of both research and professional phenomena over and above that contributed by the client. This is a problematic assumption when considered from the perspective of collaborative decision-making and client agency/ self-empowerment because it suggests the contribution of CVC component to the therapeutic alliance within the EBP conceptual model, is minimal.

Second, it is implicitly assumed within the EBP model that clinical psychology should be based on research evidence (i.e. largely empirical orientated knowledge drawn from the research component of EBP), and that scientific evidence must be accorded priority above information referred to within the other two components of the EBP conceptual model (e.g. Lilienfeld., et al, 2013, 2014). This assumption is problematic when considered from both the CVC and CE components of the model. Indeed, if the phenomena within CVC and CE components of the EBP model are to be taken seriously, they are likely to vary depending on the unique values of the client, the nature and context of the psychological difficulty, and the relevant phases of the clinical enquiry process (see chap. 5 & 6).

An analysis of the nature of phenomena referred to within the EBP conceptual model, thus reveals some disparity between the three components of the EBP model. Specifically, both the experiential phenomena derived from practice and the methodological skill of the clinician, as well as the experiential phenomena apparent in the client's knowledge and unique understandings of their issues, appears secondary to empirical phenomena derived

from the research component of the EBP model.

Ontological Properties of the Evidence-Based Practice Conceptual Model (2.4)

An examination of the ontological properties apparent in the depiction of the EBP model (or 'stool') and its three separate components (or 'legs') also reveals some disparity. This suggests that the representing the research, CE and CVC as three "legs" of a unified model may be a mistake. As argued above, the CVC and the CE components of the conceptual model both refer to specific entities (i.e. the client and the clinician) and emergent phenomena of both the client and the clinician. The research component however does not refer to a specific entity and instead refers only to knowledge itself. The majority of which is founded on empirical phenomena. This is problematic, because knowledge is an emergent property of entities, rather than a separate entity itself. In this sense, the EBP conceptual model misrepresents research, CE and CVC components as the same types of objects, when in fact they are different *kinds* of objects with distinct properties. The first, the real entities (i.e. the people involved, their interaction and their context) within the CE and CVC components, and the second, a conceptual abstraction (i.e. knowledge in its various forms) within the research component of the conceptual model.

As a conceptual model this type of ontological difference can, and has thus far been overlooked. Indeed, in its current conceptual iteration the EBP model appears to simply provide a broad outline of the three key areas of phenomena (i.e. research, CE and CVC) considered in the research and practice of clinical psychology.

Chapter 3

Epistemology

Epistemology is the study of the nature and scope of knowledge and justified belief (Oppy, 2016). An analysis of epistemology considers: the nature of knowledge, how it relates to truth, belief and justification, the means of production of knowledge, as well as skepticism about different knowledge claims (Oppy, 2016). Discussions of the epistemological orientation of EBP conceptual model remain relatively undeveloped within the relevant literature. However, EBM -from which the EBP model originates- has been subject to closer scrutiny (e.g. Bluhm 2010, 2011; Gupta 2015; Moen 2015; Worral, 2010). This section will thus be informed to a degree, by the philosophy of science literature in EBM. Central to a philosophically orientated discussion of epistemic orientation of the EBP conceptual model, is the role of values[3] This section will thus explore both the function and location of values within the EBP conceptual model, as well tacit and sometimes problematic assumptions these values currently inform.

Values and the Epistemological Orientation of the Evidence-Based Practice Conceptual Model (3.1)

A 'values free' approach and/ or perspective maintains that values, particularly those which are ethical or social in nature are inherently subjective and must be excluded from science (Douglas, 2013). However, the ampliative nature of science means there is always -and will always- be an inductive gap between theory and evidence (Douglas, 2010); i.e. no amount of evidence can ever definitively prove a theory. To assess whether there is sufficient evidence to support a theory therefore requires reference to values and in this way, some values will always be required and will always apparent within the scientific inquiry

[3] Values indicate the normative or emotive commitments people hold (Douglas, 2014)

process (Rudner 1953; Hempel 1965). Despite the relatively common belief that a 'values-free' approach protects the very core of scientific integrity (e.g. Mitchell 2004; Lacey 1999; Shrader-Frechette 1994, p. 53; Shrader-Frechette 1991, p.44 ; McMullin 1983), the practice of science is always 'shot through' with values (Douglas, 2014).

Contrary to the assumptions inherent in a 'values-free' approach, however, the presence of values within the scientific process need not be considered problematic, as long as the location of these values and their various influence are recognised and accounted for (Douglas, 2010). Important for an epistemological discussion of EBP then, is not so much the presence or absence of values but instead the whereabouts of values within the conceptual model and what their purpose or influence might be. Aligning with the works of Douglas (2008, 2009a) it suggested that it is *the role* of values and their *points of location* in the scientific process, that is critically important.

Values commitments can also be understood as tacit or explicit, with the level of recognition afforded to values and their function in the scientific process determining which category it should fall into (Douglas, 2014). The values informing the epistemological orientation of the EBP conceptual -specifically the privilege of empirical knowledge over theoretical or conceptual knowledge- can be considered relatively explicit, given that a reliance on empirical evidence is strongly advocated within the research hierarchy/ philosophy of evidence subscribed to by the EBP conceptual model.

Although detailed discussion of epistemological commitments of EBP remain undeveloped within the EBP task force literature, the model does detail and utilise a very specific philosophy of science. As the model's research hierarchy demonstrates, the default position of EBP is inarguably empiricist in its orientation. Indeed, claims about the nature of 'best' evidence are clearly apparent in the hierarchy of evidence, as well as the accompanying recommendations for further assessment of the quality of a particular study (see chap. 4). It is

important to note however, that the prioritisation of a particular epistemological position cannot itself be based on evidence. If there is no evidentiary basis for prioritising one epistemological orientation, ahead of -or instead of- another, such a decision is therefore a values-based, normative one.

In its current form, the epistemological orientation of the EBP conceptual model, specifically, the privilege afforded empirical knowledge over theoretical knowledge raises a number of concerns. Not because such an orientation represents the *presence* of values within a scientific process as a 'values-free' perspective might suggest. Instead, because the location and function of these values remains largely unrecognised and unexplored.

Values of all types serve important functions within scientific inquiry. The danger therefore, lies not in the presence of values, but in a lack of recognition of their role (Ward & Heffernan, 2017). Indeed, failure to appreciate the pervasiveness of values in the generation of knowledge does not mean that they are not exerting an influence, but simply that the influence is unacknowledged (Ward & Heffernan, 2017). Lack of recognition of values-based assumptions within the epistemological orientation of the EBP is indicative of the previously described 'values-free' perspective inherent to many scientific disciplines. Leanings towards this perspective, and the associated epistemological orientation within the of EBP model raises a number of issues. Failure to recognise these normative commitments has the potential to mask theoretical and ideological allegiances. Problematically, this may distort the detection and explanation of phenomena (Ward & Heffernan, 2017).

Somewhat ironically, the assumption of empiricist 'transparency' within the EBP model also violates the spirit of evidence-based decision-making (Wendt & Slife, 2007). Wendt and Slife (2007) highlight the *implicit* nature of these value governed choices in relation to EBP, arguing that in its current form, empiricism is treated as a window to the way things are, rather than the *particular* epistemology that it is. Some members of the APA Task

Force (e.g. Wampold 2002; Wampold, Goodheart, & Levant, 2007) have also suggested the approach to conceptualising evidence within the EBP, represents a deliberate avoidance of a discussion of epistemology.

This is evident within the APA EBP Taskforce statement which simply stipulates the reliance on some form of evidence without undue restriction on the nature of such evidence, or positing that evidence must be objective or used without exception (Wampold, Goodheart, & Levant, 2007). However, rather than an implicit values judgement, these authors argue this ambiguity is demonstrative of the EBP model's epistemological and methodological flexibility. The line of argument here suggests that this fluidity/ ambiguity allows the nature of the evidence to be determined by the relevant scientific and professional communities and is promoted as a unique feature of EBP that distinguishes it from alternate paradigms like the EST movement (Wampold 2002; Wampold, Goodheart, & Levant, 2007).

Although epistemological and methodological flexibility are noble objectives for a progressive model of EBP, simultaneously avoiding discussions of the normative scientific commitments of the model, and providing an empirically orientated hierarchy of evidence may ultimately discourages this sort of flexibility. Douglas (2008, 2009a, 2014), suggests that the function of values can also be further understood as operating in terms of the *direct* and *indirect* (see 4.3) roles they play within the scientific process. The *direct role* is the standard role values play in shaping many of our actions in science, and refers to those instances in which values are the primary reason for a choice (Douglas, 2014). If an action is ethically wrong for example, direct values reflexively operate as reasons not to proceed. Or, if an action is ethically right, then the direct values are a reason to proceed. At some locations in the scientific process, values playing such a role gives no cause for concern and may be required (Douglas, 2014). For example, in deciding which projects to pursue, or which methodologies are ethically acceptable in trialing a new therapeutic modality, it is a positive

attribute that ethical values direct our choices.

For the purpose of this thesis, values are recognised as playing a direct role in the epistemological orientation of the EBP conceptual model. Specifically, in the assumed prioritizing of empirical over and above theoretical and conceptual knowledge. Here it is argued, that values are operating in direct role within the EBP model, without adequate justification. Douglas (2010) suggests that values operating in a direct role in this kind of situation " instantiates concerns about wishing making it so" (p. 327) . Indeed, at this location within the EBP model it could be argued that values are here being afforded the same, or even more weight than the available evidence. As was previously detailed above, the prioritisation of a particular epistemological position within the EBP cannot by its very nature be entirely justified by evidence and thus represents a normative decision. In addition to the values inherent in this epistemic priority, there also exists a growing body of literature, evidencing the need for theoretical and conceptual development in both classification and treatment approaches (see 2.1 & 4.4.) currently employed within clinical psychology. The tacit decision to prioritise certain epistemic values without justification or explicit argument is therefore concerning. It risks devaluing alternate epistemological orientations, which as a growing body of literature suggests, may provide fruitful opportunities for psychological research and practice (see 4.4)

The epistemological orientation of the EBP model, and the privilege it affords empirical knowledge over theoretical knowledge, also presents a number of more practical issues for the science of EBP. Here, it is argued, that the epistemological orientation of the EBP conceptual model assumes both a very specific conceptualisation of objectivity, as well as the hypothetico-deductive theory of scientific Method (HDM) and the forms of explanation it is capable of generating. These assumptions, and their impact on both the science and practice of clinical are further explored below.

Objectivity and the Epistemological Orientation of the Evidence-Based Practice Conceptual Model (3.2)

Slife, Wiggins, and Graham (2005) suggest that the EBP's emphasis on descriptive/ correlational rather than theoretical/ conceptual knowledge forms, is the likely 'by-product' of the prevalent, albeit mistaken notion that we can only know -or will always know best- the sensory aspect of our experience (see 1.3; 1.3.1). Indeed, this notion is consistent with much of psychology's recent history (Viney & King, 1998), in which empiricism has been conflated with *objectivity* or impartiality (Slife., et al, 2005). Furthermore, inextricably linked to the empirically orientated assumptions of the EBP conceptual model are some very *specific* notions of objectivity.

Many central debates in the philosophy of science -and discussion topics covered in this thesis are in one way or another, concerned with objectivity. For example, the problem of induction, theory choice, scientific explanation, experimentation, measurement and quantification, evidence and the foundations of statistics, evidence-based science, and values in science. Understanding the notions of objectivity operating within the EBP conceptual model is therefore an integral to a discussion of the epistemology and philosophy of science underlying EBP.

Gaukroger (2012) provides a general characterisation of objectivity as:

> "….something that requires us to stand back from our perceptions, our beliefs and opinions, to reflect on them, and subject them to a particular kind of scrutiny and judgement: above all, something that requires a degree of indifference in judging that may conflict with our needs and desires." (p.103).

Gaukroger, (2012) also usefully adds to the discussion of objectivity by highlighting

the way in which the particular standard of objectivity-by which a relevant judgement can be made about the justification of various scientific claims-ultimately depends on the context and the nature of the task in question.

In this sense, objectivity can be understood as a complex concept and this is reflected in the multitude of categorisations and subdivisions of this idea (e.g., Megill 1994; Douglas 2004). For example, Douglas (2013) articulates separate 'modes' via which the different processes of objectivity can be understood and operationalized: those processes which individuals try to get at objects in the world, such as scientific experimentation or, those processes used by groups to develop knowledge, such as how people reach agreement. In addition to these separate modes, Douglas (2013) further breaks down the processes of objectivity, according to the kind of characteristics evident when operationalising these modes. For example, being able to use a theory or concept like a tool, or whether the uniformity of a given process that allows for individual interchangeability. As well as providing the means by which to operationalise different forms of objectivity, Douglas's (2013) work usefully draws attention to the fact that whilst, there is some cohesion amongst these different notions of objectivity, none of the different senses is strictly reducible to another.

Here, it is argued that, both Gaukroger's (2012) and Dougalas's (2013) approaches to objectivity highlights a number of issues inherent in assuming a *specific* notion of objectivity. More specifically, a narrow conceptualisation may inadequately reflect the complexity and irreducibility of objectivity, as well as the significance of the context and nature of the task at hand in determining what processes and characteristics are considered relevant. This in turn is likely to comprise the validity and utility of scientific problem solving and decision-making.

The above issues are further compounded when considering the nature and purpose of

objectivity itself. Firstly, the conceptual nature of objectivity means -like the prioritisation of a particular epistemological orientation- there is no evidentiary basis for ascribing which conceptualisation of objectivity ought to be used to underpin a knowledge claim, research design, method or evidentiary form. If there is no evidentiary basis to select which notion of objectivity is to judge or justify certain claims, the choices involved represent, at least in part, a normative one.

Secondly, common to all the various uses of the term 'objective' or 'objectivity' appears to be the idea that one should trust the outcome of the objectivity-producing process (Douglas, 2013). In this sense, the presence of objectivity operates as a 'good reason' for valuing scientific knowledge, and is the basis through which science holds authority in society (Machamer & Wolters 2004). Claims of objectivity are inextricably linked to the purpose of judgment and justification of various scientific claims (Douglas, 2013), and thus cannot be applied without referring to external norms or values (Reiss & Teira 2013).

If notions of objectivity are values-based, the foundation of an influential authority, and are utilised to elicit approval or consent within a decision context, it is of the utmost importance that the perceptions, beliefs and opinions surrounding specific notions of objectivity are subject to careful analysis and scrutiny. Specifically, seeking clarity about what it means to ascribe objectivity to a knowledge claim, research design/ methodology, or evidentiary form, as well as how it is decided whether they merit this status.

The consequences of adopting an impoverished and under-scrutinised view of objectivity is exemplified in the EBP model. Within the EBP model, it appears that descriptive, or correlational phenomena (e.g. knowledge derived from research component) is assumed to be more objective than theoretical, conceptual, or experiential phenomena (e.g. knowledge derived from CE and CVC components). This is evident in the prioritisation of certain knowledge forms ahead of others (see 2.3)

If broader notions of objectivity were employed within EBP–i.e. those which recognised and operationalised the process and specific characteristics of objectivity relevant to the nature and context of the task at hand-there would be numerous opportunities to recognise the possible objectivity of theoretical, conceptual or experiential phenomena knowledge forms. For example, if Douglas (2013)'s delineations of objectivity were applied to the EBP model, knowledge of a non-empirical nature-such as knowledge that is co-created by the clinician and the client (i.e. derived from the CE and CVC components of the EBP conceptual model)-could, in the appropriate context (e.g. relevant phases of the clinical enquiry process), be recognised as objective. Here, the agreement of the clinician and the client in regards to the best approach to treatment could in some instances be understood as having high levels of concordant objectivity (Douglas, 2013).

Evidence-Based Practice and Theory of Scientific Method (3.3)

Concomitant to the epistemological biases of the EBP model, is its privileging of the hypothetico deductive theory of method (HDM) and the levels of explanation it adheres to. Like the prioritisation of a certain epistemological perspective, or a specific conceptualisation of the processes and characteristics of objectivity, the favouring of a particular theory of scientific method cannot be based on evidence alone. Scientific methods and enquiry are embedded in social networks and are instead prioritised according to the influence of political, bureaucratic and institutional values. To privilege one theory ahead of another, without adequate philosophical discussion or judgment amounts to a tacit normative decision. Here, it is argued that the tacit presumption that the HDM represents *the* scientific method, is problematic for a number of reasons. Firstly, the failure to adequately acknowledge and discuss the role of the HDM within the EBP conceptual model means broader considerations of the applicability and limitations of any theory of scientific method are neglected . Secondly, the apparent assumption that there is only one theory of scientific

method risks devaluing and discouraging the consideration of alternate theories of scientific inquiry.

The discourse surrounding the nature of mainstream science has largely been structured by HDM and inductive descriptions of scientific Method. This influence is thus present in the science and practice of clinical psychology. Here, the dominance of the HDM paradigm within the EBP model can be traced back to psychology's adaptation of the EBM model, as well as the earlier adoption of clinical problem-solving practices from psychiatry , which o originates from EBM.

Standard depiction of the HDM specifies that hypotheses or theories are arrived at by conjecture and are then tested by deriving one or more observational predictions (Hempel, 1966). When prediction is supported by data, the results are considered to confirm the theory or hypotheses. Conversely, if the prediction is not borne out by data, then the theory or hypothesis is thought to be disconfirmed (Ward, Clack, Haig 2017). The HDM can thus be considered a *top-down* approach, and is recognised for its utility in the assessment of a theory's empirical adequacy.

Another popular theory of scientific method is the Inductive Method (IM). Standard depiction of the IM specifies that data are collected in a theory-free manner. Enumerative induction is central to this theory, a form of argument in which conclusions are drawn - typically in the form of empirical generalisations- from observed cases (Chalmers, 2013). The IM thus provides the basis for *bottom-up* scientific reasoning of hypotheses, laws, or theories and is recognised for its utility in the detection of phenomena.

Although each of the above theories of scientific method and their central forms of inference are helpful in achieving important research goals, they are unable to adequately structure all of the various phases of scientific inquiry (Haig, 2005, 2014; Vertue & Haig, 2008; Ward et al., 1999). The implicit assumption of the HDM within the EBP model is thus

problematic. Moreover, the tacit nature of this assumption also means that broader theoretical considerations regarding the process of scientific inquiry and methodological pluralism are currently neglected within the model. This includes a lack of reflexivity surrounding the utility (i.e. strengths and weakness) of the current guiding theory of scientific method within the EBP conceptual model (i.e. HDM), as well as insufficient consideration of potentially fruitful alternatives to this approach.

With no single theory providing a completely satisfying view of explanation, some philosophers have come to accept the strategy of explanatory pluralism (e.g. Lipton 2004). Douglas (2009b) argues that such an approach provides a broader range of cognitive tools to scientists by providing multiple ways of way of organising empirical information, so that additional predictions are more readily forthcoming. Explanatory pluralism may provide a useful methodological addition to the EBP model.

In light of these constraints and the broader range of cognitive tools offered within an explanatorily pluralistic perspective, it is evident that neither HDM nor IM alone are sufficient as general models for psychological research or practice. Alternative theories of scientific method which may perhaps supplement these traditional approaches are however available. Some of which, may be better suited to the cognitive demands of the research and practice of clinical psychology. Specifically, the investigative and explanatory tasks of clinical psychological reasoning, which are of particular significance to client outcomes in the absences of a causal/ explanatory psychological diagnostic system. One recent theory is the Abductive Theory of Method developed by Brian Haig (ATOM; Haig, 2014), which locates and combines a number of more specified research methods and forms of inference.

Abductive theory of method (ATOM) (3.3.1). As a general theory of method, ATOM is broader in scope than either the IM or HDM alone. ATOM's approach to scientific inquiry

and its unique features (i.e. those not included in standard inductive and HD approaches) are as follows. Science guided by *abductive* theory looks first to the research problem. Here, the initial conceptualisation of the developing problem explains how scientific inquiry is possible. Research problems are understood as packages, each containing and defining its own empirical, conceptual, and methodological constraints. These constraints are understood to characterise the problem and give it structure. This illustrates the genuine commitment to the formulation of a scientific problem embodied by this approach as well as enabling the researcher to effectively direct inquiry by signaling the appropriate constraints (made up of heuristics and rules) throughout various phases of scientific enquiry.

These problems are then investigated through the systematic collection of data, collected from multiples types of specific research methods. The ATOM is further distinguished as a method of enquiry by the central importance attached to the detection of empirical phenomena. *Phenomena* are those features of the world that are recurrent and generally stable, for example recency effects in short-term memory. Often phenomena take the form of empirical irregularities, although they can be more usefully understood through their relationship with scientific observation and prediction . In this sense, phenomena are features of the world that researchers seek to explain, which commonly prompt the search for their own understanding. This distinguishes phenomena from data. Unlike data, phenomena motivate scientific explanation. Phenomena are descriptions of patterns found in data i.e. they are extracted from, and evidenced by data. Data for the phenomena of recency effects in short-term memory would include empirical findings pertaining to reaction times and error rates in psychological experiments. Data is typically reduced using statistical methods to help direct the detection of phenomena, with the reliability of data forming the basis for claims that a given phenomenon exists.

Following the successful detection of phenomena, the ATOM model seeks to construct theories which plausibly explain them. This process is referred to as existential abduction and details the explanatory shift from a presumed effect(s) (i.e. phenomena claims) to an underlying causal mechanism(s) and its processes. Unlike the detection of phenomena, this is not an inductive move to a law or regularity. Here, the existence and processes of the causal mechanism are simply hypothesised; it is an abductive move from an effect to a hypothesised, underlying cause.

Explanatory theories initially deemed plausible are then elaborated upon via analogy. Here, concepts from well understood domains are drawn on to construct plausible models. This requires imaginatively drawing on the known quality and processes of mechanisms of a similar nature in more well understood domains. Such conceptual development is necessary, because the understanding of the nature of the causal mechanism is at this stage is approximate.

Once these theories are well developed they are then compared with their rivals with respect to their explanatory worth. Here, ATOM combines a set of regulative constraints to this standard depiction of abductive inference. This increases the utility of the ATOM by extending abductive inference beyond its purely logical form (i.e. identifying *any possible* explanation(s)), to inference of those patterns which detail the *most plausible* explanation(s) (Ward, Vertue & Haig, 1999). This evaluation requires making judgments of the best competing explanations primarily in regard to the explanatory worth of the theory, in addition to its empirical adequacy. Aligning with Harding (1976) the ATOM acknowledges that science pursues multiple goals and that theories are generally underdetermined by empirical evidence. As such, appraisal guided by the ATOM utilises epistemic criteria beyond that of empirical evidence. Systematic evaluation instead occurs abductively through the process of inference to the best explanation. This process highlights specific epistemic values, and

stipulates that a theory is to be accepted if it provides a better explanation of the evidence than its rivals.

This judgment is made on the basis of explanatory relations within rival theories. These explanatory relations in turn establish a theory's degree of explanatory coherence (Thagard, 1989), evaluated according to three criteria: explanatory breadth (consilience), simplicity, and analogy. *Explanatory breadth* stipulates that the more explanatorily coherent theories will explain a greater range of facts or phenomena, and is the central evaluative dimension for choosing the best explanation. *Simplicity* refers to the idea that theories that make fewer special assumptions should be given preference. Finally, theories are judged as more coherent if they are supported via *analogy* to theories that have already been established as scientifically credible.

This alternative method -which locates and combines a number of more specified research methodologies- provides one possible example of an alternate theory of scientific inquiry that could be fruitfully employed within the EBP conceptual model. As the above discussion demonstrates, ATOM provides a more comprehensive theory of method than either the IM or HDM. On these grounds, and given the ability of the ATOM to both investigate and generate causal/ mechanistic explanations, it is also suggested this theory may thus provide better guidance for psychotherapy researchers and clinicians.

As 2.3.1 detailed, the EBP model must be capable of facilitating the development of theoretical understandings and mechanistic knowledge in order to support the progression of promising research initiatives like the transdiagnostic movement and RDoc. In its current form however, the EBP conceptual model privileges descriptive and observable knowledge in the form of empirical data.

Promoting broader epistemic considerations and alternate theories of scientific Method, such as ATOM within the EBP conceptual model provides a tangible means of supporting

the progression of research initiatives, like that of transdiagnosis movement and RDoC. Such epistemological and methodological diversity also has also has a number of important implications for the clinical enquiry process and for the practice of clinical psychology more broadly (see chap.5 & 6) .

Chapter 4

Evidence-Based Practice: Notions of 'Best' Evidence

The flow on effects of the epistemic priority given to empirical ahead of theoretical knowledge -and the concomitant specific conceptualisations of objectivity and theory of scientific method this perspective promotes-are evident to differing extents in all three components of the EBP conceptual model. Nowhere is this more apparent, however, than in the research component of EBP and the philosophy of evidence the model subscribes to.

What Constitutes 'Best' Evidence ? (4.1)

In the EBP Presidential Task Force report evidence is conceptualised as "scientific results related to intervention strategies, assessment, clinical problems, and patient populations in laboratory and field settings as well as to clinically relevant results of basic research in psychology and related fields" (APA, 2006, p. 273). Within this report, multiple research designs, methodologies and evidentiary forms are endorsed e.g. RCTs and meta-analyses (i.e. efficacy research), qualitative research, clinical observation, systematic case studies, process-outcome studies, public health and ethnographic research (APA, 2006).

Despite an endorsement of evidentiary diversity, the EBP philosophy of evidence is communicated first and foremost in terms of a *hierarchy* of evidence. Specifically, sections 2.1- 2.3 of the APA's current criteria for evaluating clinical intervention research, which ranks research in ascending order, as to their relative contributions to conclusions of efficacy (American Psychological Association, 2002). This is based on the types of research designs and methodologies utilised, as well as the quality of the studies through which the evidence is produced. RCTs, meta-analyses and systematic within subject designs are at positioned at the top of the research hierarchy. These are followed by high quality quasi-experimental studies, which are ranked ahead of correlational and uncontrolled case studies at the bottom of the hierarchy. In the hierarchy of evidence proposed by EBP, the RCT is depicted as the

strongest evidentiary form for of the utility of a particular treatment. Here, the 'gold standard' of clinical evidence in EBP is the properly controlled and suitably powered RCT with appropriate blinding (Ghaemi, 2009).

Despite the insistence of the proponents of EBP, there is no consensus that RCTs provide the only good research evidence, or are even always the best kind of evidence (e.g. Lilienfeld et al., 2013, 2014; Spring & Neville, 2011). The replacement of a hierarchy that clearly and unequivocally places RCTs at the top, or attempts to explain the circumstances under which a non-randomised study may be superior to a randomised has yet to be developed.

In EBP, the purpose of the RCT is to compare the effects of a particular therapy with those of a placebo or another active therapy, under circumstances that are carefully controlled in order to minimise bias, or confounding by extraneous factors that could influence the outcome of the trial. To minimise confounding, researchers set rigorous criteria for participants before they are enrolled in a trial. This includes controlling the age of the participant, ensuring that participants' psychopathology/diagnoses are comparable, and eliminating potential participants with comorbid disorders, or those engaged in other therapies or pharmacological interventions. Participants are then randomised to receive either active intervention or placebo, as they are recruited. This step is designed to control for unknown differences among participants. Here, it is assumed that the randomisation process will balance these confounding factors between treatment groups. Because this assumption is made with regards to large numbers of repetition of the same experiment, rather than to any single experiment, researchers will commonly look for imbalances between groups after randomisation.

The statistical analyses that are used in the majority of clinical trials are also based upon similar assumptions i.e. that random sampling from the population, as well as random

allocation will balance confounding factors between treatment groups. (Bluhm, 2007) however is critical of these assumptions, and suggests that trial samples are better understood as 'convenience samples', because clinical trials are never randomly sampled from the pool of *all* eligible participants. In this sense, randomization in both sampling from the population, and allocation of subjects to treatment group, within RCT methodology and the statistical analyses they employ is always violated. Criticality of assumptions surrounding randomization within RCT is therefore necessary,

In addition to randomisation, RCT methodology utilises blinding wherever possible. This serves to eliminate potential bias in assessing research outcomes and, refers to the process in which neither the participants, nor the researcher (when possible- this is termed double blinding) know whether or not an individual is receiving active treatment or placebo. This sort of knowledge presents less of a problem with objective outcomes, for example quantified results on laboratory tests in medical research. However, psychological research often explores phenomena which require the subjective assessments of improvement by participants, or by those conducting the research. Knowledge of the group to which a participant has been allocated under these conditions could influence assessments.

The methodology of the RCT also requires participants and researchers to follow precise protocols, which are designed to ensure that all participants receive uniform treatment. For example, a given intervention must be engaged in specified amounts and at specified frequencies. The effects of the therapy are also measured using standardised psychometric scales and will typically incorporate inter-rater reliability measurements to determine how similar the data collected by different research personnel are, since individual differences in interpreting rating scales constitute another source of bias.

Jadad (1998) describes RCTs as broadly 'designed in such a way that the results are likely to yield a 'clean' evaluation of the interventions' (p. 12). The description of RCTs thus

far represents the methodological ideal. However, it is not enough for an RCT to be designed and conducted well, the design and methodology must also be reported clearly and transparently in order to influence clinical practice and policy (Spring & Neville, 2014). In this respect, the use of RCTs in psychological research have been subject to a number of criticisms about the lack of clear guidance surrounding their methodological quality.

The Consolidated Standard of Reporting Trials (CONSORT) Group seeks to address such issues by promoting transparency and standardisation of the experimental process, so that evidence users and synthesisers can clearly evaluate validity and relevance for their context. CONSORT criteria provides a checklist of 22 items (Schulz, Altman & Moher, 2010) that should be reported when presenting an RCT.

In relation to CONSORT criteria, there are a number of areas in which psychological research frequently falls short (Spring, Pagoto, 2004; Stinson, McGraph, & Yamada, 2003). Spring (2007) highlights four such areas. Firstly, the failure to clearly specify the study eligibility criteria and how this impacts on trial enrolment; secondly, the common failure to clearly describe how the sample size was determined; detailing how the randomisation sequence was generated, concealed, and implemented; and fourthly describing whether any blinding was implemented within the trial and how its success was evaluated, including blinding assessors of the study outcomes. The failure to provide such details is problematic, given this information is required to adequately appraise external validity.

Simonsohn, Nelson & Simmons (2014) argue that scientists tend to report only studies or analyses that 'work' and that much of psychological research has been subject to *p-hacking*. It is of the utmost importance then, that there the research process is a transparent one and that clear statement proposing the analyses to be undertaken etc. are included where appropriate, so clinicians are able to critically appraise research design and results. *P-hacking* is the colloquial term for the manipulation -sometimes unconsciously- of the process

of statistical analysis and the degrees of freedom in order to return findings below the p<.05 level of statistical significance (Simonsohn, Nelson & Simmons, 2014). The most costly error of p-hacking is the *false positive* , or the incorrect rejection of a null hypothesis (Simmons, Nelson, & Simonsohn, 2011).

In the of course data collection and analysis, researchers must make numerous decisions. For example, is it necessary to collect more data? Should some observations be excluded? Which conditions should be combined and which ones compared? Which control variables ought to be considered? Is it appropriate to combine or transform specific measures? It is uncommon and often impractical, for researchers to make all these decisions beforehand. Instead, it is accepted practice to explore various analytic alternatives in search of a combination that yields 'statistical significance' and then to report only what 'worked' from the resulting analysis. This is typically achieved by eliminating one of the experimental conditions from the results to produce an overall p-value that is less than .05.

The problem, however, is that the likelihood of at least one analysis producing a false positive finding at the 5% level is necessarily greater than 5%. (Simmons, Nelson, & Simonsohn, 2011). Despite the nominal endorsement that the false-positive rate does not exceed 5% (i.e., $p \leq .05$), the current standards for disclosing details of data collection and analyses within psychological research, make false positives a lot more likely (Simonsohn, Nelson & Simmons, 2014). Clinicians must therefore remain vigilant for publication bias and p-hacking in their critical appraisal of the quality of RCTs and constantly question whether the effects they are presented with are actually true, or if they merely reflect selective reporting.

What then does Jadad's (1998) 'clean' evaluation really refer to? One interpretation of a clean evaluation, is that a successful intervention outperforms the placebo therapy condition at a predetermined level of statistical significance. In doing so it provides an estimate of the

probability that the differences observed in the average outcomes between the two groups have occurred in a population in which the measured effects of the therapy are no different than those of the placebo.

The statistically orientated interpretation of a clean evaluation requires that a trial has internal validity. Or, that any differences in performance between the two interventions can be attributed to real differences in the effects of the therapeutic modalities being compared, rather than to chance. However, this is not an inference that can be drawn directly from a statistically significant result. Instead, this conclusion assumes that the trial has been well-designed and demonstrates adequate control over extraneous variables.

Notably this statistical interpretation also rests on the '*p value fallacy'* (Goodman, 1999), or the belief that the statistical significance of the results of an experiment provides both the long-term outcomes of an experiment and the evidential meaning of a single experiment. Goodman (1999) argues that this fallacy is a direct result of the routine practice of conflating Fisher's statistical methods, with Neyman-Pearson hypothesis testing. According to Goodman's (1999) line of reasoning, the dual role the p value is believed to play explains why it is so common to interpret clinical trial results without adequate consideration of other evidence that may bear on the perceived effectiveness of the treatment. Or, more simply put, the assumption that any treatment that has been shown to be effective in a clinical trial will therefore be effective in clinical practice.

The interpretation of Jadad's (1998) 'clean' evaluation of greatest relevance to clinicians is that the results of a clean clinical trial cannot easily be extrapolated to the everyday practice of clinical psychology. These concerns can be understood broadly in terms of limitations to generalisability of the RCT. Or, more specifically in terms of the compromised status of the external and ecological validity inherent in this research design. By employing techniques designed to maximise internal validity, psychotherapy RCTs have

been characterised as possessing insufficient external and ecological validity to reliably inform real-world clinical practice (Westen, Novotny & Thompson-Brenner, (2004). This 'catch-22' is often described as the distinction between external validity efficacy vs. effectiveness (See Seligman, 1995).

Criticism focuses firstly on the traditional concerns surrounding the degree to which group averages found in clinical trials reflect individual processes (e.g. Hayes et al., 1999a ;Hayes et al., 1999b). Whilst a diagnostically homogeneous sample might permit less ambiguous conclusions about the effects of the experimental treatment, the flip side of this is they may generalise poorly to a target population with a characteristically complex clinical presentation (Deacon, 2013). Secondly, the ecological validity of RCT are often compromised when researchers implement standardisation measures (e.g. Barlow, Gorman, Shear & Woods, 2000). In this sense, the delivery of a fixed number of psychotherapy sessions in close adherence with a step-by-step manual, or fixed therapist contact, which may be useful in operationally defining independent variables in an RCT, has little resemblance to routine clinical practice and is perceived by many clinicians as unduly restrictive (Addis, Wade & Hatgis, 1999) Thirdly, RCT are more broadly criticised for their lack of transportability; the degree to which treatments demonstrating efficacy in controlled research designs can be utilised in front-line service provision settings with similar benefits (McHugh, Murray, Barlow, 2009).

All of this is not to suggest that RCTs are without value. Indeed, the adoption of the RCT paradigm has greatly enhanced the internal validity of psychotherapy outcome studies (Deacon, 2013). Moreover, RCTs have increased confidence in observed outcomes of psychological treatment (Chambless & Hollon, 1998; Chambless & Ollendick, 2001) and the demonstrated efficacy of these treatments through clinical trials places psychology on firm ground as a health care profession (Barlow, 2004). However, there are indications that even

skilled practitioners of EBP mistake the purpose of RCTs. Simply put, RCTs are not adequately designed to inform clinical practice. Instead, their design ensures that, all things being equal, the benefits of receiving the therapeutic treatment outweighs the harms and that these benefits are not solely due to a placebo effect.

RCTs as Nomological Machines (4.2)

Although RCTs are not designed to inform clinical practice they do provide a standardised situation within which the effects of a psychotherapeutic treatment can be studied. As such, RCTs can be considered examples of what Nancy Cartwright ' (1997;1999) terms as a *nomological machine:* A laboratory specific, and highly structured arrangement that is designed to give replicable results if the experiment is repeated over time. Cartwright (1997) describes nomological machines in terms of fixed arrangement of factors, or components that possess relatively stable capacities which, in the appropriate sort of stable environment will, with repeated application, generate the kind of regular behaviour represented in 'scientific law'. In RCTs the relevant components are standardised interventions, the therapy of interest and its comparator (active or placebo), the participants, the rules which govern their relationship (the frequency, intensity and duration of the intervention), and the timing and methodology of measuring outcomes. This standardisation process reflects the need for *shielding* to ensure that nothing occurs 'that inhibits the machine from operating as prescribed' (Cartwright, 1999 p. 57). In RCTs, shielding can be understood in terms of the controls established to ensure a clean result from the trial, i.e., those measures which mitigate potential confounding variables described previously. In this sense, the estimated effects of a given therapy in a RCT does not demonstrate the 'real' effect, of that therapy, but its effect in the context of the trial.

Where a traditional account of science may claim that the goal of a RCT is to express the impact in statistical terms, of a particular therapy on individuals with a particular cluster

of psychopathological symptoms, Cartwright (1999) argues the goal of science is not, as is traditionally understood, to discover the 'laws of nature'. She defines laws of nature as 'a necessary regular association between properties' (1999, p. 49). In some instances, aspects of the world are constructed in such a way that the laws which govern it are naturally apparent, e.g., Newton's law of gravitation. More frequently, however, the circumstances which enable scientists to uncover laws are instead constructed in the laboratory, from nomological machines (Cartwright ,1999). On these grounds, it can be argued that that the standards used to construct nomological machines, and/ or to explain their operation, cannot be adequately interpreted as laws. At least, in the typical *regular association* sense of a law. The only reason that nomological machines can be used to produce laws of nature, is that they have been constructed in such a way as to produce them (Cartwright, 1999). Here, the components of the machine are understood as having been specifically chosen and assembled to give an answer to specific question, to which the answer is a 'law of nature'. As Cartwright notes 'We get no regularities without a nomological machine to generate them, and our confidence that this experimental set-up constitutes a nomological machine rests on our recognition that it is just the right kind of design to elicit the nature of the interaction in a systematic way' (1999, p. 89). Indeed, if changes are made to the shielding conditions or, the capacity of interest was combined with different capacities, the nomological machine would behave differently and result in a different law.

These sorts of mistakes are often made in interpreting the results of RCTs. Here, the clean results generated by the nomological machine are mistaken for the 'real' effects of therapy, when what is actually demonstrated is a manifestation of the therapies capacities in a particular set of circumstances. Problematically, for the EBP practitioner, these circumstances were not designed to imitate the complexities of clinical practice, but rather to standardise the context in which the treatment and the placebo are compared.

Recognising a RCT as a nomological machine -which has been designed to allow for the basic questions about the likely effects of a therapy relative to a comparator to be answered- highlights the importance of understanding how exactly such a machine works. For EBP then, the RCT trial ought not be interpreted without an understanding of the results of the trial, in the broader context of psychological theory and clinical practice. Within the EBP conceptual model, this requires a shift of focus from a purely efficacy orientated research hierarchy, towards greater understanding of core psychological mechanisms (implicated in both psychology and treatment), as well as the relevant experiential and self-related knowledge of both the clinician and the client. Only under these circumstances can the nomological machine truly aid the clinician and their clients. This includes broadening approaches to conceptualising psychological nosology and classification; investigating phenomena relating to therapist-client relationship; relevant therapist qualities; client-relevant characteristics; mechanisms of action of efficacious therapies; and the potential moderators of treatment outcomes research. For example, the use of transdiagnostic factors to fit treatment to individuals (Norcross & Wampold, 2011).

To understand how the RCT nomological machine works it also necessary to establish what each of the 'pieces' of the machine are doing. Why were certain types of participants enrolled? Why were certain endpoints chosen? What is the statistical analysis actually testing? How are the results of machine dependent on this combination of pieces? Blum (2007) refers to this process as *reverse engineering* the nomological machine. However, because clinical trials are modeled and developed on the basis of 'concepts from a variety of disciplines' (Cartwright, 1999, p. 58) this is not always a straightforward process. Indeed, more often than not requires this requires simultaneous consideration of the information from all of the disciplines that contribute to trial design, because none on their own provides an adequate interpretation.

To a certain extent, the skills required for reverse engineering are those stipulated by EBP. For example, Spring and Neville (2014) discuss how to use the results of various types of clinical research (including RCTs) in clinical practice. This includes locating and critiquing relevant studies through the application of various methodological criteria.

Whilst one of the successes of EBP has been to improve both the quality of reporting in clinical trials and the clinicians interpretation skills -allowing clinicians to extract the information they require with greater ease- even the highest quality appraisal skills, methodological, and reporting standards remain insufficient. RCTs are simply not informative enough. Indeed, it is the precise information clinicians require to reverse engineer that is '*black boxed'* in an RCT as well as in the published report of the study (Bluhm, 2007). Neither the statistical analyses, nor the discussions of the results of a RCT typically make reference to this background information. As such, this information is unavailable to the practitioner of EBP.

Laws and capacities in physics and psychological research (4.2.1). A capacity describes the ability possessed by an object to play a certain causal role under some circumstances (Cartwright, 1983). In physics, the study of a capacity can result in 'an exact functional form and a precise strength, which are recorded in its own special law' (Cartwright, 1983, p. 54).

In applying Cartwright's (1983) analysis to the case of clinical trials, Bluhm (2007) notes that it is important to recognise that the types of capacities described in physical laws are different from those studied in biology. Along the same lines, it is also important to note that the types of capacities described in biological medicine, for which Bluhm first adapted Cartwright's analysis, are also very different from those studied in clinical psychology (see 2.2). In Blum's (2007) discussion of laws and capacities in EBM research, biomedical science is referred to as not an 'exact science', because it operates largely at the level of

elucidating causes, or qualitative/ quantitative relations between causes and effects and is neither mathematical nor derivational. However, clinical reasoning processes in biological medicine, unlike psychology are for the most part based on established and quantifiable underlying biological mechanisms. Comparatively then, clinical psychology is *even less* of an exact science than biological medicine. Because diagnoses do not reference a quantifiable/ testable underlying mechanisms in clinical psychology, the connection between the explanatory value of the RCT and its ability to inform clinical reasoning processes is tenuous. In this sense, the RCTs in EBP can be best understood as nomological machines adapted from a discipline with clinical reasoning and treatment processes based on a very different ontology. On these grounds, it is argued that the RCT alone is an insufficient means of for generating psychological research that can usefully inform the clinical enquiry process.

Cartwright's early work on laws (e.g.,1983), argues against 'fundamentalists' who interpret laws as capturing the real behavior of the object being studied. She claims what these laws actually do is describe behavior in certain, highly controlled contexts. Cartwright (1983) provides a metaphysical, rather than methodological argument and while false laws can be used to good effect in many cases in physics, in clinical psychology the results are highly problematic from an ethical standpoint.

Though the effects clinical psychology researchers are interested in can be measured, often in a variety of ways, these capacities cannot be characterised in precise mathematical terms. For example, a RCT in clinical psychology may be interested in the capacity of a therapeutic modality to treat a DSM-5 diagnoses, as well as its capacity to do harm. These effects are then quantified and typically compared with the capacity of a placebo and/ or existing therapy to do the same things. However, the capacity of the therapy is rarely expressed using equations. Moreover, the effect of combining the therapy with other factors (i.e. altering the nomological machine) to examine how this may affect the expression of the

therapy's capacity to heal or to harm, cannot be characterised mathematically. In physics, these results i.e. the combining different capacities, can often be predicted on the basis of abstract, theoretical laws (e.g. velocity = distance travelled divided by time). In clinical psychology, they cannot. Generally, there is no way to predict the manifestation of a therapy's capacities in many of the clients seen in clinical practice from the way in which these capacities are manifested in the controlled environment of a RCT alone.

The clinical enquiry process instead, requires a causal explanation of how the capacity is expressed differently in different situations. Despite this, there is a strong tendency among the proponents of EBP to take the effects of a given therapy observed in a RCT for the *real effects* of the therapy, or at least a good estimate of the real effects. This is exemplified in the development of 'secondary resources' a central aspect of EBP, which review the literature with regards to a specific psychological diagnosis. A subset of these secondary resources, meta-analysis, statistically combines the results of multiple RCTs in order to provide a more precise analysis of these 'real' effects . However, Bluhm (2007) suggests that what a meta-analysis really amounts to 'is simply describing the results of running the same nomological machine over again' (p.161).

Meta-analysis (4.2.2). Reviews of the psychological literature have been in existence for several decades. Traditional, narrative reviews vary in both their quality and approach. A significant contribution of the EBP movement has been to challenge and revise the accepted format of these reviews, with greater efforts in recent times having been made to structure and standardise their methodological approaches. The 'systematic review' itself is now a scientific endeavor, in which a question is proposed (to be answered in advance of the analysis) and data is gathered and analyzed according to explicit methods. A meta-analysis is a *type* of systematic review that uses statistical techniques to combine the results of multiple RCTs on the same or a similar psychological intervention.

On any single RCT, the value obtained for the endpoint of interest in the research sample may vary purely by chance, from the value that would be found in the population as a whole. A confidence interval can be calculated which uses the actual value found in the trial, alongside other information (e.g. the size of the study sample) to determine to an probability, typically 95%, that the upper and lower values actually lies between within in the population. A wider confidence interval (CI) will mean that the value drawn from the research sample measured in the trial has less utility as an estimate for characterising the value of the endpoint that would be found in the population [4]. By combining the results of different RCTs -which are assumed samples of the same population and measuring the same endpoint- a meta-analysis can 'shrink' the CI around the point estimate of the efficacy of the therapeutic intervention . In doing so, it provides a more accurate estimate of the value that would be found in the whole population. For example, in a trial with a 95% CI of 16–46%, the clinician would be justified in concluding that between 16 and 46% of their clients will benefit from the therapy under consideration. A meta-analysis of a number of RCTs may then shrink that range to, for example, 26–36% and in doing so give the clinician a better idea of how many clients might benefit from this approach.

Prima facie then, the incentive for conducting meta-analyses is a reasonable one. If one RCT evidences the efficacy of a treatment, then multiple RCTs should provide better evidence. Either, subsequent trials will have similar results to the initial trial and thus provide conformation of the conclusions drawn from first, or the results of different trials will be in conflict, prompting modification of the initial assessment drawn from the first trial. However, like a single clinical trial, interpretation of meta-analyses on their own may result in an oversimplified understanding regarding the nature and extent of the evidence supporting a

[4] NB: it is the mean value in *both* the sample and the population that is referred to here

given therapeutic modality. In this sense, interpretation of a meta-analysis poses the same difficulties for the clinician as did the original, single, RCT. Since the inclusion and exclusion criteria for trials of the therapeutic modality are likely to be similar, the issue of extrapolation to clients who would not have qualified for the RCT still remains. This issue is compounded, and may even be exacerbated, by the variability of responses in clients deemed similar to the trial participants. The results of a RCT, as previously detailed, are reported as averages. Meta-analyses then essentially takes the average of those averages and in doing so they narrow the CI. However, by narrowing of the CI, valuable information about the variability of responses to the tested intervention is also lost.

In addition to these statistical limitations, meta-analyses and other systematic reviews face a number of practical issues. Firstly, any review will only ever be as good as studies that go into them. Goodman (2003) highlights this issue, by emphasising the significance of quality of the 'raw materials' within the meta-analysis, and with it the importance of accessing individual studies prior to pooling their results. Secondly, while the recent efforts to develop and enforce the registration of trials with a central body may go some way in mitigating this problem, often those conducting a review are limited to including only those RCTs that that have already been published. Generally, publication is limited to trials with a clear and typically clear positive result. This is problematic because it creates a publication bias, ultimately hampering attempts to conduct reviews. These issues, often mean that the RCTs included in a meta-analysis are more homogeneous, which in turn makes the estimate of a therapy's effects appear to be more accurate, by shrinking the CI around it. The notion of the 'accuracy' of the estimate is again of some concern. Bluhm (2007) suggests that this is another example of the effects of mistaking the 'real' phenomenon of interest, with what is actually just the results of the operation of a nomological machine.

Cartwright (1999) argues that part of the job of a nomological machine is to provide

repeatable results and details two ways in which the term ‘repeatable’ can be understood, as well as what sort of generalisations can be deduced from these two forms. Firstly, an experiment can be understood as repeatable in the sense that ‘if it were rerun in the same way with the same apparatus, it should generate the same behaviour’ (Cartwright 1999, p. 83). A good RCT is repeatable in this sense. Running a trial with the same or relatively similar protocol should produce results that are the same -within certain confidence limits- as the original trial. A meta-analysis demonstrates this phenomenon. Working on the assumption that the differences in the value of an endpoint measured in different trails are due to chance or to error, a smaller confidence interval around the value obtained in the meta-analysis -than in any of the trials- is evidence that the repeated trials are measuring the same thing. The experiment that is repeatable in this sense gives as a result a ‘general’, albeit low level law (Cartwright, 1999).

The second way Cartwright suggests that nomological machines give results that are repeatable is that ‘high-level principles inferred from a particular experiment should be borne out in different experiments of different kinds’ (1999, p. 89–90). This is the sort of repeatability that is necessary if science claims to understand something about the nature, or the capacities, of the feature under study (Cartwright, 1999). Here, the generalisations that are possible about this capacity depend on understanding the reasons for the similarities and the differences in its expressions in different circumstances. Problematically, neither RCTs nor the meta-analyses which combine RCT results are designed to be repeatable in this sense (Bluhm, 2007).

Moreover, there appears to be a tacit assumption within the EBP conceptual model, that firstly, the average effect in the population is the ‘real’ effect that the various RCTs and the meta-analysis seek to ‘find’ and secondly, that the within group variance groups is truly statistical error, rather than an indication of *real* differences in the manifestations of the

therapy's capacity. What is instead required is a scientific approach which reflects Cartwright's second sense of repeatability; the clinician need to know what factors may affect the ways in which a therapy's capacity is exercised, as well as which of those factors are of most relevance to their individual client . However, the meta-analysis only details the effects of therapeutic modality in in a hypothetical 'average' client. This limitation is exacerbated by the fact that current academic discussion on EBP is very much focused on *how* research findings should guide interventions, not on what theory of scientific method and specific processes, is necessary to do so . As such clinicians must attempt to fit research evidence with the individual characteristics of their client with little guidance as to how to do so (Gaudiano, & Miller 2013). This also means the clinical psychiatrist, psychologist or social worker must engage a range of cognitive tasks, beyond the straight forward application of EST research in order to establish treatment options relevant to the indicators of causality in question . In the absence of more nuanced research –e.g. research capable of demonstrating Cartwright's second sense of repeatability- the clinician thus requires a theory of scientific method better suited to the current research limitations they must address throughout the clinical enquiry process (see chap. 5 & 6) .

Values and Notions of 'Best' Evidence in Evidence-Based Practice (4.3)

Guided by Douglas's (2014) work on values in the assessment of evidence, this section will explore the indirect role of values within notions of 'best-evidence' subscribed to within the EBP conceptual model. Here, the *indirect* role of values will discussed with regard to internal and external standards used to assess evidentiary sufficiency, with particular attention given to the significant, yet underdeveloped role of social and ethical values to this process. The indirect role of values will then be contextualised in a more applied discussion of the influence of the Biomedical paradigm on the EBP conceptual model. This is followed by discussion of some of broader effects of notions of 'best-evidence' within the EBP

conceptual model. Specifically, the implications that notions of 'best-evidence within the EBP conceptual model have for both the direction and selection of psychological research, the clinical enquiry process and the indirect role of values at these locations.

The indirect role of values and notions of 'best evidence' (4.3.1). In addition to the previously discussed direct function of values (see 3.1), Douglas (2009a) also details the significance of the *indirect* role of values within the scientific process. Unlike values operating in a direct role, indirect values are not as determinative of the decisions being made. (Douglas, 2009a, 2014). However in the indirect role, values are used to assess the sufficiency of evidence, as well as assessing the seriousness of lingering uncertainties (Douglas, 2014) and are thus of particular significance for the EBP conceptual model. The following subsection builds upon Douglas's (2009a, 2014) work on values in science. Specifically, the role of values with respect to inference in science, as well their determinative function in decisions regarding what can be inferred from evidence. For the purposes of this thesis however, Douglas's arguments surrounding the sufficiency of evidence and the inferences that can be made from evidence is extended to include the sufficiency of a given research design and/or methodology as a whole, as well as the inferences that can made from these approaches. For example, the reliability of a particular research method, and research designs that are more likely to generate high quality evidence.

As 3.1. detailed, in science, there is always an inductive gap between evidence and theory and this means there is always some uncertainty to weigh (Douglas, 2014). Because the evidence for any particular claim is never complete, scientific generalisations by their very nature must extend beyond the evidence in order to gain explanatory and predictive capacity (Douglas, 2017) In this sense, uncertainty is part and parcel of the inductive and ampliative nature of science. Like the majority of scientific pursuits, EBP can never have complete or perfect evidence for its scientific claims. Research hierarchy, reworked research

hierarchy, no research hierarchy; questions of when a research design, methodology or evidentiary form are sufficient to support a claim, or provide enough evidence , will continue to arise. To answer such questions requires judgment. In this sense values are an inherent part of EBP, which must constantly employed by researchers, clinicians and the EBP conceptual model more broadly, in order to determine what can be inferred from the evidence and when a research design, methodology or evidentiary form can be considered adequate.

Douglas (2017) suggests that this indirect role of values can further be understood according to two different standards. Specifically, internal and external standards. *Internal standards* refer to epistemic values and the statistical testing used to access the sufficiency of on evidence. *External standards* on the other hand, refer to the social and ethical values used to weigh the consequences of error, and thus decide when evidence is sufficient for a claim. Both are useful tools within the scientific process. For example internal standards can help assess what the likelihood is that an error will be discovered sooner rather than later, and external standards can help assess concerns surrounding the consequences of that error, of making an incorrect interpretative choice.

For the purpose of this thesis it is argued that in its current form, the EBP conceptual model appears to take a largely internal approach to accessing the sufficiency of evidence. As this thesis has previously detailed, accessing the sufficiency of research designs and evidentiary forms has traditionally been dealt with via statistical and some epistemic criteria (see 4.1). For example a given statistical test sets some guidelines for evidential sufficiency and the epistemic criteria that are used to access the generalisability of research findings. Indeed, the limited attention that has been given to values within the EBP conceptual model more broadly has been geared towards internal, rather external standards.

That is not to say the EBP conceptual model operates without indirect ethical or social values commitments, or free from the influence of external standards. Rather, that the current

privilege of empirical knowledge ahead of knowledge that is more theoretical in nature within the EBP conceptual model, and the associated the orientation towards the traditional 'values-free' perspective of science appears -to some extent- to be impeding an examination of these ethical or social values commitments at the level of both research and clinical practice.

Leanings towards the scientific ideal of the 'values-free' perspective, have been previously exemplified in discussions of the unacknowledged, or tactic role of values operating directly and indirectly within the EBP conceptual model. Specifically, the failure to acknowledge the role of values in assumptions regarding: the epistemological privilege of empirical, over theoretical knowledge forms, the concomitant ascriptions to specific notions of objectivity and the HDM; and the resulting notions of 'best evidence' manifest in the EBP research hierarchy.

The more practical constraints of the 'values-free' perspective are well understood by clinicians working the interface of science and therapy. For example, in reviewing the relevant literature the clinician must interpret the data and decide which research interpretation to accept. Not uncommonly, this data is incomplete, but must be used to inform their treatment decisions regardless. The way in which this data is interpreted and translated to clinical practice thus requires a number of values- based decisions on the part of the clinician. However, the orientation towards a 'values-free' perspective within the EBP conceptual model, has traditionally meant that the role of values in these sorts of decisions remains largely unacknowledged throughout the clinical enquiry process (See 5.2).

Although 'epistemic values" criteria (e.g. internal consistency, simplicity, scope, explanatory power etc.) have traditionally been touted as sufficient for addressing questions of evidential adequacy (e.g. Kuhn 1977, Levi 1960, McMullin,1983) there are inherent limitations in applying these values alone to such a task (Douglas, 2017.). Foremost,

epistemic values are poorly placed to perform such a function because questions regarding the strength of the evidence remain unanswered by such criteria. That is not to suggest that epistemic values lack utility generally, rather that they do other jobs in science (Douglas, 2017.). For example, they can assess whether a theory or claim is minimally adequate by how strong the evidential support is for a theory or a claim and whether further research in this area is likely to be productive. However, none of these functions can determine whether a given research design, methodology or evidence form is strong *enough* to make a claim at a particular point in time.

Statistical tests provide another type of internal standard that is used for setting guidelines for evidential sufficiency. A statistical approach would suggest that all scientific fields set an internal standard for when the evidence is sufficient and employ that standard. For example, the particular standard in psychology operates according to which results are considered strong enough for publication. Generally speaking, results are expected to have less than one chance in twenty of being due to chance ($p<0.05$). This exemplifies one approach to both assessing the strength of evidence, and also deciding how strong the evidence needs to be.

However, statistical testing alone cannot deal with issues of evidential sufficiency across all judgments, nor uniformly across all fields (Douglas, 2017.). Indeed, statistical tests always involve trade-offs. For example gaining stringency in one direction by reducing the chance of a false positive (i.e. assertions that a phenomenon is due to some cause when its actually due to chance), reduces stringency in the other direction by increasing the chance of false negative (i.e. increasing the likelihood that assertions will overlook a real phenomenon) (Douglas, 2017.). Setting the level of statistical significance at the end of data evaluation is also but one of many examples the judgments inherent to these processes. (see notions of best evidence above). Moreover, these types of judgements also extend beyond the false

positive vs. false negative trade-offs. For example, similar kinds of trade-offs can be found across a range of judgments made in the *research* component of EBP conceptual model regarding whether to risk error in one direction or another. For example: Is the method employed sufficiently sensitive for detecting the phenomena of interest? Is it overly sensitive to noise disruption? Is the sample size large enough to detect a result, or is it so large that the particular phenomenon of interest will get lost in the dataset? Is the data being characterised with sufficient discrimination among the range of possible outcomes? Is the data too finely parsed?

What becomes apparent in an examination of an internal approach to indirect values judgements in science, is the inextricable link between the context of what the knowledge being produced is needed for, and any judgement surrounding the sufficiency of the research design, methodology or evidentiary form. Be that what can be considered an appropriate research design, a sufficient methodology, the right p-value to employ, or what can inferred from a research finding etc. etc.

Douglas (2017) suggests that these context dependent tradeoffs depend crucially on the social and ethical values to weigh the consequences of error in the particular case. The employment of purely internal standards -as blanket or standard approach within the EBP conceptual model- thus fails to recognise the complex range of judgments necessary when evaluating the sufficiency of research design, methodology, or evidentiary form. Moreover, there is no rational reason as to why social and ethical values should be ignored when deciding the adequacy of a research design, methodology or sufficiency of evidence for a knowledge claim (Douglas, 2010).

In fact, there are a number of moral responsible reasons for why they should be considered (Douglas 2003, 2007, 2009a; see chap. 4). In EBP for example, a clinician may have the social and/or moral responsibility -from a therapeutic alliance perspective- to give

adequate weight to knowledge provided by the client in regards to their own condition, despite the limitations of its epistemic values as a form of 'objective' evidence (see 3.2).

The importance of considering these social and ethical implications is also apparent at the more macro- level. For example the internal authority given to scientific research evidence within the EBP conceptual model (see nature of knowledge of psychopathology subsection above) also generalizes to the public authority of EBP more broadly and its attendant responsibilities, both as research field and a clinical praxis. Aligning with Douglas (2017), it is suggested then that uncertainty surrounding the strength of given research design, methodology, or evidentiary form and what can be inferred from it, may be better dealt with by examining both the internal (epistemic and statistical) and external (ethical/ social) values operating indirectly within the EBP conceptual model.

If EBP is to progress beyond the current limitations inherent in the conceptual model, rational disagreements between researchers, clinicians and policymakers surrounding notions of 'best evidence' and EBP more generally, need to be brought out in the open. For this to occur, it is necessary to shed light on tactic assumptions and refocus the 'values-free orientation towards one which clarity surrounding direct and indirect function of both epistemic *and* social/ ethical values, as well as their various roles in shaping notions of best evidence and EBP more broadly. In the examination of nations of 'best- evidence within the EBP conceptual model this requires an examination of both and internal and external standard approach to discussions of research designs, methodology, evidential sufficiency and what can be inferred from them.

Contextualising the role of indirect values in EBP: assumptions of a biomedical paradigm (4.3.2). This next section further clarifies the *indirect* function of values within the EBP conceptual model. Here, a discussion of the influence of the biomedical paradigm on the EBP conceptual model provides some context as to the ways in which epistemic, ethical and

social values have influenced notions of evidence within EBP and the practice of clinical psychology more generally. Specific attention is given to the external standards (Douglas, 2017) used to access the strength of given research design, methodology, or evidentiary form and what can be inferred from it within the EBP conceptual model.

This thesis has previously detailed the privileged position of the RCT research design, methodology and evidentiary form within the EBP conceptual model (see notions of best evidence section above). In addition to the aforementioned limitations inherent in these assumptions, the position of the RCT within the EBP conceptual model also demonstrates a number of social, ethical and bureaucratic commitments. Of particular significance, is the assumption that psychology can be usefully understood and operationalised according to the biomedical paradigm. This assumption is manifest adoption of a drug trial methodology (RCT framework) to the study of the efficacy of treatments for psychological difficulties. Aligning with Douglas (2017), this assumption can be understood as an example of the indirect way values operate within the scientific process. It can also, be considered problematic for a number of reasons.

The appropriation of the biomedical paradigm for the purpose researching psychological treatment has been referred to as the *drug metaphor* (Stiles & Shapiro, 1989) and the *medical-like meta-model of psychotherapy* (Bohart, O'Hara & Leitner, 1998). Within this research framework, the psychological problems under investigation are conceptualised as a well-defined entities (see ontology section above) to which standardised treatment can then be applied. Here, a treatment is validated by demonstrating that the disorder has been alleviated. Presuming that these are meaningful and useful assumptions, RCTs are the concomitant empirical strategy. The EBP Task Force's criteria for ESTs, then provides the clinician with standardised treatment guidelines, in which DSM diagnoses specify the client population. In this sense, the biomedical paradigm has profoundly affected clinical

psychology via psychotherapy research and the adoption of drug trial methodology (RCTs) from EBM (Deacon, 2013).

Problematically, although not surprisingly the biomedical paradigm carries with it a number of implicit assumptions, relevant to the context in which it was developed i.e. biological medicine. Firstly, it is assumed that it is the treatment, rather than relationship and respective contributions of the clinician and client which alleviates the disorder. Secondly, a biomedical problem-solving approach assumes that all clients with the "same" problem can be treated in a standardised manner.

Whilst these assumptions may have some utility in context of biological medicine, they are ill fit to the therapeutic and diagnostic context of clinical psychology (see 2.2). Unlike a standard biomedical diagnosis, a psychological difficulty cannot be as yet be defined in terms of specific and testable causal mechanism(s). As such, a psychological (i.e. DSM) diagnosis cannot be described or understood in terms of a discrete aetiology. Since a psychological diagnosis does not offer the same reliable indicator to causality and treatment options as it might in biological medicine, the clinician must engage a range of cognitive tasks, beyond the simple allocation of a diagnosis in order to establish indicators to causality and relevant treatment options. For this reason the clinical decision-making aspects of psychological intervention, must be preceded by additional investigative and explanatory tasks (see chap. 6). It also means the psychological intervention will require greater levels of adaption and client/ therapist co-creation than is typically necessary with a biomedical intervention.

Outside of the context of the biomedical paradigm, this thesis has previously argued that such assumptions demonstrate the epistemic priority afforded to knowledge pertaining to the research component, over and above knowledge pertaining to the CE and CVC components of the EBP conceptual model (see 2.1). Here, the addition of Douglas's (2017) external/ external standards perspective, to understanding the role and function of values, and

the context of the biomedical paradigm brings the social ethical and bureaucratic values behind such assumptions to the fore. When considered from this values perspective, what becomes apparent is that although these assumptions are ill fit to the diagnostic and therapeutic context of clinical psychology, they are without context or logic. On examining the influence of the biomedical paradigm within the EBP conceptual model for example, it becomes easier to understand why empirically based knowledge forms and a medical problem-solving approach (i.e. the current operationalisations of EBP as a process of clinical decision-making) are so highly privileged. Indeed, within diagnostic context of the biomedical paradigm and the specific and testable causal mechanism a biomedical diagnosis commonly refers to, this represents a rational and ethical approach to treatment selection.

Likewise, by examining the historical and interdisciplinary institutional context of EBP, the privilege afforded to the RCT research design and methodology is more readily understood. At times -more so historically- inadequacies in research design and methodology have seen psychological clinical trials excluded from research syntheses (Davidson et al., 2003). Lack of inclusion of behavioral treatments in research syntheses in turn deprives the psychological evidence based of an opportunity to influence policy (Spring 2007). For psychological interventions to become standard of care then, it is critically important that behavioural treatments are able to be evaluated in systematic evidence reviews alongside research from allied disciplines. This requires the 'drug-trial methodology', which is capable of crossing these disciplinary divides with a common language of evidence.

More broadly speaking, all major health professions and institutions now endorse EBP policies. Preconditions are thus established for a shared conceptual grounding and vocabulary that facilitates transdisciplinary collaboration in research and practice. Indeed, treatment utilization trends, public education campaigns, grant funding priorities, insurance policies, the bureaucracy of managed care organisations, psychopharmaceutic treatments

and the language used to describe psychiatric diagnoses and psychotherapy, *all* support a biomedical paradigm and the drug-trial research methodology (Bryceland & Stam 2005; Deacon, 2013)

The broader institutional context of the EBP conceptual model (e.g. disciplinary history, policy, diagnostic criteria, healthcare systems, insurance bodies etc.) then specifies certain requirements (e.g. statistical transparency, common language etc.) in determining notions of 'best-evidence'. Here, what is considered to be an adequate research design, methodology and evidentiary form, as well as what information can be inferred from these, is inextricably linked the social, bureaucratic and ethical values inherent within the biomedical paradigm. The values maintaining notions of best evidence within the EBP conceptual model cannot therefore be understood one purely internal i.e. epistemic or statistical criteria alone . Indeed, as the influence of the biomedical paradigm within the EBP conceptual model demonstrates social, bureaucratic and ethical values also appear to have an important indirect function in determining notions of 'best evidence', what constitutes EBP and how it ought be operationalised in a professional setting.

Notions of 'Best' Evidence: Implications for Psychological Research (4.4)

Whilst few disagree that psychology should be based on evidence, the EBP research hierarchy offers a relatively narrow perspective of what can be considered adequate evidence (see 4.1). In the broader scope of the EBP conceptual model, this is manifest in the privilege afforded to certain research designs and methodologies ahead of others, as well as the evidentiary forms they produce. This section explores some of the wider and more practical implications of this privilege. Specifically, the prioritisation of certain research projects ahead of others on the indirect basis of notions of 'best evidence' currently ascribed to within the EBP conceptual model.

In doing so, it is suggested that the indirect role values play in determining notions of 'best-evidence' within the EBP conceptual model also has a determinative function regarding the direction and selection of research that is pursued within the discipline. Here, it is argued that values function indirectly to determine the types of phenomena that are considered suitable to investigate, the perspective research is able to take on a given phenomena, and explanatory output of clinical research more generally.

Values and the selection and direction of psychological research (4.4.1). Douglas (2014) suggests that decisions regarding which research projects will be pursued is another common location within the scientific process, in which values exert a significant influence. An examination of the relationship between the values inherent to the notions of 'best evidence' subscribed to within EBP conceptual model and the current state of psychological research, suggests that this also the case with the scientific processes of EBP.

Here, the quagmire of epistemic, social, ethical and bureaucratic values underlying the notions of 'best evidence' (see 4.3.1). within the EBP conceptual model, also influence decisions regarding the direction and selection of psychological research projects. In addition to the impact of these values, decisions regarding the direction and selection of research are also always subject to the values of the research institution, researcher and wider process of research more generally.

Much like the values- based decisions concerning when a given research design, methodology or evidentiary form is adequate, Douglas (2014) suggests that scientists have to make a number of decisions surrounding which areas of study to pursue and how to pursue those areas. Indeed, these decisions -which determine what sort of research scientists choose to pursue- also require the convergence of a range of values (e.g. epistemic social, ethical, personal, aesthetic) within a disciplinary and funding context and (Douglas, 2014). For example, a researcher's disciplinary training and the overarching framework their

discipline adheres to will focus their research attention on certain phenomena, rather than others. Similarly, the researcher will be influenced by the resources and sources of funding available (Douglas, 2014). If for example, there is more funding/ supervisors available for research on a particular topic, or an in a particular area within their discipline/ training institute, the researcher/ PhD or Master's candidate will often shift their focus to that topic, if they are unable to gain funding/ supervision for their initial preferences.

The selection and direction of research within clinical psychology is subject to similar forces. In this instance the EBP conceptual model, or the overarching disciplinary framework focuses the attention of the research groups and/ or the academic institute to certain phenomena according to the research designs, methodologies and evidentiary forms that are prioritised in the research hierarchy. In this way, the indirect role of values within the EBP conceptual model are evident beyond notions of best-evidence' within the conceptual model itself and additionally, operate as a broader disciplinary values perspective which determines the viability of different psychological research projects.

This is problematic for a number of reasons foremost, the values underlying current epistemic assumptions within the EBP conceptual model only promotes a very specific epistemological perspective and the research designs, methodologies and evidentiary outputs associated with them. This discourages epistemological pluralism -and by proxy methodological and explanatory pluralism and ultimately research diversity and innovation.

Here, research projects exploring the phenomena that these approaches are uniquely capable of investigating -and ultimately valuable knowledge production in clinical psychology- is impeded. Indeed, there are limits to the range of phenomena that can be explored and thus the range of research projects that can be pursued according current 'gold-standards' provided by the EBP research hierarchy. For example, conducting an RCT on a

given phenomena may sometimes be unattainable for methodological or ethical reasons (Bohart, 2000; Gray, Plath, & Webb, 2009).

Values and the proliferation of EST research (4.4.2). The lack of research diversity these values-based assumptions perpetuate, is evident in the disproportionate proliferation of treatment efficacy research (or ESTs), one of the few areas of psychological research amendable to the RCT methodology. Here, the predominance of ESTs within the evidence base is so pronounced, that that some commentators have suggested that most of what constitutes EBP is in the area of EST (Bauer, 2007; Chambless, 1995; Chambless et al., 1998). Indeed, ESTs are frequently conflated for EBP more generally (Dozois et al., 2014; Pagoto et al., 2007; Luebbe et al., 2007) with many professional in the mental health field tending to equate the more comprehensive notion of EBP with manual-driven ESTs (Goldfried, 2011).

The preponderance of EST research can thus be considered problematic. Not only in terms of the priority of certain forms of research and knowledge it represents (i.e. knowledge from the research component of EBP conceptual model ahead of knowledge from the CE and CVC components; see 2.3) and the limitations inherent in the RCT design (see 4.2), but also in regards to the limitations and substantial criticism that have been directed at EST movement more specifically (e.g. Ashcroft, 2004; Bernal& Scharró-del-Río 2001; Westen et al., 2004). For example, Addis and Waltz (2002) have argued that the use of such EST treatments rests on a number of problematic assumptions and have called for evidence to be collected to support these claims. Specifically, that research findings do generalise to clinical settings, that the use of these treatments improves client outcomes, and that ESTs can be feasibly implemented and taught. These sentiments are also echoed by Nathan (2004) who has called for clarification from the proponents of ESTs in a number of areas to establish that: specific factors of given treatments are more important than the common factors shared by all

treatments; efficacy studies have higher evidentiary value than effectiveness research; and that evidence is more important than clinical judgment in regards to therapeutic outcomes. Wampold Ollendick, & King (2006) also offer a similar line arguments with respect to the utility of standardised ESTs, by questioning whether empirically supported therapies outperform non-empirically supported therapies. Here, they suggest that the latter may simply be untested as apposed refuted. Although several authors (Lilienfeld., et al 2013,2014 ; Spring, 2007; Westen & Bradley, 2005) have argued that ESTs merely represent one of many potential operationalisations of the research component of EBP, as the preponderance of ESTs demonstrates RCTs are inarguably one the most dominant forms of 'evidence' guiding EBP. Bohart (2000) suggest this need not be the case, that there are other ways to construe EBP, and further that it is pragmatic imperialism to force both clinical research and practice into an EST framework.

Implications: underdeveloped areas of psychological research (4.4.3). Mahrer (2005) suggests that the current and somewhat single-minded emphasis on ESTs apparent with within the EBP evidence-base, also risks losing sight of other sources of variability in therapy outcomes. Indeed, the empirical privilege, concomitant notions of 'best evidence' and resulting predominance of EST research, has also meant that research focused on CE and CVC components of EBP - the lynchpin in shared client, therapist decision-making (Gravel, Legare, & Graham, 2006)- remains underdeveloped. This includes research on phenomena such as the therapist-client relationship, relevant therapist qualities, as well as numerous client-relevant characteristics such as cultural background, personal values, ethnicity, preferences for particular treatments, willingness to receive treatment, seriousness of the dysfunction etc. (Mahrer, 2005). Indeed, current gaps in the evidence base from an EBP perspective draws attention to key client centered variables (e.g. preferences for one therapy over another, credibility of treatment rationales, ability and/or willingness to adhere

to treatment, demographic and socioeconomic variables that enhance or impede access to treatment and/ or that contribute to attitudes about treatment acceptability), as well as clinician-based factors (e.g. the ability to: deliver the appropriate EST for client's issue; adapt treatments to unique clients; select and deliver the appropriate assessment; and to communicate effectively with client) both of which have received limited research attention, empirical or otherwise (Bauer, 2007).

This is likely to remain the case as long EBP policy makers (e.g. The Canadian Presidential Task Force on Evidence-Based Practice of Psychological Treatments) maintain views such as "clinicians should use the hierarchy of research evidence to determine which approach to treatment is optimal and to revisit this hierarchy when necessary" (Dozois et al., 2014, pp. 154). Or, as long as it is considered EBP to utilise research findings lacking external and ecological validity to inform therapy, on the basis that it was generated according to an 'approved methodology'.

These positions and practices they maintain, are both ethically and practically problematic, considering the regular instances in which clinicians must address nuances apparent in the client's culture, presenting issue(s), values and characteristics etc. which are at present unaddressed, or underdeveloped within the research base. Bauer (2007) suggests that clinicians regularly face these gaps because the fields dominant research paradigms tend to yield data about homogeneous majority groups, receiving standard treatment in optimal settings. This creates a number of problems. For example a clinician working with Maori youth who seeks research on a culturally relevant approaches to therapeutic intervention may find little in the way of 'research hierarchy approved' evidence, to inform their practice.

On the other side of the Scientist- Practitioner dyad the researcher who seeks to address this knowledge gap is likely also likely to face constraints, as a result of epistemic priority afforded to empirical rather than theoretical approaches and the concomitantly narrow

conceptualisations of adequate research design, methodology and evidentiary forms, apparent in the EBP conceptual model. For example on the basis of the sample sizes available of the relevant population, phenomena of interest and considerations of culturally safety, it might be decided that the gold- standard in research design (the RCT) is a poor fit for the aforementioned research project. With these considerations in mind, the researcher may consider it more appropriate to utilise a Kaupapa Maori research design and/ or a qualitative methodology.

Although an in depth of understanding of the phenomena of interest and culturally safety are important research goals, which are relevant to this -and some might argue any- research project, prioritising them may have a number of negative outcomes for the research project. For example research projects currently utilising this sort of design are afforded a lower position within the EBP research hierarchy. This is also likely to mean less recognition within the evidence base and potentially less respect afforded to the research output from an academic and/or professional view point. As such, research projects of this nature are also less is likely to receive funding (or supervision in an academic setting) which may mean the phenomena of interest in this population cohort is generally less likely to be researched and to enter and inform the evidence base (see 4.4.1).This in turn, inhibits the practice of the clinician working from the other side of the Scientist- Practitioner dyad from receiving the knowledge they require to inform their practice, and potentially the therapeutic experience of the client.

The empirical privilege and the concomitantly narrow conceptualisations of adequate research design, methodology and evidentiary forms within the EBP conceptual model, also risks discouraging research and innovation in other potentially profitable areas. Like research pertaining to the CVC and CE components of EBP, it has been suggested that insufficient research attention has also been given to: identifying the fundamental processes underlying

disorders and/ or multiple disorders; testing and validating the underlying mechanisms of action of efficacious therapies, as well as common versus specific factors in psychotherapy (Mulder, Murray, & Rucklidge, 2017); and the potential moderators of treatment outcomes research (Kazdin, 2008; Gaudiano & Miller, 2013).

Whilst historical emphasis on RCTs -conducted to test the efficacy of multicomponent treatment packages for *DSM*-defined mental disorders- may have enhanced the internal validity of psychological treatment research, the connection between the explanatory value of this evidentiary form, and its ability to inform clinical reasoning processes (i.e. to causally explain psychopathology) remains tenuous (See 4.3. for more detail). Problematically, the RCT requires little in the way of descriptions of how the active mechanism functions (Russo & Williamson, 2011). Instead, the basis of these evidentiary claims is reliable, objective, and content-neutral methods of statistics alone. Put simply, the biomedical approach to psychotherapy (see 4.3.2) research is not intended to identify causal therapeutic mechanisms (Deacon, 2013). As a result, research that seeks to identify the fundamental processes underlying disorders and/ or multiple disorders (i.e. transdiagnostic models of psychopathology), and successful therapies -as well as potential moderators of successful therapies- has historically received inadequate attention.

Here, it is suggested, that the relative paucity of research in this area, is a likely outcome/ effect of aforementioned indirect role of values, within the EBP conceptual model. Specifically, those values which inform the narrow conceptualisations of adequate research design, methodology and evidentiary forms (see 4.3.1). In this instance, the values inherent in the EBP conceptual model, operate to inform a broader disciplinary values perspective, focusing the attention of research groups and/ or academic institutes to certain phenomena, according the prioritisation of specific research designs, methodologies and evidentiary forms.

Research in these areas - for example investigation of the 'active' ingredients within effective treatment packages that may be specifically efficacious for more general/ transdiagnostic symptoms (e.g. rumination) as well as specific symptoms (e.g. hallucinations, compulsions,) and maladaptive processes (e.g. parental reinforcement of oppositional behavior, fear of negative social evaluation)- represents a significant long-term investment for improving clinical practice and client outcomes (Kazdin, 2008). The limited research attention that has traditionally been focused in this area, can thus can be considered problematic for a number of reasons.

Foremost, an evidence base that truly informs clinical practice requires reasonable evidence that a given construct of interest is modifiable and that some of the mechanisms of change are discernable (Davidson & Spring, 2006). Here, a greater depth of understanding regarding the mechanisms that underlie specific symptom clusters, or effective therapies has the potential to help explain comorbidity among disorders, generate more effective assessment (Nolen-Hoeksema, Watkins, 2011) and facilitate the development of innovative treatments (Deacon, 2013). For example, a modified version of CBT which has been designed to maximize improvements in mediating cognitive processes in social phobia appears to be more effective than standard cognitive-behavioral treatment (Rapee, Gaston & Abbott, 2009).

In order to support research initiatives of this nature – for example research investigating transdiagnostic models of psychopathology, or the or the transdiagnostic components of a given therapy that make them more or less effective for certain subgroups, or that generalise across well across different subgroups (Hayes, Levin, Plumb-Vilardaga, Villatte & Pistorello, 2013: Murphy et al., 200)- the EBP conceptual model must afforded greater recognition to mechanistic and causal knowledge forms. This in turn requires broader conceptualisations of what can be considered an adequate guiding theory of scientific

Method, research design, methodology or evidentiary form.

The investigation of mechanisms underlying disorders and/ or multiple disorders, as well as the transdiagnostic components of a given therapy are now burgeoning research areas. Both in terms of the RDoc (e.g. Cuthbert, 2014; Cuthbert & Insel, 2013; Insel, Cuthbert, Garvey, Heinssen, Pine, Quinn K *et al*, 2010; Sorel, 2013) and the transdiagnostic (e.g. Barlow, 2000, 2002; Barlow et al., 2004; Harvey, Watkins, Mansell, & Shafran, 2004; Heleniak, C., Jenness, Vander Stoep, Ehring, Watkins, 2008; Kring & Sloan, 2010; Mansell, Harvey, Watkins, & Shafran, 2009; McCauley, & McLaughlin, 2016; McLaughlin, Aldao,Wisco,& Hilt, 2014; Moses & Barlow, 2006; Nolen-Hoeksema, Watkins, 2011, Norton, 2008) research movements. Problematically however, the philosophy of evidence maintained by the EBP conceptual model may mean regardless of these significant developments, research of this nature may still receive inadequate recognition within the evidence-base or may be subject to evidentiary prejudice when clinicians seek to translate the research to clinical practice.

More specifically, the research designs, methodologies and levels of explanation that may be necessary for a causal and/ or mechanistic research perspective perspectives may not always align with the currently endorsed notions of 'best evidence'. Specifically, the epistemic privilege afforded to empirical over theoretical understandings, manifest in the prioritisation of specific research designs, methodologies and evidentiary forms and evident in the EBP research hierarchy. These assumptions within the EBP conceptual model, and direct and indirect functions of values underlying them, also have a number of problematic implications for the broader clinical-enquiry process. This is evident in the current operationalisation EBP as a process of clinical decision-making.

Chapter 5

Evidence-Based-Practice: The Limitations Of A Clinical *Decision-Making* Approach

Despite the heavy emphasis given to the research component of the EBP conceptual model, EBP is also intended as a guide for professional praxis. This is currently operationalised in terms of a process of clinical decision-making (APA, 2006; Lilienfeld et al., 2013; Spring & Neville, 2014). This thesis has examined both the function and location of values within the EBP conceptual model, as well as the assumptions of the model informed and maintained by these values. Building on this discussion, this chapter will explore some of the implications of these findings in regards to the current approach to operationalising the EBP conceptual model. It will then examine the contribution of the ATOM framework of case-formulation (Haig; 2014) to the clinical enquiry process.

An Intervention Orientation: The Current Evidence-Based Practice Approach to Clinical Enquiry (5.1)

Earlier arguments demonstrate how the ontological and epistemological foundations of EBP result in a conceptual model that is largely focused on intervention research. This was discussed in terms of the conceptually confusing representation of EBP offered by the three-legged 'stool' (see 2.4), as well as its inadequacies in regards to the ontological demands of clinical psychological reasoning, and the cognitive demands facing the clinical practitioner.

As a result, EBP has been inappropriately conceptualised as an intervention orientated clinical *decision-making* process. These limitations of this approach are evident in the professional application of EBP. Specifically, its current operationalisation as a series of linear decision-making tasks, in which the clinician evaluates different intervention strategies and then applies the most suitable alterative (e.g. the 5As; Spring & Neville, 2014).

Problematically this does not include the investigative and explanatory components

(i.e. What is causing psychopathology) of clinical enquiry . This is apparent in the 5A's approach to clinical decision-making (see 1.2.4), which begins *after* the initial client assessment. This starting point fails to acknowledge the range of cognitive tasks included in the clinical enquiry process, beyond the simple allocation of a diagnosis and subsequent selection of a therapeutic intervention i.e. those tasks that are necessary to establish indicators to causality and relevant treatment options. For example, the initial definition of the problem space and thinking explicitly and abductively about the possible causes of relevant psychological phenomena.

Although an interventionist orientated decision-making approach may have utility when the diagnoses in question references scientifically established and testable biological mechanisms, as is the case in EBM (see 2.2), psychological diagnoses (i.e. The DSM-5) are established exclusively on the manifestations of hypothesised underlying causes. They cannot therefore, offer the same reliable indicator to causality and treatment options as they do in biological medicine. Rather than make a *decision* between treatment alternatives which target an underlying and testable biological mechanism in different ways, the clinical psychologist must engage in an in depth process of clinical *enquiry*, in order to infer causal psychological mechanisms and establish relevant intervention targets. The current operationalisation of EBP as a clinical decision-making process thus fails to adequately detail all of the cognitive tasks necessary for a complete clinical *enquiry* and the clinical reasoning tasks this entails.

Evidence-Based Practice,Values and the Clinical Enquiry Process (5.2)

This thesis has previously argued that there appears to be an orientation towards the traditional scientific ideal of a 'values-free' perspective within the EBP conceptual model. This was detailed firstly, in regards to the failure to acknowledge, the role of values and the associated assumptions, within the very foundations of the EBP conceptual model (see 3.1).

Specifically, the epistemological privilege of empirical, over theoretical knowledge forms, the concomitant ascriptions to an impoverished view objectivity and the HDM, as well as the resulting notions of 'best evidence' manifest in the EBP research hierarchy. This orientation towards a 'values-free' perspective was then further exemplified in discussion of the internal standards, or the specific subset of cognitive values (i.e. epistemic and statistical) used for assessing notions of 'best evidence' (See 4.3.1), as well as the failure to consider external standards, or social/ ethical values in this assessment .The assumptions implicit in this orientation, and the problematic implications of these assumptions were then discussed in regards to the EBP as a conceptual model.

However, the assumptions inherent in the epistemological perspective and values orientation of the EBP conceptual model, also conflicts with a number of practical realities faced by the clinician when operationalised for use in clinical practice . In this sense, the limitations inherent to the epistemological perspective and associated 'values-free' orientation of the EBP conceptual model, can also be considered problematic in regards to the clinical enquiry process.

The process of clinical enquiry, requires the clinician to engage in a range of cognitive tasks (see 5.3.1). For example, detecting relevant signs and symptoms, integrating the different knowledge forms from the three components of EBP (e.g. nomothetic and idiographic, empirical and experiential), inferring and identifying causal psychological mechanisms, interpreting and translating research to clinical practice, establishing treatment options relevant to the indicators of causality in question, all the while and evaluating reasoning processes and outcomes at each phase of enquiry. These are complex cognitive tasks, which also require numerous values- based decisions and/ or judgments. Here, it is suggested that the orientation towards a 'values-free' perspective, within the EBP conceptual model has meant that the role of values inherent to the tasks of clinical enquiry, remain

largely unacknowledged and thus underdeveloped within the current operationalisation of EBP as a process of clinical decision- making.

On these grounds (as well as arguments made in 5.1 & 5.3), it is argued that current iteration of the EBP conceptual model fails to adequately represent the complexities of clinical psychological reasoning, and thus translates to an inappropriate operationalisation of clinical enquiry - the EBP process of clinical decision-making. Indeed, the lack of acknowledgement of the role and location of values within the EBP conceptual model has meant that the current iteration of model offers the clinician's little in the way of guidance, as to how to identify and address the presence of values inherent to the process of clinical enquiry. This presents a number of issues, when one attempts to translate the EBP conceptual model as a guide for professional practice.

Firstly, it is important to highlight that that the lack of acknowledgement and/or guidance, surrounding the function and location of values in the current operationalisation of EBP process of clinical decision-making does not mean that different phases of clinical enquiry are in anyway free of values. It simply means there is currently no acknowledgment of function and location of values throughout the different phases of clinical enquiry . Problematically, this failure to recognise normative commitments has the potential to mask the personal, theoretical and ideological allegiances of the clinician , distort the detection and explanation of phenomena (Ward & Heffernan, 2017) and ultimately decrease the utility of the clinical enquiry process.

A failure to recognise these normative commitments thus calls into question the scientific integrity of EBP as a model designed to guide professional practice , in terms of the reliability, internal validity (i.e. the uniformity/ generalisability of the clinician's approach with different clients), external validity (i.e. the generalisability of the approach across different clinicians) and somewhat ironically given the empiricist orientation of the

model, what can be said for the objectivity of EBP and it's current operationalisation as process of clinical decision-making. In light of these limitations, I argue that it is necessary to equip the EBP clinician with methodological approach capable of identifying and engaging with the values relevant to different phases of enquiry process in a standardised manner (see chap. 6).

Secondly, the failure to explicitly acknowledge the function and location of values and/ or provide a means of identifying and addressing them during the clinical enquiry process, has the potential to create ethical dilemmas for the EBP clinician. More specifically, when translated to clinical practice some of the previously detailed values commitments inherent in the EBP conceptual model, may encourage the EBP clinician to prioritise the ethical requirements of EBP ahead of their own ethical responsibilities to their client.

As was previously argued in sections 2.3 and 2.3.1, the EBP conceptual model prioritises knowledge from the research component, ahead of knowledge that emerges from the CVC component. The current operationalisation of EBP to a process of clinical decision-making , may thus promote a therapeutic approach supported by the 'gold-standard- of evidence that its poorly suited to the client e.g. has little cultural relevance. Or, one which follows the EBP research hierarchy, but is poorly aligned with CVC component of EBP as a result. In doing so the ethical requirement that a given intervention be based on a particular standard of scientific evidence (O'Donohue, & Lilienfeld, 2007), may compromise the clinician's ethical responsibility to adequately recognise agency and values of their client.

Problematically, the EBPs blanket approach of prioritising certain forms of knowledge and the associated orientation towards a 'values-free perspective' does not account for the way different values function throughout process of clinical enquiry. Indeed, if the clinician is to honor their ethical responsibilities the most relevant knowledge form will vary depending the particular phase of the clinical enquiry process (i.e. the location of the values-

based decision), their client, and their unique psychological difficulties (i.e. the nature and context of the values decision). It is therefore necessary to highlight and identify the nature and context of values that are relevant throughout to different phases of the clinical enquiry. This requires a methodological approach for understanding which sort of values (e.g. epistemic or ethical) are relevant to which phases of clinical enquiry, and how they ought be prioritised (see chap. 6). This is not currently available in the current operationalisation of EBP as a process of clinical decision-making.

Theory of Scientific Method and the Clinical Enquiry Process (5.3)

Since the instantiation of the Scientist-Practitioner Model over 50 years ago (Nelson-Gray, 1994; Shapiro, 1979), the science and practice of clinical psychology been guided by the assumption that clinical reasoning should be guided by models of scientific reasoning. Based on this assumption, the relationship between clinical enquiry and scientific inquiry can be considered a parallel one (Vertue & Haig, 2008; Ward et al., 1999). The HDM has been previously detailed as the dominant theory of scientific Method, utilised within the EBP conceptual model and the broader scientific discipline of clinical psychology (See 3.3). Indeed, the current support of HD approach as the field's dominant research paradigm is apparent within the notions of 'best evidence' assumed by the EBP conceptual model. Within the conceptual model, this privilege of the hypothetico- deductive paradigm, is apparent in the relative value afforded to specific research designs, methodologies and evidentiary forms that align with this approach, ahead of those pertaining to alternate theories of scientific Method within the EBP research hierarchy.

From an applied perspective, the position the of the HD paradigm, within EBP conceptual model means that clinical psychology's approach to psychological assessment and clinical reasoning is largely guided by the hypothetico- deductive approach. Problematically, the parallel nature of clinical enquiry and scientific inquiry means that those limitations

inherent to the EBP conceptual model's HDM orientation, also impact the clinical enquiry process . In the current operationalisation of EBP as a process of clinical decision-making, this is evident in a methodologically underdeveloped approach to clinical enquiry, that fails to include the necessary investigative and explanatory components of clinical psychological reasoning. In its current form this may result in underdeveloped conceptualisations of the clients presenting issues and formulations which 'close' prematurely on the basis of purely descriptive explanations of client difficulties. Failure to accurately identify and detail those causal mechanisms informing and maintaining the client's difficulties then results in inadequate treatment targets and, ultimately, poorer outcomes for the client.

Moreover, as section 2.32 detailed, implicit in the CE component of the EBP conceptual model is the expectation that clinicians have the practical knowledge to conduct a systematic analysis of their clients' problems (Ward, Haig & Clack, 2017) as well as the supporting knowledge of scientific theory of method necessary to guide this process. This is an implicit assumption because descriptions of EBP (e.g. APA Presidential Task Force on Evidence- Based Practice, 2006, Spring & Neville, 2014) emphasise the need to acquire and cultivate knowledge of *specific* methodological skills, but overlook the critical importance of using an explicit general theory of scientific method to guide the whole inquiry process (Ward, Haig and Clack, 2017).

This is deeply problematic given both the default position of the HDM within the EBP conceptual model and the nature of clinical psychological reasoning . Indeed, psychological diagnosis, unlike medical diagnoses cannot be as yet be defined in terms of specific and testable causal mechanism(s). As such, a range of cognitive tasks must be undertaken in order for the clinician to establish indicators to causality and relevant treatment options. In light of these constraints, it is evident that the current HD orientation of EBP, is ill suited to the ontological demands of clinical psychological reasoning and offers thus offers insufficient

methodological guidance throughout the clinical enquiry process. This, as well as those constraints outlined above (see 5.2) necessitates an alternative methodological approach to operationalising EBP for an applied professional setting.

ATOM and the clinical enquiry process (5.3.1). In section 3.3.1, the Abductive Theory of Method (ATOM; Haig, 2014) was used to exemplify how alternate theories of scientific method, may have utility in supplementing traditional approaches psychological research. ATOM (2014) has also been developed as analogous conceptual framework for identifying and structuring psychological assessment tasks and identifying relevant treatment targets (Ward, Clack & Haig, 2016; Ward & Haig, 1997; Ward, Vertue & Haig, 1999; Vertue & Haig, 2008).

Here, it is suggested that the alternative *abductive* approach may be better suited to both the ontological and methodological demands of clinical reasoning and the broader clinical enquiry process. Firstly, through the identification of those causal mechanisms most salient to the client (and thus the most relevant targets for their psychological treatment), and secondly through the integration of transdiagnostic understandings of psychological dysfunction to the EBP clinical enquiry-process. Moreover, ATOM offers a systematized conceptual map to assist practitioners in identifying, coordinating, and achieving the multiple tasks of assessment and treatment planning (Ward, Clack & Haig, 2017). It does this by identifying five major phases of clinical inquiry: (1) establishing a focus of inquiry (defining the problem space); (2) detecting a client's symptoms, signs, or problems (phenomena detection); (3) inferring causes for each of these symptoms, signs, or problems (theory generation); (4) developing an integrated case formulation (theory development) and (5) evaluating the adequacy of the formulation (theory appraisal).

As a systematic and methodologically driven transdiagnostic formulation model, that includes the necessary investigative and explanatory components of the clinical enquiry process, ATOM can also provide the basis for a fruitful alterative to the current operationalisation of EBP as a process of *clinical decision-making* (see chap. 6). In other words, it can provide a framework within which the valuable aspects of the IBP model can be located.

Phase 1: establishing a focus of enquiry. The first phase acknowledges that clients often present with ill-defined or vague complaints, and multiple problems. As such, the primary initial task of the clinician is structuring the problem space in a way that allows for the subsequent formulation of a plausible explanatory theory. In clinical practice, a case formulation (i.e., clinical explanation) is developed in order to address a particular focus on inquiry, typically a question posed by a clinician and/or referral agency. The goals and content of a case formulation then vary depending on the specific focus of inquiry. In this sense, the focus of inquiry helps guide the initial structuring of the problem space.

Determining this focus can be a surprisingly challenging task. Not uncommonly, what the clinician may have thought of as the key issue(s) changes with the acquisition of subsequent assessment data. For example, what at first seems to be an example of substance abuse might turn out to more fundamentally concern severe interpersonal problems. The clinician must ensure the focus of inquiry is relevant, ethical, and precise enough to answer. For example, a focus of inquiry might be to explain why 'Jane' consistently experiences feelings of abandonment in her intimate relationships, becomes socially withdrawn, and drinks too much alcohol.

Phase 2: detecting clinical phenomena. In applying the ATOM to clinical reasoning and case formulation assessment, Phase 2 also includes the process of data collection. This

phase of psychological assessment is traditionally overlooked, which can result in insufficient descriptions of client complaints and underdeveloped characterisations of data as treatment targets. Following the ATOM however, an abductive framework for clinical practice stresses the clarification of client problems and distinction between clinical data and clinical phenomena.

In clinical assessment, data is idiosyncratic in nature to particular settings and times. This includes direct observation, verbal reports from interviews, file material, and psychometric scores. Data collection is guided by evidence-based interview protocol, the referral question, and salient cues (or 'flags') that arise during an exploration of client functioning. The value assigned to data relies on its quality and is determined by the reliability, validity, and scope of the data collection. The evaluation criteria of the clinical reasoning process in this phase are thus the reliability and validity of the data assessment process. Meeting these requirements firstly requires a multi-method (and where possible multi-informant) assessment that utilises psychometrically sound scales and skillfully structured questioning techniques.

Descriptive hypotheses about phenomena are then inferred from clinical data. Here, phenomena refer to the general features of the client's functioning for which explanation is sought, and are understood as patterns in observed or reported functioning that the client experiences across settings and time. Data is analysed for phenomena by attending to data quality, pattern suggestion, confirmation of the pattern, and then seeking the generalisability of the pattern. In this sense, DSM-5 (American Psychiatric Association, 2013) diagnoses such as Major Depressive Disorder can be understood as phenomena because they are patterns of observed/ reported events that are present across settings and time. However, phenomena do not have to meet criteria – for example, consistent difficulties to maintain relationships in a number of areas could be described in terms of the phenomena of relationship dysfunction.

Focusing inquiry first on descriptive explanations (i.e. phenomena) improves clinical assessment in a number of ways. Firstly, it acknowledges and structures the primary task of the clinician: that clients typically present with ill-informed problems, and that the clinician must therefore adopt a problem-solving approach and structure the problem space in a way that allows for the subsequent construction of plausible explanatory theories (Ward, Vertue & Haig, 1999). Secondly, drawing phenomena from data emphasises the importance of accounting for existing limitations in the detection of phenomena and requires the clinician to carefully attend to reliability and validity of clinical data.

These improvements serve to offset clinician motivations (e.g. theoretical orientation) and cognitive biases at play in the assessment process and also requires the clinician to stay focused on data about the client's current problems. Where appropriate, this also serves to ground the clinician in the individual's lived experience and what they are noting. In addition, this promotes a descriptive phenomenological approach (i.e. one focused on the understanding and description provided by the client of their subjective experience) to understanding psychopathology and thus richer clinical data.

Phase 3: inferring psychological mechanisms. The next phase involves thinking explicitly and abductively about the possible causes of relevant psychological phenomena. In doing so, the ATOM approach to clinical practice avoids conflating problem/ phenomena detection with a treatment target/ causal explanation and thus prematurely formulating the client's case. Instead, existential abduction is used to hypothesise both the existence and processes of the causal *mechanisms* that may be perpetuating and maintaining the clinical phenomena. Bechtel (2008, p. 13) defines mechanism as follows: 'A mechanism is a structure performing a function in virtue of its component parts, component operations, and their organisation. The orchestrated functioning of the mechanism is responsible for one or more phenomena.' References to mechanisms provides explanatory depth to both normal and

maladaptive functioning. Here, it is expected that the psychopathology signs and symptoms (and the psychological and social *issues*) are caused by disrupted or damaged mechanisms and their relevant systems. For example, phenomena of anxiety, low mood, and challenge avoidance may be explained by cognitive causal mechanisms such as a core belief of personal incompetency.

Causal mechanisms may also have distal and/ or proximal contributing causal conditions. As such, different classes of distal factors such learning history, heritability, and organicity as well as the proximal factors from the client's current social situation must be identified to guide the construction of explanatory hypotheses. This acknowledges that various distal factors (e.g. attachment history) and proximal triggers (e.g. a relationship breakup) function as constraints to the explanation of why and how the client's difficulties have developed and been maintained. Or, the plausible causal mechanisms.

Finally, aligning with the CVC component of the EBP conceptual model, it is crucial to explicitly consider clients' characteristics and core values and to ascertain: Firstly, how they are implicated in the onset and perpetuation of a person's psychological difficulties, and secondly to point to ways that they could be utilised in an intervention plan.

Following the Scientist Practitioner approach, the actual choice of explanatory hypothesis in this phase is guided by the relevant research literature within a particular area.

Here six types of psychological functions identified in the RDoC and transdiagnostic research (Morris & Cuthbert, 2012) are used to structure clinicians' thinking about possible mechanisms causing. 1) *Negative valance systems*: Systems that detect current, potential and sustained threats and loss e.g. a view of men as potential threats. 2) *Positive valance systems:* Systems concerning approach motivation, reward responsiveness, and habit formation e.g. positive attitudes towards alcohol consumption 3: *Cognitive systems:* Systems pertaining to attention, memory, perception, language, and effortful control e.g. attentional

bias towards phobic cue e.g. a spider. 4) *Intrapersonal social processes:* Internal: self-conceptions, self-knowledge, working models e.g. view self as unworthy of love and inherently inadequate. 5) *Self-regulation systems:* Systems pertaining to regulation of arousal, construction of action plans, coordination of internal processes e.g. deficient problem formulation capacities, 6) *Interpersonal social systems* :Systems of affiliation, attachment vicarious learning e.g. strategies of social avoidance.

However, the five types of psychological functions identified in the RDoC and transdiagnostic research offer just one conceptualisation how to structure clinicians' thinking about possible mechanisms. As an essentially transdiagnostic methodology, the ATOM framework can be used to integrate various causal mechanisms identified across theoretical orientations. Here, an increased level of methodological sophistication avoids appealing to a particular classification system or theoretical paradigm. This is a notable advantage of the ATOM approach to clinical decision-making, when considered in relation to the current diagnostic constraints of psychological nosology and the developing nature of science within clinical psychology (see 2.1).

Significantly, a transdiagnostic approach to clinical formulation recognises that different psychological phenomena can be can be treated and thus explained, by targeting the same/ overlapping causal mechanisms (Mansell et al., 2009). For example, theoretical work on the phenomena of substance abuse and bulimia nervosa will both detail causal mechanisms /treatment targets of behavioural and attentional control, and emotion regulation. In this way the ATOM approach to identifying relevant treatment targets draws on multiple 'silos' of psychological research (e.g. the psychology of cognition, behaviour development, systems, cultural etc.) to identify the causal mechanisms most *salient* to the individual client's difficulties.

The evaluation criteria of the clinical reasoning process at this phase is the plausibility of explanations for the client's identified phenomena.

Phase 4: developing a case formulation. The fourth phase generates a clearer picture of how the causal mechanisms interact to generate and maintain the client's clinical phenomena, and in doing so identifies the most salient treatment targets to the client. The aim here is to ascertain and represent each mechanism's relationship with other mechanisms, as well as the various contributing factors in a simplified causal model. This is very much a guiding ideal and developing a tightly integrated clinical theory will not always be possible. However, attempting the exercise betters the explanation of the client's symptoms and therefore provides greater clarity for identifying relevant treatment targets (Ward, Vertue & Haig, 1999). This also constitutes an idiographic strategy (Allport, 1937) in that the clinician has constructed a unique conceptualisation of the *individual* client.

During this stage of the inquiry process, a comprehensive case formulation is developed, combining descriptive and explanatory hypotheses. For example, the hypotheses that a client has negative beliefs about themselves as inadequate (causal mechanism), has attentional bias to criticism and rejection (causal mechanism), is fearful of involvement with others (causal mechanism), avoids interpersonal contact (phenomenon), and abuses illicit substances (phenomenon) all need to be integrated into a coherent model. Instead of simply diagnosing this person as having an Avoidant Personality Disorder, the clinician would model the hypothesised causal or functional relationships in the development of their case formulation. This reflects the transdiagnostic nature of ATOM guided clinical inquiry.

In the above example, the tendency to abuse drugs could be strongly related to a client's views of themselves as inadequate (resulting in frequent episodes of perceived ridicule and shaming) and subsequent dysphoria. The fear of getting involved with others would function to amplify negative affect, creating further relationship turmoil and result in

increased drug use as an escape and avoidance strategy. In this sense, the formulation – the culmination of the clinical reasoning process- offers a comprehensive and, hopefully, integrated 'mini' theory that attempts to explain why a client developed his/her problems at a particular time and what is maintaining them (Haig, 2014; Ward et al., 1999).

The evaluation criteria of the clinical reasoning process at this phase is thus evaluating the coherency of the integrative reasoning processes. This establishes how well claims about the relevant phenomena and causal mechanisms (including proximal and distal factors) have been linked in accounting for the client's present problems. Once established, the causal model is detailed in a verbal narrative outlining the case-formulation.

Phase 5: evaluating the case formulation. The final phase assesses the epistemic value of the clinical reasoning process, with particular emphasis to the explanatory coherence of those interrelationships between psychological mechanisms and the phenomena detailed in the case formulation.

A clinical situation by its very nature facilitates a number of plausible case formulations that align with the available evidence and thus a number of plausible treatment approaches (Ward, Vertue & Haig, 1999). Evaluation of the case formulation is therefore a crucial part of the clinical reasoning process to ensure that only those causal mechanisms most salient to the client's problems (and thus the most the effective targets of psychological intervention) have been identified. However this facet of case-formulation is typically under-emphasised. The delineation of case formulation evaluation adopted by the ATOM framework in Phase 5– as well as the evaluative criteria detailed in each prior phase of the clinical reasoning process – may therefore increase the utility of EBP as a process of clinical decision –making, by pointing to those treatment targets (or causal mechanisms) most salient to the individual client.

Applied to clinical practice, the ATOM evaluative approach again emphasises explanatory coherence and, in doing so, that formulation appraisal should extend beyond empirical adequacy. This includes evaluation criteria such as the internal coherence, external consistency, unifying power, fertility or heuristic, simplicity, and explanatory depth of the formulation. This process engages the clinician in a critical appraisal of their formulation and encourages them to answer a number of questions. For example: Are there any contradictions or gaps -such as unaccounted for psychological phenomena- in the formulation (internal coherence)? Is this formulation aligned with relevant psychological theory and research pertaining to the client's issues (external consistency)? Does this formulation draw together all the relevant psychological phenomena to innovatively account for all of the client's identified difficulties (unifying power)? Does this case formulation lead to an intervention plan (heuristic/ fertility)? Does this case conceptualisation make the fewest special assumptions? For example, a formulation that utilises a social-learning interpretation in most instances is likely to be favoured over psycho-dynamic theory, emphasising unconscious psychic conflict and drives (simplicity). Finally, is this case formulation purely descriptive or does it discuss and link the fundamental causes of the individual's problem (explanatory depth)? This broad approach to evaluation increase the utility of EBP as a process of clinical decision-making, by ensuring those causal mechanisms identified as most salient to the client do in fact represent the most relevant and fertile targets for their psychological treatment.

These phases will be further developed within chapter 6 in a comprehensive model of EBP fit to guide the process of clinical decision- making.

Chapter 6

Evidence-Based Practice: A Process of Clinical Enquiry

I have previously argued that the EBP conceptual model prioritises empirical knowledge over theoretical and/ or conceptual knowledge and is focused on largely on intervention research. As a result, EBP has been inappropriately operationalised as a process of *clinical decision-making*, as opposed to a broader process of clinical *enquiry* (see 5.1). Problematically, this excludes the necessary investigative and explanatory components (i.e. those tasks which establish the casual explanations for psychopathology) of professional practice. In this sense, EBP– as it is represented by the 'three-legged stool'- has significant limitations as a conceptual model and is inadequate as model of professional practice. It is therefore necessary to replace the 'stool' with another more process orientated representation.

Building on earlier critiques established in chapters 2-5, in this chapter I take apart the EBP conceptual model and -retaining some of its key ideas (e.g. the stakeholders and knowledge related phenomena involved)- replace it with the methodologically orientated *Model of Clinical Enquiry* (MCE). The MCE is based on an adaption of the ATOM framework for case-formulation (Ward, Haig & Clack, 2017), which grounds the enquiry model in a clinically relevant theory of scientific method. A number of additions are made to the ATOM framework, based on earlier critiques of some of the EBP conceptual model. These additions highlight the different forms of knowledge and values operating throughout the clinical enquiry process, their relationship to the key stakeholders, and offers a description of how they unfold across time.

The Evidence-Based Practice Model of Clinical Enquiry (6.1)

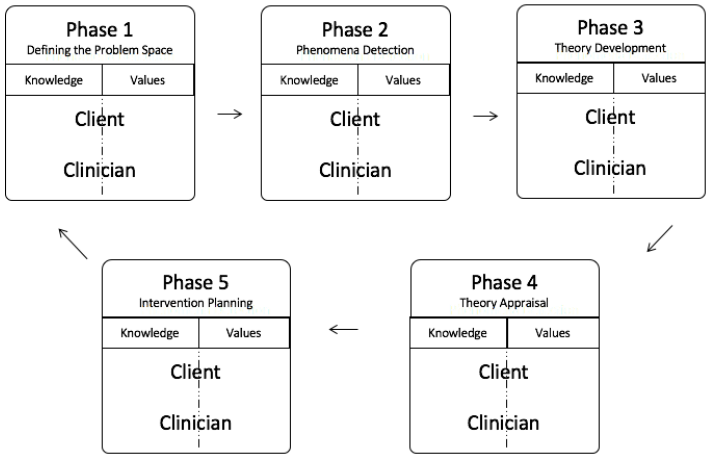

Figure 1. The Model of Clinical Enquiry

Responding to the specific cognitive demands facing the *clinical* practitioner (see 5.3), The MCE offers a new way of operationalising EBP. As Figure 1. details, this includes the emergent properties of the client and clinician -specifically relevant knowledge and values related phenomena- and how these relate to the different phases of the clinical enquiry process.

Given the paucity of discussion surrounding the methodological, or process elements of EBP, it is also hoped that this approach to clinical enquiry will offer a practical addition to the EBP literature and stimulate greater theoretical discussion in this area. The recent paper by Mulder, Murray and Rucklidge (2017) on common and specific factors in psychotherapy provides a process orientated addition to EBP literature, with their inclusion of collaborative decision-making, individual case formulation, ongoing monitoring and feeding back into research to the EBP conceptual model. As the only current process orientated EBP literature to include the explanatory elements of the clinical inquiry process thus far, this paper can be considered complimentary to the reconceptualisation of the EBP in Figure 1 and outlined in the following sections. Here, the MCE extends the work of Mulder et al. (2017) by providing a greater level of detail to the investigative and explanatory components of EBP.

Such a methodologically orientated approach expands upon the existing clinical decision-making process currently referred to by the EBP conceptual model, with the inclusion of those investigate and explanatory components of clinical enquiry process. In so doing, the MCE retains key ideas from the EBP conceptual model, that usefully inform clinical practice. These include, identifying the stakeholders involved (i.e. the clinician, their institutional affiliations and the client), as well as incorporating the majority of the knowledge related phenomena detailed in the EBP conceptual model. For example, the clinical expertise of the clinician (i.e. that the clinician is to be sufficiently informed) and the client's values and characteristics (i.e. that understandings and values of the client need to be adequately accounted for). The MCE also accommodates the pre-existing and intervention-specific process elements of EBP as elaborated by Spring and Neville (2014), that is, the 5 As (*Ask*; *Acquire; Appraise; Apply; and Assess*) during its final phase.

A Methodological Approach to Evidence-Based Practice (6.2)

This section adapts the ATOM framework for case-formulation (Ward, Haig & Clack, 2017) for the MCE. Here, the addition of the necessary explanatory elements (i.e. those which precede intervention planning) further delineates the cognitive tasks of the clinical enquiry process, as well as detailing the relevant knowledge and values of the key stakeholder, and how these unfold across time.

In order to clarify the practical connections between the conceptual elements of EBP and the MCE, some additions need to be made to the ATOM case-formulation framework (Ward, Haig & Clack, 2017). These include elaborations of: the different forms of knowledge salient to each phase of clinical enquiry; the location of the values relevant to the different phases of the clinical enquiry; and the different function(s) of knowledge and values throughout the clinical enquiry process.

It is important to acknowledge that the MCE represents an idealised model of clinical enquiry and should not be reified. The different phases are conceptual ones and are thus designed to be dynamic and iterative. In reality, there is a lot of overlap between the cognitive tasks, knowledge and values detailed in each phase.

In the following sections, the knowledge related phenomena of greatest relevance to the primary cognitive task at each phase is described separately. As an iterative process however, it important to note that the majority of knowledge related phenomena is likely to be of relevance throughout subsequent phases. Likewise, values are an inherent aspect of the enquiry process and although their level of applicability varies throughout the different phases of the clinical enquiry process, these values are in fact operating to some extent at all times. For simplicity sake, once detailed, values are then presupposed throughout the remaining phases of clinical enquiry process with a few necessary exceptions.

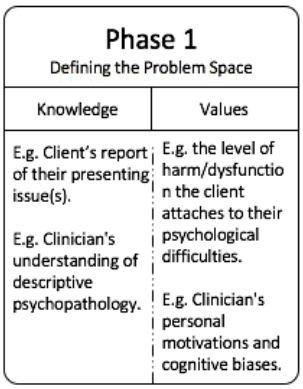

Figure 3: Examples of knowledge and values related phenomena relevant to Phase 1

Phase 1: structuring the problem space (6.2.1). The primary cognitive task in Phase 1 is to structure the problem space in a way which allows for the later formulation of a plausible explanatory theory. That is, the focus of enquiry needs to be clearly described. As *Figure 2* demonstrates, addressing this task requires taking into account the knowledge and values of both of the key stakeholders in the EBP clinical enquiry process. In clinical practice, this is typically a question posed by a clinician and/or referral agency. The clinical

explanation (i.e. case-formulation) developed in Phase 3, then addresses the particular focus of inquiry. The goals and content of case-formulations thus vary depending on the specific focus of inquiry.

During Phase 1, knowledge held by both the clinician and the client helps to structure the structure the focus of enquiry. Here, the client provides *self- knowledg*e (see 2.3.3) through first person accounts of their presenting issue(s). The clinician will also utilise their knowledge of descriptive psychopathology and psychological nosology, as well as their own clinical opinion, experience and interpersonal/ communication skills to further engage in the cognitive tasks of Phase 1. It is also necessary for the clinician to draw upon *institutional knowledge* (see 1.1.2), in the form of client referrals and records when structuring the problem space.

As previously detailed, the application of knowledge throughout the scientific process is a value laden process. From the client perspective, salient values in Phase 1 relate to both prudential values, as well as the client's perception of their central issue(s). This includes for example, the level of harm/dysfunction the client experiences, as well the relative prioritisation of these difficulties.

In Phase 1 -and the remainder of the enquiry process- according to the MCE the clinician should always be aware of these client related values, as well as their own personal motivations and cognitive biases. For example, appreciating how their personal views of what constitutes a 'healthy' intimate relationship may influence their perception of a client's interpersonal difficulties. The clinician and broader clinical enquiry process is also influenced by the values endorsed by any relevant institutional affiliations. These include constraints surrounding the role definitions of a client and clinician, which procedures ought to be undertaken, conceptualisations of what represents a legitimate focus on enquiry, and what particular diagnostic system is endorsed.

According to the MCE, a number of *epistemic* values ought to be considered in Phase 1. In this regard, the clinician should consider the ***reliability***, validity and the coherence of the data used to formulate the question. Relevant considerations here include for example, the consistency of knowledge provided by different stakeholders, and how the potential client's mental state may have influenced the data they provided.

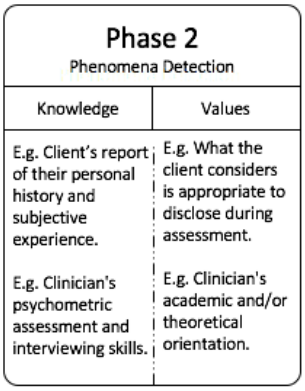

Figure 3: Examples of knowledge and values related phenomena relevant to Phase 2

Phase 2: phenomena detection (6.2.2). The primary cognitive task in Phase 2 is the detection of clinical phenomena. This task can be broken down into two sub-tasks that engage the knowledge and values of both the client and the clinician (see *Figure 3*), firstly the process of *data collection,* and secondly, the *formulation of descriptive hypotheses*.

Data collection is guided by the focus of inquiry established in Phase 1. This process is undertaken using evidence-based interview protocols, reliable and valid psychometric tools, and salient cues identified by the clinician during their explorations of client functioning.

Data collection is followed by the *formulation of descriptive hypotheses*. To complete the second subtask of Phase 2, the clinician analyses client data for patterns from which psychological phenomena can then be inferred. The clinician seeks to establish whether these patterns represent genuine psychological phenomena, by assessing the generalisability of these patterns with regards to client functioning; are they comparatively stable patterns or

effects?. This process is of course informed by the knowledge and values of the client and clinician as the key stakeholders in the EBP enquiry process.

In Phase 2, the client provides both *self- knowledge* and *anecdotal knowledge* (see 2.3.3) in the form of clinical data. The former may include the client's report of their personal history, subjective experience, cognitions, behaviors, relationships and existing coping strategies. The latter may take the form of the client's subjective understandings of anxiety that are informed their mother's history of anxiety.

In addition to this client related knowledge, the clinician also draws upon their own clinical expertise. In Phase 2, this includes knowledge relating to psychometrics and the theory of scientific method. For example, the various psychometric properties of the selected assessment tool(s) and the difference between data and phenomena.

To engage in the cognitive task of phenomena detection, the clinician utilises knowledge in the form of various practical competencies. These include assessment and interviewing skills throughout the data collection process, their diagnostic judgement in regards to psychological phenomena, as well as their appraisal skills in regards to their own personal cognitive processes, and clinical practice.

From a values perspective, both the self- identified personal values and response biases of the client are pertinent during the second phase of the clinical enquiry process. For example, data relating to the, cultural, spiritual and familial values of the client, as well as the client's judgments surrounding what information they considers appropriate to disclose to their clinician during assessment.

Throughout Phase 2 the clinician must also consider the role of values in regards to the cognitive task of phenomena detection. During this phase, the clinician must be mindful of their academic and/or theoretical orientation and its potential to colour the process of phenomena detection. For example a clinician with a PhD in psychodynamic psychology

may be more likely to identify intrapsychic phenomena such as slips of the tongue or problematic dreams as especially salient. Throughout the phenomena detection process, the clinician will also be considering pertinent epistemic values. Specifically, the empirical adequacy of the assessment process. For example the reliability of data provided by client and/ or the validity of clinical data drawn from the client referral.

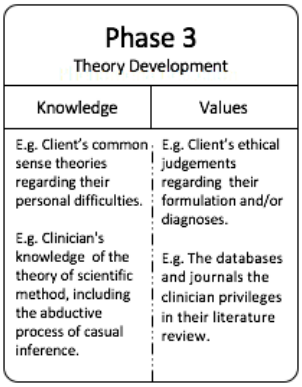

Figure 4: Examples of knowledge and values related phenomena relevant to Phase 3

Phase 3: theory development (6.2.3). The primary cognitive task of Phase 3 of the clinical enquiry process is theory development. This can be simplified according to a number of related subtasks. As *Figure 4* details, the process of theory development involves a complex interplay of the knowledge and values of both the client and clinician, as key stakeholders in the EBP clinical enquiry process. In the following description of Phase 3, the relevant knowledge and values are thus described as they relate to the relevant subtasks.

The first subtask of theory development is *existential abduction.* Here, the clinician hypothesises both the existence and processes of the causal mechanisms that may be perpetuating and maintaining the clinical phenomena identified in Phase 2.

This subtask is informed by the clinician's knowledge of the theory of scientific method. Specifically, the abductive process of causal inference. Clinician relevant knowledge during the process of existential abduction will also relate to basic psychological processes and

psychological theory. For example the clinician's understanding of arousal and regulatory processes and Social Learning Theory.

During the second subtask the clinician *identifies relevant distal and/ or proximal factors*. Distal factors may include for example the client's learning history and the potential heritability and/ or organicity of their difficulties. Examples of proximal factors that include factors pertaining to client's current social situation, that contribute to their psychological phenomena, such as a friendship dissolution.

At this point in the theory development process, the clinician *explicitly considers the client values and characteristics,* in regards to how the values and characteristics of the client may be implicated in the onset and perpetuation of their psychological phenomena. The clinician's practical and theoretical knowledge in regarding the influence of individual, cultural, and contextual differences on psychological functioning are salient to this subtask. Client related knowledge is also pertinent to the completion of this explanatory task. This includes the first person perspective of the client regarding their own priorities, needs and core values (i.e. *self- knowledge*). *Anecdotal knowledge* provided by the client may also be of relevance to this subtask. For example, the client's common sense theories on what prompted and/ or is maintaining their personal difficulties.

Those causal mechanisms most salient to the individual client's difficulties are then identified in the next subtask. This is referred to as *establishing explanatory hypotheses* and ideally should be guided by a model overviewing the structure and organisation of the mind. An example of such a model is the RDoC's matrix of psychological domains and units of analysis Morris & Cuthbert, 2012): 1. *Negative valance systems;* 2. *Positive valance systems;* 3: *Cognitive systems; 4. Self-regulation systems;* 5. *Interpersonal social systems).* The choice of the clinicians clinical hypothesis is thus guided by the relevant research literature within a particular area. Relevant knowledge drawn on when establishing an

explanatory hypothesis includes literature review and research evaluation skills. Specifically, the critical analysis of evidence (e.g. synthesised literature reviews, systematic within subject design, RCTs, cases studies etc.) as it relates to causal psychological mechanisms.

In formulating explanatory hypotheses , the clinician must also be aware of the role values play in informing the evidentiary sources they choose to draw from. For example, the databases and journals that are privileged in their literature review. Throughout this subtask, s/he must also consider relevant epistemic values. For example the reliability and validity of research pertaining to basic psychological processes or, the fertility and heuristic of psychological theory used to guide their explanation.

The next subtask in the theory development process is to *create a simplified causal model.* Here, the clinician ascertains and represents each mechanism's relationship with other mechanisms, perhaps utilizing diagrams**.** This subtask helps clarify clinical understanding concerning how the causal mechanisms interact to produce and maintain the clinical phenomena. The process of creating a causal model also points to the client's *core* mechanisms and in doing so, identifies those treatment targets most salient to the client's psychological difficulties.

During this subtask, the clinician engages both practical and theoretical knowledge in order to integrate nomothetic phenomena (e.g. relevant psychological research and theory) with ideographic phenomena (e.g. the understandings and values of the client) in an explanatory context.

Because the integration of nomothetic and ideographic phenomena also requires a number of normative judgements, the clinician should also consider the role of values inherent to this process. Specifically, those values involved in balancing the ethical requirements of EBP (and the prioritisation of idiographic phenomena this demands) with

their ethical responsibilities to the client (and the prioritisation nomothetic phenomena this may require; see 5.2).

The consideration of *epistemic* values is relevant when creating a simplified causal model. Here, epistemic values are utilised by the clinician to evaluate the explanatory breadth and the coherence of their integrative reasoning processes. This may take the form of an informal plausibility check of the causal model, in which the clinician evaluates the mechanisms they have inferred, and connections they may have made between descriptive and causal hypotheses.

The next subtask of during the theory development phase is *case-formulation.* A case-formulation incorporates both the clinician's descriptive and explanatory hypotheses (referring to causal mechanisms). This will also include details of the onset, development and interrelationship(s) of these mechanisms, as well as their various contributing factors. During this subtask the experiential knowledge of the practitioner may also be of relevance. For example prior clinical experiences with a similar psychological phenomena. This may include the explanations and/ or mechanisms that were detailed in a past client's case formulation. Undertaking this process of analogy, also requires knowledge regarding theory of scientific method. For example understanding the role of analogy in theory building and how to make analogies between current client and past client's for explanatory purposes.

The final subtask in Phase 3 is to *present the case-formulation.* Here, the causal model is presented to the client in the form of a verbal narrative. Relevant client values during this subtask are manifest in the client's perception of their case formulation. For example the possible ethical judgements client may have regarding their formulation and/or diagnoses, and what this may mean for their view of themselves as either a 'good' or 'bad' person. Note that client values detailed in Phases 1 and 2 can also be considered applicable throughout the broader cognitive task of theory development.

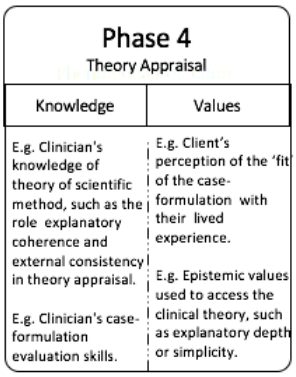

Figure 5: Examples of knowledge and values related phenomena relevant to Phase 4

Phase 4: theory appraisal (6.2.4). The major cognitive task in in Phase 4 is the critical appraisal of the clinical theory (i.e., case formulation). This includes an assessment of both the empirical adequacy and its explanatory coherence of the theory and is used to establish the epistemic value of the of the case-formulation and the causal explanations it provides. As *Figure 5* demonstrates, the relevant knowledge and values of both the client and the clinician must be engaged in order to evaluate the case-formulation in manner.

During this process , relevant clinical knowledge relates to the theory of scientific method, as well as more practically orientated case- formulation appraisal skills. For example, understandings of the role of internal coherence and external consistency in establishing the empirical adequacy of the theory, and their skills at systematically applying epistemic criteria (such as explanatory depth and simplicity) to their client's case-formulation.

Epistemic values are particularly salient to Phase 4, given the evaluative nature of the cognitive task. Here, the clinician posits a number of questions, in order to establish the empirical adequacy and explanatory coherence of their clinical theory. For example, does my explanation account for all relevant data? Does it align with the salient literature? How does my explanation fit with client's understanding of their situation? Is my case formulation logically consistent? During this critical evaluation process, consideration is also given to

how the current formulation compares with any competing explanations of the client's psychological phenomena, that may have been considered during theory development.

Client values of particular relevance to this phase of the clinical enquiry process, relate to the client's perception of their case-formulation. For example how the client's perceives the case-formulation 'fits' with the lived experience of their psychological difficulties. As with any phase of the clinical enquiry process, the clinician must explicitly consider both values and the knowledge held by the client.

Incorporating client related knowledge and values in this way is pertinent from a therapeutic alliance perspective and also ensures adequate recognition is given to client agency. Moreover, the client's evaluation of their case-formulation during Phase 4, can also be considered a feature of the empirical adequacy of the clinical theory and will therefore inform the clinician's epistemic appraisal of their formulation.

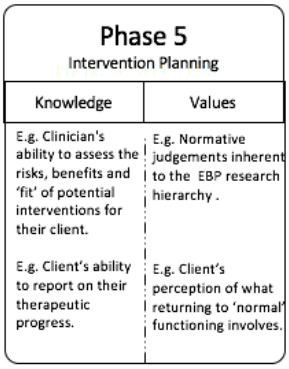

Figure 6: Examples of knowledge and values related phenomena relevant to Phase 5

Phase 5: intervention planning (6.2.5). Intervention planning is the final cognitive task in clinical enquiry process. Here, the mechanisms/ treatment targets identified in Phase 3 are used to inform decisions about the management and treatment of the client's presenting condition. This process involves the collaboration of the knowledge and values of both the client and clinician (see *Figure 6*) and can be further broken down into three subtasks, each engaging: Reviewing the relevant literature; creating a treatment plan; and evaluation and

follow up. It is also important to note that standard approaches to EBP as a clinical decision-making process (e.g.The 5As; Spring & Neville; 2014) can be accommodated during this phase.

The first subtask of Phase 5 is to *review the relevant intervention literature*. This involves the identification and critical appraisal of treatment efficacy research as it relates to the previously identified treatment targets. Throughout this subtask relevant knowledge therefore relates to the clinician's literature review and research evaluation skills. Specifically, the critical analysis of evidence as it relates to therapeutic intervention, including therapeutic efficacy and therapeutic effectiveness research (e.g. meta-analyses, RCTs, systematic within subject designs, case studies etc.).

In applying this a number of epistemic values are also of relevance . These include: empirical adequacy, as it relates to the reliability and validity of the data of treatment efficacy data; the plausibility of statistical inferences: (e.g. What the statistical modelling actually tests and whether the statistical model adequately capture and evidences the construct of interest)*;* the external and ecological validity of the findings (e.g. The generalisability of the findings to client circumstances and the therapeutic setting); and the external consistency of the research (e.g. How the findings concur with other treatment efficacy research, theoretical explanations of the phenomena and relevant basic science research). Throughout this subtask, the clinician ought also be aware of the role of values in regard to the normative judgements inherent to the EBP philosophy of evidence. For example, the privileging of empirical knowledge over theoretical or conceptual knowledge apparent in the evidence hierarchy, including the research designs, methods and evidentiary output that can be considered sufficient evidence by these standards.

The information gathered during the first subtask of Phase 5 is then used to *create a treatment plan*. During the second subtask in the intervention planning phase the best

supported treatment is further evaluated with regard to how it aligns with the client's characteristics and resources, as well as the likely acceptability and uptake of treatment by the client. This is achieved through proactively engaging the client in a process of collaborative decision-making.

Client related values are of course a fundamental component of this subtask. In addition to considering the client's values and characteristics as identified in Phases 1 through 4, the clinician also considers the clients normative judgements as they relate to intervention and treatment outcomes. For example their client's therapeutic goals and/ or future aspirations, as well as their perception of what returning to 'normal' functioning involves.

In creating a treatment plan, similar knowledge related competencies as those employed during Phase 3 are relevant . Specifically, those clinical skills necessary to integrate ideographic and nomothetic knowledge. During Phase 5 however, balancing these different knowledge forms, will occur in the context of therapeutic intervention. Throughout Phase 5, the clinician also engages their collaborative decision-making skills, as well as the clinical competencies that enable them to evaluate the risks, benefits and 'fit' of potential interventions with their individual client. For example, despite being the most effective intervention for the mechanism identified, flooding techniques might not be used for a client with specific phobia. In considering client characteristics -such as a historical trauma using this technique in a previous therapeutic encounter- it may be decided that this represents an inappropriate treatment choice for the individual client.

Evaluation and follow up are last subtasks of Phase 5 and are an ongoing and iterative process in which the outcomes that occur, both during and after evidence-based intervention are continuously analysed. The approach to treatment and the treatment goals are then realigned as necessary, based upon local data from the client.

Client related knowledge is particularly salient during this subtask. Specifically the *self-knowledge* relating to treatment progress, that the client is able to provide. For example, situations that may have been triggering the client's negative automatic thoughts, or elements of treatment which the client believes are proving to be ineffective. Relevant client related knowledge during this subtask may also include *anecdotal knowledge* that influences the client's understanding of treatment. For example the client's neighbours experience of CBT.

Conclusions

EBP is central to both the research and profession of clinical psychology. Although there is extensive literature available in this area, the EBP conceptual model itself has been subject to little theoretical examination. Specifically, regarding its basic ontology and epistemology, as well as the theory of scientific Method on which it is built and the notions of 'best evidence' this informs. Despite the lack critique within the relevant literature, the theoretical basis of the EBP model is by no means normatively neutral. By investigating the history of EBP, the properties of its three different components (research, CE and CVC) and the current operationalisation of the conceptual model for clinical practice, I have sought to bridge this gap.

This examination, has revealed a number of significant limitations regarding the EBP model's current representation as a 'three-legged stool'. This includes the privilege of empirical over theoretical and conceptual knowledge claims, a resultant focus on intervention research, and the failure to recognise the values-based nature of such commitments.

These limitations also pose a number of constraints when translated as a guide for professional practice. This is evident in the current intervention focused operationalisation of EBP as a process of clinical-decision making. Problematically, this approach excludes the critical investigative and explanatory components (i.e. Those tasks involved in establishing casual explanations for psychopathology) of the clinical enquiry process.

On the basis of these findings I suggest that in its current form, the EBP model fails to align with the conceptual and practical demands of clinical psychological reasoning. It is therefore necessary to replace the EBP 'stool' with a more methodologically orientated representation of the clinical enquiry process. To achieve this, I have dismantled the EBP

conceptual model and -retaining some of its key ideas (e.g. The stakeholders and knowledge related phenomena involved)- replaced it with the MCE.

The findings of this thesis and the impetus behind the MCE, reference the larger issue of prematurely accepting models as established fact, without adequate consideration of the theoretical orientation and normative assumptions on which they are built. Without adequate examination of these areas, conceptual frameworks of this nature risk privileging certain types of knowledge and knowledge acquisition at the costs of fruitful alternatives. Or, becoming a simple assimilation of masses of seemingly disconnected pieces of information, in which the model itself becomes difficult to master, apply and teach. This is not an uncommon occurrence given the ideological and normative barriers that may exist when a theoretical model is examined from within its discipline of origin. In such instances a philosophy of science lens offers useful theoretical insights and practical improvements, especially in examining underlying concepts (Douglas, 2010). This sort of investigation is of particular importance to the EBP movement, given that the conceptual model has adapted from another scientific discipline. Specifically, medical science and the EBM model, which guides the discipline's research and medical practice.

Using a philosophy of science lens to examine the EBP model also highlighted a number of areas of uncertainty currently facing the researchers and practitioners of clinical psychology. Based on the findings of this thesis, I put forward three of these concerns as key areas for future theoretical and conceptual development. The first of which is disciplinary understandings regarding the nature of mental disorders. The second concern highlighted by this thesis is the role of values in both the research and application of clinical psychology, and the third is the need for a sufficiently comprehensive model of the clinical enquiry process. These are detailed below.

Disciplinary understandings regarding the nature of mental disorders require significant theoretical attention. The lack of construct validity within diagnostic systems like the DSM-5, means psychological difficulties like anxiety and depression currently exists as mere placeholders for future causal explanations. In this compromised state, psychological classification systems, can only *offer* the clinical researcher, practitioner and client, mere descriptions of various symptom clusters. If the EBP movement and the research and profession of clinical psychology more broadly are to progress, understandings regrading nature of mental disorders ought be a high priority for theoretical and conceptual development.

In time, it is likely that transdiagnostic models of psychopathology and the RDOc project - innovative approaches to researching psychological difficulties- will offer a better ways of classifying and understanding the etiology of mental disorders. These developments have obvious implications for clinical science. As an applied scientific process, EBP must be fit to seriously engage with this sort of disciplinary progression and the demands of its application in a professional setting. These areas, thus require concentrated theoretical attention and further conceptual development.

The role of values within the science and practice of clinical psychology also requires significant theoretical consideration. Values of all types serve important functions within scientific inquiry, and clinical enquiry processes. However, I have argued that like many scientific disciplines, the EBP movement and clinical psychology more broadly currently maintains a 'values-free' perspective. While attention is given to the values of the client, little acknowledgement or guidance is offered surrounding the function and location of those values inherent to the science and application of clinical psychology.

In regards to the foundations of EBP, significant normative commitments include epistemological claims such as what can be considered an appropriate theory of scientific

method, research design or methodology, and when evidence can be considered sufficient to support a claim. The cognitive tasks the clinician must engage in throughout the clinical enquiry process also require numerous values- based decisions and/ or judgments. However, the prevailing orientation towards a 'values-free' perspective, has meant the that the role of values inherent in this process, remains largely unacknowledged and thus underdeveloped. Because values *do* in fact play a significant role in guiding the acquisition of knowledge and how this knowledge is applied in a practical setting, the location and function of values require further conceptual and theoretical development.

The critiques of EBP provided by this thesis, including the aforementioned compromised state of psychological nosology and lack of theoretical development regarding the function and location of values, also highlights the need for a sufficiently comprehensive model of the clinical enquiry process. Neither the EBP 'three-legged stool', nor the process of clinical decision-making it is currently operationalised as (for example 5 As; Spring & Neville, 2014), satisfactorily detail or guide this process.

In this thesis, I have argued that the root of this issue appears to be the ontological and epistemological the origins of the EBP in EBM. This has resulted in a conceptual model that is largely focused on intervention research, and an inappropriate operationalisation of EBP as process of clinical decision-making.

As a result, the process elements of EBP are represented as a series of linear decision-making tasks, in which the clinician evaluates different intervention strategies and then applies the most suitable alterative. This is evident in the 5A's approach to clinical decision-making which begins *after* the initial client assessment. This starting point fails to acknowledge the range of cognitive tasks included in the clinical enquiry process, beyond the simple allocation of a diagnosis and the subsequent selection of a therapeutic intervention. Problematically, this approach to clinical reasoning excludes those critical investigate and

explanatory tasks of the clinical enquiry . This is likely to result in underdeveloped conceptualisations of the clients presenting issues and formulations which subsequently 'close' prematurely, on the basis of purely descriptive explanations of client difficulties.

Whilst an interventionist orientated decision-making approach may have utility in EBM, where the diagnoses in question references scientifically established and testable biological mechanisms, psychological diagnoses (i.e. The DSM-5) are established exclusively on the manifestations of hypothesised underlying causes. They do not, therefore, offer the same reliable indicator to causality and treatment options. Failure to accurately identify and detail those causal mechanisms informing and maintaining the client's difficulties is therefore likely to result in inadequate treatment targets and, ultimately, poorer outcomes for the client. As such, theoretical development of a sufficiently comprehensive model of the clinical enquiry process is critical.

I have developed the MCE as a preliminary attempt to address these issues and stimulate further theoretical development in the area. This methodologically orientated approach to the clinical enquiry highlights the different forms of knowledge and values operating throughout the clinical enquiry process, their relationship to the key stakeholders, and how they unfold across time. In doing so, the MCE also retains some of the key ideas of the EBP model, such as the stakeholders and knowledge related phenomena involved in the clinical reasoning process.

Whilst the methodological nature of the MCE, cannot resolve the uncertainty posed by our current understandings of the nature of mental disorders, it can help the clinician navigate the complexities of clinical reasoning process, associated with the compromised state of our diagnostic systems. This is achieved through MCE's basis in the ATOM framework for case-formulation (Ward, Haig & Clack, 2017), which locates the enquiry process within a clinically relevant theory of scientific method i.e. One the that is capable of fulfilling both

ontological and methodological demands of clinical reasoning and the broader clinical enquiry process.

In doing so the MCE includes the necessary investigative and explanatory components absent from previous operationalisation of EBP as a process of clinical decision making (e.g. 5As). Integrating the ATOM in this way, also further delineates the different phases of the clinical enquiry process. This offers a systematized conceptual map that assists practitioners in identifying, coordinating, and achieving the multiple tasks of assessment and treatment planning (Ward, Clack & Haig, 2017), as well as integrating transdiagnostic understandings of psychological dysfunction to the clinical enquiry process.

The MCE also contributes to the theoretical development of role of values within the science and practice of clinical psychology. This is achieved by detailing the relevant knowledge and values related phenomena of the client and the clinician, and how these relate to the different phases of the clinical enquiry process. Here, the inclusion of the function and location of values -beyond cursory considerations of client values and characteristics offered by other approaches- draws attention to any theoretical and ideological allegiances that may be apparent at different phases of the clinical enquiry process. The MCE thus promotes increased accountability of both clinicians and the research they utilise, offers greater clarity in the detection and explanation of phenomena, and more in-depth considerations of client agency. It is hoped that the developments offered by the MCE will inspire further discussion in this area and in doing so, contribute to the future development of EBP, and the science and practice of clinical psychology more broadly.

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