Why the CEBMa model is misleading.

Patrick Vermeren* – May 2015

I will argue that the model referring to four "sources" of evidence is misleading because it does not explicitly take into account the "level of evidence," the quality of the evidence, or the level of trustworthiness of the source. I view the CEBMa opinion that "evidence" is the same as "information" as highly problematic. It is also uncertain whether the four criteria proposed by Sackett et al. (1996) are translated correctly into the field of I/O psychology and management. I propose a return to the original definition of evidence as in "proof" and not "information."

Origins and evolution of evidence-based practice

The origins of the "evidence-based practice" movement can be traced back to the medical field. In 1996 - almost 20 years ago - Sackett et al. proposed the following definition (p. 71):

> *"Evidence based medicine is the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research."*

This definition was not the first, as the early definition was framed rather as an opposition to clinical experience, eminence (or authority), and tradition. Sackett and his co-authors tried to reconcile these opposing views by emphasizing the complementary character of experience and research. Their attempt to define and promote Evidence-Based Medicine (EBM) in an opinion article less than two pages long needs to be put in its historic context: a majority of MD's (medical doctors) did not base their clinical decisions and their practice on the best available scientific evidence. MD's were the "notables" of the communities and their advice was often based on their authority. Even now some areas of medicine are still tradition-based or eminence-based care rather than evidence-based medicine (Carter, 2010; Goldacre on Twitter, May 14, 2015 in a tribute to Dr. Sackett who passed away that day).

In 1996, a minority of GP's (general practitioners) used scientific evidence in their daily practice. This might not seem odd if you know that research in the Netherlands revealed that only 67% of GP's adhered to Evidence-Based Guidelines (Grol, 2001) – and that is a relatively high percentage compared to other studies that show 30% to 45% of care is not in line with scientific evidence and 20% to 25% of care is not even needed or is

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potentially harmful (e.g., Shuster et al., 1998; Graham et al., 2006; McGlynn et al., 2006). Cardiologist Thomas Lee of Harvard Medical School estimated that only 30% of what doctors do is supported by solid evidence, referring to the use of stents as an example of applying a technique without good evidence (the use of stents has dropped since it was demonstrated that they were not better than medication; Oransky, 2008). One only needs to look at the number of GP's who still believe in homeopathy today. Homeopathy is basically a dilution method to prepare "cures" that is entirely contradictory to chemical science. The substance (active ingredient) is diluted until the liquid (water) no longer contains even a single molecule of the original substance. As a result, this liquid cannot have any other effect than a placebo-effect, unless one really believes the crazy explanation offered by homopaths that "water has a memory" and will recall the substances it once contained (albeit a selective memory as it does not seem to "remember" other, even poisonous molecules) or that "the less molecules are in the liquid, the more potent/powerful" (I guess that would contradict even the most uninformed layperson's hunch).

So the main objective of Sackett et al. was to direct MD's towards using more evidence to base their decisions on. Sackett et al. also explain (and insist on the value of) "external clinical evidence" on pages 71-72:

> *''By best available external clinical evidence we mean clinically relevant research, often from the basic sciences of medicine, but especially from patient centred clinical research into the accuracy and precision of diagnostic tests (including the clinical examination), the power of prognostic markers, and the efficacy and safety of therapeutic, rehabilitative, and preventive regimens. External clinical evidence both invalidates previously accepted diagnostic tests and treatments and replaces them with new ones that are more powerful, more accurate, more efficacious, and safer.''*

Although the definition by Sackett et al. is still the most widely cited (and continues to serve as a reference for other fields, such as psychology, human resources, or management), other medical authorities have since proposed definitions:

> *"Evidence-based medicine (EBM) is the application of the most current and best research findings into clinical practice."* (Guyatt & Rennie, 2002; Straus et al., 2005; Moreno & Johnston, 2013).
>
> "Gezondheidenwetenschap.be" – a Belgian government-sponsored initiative to inform the public about health issues defines it as (on their website): "*medicine based on scientific evidence."*
>
> MD Marleen Finoulst, one of the driving forces behind the Belgian initiative to inform the public on health issues (e.g., gezondheidenwetenschap.be) has an even more narrow definition: "*Medical decisions are based on scientific research that is continuously critically appraised.*" In this way, she writes, medicine has evolved "*from an 'art' to knowledge based on scientific evidence*" (Finoulst, 2013).

Not only have the definitions become more science oriented, "how to practice EBM" has also been outlined in more specific terms. CEBAM, the Belgian Branch of the Cochrane Collaboration refers to "5 basic steps of Evidence-Based Medicine":

1. Formulate an answerable clinical question

2. Find good literature
3. Critically appraise the literature
4. Interpret the results
5. Put these results into practice

The Cochrane community uses three different definitions to coin the concept (retrieved from: http://community.cochrane.org/about-us/evidence-based-health-care):

- ***"Evidence-based health care*** *is the conscientious use of current best evidence in making decisions about the care of individual patients or the delivery of health services. Current best evidence is up-to-date information from relevant, valid research about the effects of different forms of health care, the potential for harm from exposure to particular agents, the accuracy of diagnostic tests, and the predictive power of prognostic factors.*
- ***Evidence-based clinical practice*** *is an approach to decision-making in which the clinician uses the best evidence available, in consultation with the patient, to decide upon the option which suits that patient best.*
- ***Evidence-based medicine*** *is the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence-based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research."* (author note: this is the Sackett et al. definition)

So, their standard for putting EBM into practice results in a far more stringent definition of "Evidence-based health care": they mention "best evidence" twice and clearly tie it to well conducted research.

Indeed, a lot of doctors and health care organizations are abandoning the notion of Evidence-Based Medicine in favor of "Science-Based Medicine," probably because they are fed up with the misrepresentations from non-evidence-based practitioners.

There are at least two conclusions that can be drawn so far: First, Sackett and colleagues have made a big contribution in advancing a definition of EBM in an era where many doctors did pretty much what they thought was best, very often following opinion leaders whose reputations were grounded in eminence and tradition rather than sound research. It is still "only" a definition, concocted by people and not an empirically derived fact. Times have changed and we have moved up the scientific ladder in lots of fields, so it is time to abandon the old definition by Sackett et al. and move toward a new definition. And even if you wanted to keep this old definition, it is clear that some people have come to misinterpret (perhaps deliberately) the core concepts Sackett et al. described and explained.

It seems that psychologists are moving on, as some researchers and psychologists are calling for a new definition. For example the Canadian Psychological Association recently defined Evidence-Based Practice as:

> "*the conscientious, explicit, and judicious use of the best available research evidence to inform each stage of clinical decision-making and service delivery, which requires that psychologists apply their knowledge of the best available research in the context of specific characteristics, cultural backgrounds and preferences."* (Dozois et al., 2014, p. 155; underline added)

By all means science should inform each stage of decision-making. Scientific findings are not "just" one of the four sources – they are the most important and reliable source to inform decision makers.

Second, I would like to mention that EBM has evolved in another direction: The EBM movement has also produced practice guidelines, for the purpose of providing stronger scientific foundation for clinical work and achieving better and safer outcomes. Such guidelines are almost entirely non-existent in the fields of psychology, HR, and management. This is still no guarantee that these guidelines will be applied; the human factor is considered the main reason for poor adherence to EBM and practice guidelines, and that is why medical researchers are now looking at psychological research to inform them how to get more adherence by practicing MD's (Moreno & Johnston, 2013).

The core of the matter: evidence!

Thus, it is clear that there is still heated debate on what the best definition of "evidence-based"is, and this is exactly the core of the matter: What should be considered (good) evidence?

It is often (conveniently?) forgotten or neglected that the concept of Evidence-Based Medicine is intimately associated with the levels and quality of evidence. Professional experience and opinions are given the lowest evidence ranking in medicine. This should be no different in psychology, HR, or management. Quite the contrary, the field of psychology has demonstrated that both lay people and researchers carry the heavy burden of biases,[1] prejudices, preconceptions, and even partiality. These types of thinking errors prevent objective assessment. Confirmation bias, survivor bias, self-confirmation bias, sunk-cost bias, anchoring effect, the fundamental attribution error, recency effect, etc. are all notions that are well known to psychologists, so there is no reason to lower the standards for the concept of Evidence-Based HR or Evidence-Based Management. It is also a well-established fact that (lay) people overestimate the trustworthiness of their own experiences. Seeing something through one's own eyes can be a powerful experience and can wipe away the evidence from scientific research that is in contradiction with one's experience. After all, our eyes "told" us the earth was flat and that the sun orbited around the earth, so it *must* be true?

The CEBMa model and its explanation

[1]The Cochrane Group defines bias as "a systematic error, or deviation from the truth, in results or inferences."

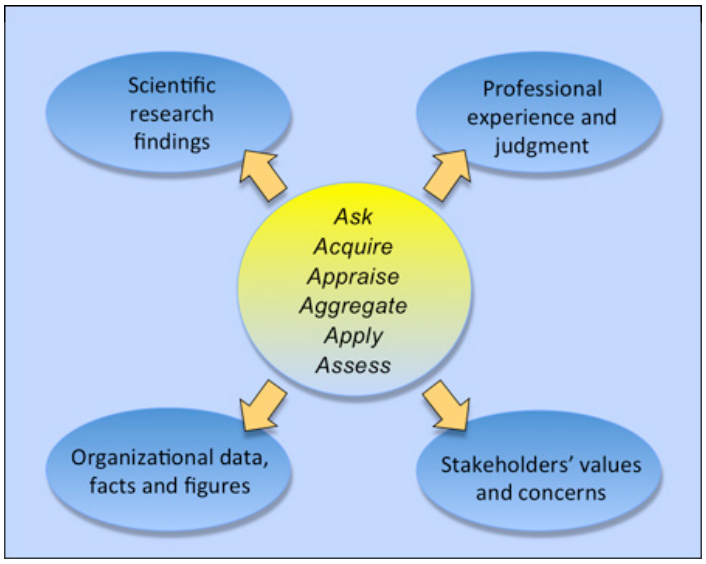

Figure 1: the CEBMa representation of Evidence-Based Management

Figure 1 is the CEBMa model to represent "Evidence Based Management." Note that all four blue ovals are the same size. Lay people, managers, and even HR-professionals might conclude that the "four sources" of evidence are equally valid or carry equal weight, because they are represented in the same size. This suggests there is no difference in levels of evidence or quality of the evidence - and thus no difference in trustworthiness. For example, in terms of stakeholders' concerns, should "what the patient wants is what the patient gets" be considered equally important as scientiic research findings? In terms of professional experience, quacks like homeopaths can certainly argue that their experience or client feedback has convinced them that homeopathy works. But how will you appraise their obvious mistakes?

The CEBMa explanation of "What is Evidence-Based Management?" states: *"by 'evidence', we in general just mean information."* This is where I, and many philosophers of science and other scientists profoundly disagree.

I do agree with CEBMa's further recommendations, e.g., leaders should bring more scientific evidence into their decisions and learn how to critically appraise evidence. After all, Hunter et al. (2011) identified reliance on "experience and expertise" as the third most common source of management mistakes! All too often, managers try to look at new problems in a way they are accustomed to. They should try to think more "out of the box" or "in the new context."

The following examples will illustrate why placing the four sources of evidence at the same level is problematic:

- If a patient or GP prefers homeopathy to treat cancer or child diarrhea, and that preference is acted upon, it would be a serious mistake – probably resulting in premature death (see the warning on the WHO website not to use homeopathy for these conditions as it will lead to premature death).
- Suppose research has demonstrated there is a very good drug that cures 70% of child diarrhea, a mediocre treatment that cures50% of child diarrhea, and a mixture that has no effect at all on child diarrhea but can lead to complications. The latter mixture is based on traditional beliefs. Would an MD (who swore to the

Hippocratic Oath) administer the mixture that has no effect if that would result in death, even if the "stakeholders" believe in it or want to maintain a cultural tradition that dictates the mixture should be used? I think not. The CEO of a local Red Cross organization once explained that if giving someone the most effective cure was not feasible in a certain region because of the high price of the drug (say a month's worth income) or the fact that people would have to walk a half day to the pharmacy, then the EBM definition by Sackett would allow administration of the mediocre cure (healing 50%) because it is simply not feasible in this case to go for "the best." But even this type of flowchart path by no means puts "cultural values" or "stakeholder concerns" at the same level of "evidence" as the evidence provided by scientific research. The MD would still need to refuse to use the mixture that as no effect and leads to complications.

- An organization wants to start implementing annual appraisals with a scoring system. A meta-analysis conducted some time ago (Kluger and Dinisi, 1996) demonstrated that scores have no influence on productivity levels at all, and do not produce any learning effects. Other research suggests people find giving a score to be a very arbitrary process (e.g., Wood & Maguire, 1993). Would it be smart to adopt this costly evalution procedure into the HR-practice, especially since a lot of research has demonstrated that a majority of employees are dissatisfied with their performance review practices? I think not (although the practice is still very much alive and kicking).
- There is great consensus among academics of different fields (e.g., biology, medicine, philosophy, and psychology) that Freudian and Jungian theories are pseudoscience. Freud's letters to several disciples (such as Binswanger, Stärcke, and Laforgue) revealed he knew his psychoanalytical approach did not work and he did not even seek to cure, but only to "understand," and obviously to earn money. Jung believed archetypes could be found in "the collective unconsciousness" and were not the result of the physical world but existed in a metaphysical "parallel universe." He believed human brains could get access to this world (probably though paranormal processes – in which he firmly believed). Despite this, there are popular tests based on this complete nonsense theory, such as MBTI (Myers-Briggs Type Indicator) and Insights Discovery. If there is not a single piece of scientific proof that determining your type actually increases employees' understanding of other people or productivity, why would a company waste money on it? Still, a lot of them do so on the basis of hearsay and social proof. (*Millions have taken the test, so they can't be wrong, can they?* Yes, they can, as millions believe in the existence of paranormal stuff, although no one has ever been able to prove this, notwithstanding millions of research dollars spent on it.)

Moreover, the model in figure 1 does not refer to levels of evidence, which is in contradiction with a lot of the presentations and texts that can be found on the CEBMa website. So it would be better to be consistent and honest by acknowledging that the four sources are far from equal with regard to reliability.

Towards a hierarchy

I recommend that CEBMa revise its representation of EB Management in a way that demonstrates a clear hierarchy of the trustworthiness of the evidence and cautionary warnings associated with each. A model that better represents the levels and quality of evidence might look like this:

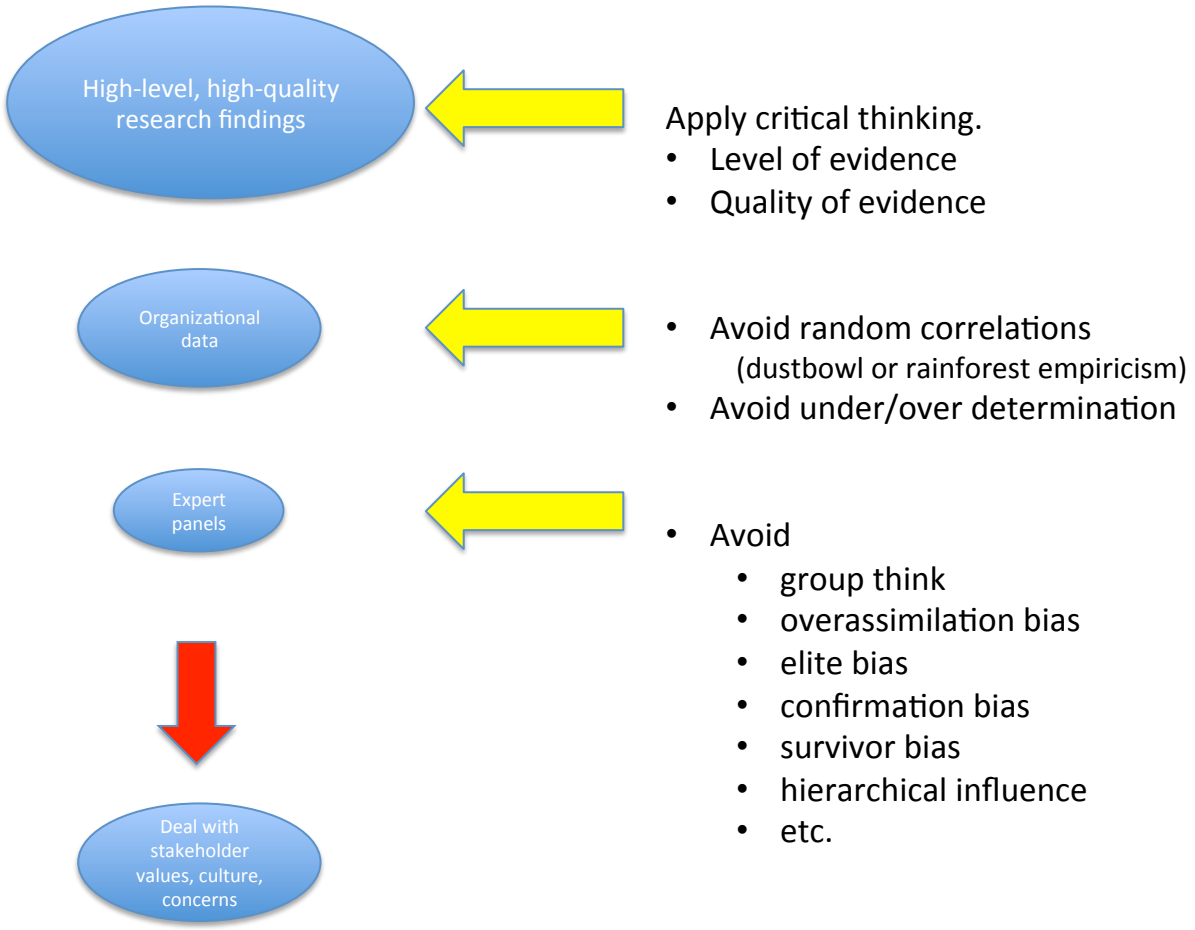

Figure 2: author's proposal

The reasons I propose this hierarchy are summarized as follows.
First, **science is *a method* that was specifically developed to overcome the mistakes and biases that are the result of our brain processes.** Scientists realized every human is prone to bias and prejudice. Science helps us avoid mistakes and overcome our preconceptions; as such, it is sometimes called "uncommon sense" as scientific results often contradict our "gut feelings." Michael Shermer, psychologist and co-founder of the Skeptic community in the USA, argues that science has even helped us increase our moral sense (Shermer, 2015). It would be a serious mistake to place our biased experiences at the same level as the evidence collected through a much more reliable method called science.

Second, **the definitions of EBM (Evidence Based Medicine) have evolved** as more and more MD's have become convinced of the benefits of EBM and EB Guidelines. Sackett et al. (1996) wrote in the last paragraph of their very brief article that evidence-based medicine was "a relatively young discipline" that would "continue to evolve."

Medical programs would provide further information and understanding about what evidence-based medicine is and is not. Sackett et al. wished the concept to evolve, not to remain the same for 20 years. There are a plethora of guidelines being published in the medical field and it is clear they are more science based than eminence based. Science is a slow and gradual or incremental process - but it is relentlessly replacing the authority- or eminence based model. We should embrace this evolution and scientific progress and not refer to a somewhat outdated definition.

Third, there is great consensus that the notions of **levels of evidence** and **quality of evidence** are very important.

Sackett proposed "levels of evidence" in 1989:

Level	**Type of evidence**
I	Large RCTs with clear cut results
II	Small RCTs with unclear results
III	Cohort and case-control studies
IV	Historical cohort or case-control studies
V	Case series, studies with no controls

Adapted from Sackett, DL. *Rules of evidence and clinical recommendations on the use of antithrombotic agents*. Chest 1989;95:2S–4S

This notion of *levels of evidence* has also evolved: There are now other descriptions of levels of evidence. For example, these are the levels of Evidence for Therapeutic Studies from the Centre for Evidence-Based Medicine, http://www.cebm.net:

Level	**Type of evidence**
1A	Systematic review (with homogeneity) of RCTs
1B	Individual RCT (with narrow confidence intervals)
1C	All or none study
2A	Systematic review (with homogeneity) of cohort studies
2B	Individual Cohort study (including low quality RCT, e.g.; <80% follow-up)
2C	"Outcomes" research; Ecological studies
3A	Systematic review (with homogeneity) of case-control studies
3B	Individual Case-control study
4	Case series (and poor quality cohort and case-control study)
5	Expert opinion without explicit critical appraisal or based on physiology bench research or "first principles"

It is clear from this modern version of "levels of evidence" that case studies, expertise, experience, and anecdotes are ranked at the lowest level of evidence.

> *"Experience is the name everyone gives to their mistakes."* - Oscar Wilde, *Lady Windermere's Fan*

For a scientist, these methods are just good for generating hypotheses. Philosophers of science often distinguish between the "context of discovery" (for which case studies, observations of the "real world," and expertise can help a scientist construct a model or a hypothesis that can be tested) and the "context of justification." In the latter context, studies should be conducted to test for the purpose of confirmation or refutation the hypotheses generated during the discovery phase. This means several methodologically

sound controlled studies (such as RCT's) with sufficient participants (to deal with the problem of underpowered studies) should be conducted. The next phase is replication and the final phase is systematic review, which holds the promise of being the highest level of reliable evidence.

But determining the level of evidence is not enough: **within each level, the quality must still be assessed**. As I will argue later, being lazy is never an option. For example, if an RCT is not properly randomized, is not (double) blinded, is underpowered or lacks a description of exclusion criteria, it might have a lower level of quality as the quality found in a lower ranked level. To deal with this problem, systems that attempted to score quality were invented, such as the Jadad score (Jadad and his colleagues developed a five-question scale that is now criticized for being overly simplistic), the SIGN score (Scottish Intercollegiate Guidelines Network), or the most endorsed GRADE score (Grading of Recommendations Assessment, Development and Evaluation). CEBMa offers resources to help with this issue (http://www.cebma.org/frequently-asked-questions/what-is-critical-appraisal/).

Indeed, even systematic reviews (the most popular form is the meta-analysis) do not guarantee high quality if the methodology is flawed. In medical research at least, problems with meta-analyses are acknowledged, especially with so-called overlapping meta-analyses having discordant conclusions. Those can be the result of different interpretation, use of different criteria for study collection and/or inclusion (garbage in, garbage out), publication bias, use of different methods of meta-analytical techniques, etc. I will discuss two examples of the problem with meta-analyses in the field of psychology - one quite old and well-known and one more recent.

The first example concerns the so-called Dodo Bird Verdict in clinical psychology. A long standing myth (Rosenzweig, 1936) is that of the equivalence of psychotherapies (e.g., psychodynamics, Gestalt, Cognitive Behavioral Therapy, Exposure Therapy, etc.). Although several meta-analyses demonstrated that there was clear evidence for significant differences among the effects of different therapeutical "schools" (Smith, Glass, & Miller, 1980; Weisz, Weiss, Alicke, & Klotz, 1987; Reid, 1997; Shadish, Matt, Navarro, & Phillips, 2000; Chambless & Ollendick, 2001), one meta-analysis (Wampold, Mondin, Moody, Stich, Benson, & Ahn, 1997) reached different conclusions and is often cited by practitioners as proof of the Dodo Bird Verdict. However, other researchers (e.g., Hunsley & Di Giulio, 2002) demonstrated the data in the meta-analysis showed exceptionally strong evidence for treatment specificity. Several problems in the Wampold et al. meta-analysis were discovered: some types of cognitive behavioral treatment were compared to other types of cognitive behavioral treatment and they also simply made mistakes in their calculations. After correcting the calculations, the data strongly contradicted the Dodo Bird Verdict. The most effective therapy was Cognitive Behavioral Therapy for a number of problems (e.g., anxiety, depression, and PTSD).

The second example concerns a recent meta-analysis of executive coaching, conducted by Theeboom, Beersma, & van Vianen (2014). Their findings contradicted those in the review published by Rob Briner on the CEBMa website, who found no evidence for the effectiveness of executive coaching. Theeboom et al. stated in their abstract: "*These findings indicate that coaching is, overall, an effective intervention in organizations,*" (p. 1). On closer observation, several problems can be found with the meta-analysis. First,

the level of studies included was low, with only seven RCT's that included 351 participants in total. Four of those RCT studies were conducted by the same researcher and almost every study was highly underpowered. The other studies included in the meta-analysis used methodologies such as quasi-experimental field studies and within-subject designs without control groups. Another problem was that one study (Smither et al., 2003) included 1243 participants out of a total of 2090. Moreover, this study in fact was primarily about a 360° feedback program and the coaching intervention was not specified. In total, 18 studies were included, and with abstraction of the Smither et al., study, nine (445 participants) out of 17 studies (847 participants) used some form of Cognitive Behavioral Therapy interventions. The authors cite even more limitations than I have stated here. In short, their "findings" did not allow for the strong conclusion that coaching is an effective intervention. At the very best, it offers an indication some forms of coaching (cognitive behavioral) might be effective, which would be in line with the meta-analytical evidence found for CBT in clinical settings.

To solve the problems of low-quality meta-analyses and to retain the status of highest level of evidence and quality, several criteria and methods have been proposed, such as checklists (PRISMA[2]/MOOSE), the PICO framework (which in EB Medicine stands for Population, Intervention, Comparator and Outcome), or the PICOTS framework (adding Timing and Setting), flowcharts, methods for publication bias assessments, Bayesian methodology, upfront publication of protocols for meta-analysis (PROSPERO), etc.

These problems with meta-analyses by no means give us an excuse not to base our decisions upon well-conducted systematic reviews and more statistically oriented meta-analyses, as the other sources are by far less trustworthy. It only makes it crystal clear that being lazy is not an option - a sustained effort will always be required to thoroughly select, read, and then critically appraise the levels of evidence, the quality of the methodology, the interpretations and conclusions drawn, etc.

Why confusing practitioners is not an option

In medicine, MD's have been slow to adopt Evidence-Based Medicine. For example, a study conducted in the field of plastic surgery by Loiselle et al. (2008) showed that in 1983, 93% of the published studies were level 4 or 5 and by 2003 the percentage of studies at level 4 or 5 had only dropped to 87%, with just 1.5% of the studies at level 1. If we want the fields of HR or management to pick up on Evidence-Based HR or Evidence-Based Management at a higher adoption rate, we must not confuse those professionals with models such as the CEBMa model, which at first glance places the levels/quality of evidence at the same level of importance. And substituting evidence for information is a serious mistake.

It should be clear to anyone that considering only a limited number of criteria is largely insufficient. A lot of methodologically flawed research gets published in A1 (international peer-reviewed) papers. The levels of evidence do not reflect the quality of the methodology and thus the results; one has to look at statistical power, etc. Again, it requires slow, effortful thinking and one needs to apply several criteria to appraise the evidence.

[2] PRISMA = Preferred Reporting Items for Systematic reviews and Meta-Analyses.

This is perhaps not what most of us expect or desire; however, it is an inconvenient truth that needs to be told. But those who are truly professional will acknowledge that looking for the best evidence will require a lot of effort and critical thinking. Given the obvious advantages, such as better decision making (e.g., in hiring decisions), true professionals are willing to pay this price.

Practical implications

It is obvious that people need to be trained at consulting scientific databases and critically assessing the research papers. It is clear that companies will need to invest in people who are capable of doing so. But it will cost only a fraction of the huge investment often required for the latest hype – Big Data. It is one of the goals of CEBMa to promote evidence ased practice- but then one of the first things CEBMa should do is offer clarity and consistency, and thus change the graphic representations of their model (figure 1). They are welcome to use or adapt my suggestion.

To provide the novice in Evidence-Based HR or Evidence-Based Management with some guidelines to deal with the seemingly overwhelming complexity of assessing evidence, several researchers have proposed a series of guiding questions to be asked:

1. In which research fields will I find the best available evidence? In this particular case, is it the field of biology, evolutionary biology, evolutionary psychology, clinical psychology, social psychology, etc?
2. What is the best database to consult the research (e.g., Google Scholar, ABInform, PsycInfo, etc.)?
3. Can I find information in the academic literature? If so:
    a. To what level of evidence does the information/study belong to?
    b. For reviews: what level of evidence does it include? Is it a narrative review or a meta-analysis?
    c. What is the quality of the methodology used?
    d. How large was the group/sample studied?
    e. How clear was the demonstrated difference?
    f. Have adverse effects been studied too?
    g. How strong is the evidence (i.e., is the evidence consistent across studies)?
    h. Would this evidence apply to my sector? Why not? Are we really "more special" than other human organizations?
    i. …

On a final note, it is true that in a business context (as in medicine!) it is key to make decisions based on the best available data, and one cannot wait for the perfect evidence, should that exist at all. But it is a myth that no good evidence in the field of HR or management is available. There is plenty of it. Some people merely rationalize the fact that they don't base their judgments on the available scientific data with statements such as: *"I have no time to spend on that"; "it is too hard to find information"; "it is too hard to read academic literature"; "they are only contradicting themselves"; "in 10 years, they will come up with something entirely new."*Or people look for the one (or few) studies that confirm their opinions (even if the studies contradict the vast body of research, which should raise doubts). This is called "cherry picking" and the result is a

severe case of confirmation bias. In the vast majority of cases, it is sheer laziness and unprofessional behavior that lies at the roots of their being uninformed.

More importantly, as new research methodologies have been developed and the computing power has dramatically increased, we have to make sure we base our decisions on the most recent state of the evidence. In EBM, Shekelle et al. (2001) suggest that on average each set of Clinical Practice Guidelines should be reviewed every three years. That certainly poses a big challenge for both researchers and practitioners, but it is my hunch that similar review policies will be needed in the field of EB Management because the field is changing dramatically – just think of the hype of Big Data and HR-Analytics.

Especially for big companies, there is absolutely no excuse not to hire professional people who can review the literature and help them make more evidence-based and thus more moral decisions.

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