

Research Findings Practitioners Resist: Lessons from Evidence-Based Medicine and  
Implications for Evidence-Based Management

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“Evidence-based medicine is flying with knowledge, instead of flying blind.”

Donald Berwick, M.D., President and CEO, Institute for Healthcare Improvement  
(PBS Newshour, 2009)

“The time is ripe for the ‘evidence-based’ mantra to be silenced...if EBM (evidence-based medicine) does not fall spontaneously, it may need to be pushed.”

Bruce Charlton, M.D., Professor of Theoretical Medicine, University of Buckingham  
(Charlton & Miles, 1998, p. 373)

The movement toward evidence-based management (EBMgt) is gaining momentum. EBMgt is about making decisions that integrate the best available research evidence with practitioner expertise and judgment, evidence from the local context, and the perspectives of those who might be affected by the decision (Briner, Denyer, & Rousseau, 2009). However, history tells us that this movement is bound to encounter some resistance along the way (e.g., Johns, 1993; Rogers, 2003). The parallel movement of evidence-based medicine (EBMed) has preceded that of management, with the term EBMed having been introduced in the early 1990s and the practice of EBMed growing phenomenally since then. The proportion of medical practice that is evidence-based, estimated to be about 10% in the late 1950s, is growing; more recent estimates range from 65-82% (Earle & Weeks, 1999). The *British Medical Journal* has called EBMed “one of our most important medical milestones” (Dickersin, Straus, & Bero, 2007, p. s10), on par with anesthesia, antibiotics, and the discovery of DNA structure. Nonetheless, the opening quotes, both from physicians, illustrate the radically differing receptions that EBMed has received from various parties. For Berwick, EBMed provides information and clarity, while for Charlton, it serves as a call to arms.

What is at the root of such divergent views? In particular, what can explain such zealous reactions against evidence-based practice? A variety of criticisms have been leveled at EBMed over the years. Some clinicians cite a lack of time and resources to practice EBMed (Straus & McAlister, 2000). Others claim a lack of evidence that EBMed actually “works,” in other words,

that the practice of EBMed actually improves patient outcomes (Norman, 1999; Straus & McAlister, 2000). From a more philosophical perspective, Kerridge (2010) has questioned whether EBMed seeks to perpetuate the dual authority of traditional medicine over complementary and alternative medicine and physicians over other health professions. Still other criticisms result from misperceptions regarding EBMed, for example, that it ignores patients' values and preferences, that it is a cost-cutting tool in disguise, or that it promotes a "cookbook" approach to medicine (Straus & McAlister, 2000). And some critics just do not like the "proselytizing zeal of EBMed proponents" (Charlton & Miles, 1998, p. 373) or their presumption that the practice of medicine "was previously based on a direct communication with God or by tossing a coin" (Fowler, 1997, p. 240).

Such criticisms of EBMed give us some idea of what to expect in reaction to EBMgt as it attempts to become common practice á la EBMed. In fact, similar criticisms have already been directed towards EBMgt. Critics have questioned the push for EBMgt before evidence exists to show that the practice of EBMgt would improve organizational performance (Reay, Berta, & Kohn, 2009). Others have expressed concern about the nature of the "the best scientific evidence" (i.e., the best evidence according to whom?; Learmonth, 2009), suspecting that the EBMgt movement might prioritize certain types of research over others, both substantively (e.g., favoring research that endorses managerialist beliefs and reinforces managerial power) as well as methodologically (e.g., positioning meta-analysis as superior to qualitative research; Learmonth, 2006; Learmonth & Harding, 2006).

We would argue that one critical cause of resistance to evidence-based practice is resistance to the evidence itself. Consider the following example from medical research. *Effective Care in Pregnancy and Childbirth* (Chalmers, Enkin, & Kierse, 1991) is an extensive

collection of meta-analyses—extensive being a two-volume, 1,516-page tome that reviews more than 3,000 randomized controlled clinical trials—that “has shaken obstetrics worldwide” (Naylor, 1995, p. 841). Mann (1990) describes some of the work’s conclusions as well as its reception at the time. The research contained in the volumes clearly rejected such common practices as routine episiotomy (cutting the tissue between the vagina and anus to facilitate delivery) and repeating Cesarean sections routinely after a woman has had one (to avoid a rare risk of a C-section scar coming open during delivery and harming mother and baby). In contrast, it directly endorsed less common practices such as vacuum extraction (rather than forceps; used to facilitate delivery when the baby is “stuck”), the use of corticosteroids for women who are delivering prematurely (to prevent harm to the baby), and external turning for breech births (when the baby is coming out butt or feet first rather than the normal head first).

As with the opening quotes, reactions to the book varied greatly. As cited in Mann (1990, p. 476), one medical journal called it “arguably the most important publication in obstetrics since William Smellie wrote *A Treatise on the Theory and Practice of Midwifery* in 1752.” An editor of another medical journal wrote that “the price of £225 (\$400) should protect aspiring registrars (medical residents) from acquiring too many confused ideas from its pages.” A physician pronounced its authors “an obstetrical Baader-Meinhof gang,” referring to one of post-World War II Germany’s most violent left-wing organizations. The latter two comments indicate a disbelief or lack of acceptance of the research findings (“confused ideas”), with the visceral likening of the authors to a militant group in the vein of Charlton’s earlier call to arms. The authors of the collection were not surprised at their critics, saying “we have very strong evidence that obstetricians should do some things they are not doing, and we call into question the relevance of some of the things they are doing.” Although this statement was made regarding

obstetricians, we imagine that we could make similar statements about managers (see, for example, Rynes, Colbert & Brown, 2002).

In this chapter, we explore resistance to evidence itself. What types of research findings do practitioners (of various fields) find difficult to believe or accept? Our discussion necessarily assumes practitioners' awareness of research findings. Certainly this is often not the case, and we have discussed elsewhere the issue of practitioner lack of awareness of findings, its contribution to the academic-practice gap, and strategies to increase practitioner knowledge (e.g., Rynes, in press; Rynes et al., 2002; Rynes, Giluk, & Brown, 2007). However, after being exposed to relevant research, practicing managers may disbelieve or dismiss findings, as we observed with some of the obstetrics meta-analytic findings discussed above. What are the underlying sources of such disbelief or lack of acceptance?

Rynes (in press) has previously considered this question in the context of industrial/organizational psychology after reviewing related research in the areas of utility analysis, selection, and jury reactions to expert testimony. In this chapter, however, we will examine this question through the lens of evidence-based medicine and medical research. Because the field of medicine is further ahead than management on the path of evidence-based practice, we believe it can provide rich insights into resistance to research evidence. Our approach will also illustrate that resistance to research findings is not limited to the discipline of management, and occurs for reasons that are widely applicable across disciplines. Once we have explored the types of research findings practitioners find difficult to believe or accept, we turn to implications. In other words, given predictable resistance to evidence, what might be done to promote EBMgt more effectively?

#### Sources of Practitioner Resistance to Research Findings

### *Distrust of Scientists, Statistics, and Special Interests*

We start with perhaps the broadest source of resistance: distrust of academics or scientists, the statistics and scientific methods that they use, and the role of sponsorship and special interests in the creation or presentation of research. This resistance strikes not directly at the substantive content of the research findings, but rather at the creators of the research, their methods, and potential conflicts of interest. Because this source of resistance can color perceptions of all research findings, it is an important place to start. Although these areas of distrust are related to some degree, they are also distinct, so we discuss them in turn.

*Distrust of Academics/Scientists.* Previous writings on the relationship between academics and practitioners have visualized the two groups as functioning in “separate worlds” (Rynes et al., 2007) or across a “great divide” (Rynes, Bartunek, & Daft, 2001). Indeed, academics and practitioners do exist in very different cultures. Murphy and Sideman (2006) argue that the *practice-driven culture* emphasizes real-world problem solving. Practitioners are encouraged to take action (“get it moving”), even in the face of considerable uncertainty, drawing from any source necessary to devise a solution. The buy-in of end users and other stakeholders is crucial, so an important component of practice is an ability to persuade others of the value of one’s proposed solution. The action orientation ensures that the problem-solving process happens quickly. *Science-driven culture*, on the other hand, emphasizes empirical confirmation and scientific caution (“get it right”). Theoretical support and linkages to prior research are critical, particularly as the only necessary buy-in is that of one’s scientific peers. This emphasis on precision and method means that new academic findings develop and disseminate slowly. Practitioners and scientists do seem to live in separate worlds, and “understanding ‘the other’... rarely happens without resistance” (Fisher, 2004, p. 1).

The conception of academics as “other” not only creates a considerable credibility gap with practitioners, but also sets up a demonizing process, resulting in an “us-against-them” dynamic. Social psychology research helps us to understand why this occurs. People view themselves as individuals but also have social identities, “their definitions of themselves in terms of their group memberships” (in this case, as a manager/practitioner or an academic; Turner & Haslam, 2001, p. 25). Individuals categorize others with whom they share a group membership as part of their “in-group” and those who do not share the membership as part of an “out-group.” In doing so, individuals tend to maximize similarities within and differences between the in-group and out-group (Gaertner et al., 2000). This social categorization of others—the mere acknowledgement that individuals belong to one group rather than another—can result in attitudes and behavior that favor the in-group and discriminate against the out-group (Tajfel, Flament, Billig, & Bundy, 1971). Such bias is more likely when the social identity is salient as well as when a group perceives its status to be under threat from another group (Turner & Haslam, 2001). Right now, EBMgt is a movement that is largely *driven* by academics and scientists, yet is largely intended to *affect* managers or practitioners. In this context, EBMgt is likely a factor that not only makes salient the managers/practitioners’ group identity, but may also be perceived as a threat to their status or autonomy, suggesting that the “us-against-them” mentality may become particularly severe.

For a real-world illustration, consider a relatively recent controversy in the field of mental and behavioral health. In a review of the practice of clinical psychology, Timothy Baker and his colleagues (Baker, McFall, & Shoham, 2008) were highly critical of the impact of clinical psychologists on clinical and public health, citing their tendency to value personal experience over research evidence, to use assessment practices with little to no psychometric support, and

failure to use interventions with strong evidence of efficacy. This prompted one popular science writer (Begley, 2009) to ask with respect to Baker et al.'s research, "Why do psychologists reject science?" Examination of almost 75 on-line reader comments (posted on *Newsweek.com*, 2009) regarding Begley's article proved rather illuminating. One of the first readers commented, "Amusingly, only 1 out of 3 authors of the paper has an actual license to practice Psychology in the state of their university." Implicit in this reader's statement is the notion that, because the authors are academics rather than licensed, practicing psychologists, they do not have the standing to critique practice. Another reader, noting a lack of research on the long-term effectiveness of "so-called evidence-based treatments," questioned the motives of academic researchers: "most researchers are just looking to prove something quickly and have publications so they can obtain tenure at some university." Finally, another reader summed up his or her views by saying "If science had all the answers, I think we would see quite different conditions in all aspects of life and in our society." This virtual dismissal of science as a whole surely must also reflect this reader's view of those who create it.

Thus, practitioners' distrust of academics and scientists appears to reflect social categorization in action. However, recent theoretical and empirical work offers another explanation for such distrust and skepticism regarding academics and scientists – a phenomenon that Kahan and colleagues (Kahan, 2010; Kahan, Jenkins-Smith, & Braman, 2010) call "the cultural cognition of expert consensus." Cultural cognition refers to the influence of group values—such as equality and authority, individualism and community—on risk perceptions and related beliefs. As Kahan (2010) notes, most people are not in a position to evaluate technical or scientific data on their own. As such, they tend to follow the lead of experts that they regard as credible. And who is considered credible?

Kahan and colleagues have found that the people whom laypersons see as credible are those whom they perceive to share their own values. To illustrate, in one study, Kahan, Braman, Cohen, Slovic, and Gastil (in press) investigated attitudes toward the human-papillomavirus (HPV) vaccine for girls. HPV is a sexually transmitted virus and the leading cause of cervical cancer. The Centers for Disease Control and Prevention (CDC) recommended in 2006 that all girls ages 11 and 12 (who presumably are not yet sexually active) receive the vaccine. Critics worry not only about harmful side effects of the vaccine, but also that it will encourage unsafe sexual activity. The CDC (2009) reports that only about a quarter of teenage girls received the vaccine in 2007 and that this proportion increased only slightly in 2008.

To study the possible reasons for the slow uptake of HPV research, Kahan and his colleagues (in press) created arguments for and against mandatory HPV vaccination. Arguments were then matched with fictional experts whose appearance and publication record were designed to be consistent with distinct cultural perspectives (e.g., hierarchical and individualistic versus egalitarian and communitarian). Their findings show that participants in the experiment aligned their views with the expert whom they perceived to share their values. Another experiment (Kahan et al., 2010) yielded similar results. Participants were asked to evaluate whether an individual of elite academic credentials (e.g., Ph.D. from Harvard, Professor at Stanford, member of the National Academy of Sciences) was a “knowledgeable and trustworthy expert.” Again, participants’ responses depended upon the fit between their values and those of the expert. If the expert endorsed a position (on climate change, nuclear waste disposal, or handgun regulation) that was consistent with the position associated with participants’ values, then he or she was more readily viewed as knowledgeable and trustworthy. In addition,

participants also tended to overestimate the proportion of experts that held views consistent with their own views and values.

Although Kahan's work has examined only the cultural values described above, the broader implications for evidence-based practice are profound. Whether or not academics and scientists are viewed as credible and trustworthy is dependent upon whether practitioners perceive them as sharing their values. As we saw from the contrast of practice-driven and science-driven cultures (Murphy & Sideman, 2006), academics and practitioners have quite different values, performance criteria, and audiences.

Of course, because of these cultural and value differences, one might think that academics and scientists would do everything they can to bridge the "great divide" (Rynes et al., 2001). Indeed, many do advocate or engage in such efforts [e.g., Van de Ven & Johnson's (2006) and Van de Ven's (2007) engaged scholarship, Bartunek's (2007) relational scholarship of integration]. However, the efforts of academics to engage with laypersons often fail. As Begley (2010) notes in her *Newsweek* article, "Why scientists are losing the PR wars," scientists have "abysmal communication skills," at times exhibiting a "smarter-than-thou condescension" (p. 20). Latham (2007) agrees that most academics do not yet possess the skills to communicate with practitioners. He suggests that academics essentially need to "become bilingual" (p. 1029), mastering not only scientific language but also the translation of that language for practitioners. He gives examples of how he adjusts his language when communicating with practitioners (e.g., "hypotheses" become "ideas," results of F-tests and structural equation modeling become graphs that show "what happened where we did, versus where we did not, implement our ideas," p. 1029). Olson (2009) argues that communication is often more about telling a good story and

engaging the audience's hearts (a skill at which scientists generally do not excel) than solely rational explanation of the data (see also Heath & Heath, 2008 on making ideas "stick").

And as for academics' condescension toward non-scientists to which Begley (2010) refers? It is sometimes observed, even within our own field of management. For example, in response to the recommendation that the management field start doing and rewarding research that can be read and applied by business people, McKelvey (2006) asks, "Should management research be held hostage to people who seem mentally challenged when reading the *Harvard Business Review*?" (p. 823). Such queries are not likely to win any practitioners' hearts. Thus, in some respects, academics and scientists are their own worst enemies in building trust and credibility with practitioners.

One obstacle likely to be encountered in attempting to change this state of affairs is scientists themselves, who do not necessarily see the need for change. As one scientist reader commented on Begley's (2010) article: "I admit that I honestly didn't know it was supposed to be about winning or losing the PR wars as this article suggests. Spending most of my life in various scientific fields, I always thought science was about gaining knowledge. What an odd view by the author" (*Newsweek.com*, 2010).

Thus, the credibility and trustworthiness of academics is in question in part simply by virtue of who they are: a socially-identified "other" with respect to practitioners, belonging to a culture emphasizing different values and performance criteria than that of practitioners, and communicating in a language and manner that practitioners do not always understand. Although the issue of communication is one that seems quite actionable, the others are not so easily remedied. Consequently, one important source of resistance to research evidence is practitioners' distrust of the creators of the research—that is, the academics or scientists themselves.

*Distrust of Statistics and the Scientific Method.* Practitioners are also generally skeptical of statistics and the scientific method—the foundation of research. This skepticism is nicely summed up in the phrase popularized by Mark Twain: "There are three kinds of lies: lies, damned lies, and statistics." According to Wikipedia, the phrase is used mostly by people who wish to disparage statistics that do not support their positions, or to denounce the use of numbers to bolster weak arguments. Such distrust is a challenge for evidence-based practice, particularly given the evidence that having a positive attitude toward research is a strong predictor of the use of research findings in practice (e.g., Champion & Leach, 1989; Kenny, 2005; Lacey, 1994). There are several reasons for this skepticism. First, individuals have a strong preference for intuitive or clinical decision making, despite the fact that statistical or actuarial methods outperform clinical judgments in a wide variety of circumstances (Ayres, 2008; Grove & Meehl, 1996; Grove, Zald, Lebow, Snitz, & Nelson, 2000). This preference may partially stem from the fact that the vast majority of people are fairly naïve regarding statistics (Best, 2001). Rynes (in press) discusses the preference for clinical judgment in the context of utility analysis, employee selection, and jury decision making. However, this preference is certainly evident in healthcare-related areas as well—for example, clinical psychology.

Vrieze and Grove (2009) surveyed close to 200 clinical psychologists regarding their use of mechanical and clinical combination—in other words, the way in which they integrated patient assessment results to make decisions regarding diagnosis, treatment, or prognosis. Ninety-eight percent of the clinical psychologists integrated assessment results using clinical methods, while only thirty-one percent used mechanical methods. (Percents are greater than 100 because respondents were given nine different options to describe how they normally combine data. Although mechanical and clinical prediction techniques are theoretically mutually

exclusive, the researchers wanted to allow for the fact that many respondents do not share this point of view). Respondents gave a variety of reasons why mechanical prediction methods were not used. The most common reason was simply that they did not believe they worked; mechanical methods could not possibly account for all of the factors that influence a prediction, substitute for a clinician's intuition, or be as accurate as other methods. Others admitted that they were not familiar enough with mechanical methods to be comfortable using them or thought that they were simply too difficult to apply.

Second, skepticism also results from a perceived lack of generalizability of the findings. Practitioners find it difficult to reconcile the aggregate results provided in research to a specific case or situation. Charlton (1997), the critic of EBMed whose quote kicked off the chapter, believes that epidemiological data do not provide the information necessary to treat an individual patient. As he characterizes it, this is the intractable error of EBMed, and "no amount of statistical jiggery-pokery with huge data sets can make any difference" (p. 170). There is a flawed, unstated assumption in this assertion, however. Individuals criticize research as irrelevant because statistics can only give average probabilities (i.e., cannot make an exact prediction regarding a unique individual or circumstance). In doing so, they seem to imply that they, as clinicians, *can* make an exact prediction (Grove & Meehl, 1996). Of course, we know that this is very rarely the case.

Grove and Meehl (1996) respond to this assertion of average probabilities as irrelevant with a hypothetical example. They ask us to imagine that our physician has advised us to undergo surgery for some serious health condition. We ask whether the surgery will solve our health problem and how risky it is (i.e., does it work? Will we die in surgery?). Most of us would look for an answer referencing statistical probability (e.g., it works 50% or 90% of the

time; one in 1,000 patients or five in 100 will die during surgery). They ask, “How would you react if your physician replied, ‘Why are you asking me about statistics? We are talking about *you*—an individual patient. You are unique. Nobody is exactly like you. Do you want to be a mere statistic? What differences do those percentages make, anyway?’” (p. 305). Clearly, none of us would be satisfied with such an answer, but those who claim that averages are irrelevant to a unique person or situation are essentially similar to a physician answering just that. As Rousseau (2006) points out, this belief that a patient or an organization and its problems are special and unique—termed the *uniqueness paradox* (Martin, Feldman, Hatch, & Sitkin, 1983)—is common. Unfortunately, it is a belief that works against the movement toward evidence-based practice.

Lastly, another reason that practitioners may distrust statistics and the scientific method is that the resulting evidence keeps changing. Shojania and colleagues (Shojania, Sampson, Ansari, Doucette, & Moher, 2007) examined 100 systematic reviews of medical research, a highly recommended source of evidence to guide clinical decision making. They found that changes in evidence relevant to clinical decision making—changes often as drastic as a complete reversal of recommendation—occur in a relatively short time period. Within one year, fifteen percent of reviews must be updated; within two years, twenty-three percent, and at 5 and ½ years, half of reviews are no longer correct.

Certainly, knowledge evolves in the management field as well. For example, research regarding teams and conflict at one time reflected the idea that relationship conflict (e.g., conflict regarding values or interpersonal style) was harmful to both team performance and satisfaction, while task conflict (e.g., conflict regarding procedures or resource distribution) could be beneficial (e.g., Amason, 1996, Jehn, 1995). In the introduction to a meta-analytic study of the

issue, , DeDreu and Weingart (2003) summarized this view before presenting their “new” results showing *both* task and relationship conflict to be equally disruptive. In all likelihood, of course, findings will continue to evolve as researchers attempt to develop an even more nuanced understanding of when, and under what circumstances, conflict is harmful or beneficial (though certainly much has already been done in this area, which we will not review here).

For those of us who do research, we understand that this changing landscape reflects the nature of research and the incremental process by which knowledge develops. It does beg the question, however, of how often systematic reviews and guidelines to managers will have to be updated. Although knowledge has always changed and progressed, this may be particularly frustrating for managers, given that staying up-to-date on research is only one item in an extraordinarily long list of responsibilities (if it is on their list at all). Worse still, the progression of research knowledge often seems cyclical or back-and-forth rather than linear, as illustrated by changes in results over time concerning, say, the relationship between hormone replacement therapy and women’s cardiac health or the success of low-fat diets in treating obesity.

*Distrust of Sponsorship and Special Interests.* Our discussion of individuals’ distrust of scientists and scientific research in general would be incomplete without understanding the role of sponsorship and special interests in adding to such distrust. First, research sponsorship (e.g., by an industry trade group) or related financial conflicts of interest (e.g., researchers having financial ties to an industry) cause people to have doubts about research findings; moreover, evidence tells us that this suspicion is warranted. Bekelman and colleagues (Bekelman, Li, & Gross, 2003) completed a systematic review of financial conflicts in biomedical research. They reviewed research from 1980 onward; 1980 was the year in which the Bayh-Dole Act passed, which encouraged academic institutions and researchers to partner with industry. Their findings

reveal the prevalence of financial relationships among industry, scientists, and academic institutions: approximately 25% of researchers were affiliated with industry (e.g., received research funding from industry) over that period and approximately 66% of academic institutions held equity in “start-ups” that sponsor research performed by their own faculty. Analysis of 1140 studies examining industry sponsorship and research conclusions exposed a more worrisome, but perhaps not surprising, result: industry-sponsored research tended to draw pro-industry conclusions. Some specific examples will better illustrate their results.

Barnes and Bero (1998) investigated 106 reviews on the health effects of passive smoking (i.e., secondhand smoke). Of the 106 reviews, 37% concluded that secondhand smoke was not harmful to one’s health; 74% of these reviews were written by authors affiliated with the tobacco industry (defined as having received funding from the tobacco industry, submitted a statement to the government on behalf of the tobacco industry, or participated in multiple tobacco industry-sponsored symposia). The authors controlled for other potential explanatory factors, including article quality, peer review status, article topic (e.g., specific type of health effect), and year of publication—tobacco industry affiliation was the only factor associated with concluding that secondhand smoke was not harmful to one’s health.

Stelfox and colleagues (Stelfox, Chua, O’Rourke, & Detsky, 1998) came to similar conclusions regarding a different substantive area and industry. They examined research on the safety of calcium-channel antagonists (a class of drugs used to treat high blood pressure or angina/heart pain) and researchers’ financial relationships with the pharmaceutical industry. They categorized each article as supportive, neutral, or critical of the use of calcium-channel antagonists. Results indicated that authors supportive of the drug class were significantly more likely than neutral or critical authors to have financial relationships with manufacturers of

calcium-channel antagonists (96% versus 60% of neutral authors and 37% of critical authors) as well as with pharmaceutical companies in general (100% versus 67% of neutral authors and 43% of critical authors), regardless of which products they manufactured. Such relationships with pharmaceutical companies may also influence EBMed through creation of the clinical practice guidelines themselves. An initial study of this issue (Choudhry, Stelfox, & Detsky, 2002) found that the majority of authors had some form of interaction with the pharmaceutical industry—58% had received financial support to perform research, 38% had served as employees of or consultants to the pharmaceutical industry, and 59% had relationships with the companies whose drugs were considered in the guidelines they authored.

Authors of the reviews discussed (Barnes & Bero, 1998; Bekelman et al., 2003; Choudhry et al., 2002; Stelfox et al., 1998) advocate for clear disclosure of these conflicts of interest. Although one cannot automatically conclude that all conclusions of scientists with industry affiliations are biased or incorrect, readers must be able to take such relationships into account when evaluating an article's conclusions. Review authors also recommend further study to better understand the influence of industry affiliations and an effective policy approach to minimize research bias.

In addition to sponsorship and financial conflicts of interest, we must examine special interest groups (e.g., trade associations, professional associations, groups sharing views on a social /political issue such as the environment, gun control, etc.) . Such groups generally have a vested political or financial interest in research conclusions as they relate to the group's position. Thus, they may choose to selectively promote research that supports their position, to actively spread "misinformation" to advance their position, or to deliberately interfere with the dissemination of research that counters their position.

Mooney (2005) relates an illustrative example of the industry groups representing sugar and high-fructose corn syrup. In 2002, the World Health Organization (WHO) convened an expert panel to review evidence relating diet and physical activity to health conditions such as obesity and type 2 diabetes; in early 2003 the panel issued a report regarding its conclusions and recommendations (WHO, 2003). The recommendations emphasized increasing physical activity, eating more fruits and vegetables, and reducing intake of fat and sugars. With respect to sugar, the panel recommended limiting free sugars (those added to food as opposed to occurring naturally) to 10% of daily calories; it characterized the evidence linking sugar (particularly from sugar-sweetened beverages) to obesity as fairly consistent. The U.S. Sugar Association (among other food industry groups) took action. It informed WHO that it would “exercise every avenue available” to challenge what it characterized as a “misguided, non-science-based report” (U.S. Sugar Association, 2003, p. 1). Indeed, the Association threatened to lobby congressional allies to withdraw all funding from the WHO; these same allies contacted the Health and Human Services Secretary to demand that WHO cease all promotion of the report. The Association also worked to discredit a particular scientist, Shiriki Kumanyika, who was a member of the expert panel that produced the report. She was also a member of the Food and Nutrition Board at the Institute of Medicine (IOM). This organization had produced a report on a similar topic, noting in its report that no more than 25% sugars should be consumed to prevent nutrient loss. The U.S. Sugar Association promoted this as a contradiction and Kumanyika as “speaking out of both sides of her mouth” (Mooney, 2005, p. 122); the IOM clarified that the 25% figure was not a dietary recommendation (i.e., it was not endorsing 25% sugar intake) but rather a maximum intake level to prevent nutrient loss, and therefore its conclusion did not contradict the WHO report. Mooney (2005) describes the data relating sugar, particularly sugar-sweetened beverages,

to obesity as “especially troubling” and painting a “consistent picture” that our eating and drinking habits are making us obese (pp. 125-126). The U.S. Sugar Association states that, with respect to obesity, “there has to be a scapegoat...sugar is not part of the problem” (Pastor, 2010, ¶3, 4).

Current evidence suggests the debate could continue. Various meta-analyses exist summarizing the research on sugar-sweetened beverages and obesity. Some conclude there is a positive relationship and sufficient evidence to support public health recommendations to reduce consumption (Malik, Schulze, & Hu, 2006; Vartanian, Schwartz, & Brownell, 2007); others conclude there is no relationship or that the science does not yet support such a dietary recommendation (Forshee, Anderson, & Storey, 2008; Gibson, 2008). Complicating the picture and consistent with our previous discussion is the finding that studies that are not funded by the food industry tend to find significantly larger effects than those that are funded by the food industry (Vartanian et al., 2007); at least one of the meta-analyses finding no relationship was sponsored by the American Beverage Association (Forshee et al., 2008).

One can see how sponsorship, conflicts of interest, and deliberate actions by special interest groups to obfuscate research findings can cloud the truth of what research actually says and create distrust of scientists and research in general. As Mooney (2005) observes, “If Americans come to believe you can find a scientist willing to say anything, they will grow increasingly disillusioned with science itself” (p. 11). Indeed, MacCoun (1998) notes that “the latter half of this century has seen an erosion in the perceived legitimacy of science as an impartial means of finding truth” (p. 259). Increasing disillusionment will only intensify a distrust of scientists and science that is already greater in the U.S. than in most of the rest of the world (Begley, 2010; Hofstadter, 1964). In sum, distrust of academics/scientists, the statistics

and scientific methods that they use, and the role of sponsorship and special interests in the creation and presentation of research serve as the foundation of resistance. This base of resistance is in place before practitioners even process the research itself—to think about the substantive content of the research findings and what the research might mean for themselves and their organizations.

### *Threatening or Anxiety-Provoking Findings*

Moving to research findings *per se*, it appears that many types of findings provoke anxiety or are perceived as threats by practitioners or laypeople. For example, in the management field, threat is often illustrated with individuals' reactions to research regarding genetically heritable traits such as intelligence (e.g., Pinker, 2002). Rynes and colleagues (Caprar, Rynes, & Bartunek, 2010; Rynes, in press) and Pinker (2002) argue that the idea that intelligence has a major role in vocational and financial success is a threat to individuals' self-image and deeply held personal beliefs. Indeed, research has the potential to threaten practitioners in a variety of ways, including not only self-image but also role, status, or financial standing.

How do individuals tend to react to threat? When faced with an event that might have negative or harmful consequences, people experience increased stress, anxiety, and arousal; in response, they tend to become more rigid. The threat-rigidity thesis (Staw, Sandelands, & Dutton, 1981) suggests that this rigidity is exhibited in two ways. First, information processing is restricted; people narrow their attention and focus on what they currently know and believe. As a result, individuals become less open to new ideas or perspectives. Second, constrictions in control occur; in other words, people tend to behave in habitual ways or rely on dominant responses. In essence, individuals rely on both familiar knowledge and familiar behavior when under threat. Similar responses occur at the group and organizational levels, though they may

manifest differently (D'Aunno & Sutton, 1992; Griffin, Tesluk, & Jacobs, 1995). Although this “bear down and stay the course” approach may be appropriate in stable and predictable environments, it is generally maladaptive in the dynamic and complex environments in which most individuals currently operate. And it would seem to work heavily against thoughtful processing of new and evolving research evidence and integration of that evidence into practice, particularly if that integration requires changes in behavior or processes.

In one infamous case of medical research (Brownlee, 2007; Groopman, 2002), the threatened group fought back with a vengeance. The evidence concerned the treatment of low back pain. This would seem to be a crucial area of medicine in which to consider research evidence, as the condition affects many people: approximately two-thirds of adults will suffer from low back pain at some point in their lives, although many instances of back pain will simply go away on their own. When this does not occur, however, individuals turn to medical intervention.

The two most common surgical treatments are discectomy (in which a central portion of the disc is removed) and spinal fusion (which involves removing discs and mechanically bracing the vertebrae). In 1993, the federal Agency for Health Care Policy and Research (AHCPR) convened a panel of twenty-three experts to evaluate the scientific evidence regarding treatment of low back pain and to formulate clinical guidelines for physicians. The panel did not explicitly consider spinal fusion, as its mission was focused only on treatment options for patients within the first three months of back pain. However, a member of the panel, Dr. Richard Deyo, had recently published a meta-analysis (Turner, Herron, & Deyo, 1993) of the results of spinal fusion, as well as a review of the treatment of low back pain (Deyo, Cherkin, Conrad, & Volinn, 1991). The meta-analysis concluded that spinal fusion lacked scientific rationale and required more and

higher quality research, including comparison to nonsurgical and other surgical methods. In the review, the authors concur with the Institute of Medicine's (the health arm of the National Academy of Science) conclusion that "surgery for chronic back pain is overused and often misused" as an approach to the treatment of back pain (Deyo et al., 1991, p. 50). It is generally no more effective than nonsurgical treatment and often less effective; for patients undergoing repeated back surgeries, there are often severe adverse effects. In addition, spinal fusion is sometimes performed when the simpler discectomy would be sufficient (Deyo, Nachemson, & Mirza, 2004).

In the end, the panel concluded that nonsurgical interventions should be tried first, as there was little evidence to support surgery as first-line treatment. Spine surgeons rallied. Many sent letters to Congress contending that the agency's panel was biased. Dr. Neil Kahanovitz, a board member of the North American Spine Society, led a group of spine surgeons that lobbied Congress to cut off the agency's funding. Sofamor Danek, a manufacturer of screws sometimes used during spinal fusion, sought a court injunction to prevent publication of the guidelines. The agency survived the onslaught, but its budget was drastically cut. In an effort to protect the agency, its director worked to soften its mission to that of a "clearinghouse" for data, meaning it could no longer offer explicit guidance to Medicare as it determined coverage of treatments. The word "policy" was removed from the agency's name, which became the Agency for Healthcare Research and Quality (AHRQ). As Groopman (2002) notes, "the guidelines that were eventually published were medically conservative, but the furor surrounding the panel tainted its credibility, and its recommendations have had little impact on surgical practice" (p. 72). Indeed, Brownlee (2007) notes that between 1997 (three years after the guidelines were published) and 2006, "the

number of spinal fusions went up 127 percent, from a little more than 100,000 a year to 303,000 annually” (p. 32).

What accounts for the quick mobilization and fairly drastic response of the spine surgeons to this panel, whose purpose was simply to critically examine the evidence and recommend supported treatment approaches? The panel’s conclusions likely threatened the surgeons on multiple fronts. First, a research-based conclusion questioning or recommending against surgery would “hit them in the pocketbook.” One physician puts it bluntly: “In medicine, if you are able to stick a needle into a person, you are reimbursed at a much better rate by the insurance company. So there is a tremendous drive to perform invasive procedures” (Groopman, 2002, p. 69). And even among surgeries, there is a financial hierarchy. In one physician’s practice area, the surgeon’s fee for a discectomy is between \$5,000 - \$7,000, but \$20,000-\$30,000 for a spinal fusion (Groopman, 2002, p. 70). The potential for financial damage should surgery fall out of favor as the preferred treatment option was clearly a tangible threat to the physicians.

A second threat, less tangible but perhaps even more severe, would target physicians’ very identity. March’s (1994) research in decision making suggests that individuals use two basic models to make decisions. In the *consequences* model, an individual weighs the costs and benefits of the alternatives and chooses the alternative providing the most benefit with the least cost. This reflects a rational approach to decision making, yet we know that individuals are not as rational as they are often painted (Ariely, 2009). In the *identity* model, individuals ask themselves three questions: *Who am I? What kind of situation is this? What would someone like me do in this situation?*

Think about this latter model in terms of how a spine surgeon might apply it to decisions regarding patient diagnosis and treatment recommendation. What would his or her answers to the three questions likely be? *I am an expert in surgery of the spine. This is a situation of a patient with low back pain. Someone like me performs spine surgery to treat low back pain.* Aside from the lucrative nature of the profession, many spine surgeons likely take pride in their work and their ability to relieve patients' pain through surgery. But with respect to March's third question, what does "someone like a spine surgeon" do to treat patient low back pain, if not perform spine surgery? A panel recommending against such a decision threatens the surgeons' very identity.

The greatest perceived threat of any research finding, however, may be to practitioners' judgment and autonomy. As discussed previously, practitioners (including doctors) have a strong preference for intuitive or clinical decision making, despite its inferiority to statistical or actuarial methods (Ayres, 2008; Grove & Meehl, 1996; Grove et al., 2000). The superiority of actuarial methods is likely a threat to their self-image as individuals of sound judgment and intuition (Ayres, 2008). In addition, actuarial methods may also threaten doctors' power and control. Dopson and colleagues (Dopson, Locock, Gabbay, Ferlie, & Fitzgerald, 2003) observe that doctors may selectively resist evidence-based clinical guidelines depending on "whether doctors see them as authoritative, credible, professional documents that help them improve their practice, or as a form of management imposition and control" (p. 323). In illuminating the power struggles within the EBMed movement, Pope (2003) turns back to our own management literature to compare the resistance to EBMed by physicians to the efforts of other occupational groups to resist rationalization and the formal specification of work practices, such as the cooks described in Fine (1996), the technicians studied by Barley (1996), or the managers and

professionals studied by Leicht & Fennell (2001). Harkening back to our earlier discussion on academic/scientist credibility, Dopson et al. (2003) suggest that doctors' view of guidelines as helpful or controlling often depends on the origin of the guidelines—that is, their perception of the credibility and motivation of the experts who created them.

We also previously discussed that some practitioners believe that aggregated research results are irrelevant to any particular unique set of circumstances. Another form of belief related to the generalizability of research evidence, however, seems to assert not that research results are irrelevant, but that they can be relevant only when used in conjunction with expert clinical judgment. Miles (2009) wonders of EBMed advocates, “Do they not appreciate that navigating the huge inferential gap between the *general* and the *singular* has always been part of the exercise of judgment in medicine, which judgment necessarily appeals to sources of knowledge other than the results of empirical clinical research?” (p. 928). As we stated in the introduction, both EBMed and EBMgt aim for physicians/practitioners to integrate best available research evidence with clinical expertise and judgment; neither “cookbook medicine” nor “cookbook management” is being prescribed.<sup>1</sup> As Briner and colleagues (Briner et al., 2009) point out, judgment is an essential management skill. Critical appraisal of research—is it valid and reliable? is it relevant to this issue and this context?—is required for effective evidence-based practice.

To give just one example, there are myriad empirically-supported strategies to enhance transfer of training, that is, the degree to which trainees apply the knowledge, skills, and attitudes they learn in training to the job (Burke & Hutchins, 2007). But practitioner judgment will be necessary to determine, of the empirically-supported strategies, which an organization can

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<sup>1</sup> Of course, some would question whether this “should” be the case, as evidence suggests that the addition of clinical judgment generally deteriorates the quality of decision making; e.g., Highhouse (2008).

support from a resource perspective, which are most likely to be accepted by managers and employees, which align best with the organizational culture, and so on. However, the misperception that evidence-based practice is calling for a suspension of expert judgment in research persists. And as long as practitioners believe this, they will interpret research evidence as a threat to their judgment and autonomy.

### *Findings Contradictory to Personal Experience*

Personal experience can serve as another source of resistance to research evidence. Individuals draw conclusions from their personal experience. Consider the research on the link between sugar and obesity previously discussed in the U.S. Sugar Association example. As you read WHO's dietary recommendation to limit sugar intake to 10% of your calories based on this research, you may have nodded your head, "Yes, I have experienced this. When I have limited high-sugar food and beverages in my diet, I've lost a few pounds." In that case, your personal experience validated the research, and it was probably easy to "buy into" the research conclusion and dietary recommendation because it simply confirmed what you already believed to be true. However, what if your personal experience contradicted the research? As we discuss below, you may be much less likely to be persuaded. Individuals' personal experience is akin to their personal collection of anecdotes. Not only do individuals have a strong preference for anecdotal evidence (i.e., stories), but they probably also have a particularly strong need to believe in their own stories.

Stephen Gould has called humans "the primates who tell stories" (Dawes, 1999, p. 29). Indeed, narrative plays a central role in the human experience (Landau, 1984) and is a "primary and irreducible form of human comprehension" (Mink, 1978, p. 132). In other words, narratives (such as stories and anecdotes) are how we make sense of the world. We would argue that

personal experience is the ultimate narrative, one's own individual story. And when it comes to stories versus statistics, people generally prefer the stories (Kida, 2006). Consistent with this preference, if individuals are presented with statistical evidence but are then confronted with a counterexample (i.e., an example contrary to the statistical evidence), they display a bias *against* the statistical information and *in favor of* the example (i.e., the base-rate fallacy; Allen, Preiss, & Gayle, 2006). In essence, individuals are influenced by salient, individual cases more so than generalized, abstract probabilities (e.g., Kahneman & Tversky, 1973). This is true regardless of whether the individual case is counter to research (as in the base-rate fallacy) or consistent with research.

For example, consistent with the base-rate fallacy, research on jury decision making shows that juries are more persuaded by expert testimony that focuses on individuating information (e.g., a concrete example that illustrates research) than on abstract summaries of research (e.g., Gabora, Spanos, & Joab, 1993; Kovera, Levy, Borgida, & Penrod, 1994; Schuller, 1992). In addition, Bornstein (2004) has found that experts who present anecdotal evidence are perceived as more credible than those who present non-anecdotal evidence, even after controlling for the expert's credentials. Concrete examples and anecdotes are useful for juries, particularly given the way they make decisions. Specifically, Pennington and Hastie (1999) found that juries tend to use a "story-based" model of decision making. In evaluating evidence, jurors essentially "construct a story structure summary of the evidence" (p. 527), creating a causal model that explains the facts they are given. Thus, anecdotes and stories have a sensemaking purpose. Any subsequent decision is then based on this causal explanation (i.e., story) that the jurors have imposed on the evidence.

This preference for narrative is also seen in the area of health communications, a field in which researchers study how to persuade people to adopt health-related behavioral changes (e.g., quit smoking, use condoms). For example, De Wit and colleagues (De Wit, Das, & Vet, 2008) compared the effects of narrative and statistical evidence in persuading men who engaged in high-risk sex to obtain the hepatitis B vaccine. They found that men's perception of personal risk and intention to get vaccinated were highest in response to the narrative evidence, and posit that narrative evidence may be less subject to defensive responding.

Narrative may be particularly powerful when research contradicts one's beliefs. Slater and Rouner (1996) investigated the effectiveness of alcohol education messages (e.g., health risks, drunk driving) with college students. Statistical evidence was rated as more persuasive and believable by students whose beliefs and values about alcohol were consistent with the messages. However, students for whom the messages were inconsistent with existing beliefs and values were more persuaded by anecdotal evidence. In a review of narrative communication as a tool for health behavior change, Hinyard and Kreuter (2007) suggest that narrative communication not only is viewed as more personal, realistic, believable, and memorable (versus non-narrative forms such as statistics), but also appears to be processed differently. They argue that audience members become immersed in a narrative and connect to the characters within it, and thus are less likely to counterargue the key messages and more likely to allow the characters to influence their attitudes and beliefs.

Thus, research evidence supports that narrative—particularly vivid and concrete stories—has the power to trump statistical evidence. Heath and Heath (2008) make a persuasive case for “concreteness” and “stories” as two key qualities to make ideas “stick.” We would propose that personal experience—in essence, one's own narrative—is likely one of the most powerful stories

of all in terms of its ability to produce resistance to contradictory research evidence. First, it is well-documented that individuals have a need to view themselves positively (e.g., Allport, 1955; Epstein, 1973; Steele, 1988) and will both think and act in ways that maintain or enhance this self-image (e.g., Blaine & Crocker, 1993; Greenberg & Pyszczynski, 1985; Greenwald, 1980; Steele, 1988). Thus, in terms of practice—whether medical or management—individuals want to think of themselves as knowledgeable and good at what they do. Research evidence that suggests to people that what they know is wrong, or what they do is ineffective, puts their positive self-view into question. Second, individuals use their own behavior as a source of evidence for their beliefs and attitudes (Bem, 1972), and they also prefer consistency between their attitudes and behavior. When attitudes and behaviors conflict, individuals experience cognitive dissonance, or tension; they then adjust their attitudes or behavior to return to a state of consistency (Festinger, 1957). Thus, believing in one's practice, regardless of the evidentiary support for the practice, is not only a way of maintaining a positive self-image but also a way of reducing the dissonance that would be created by doing something in which one did not believe.

Two practitioners illustrate how belief forms with respect to what they do. London physician William Asher (Asher, 1972) described the following paradox in medicine, now known as Asher's paradox: "If you can believe fervently in your treatment, even though controlled tests show that it is quite useless, then your results are much better, your patients are much better, and your income is much better too. I believe this accounts for some of the remarkable success of some of the less gifted, but more credulous members of our profession, and also for the violent dislike of statistics and controlled tests which fashionable and successful doctors are accustomed to display" (p. 48). He suggests that most physicians mentally compromise; they believe enough in their practice to be able to maintain a positive view of

themselves and keep their patients happy, while knowing, if they are completely honest, that their practice may be inadequate. Freidson (1970) suggests that such belief is necessary in order to practice, that the practitioner must believe “that what he does makes the difference between success and failure rather than no difference at all” (p. 168).

Coincidentally, this idea of needing to believe in what one is doing, regardless of the evidence, surfaced 40 years later in the management field. A top-level and veteran human resource executive provided commentary to the Rynes, Brown, and Colbert (2002) article that presented evidence of various discrepancies between research findings and practitioner beliefs in HR. His view illustrates the potential dominance of personal experience—of belief in one’s stories—in the face of evidence. He states: “I think that, for most HR officers, *belief follows practice*. We tend to believe in those things we do and are able to implement...unfortunately, I don’t think that greater exposure to the literature will have much impact on us” (p. 103; emphasis added). What one does shapes one’s beliefs, and believing in what one is doing both enhances self-image and maintains consistency between belief and behavior.

The primacy of personal experience—individuals’ personal collection of anecdotes—creates a formidable challenge for evidence-based practice. Everitt and Wessely (2008) note that, “Past experience can be misleading, and the plural of anecdote is not evidence” (p. 33). However, people like and believe in anecdotes, especially their own. Consequently, contradictory evidence will create resistance.

### *Findings that Require Change*

It is well-known that individuals do not generally embrace change; inertia is a powerful force. People have a strong affinity for the status quo (Samuelson & Zeckhauser, 1988), and unless the incentive to change is compelling—although “compelling” is in the eyes of the

beholder—they will tend to stick with what they are currently doing. In fact, they will often exert a great deal of effort to stay as they are, a tendency that Schön (1971) labeled *dynamic conservatism*.

In addition to reasons already discussed (e.g., loss of status, perception of threat), there are still other reasons why individuals resist change. For example, resistance to change has a dispositional component (Judge, Thoresen, Pucik, & Welbourne, 1999; Oreg, 2003; Wanberg & Banas, 2000): individuals who are risk averse or have a low tolerance for ambiguity tend to dislike change (Judge et al., 1999; Oreg, 2003), whereas those who are optimistic or have a strong sense of self-efficacy are more likely to accept it (Judge et al., 1999; Wanberg & Banas, 2000). However, although personality may be a factor in resistance to change, it is seldom the only important factor. Individuals selectively process information, taking in and interpreting information in ways that reinforce their existing knowledge, beliefs, and attitudes (Fiske & Taylor, 1984; Greenwald, 1980). Consequently, they may fail to perceive information supporting the need for change or may interpret information in such a way that the costs associated with change seem to outweigh its benefits. Lastly, individuals are reluctant to change simply because of habit. Habits are intrinsic to human nature (Dewey, 1922). The automaticity inherent in habits minimizes cognitive effort in information processing (Shiffrin & Schneider, 1977), and thus offers a way of coping with life's complexities. In addition, habits provide a sense of comfort and security in a turbulent environment (Dewey, 1922). In spite of a compelling incentive to change, then, the status quo often prevails.

Ayres (2008) tells the tragic story of Austrian physician Ignaz Semmelweis. In the 1840s, Semmelweis completed observations in a maternity ward. He noticed that deaths from childbirth (puerperal) fever were greater among women treated by doctors and medical students than those

treated by midwives. In the mid-19th century it was common for a doctor to move from one patient to the next, or from an autopsy to a patient, without washing his hands. Semmelweis reasoned that doctors and students must be transferring some type of “particle” that was causing the deaths. He noticed that mortality rates dropped markedly if doctors washed their hands in chlorinated lime before treating each patient and, thus, ordered doctors to wash their hands prior to each examination.

The physicians were extraordinarily resistant. Handwashing would be a waste of their valuable time. In addition, because Semmelweis could not offer an explanation for why unwashed hands would cause death, physicians discredited his observations. Semmelweis endured much ridicule and was eventually fired. He ultimately suffered a nervous breakdown and was admitted to a mental hospital until his death in 1865. Ayres (2008) remarks on the resistance: “No one likes to change the basic way that they have been operating. Ignaz Semmelweis found that out a long time ago when he had the gall to suggest that doctors should wash their hands repeatedly throughout the day” (p. 111).

But perhaps it was the lack of theory, the fact that Semmelweis could not explain *why* handwashing worked, that drove their resistance? Alas, even today, when we clearly *do* know why handwashing works to prevent infection, doctors still do not wash their hands enough. Studies generally report that less than 50% of healthcare workers wash or sanitize their hands as instructed, with physicians having lower compliance rates than nurses or other healthcare workers (e.g., Lankford et al., 2003; Pittet, 2001; Pittet, Mourouga, & Perneger, 1999; Saba et al., 2005). Interestingly enough, however, one barrier to hand hygiene compliance (as reported by health care workers) is their perceived lack of scientific evidence showing that improved hand hygiene will lower hospital infection rates (Pittet, 2001). In other words, even today,

Semmelweis might still have a fight on his hands. And in a nod to the power of personal experience, health care providers who were asked to identify important obstacles to improving their compliance with hand hygiene guidelines noted that they had rarely seen complications due to lack of hand washing (Grol, 1997). *Status quo* prevails, indeed.

Thus, the power of inertia and individuals' preference for the status quo (Samuelson & Zeckhauser, 1988) can work against evidence-based practice, particularly given our previous discussion on the changing nature of knowledge and evidence (e.g., DeDreu & Weingart, 2003; Shojania et al., 2007). Heath and Heath (2010) caution, however, that "what looks like a people problem is often a situation problem" (p. 3). We will discuss the latter idea (environment) in the next section and both of these ideas (people plus environment) in more detail in the implications section of the chapter.

#### *Findings Unsupported by Context*

Finally, research findings unsupported by local context may provoke resistance. An individual practitioner does not make decisions to embrace or resist various research findings in a vacuum; rather the people, processes, structure, and culture that exist within or characterize their environments influence these decisions. Researchers have noted the importance of contextualization in conducting, interpreting, and reporting research (e.g., Bamberger, 2008; Johns, 2001, 2006; Rousseau & Fried, 2001). Thus, it will also be critical to consider context in individuals' reactions to research findings. As Johns (2001) notes, context can "provide constraints on or opportunities for behavior and attitudes in organizational settings" (p. 32). Relevant contextual factors (Rousseau & Fried, 2001) may include those at the individual (e.g., performance and reward criteria for role) and organizational (e.g., structure, culture) levels, within the external environment (e.g., legal/institutional impact, national culture), and related to

time (e.g., contemporary events). In short, “context counts” (Bamberger, 2008, p. 839).

Although a complete discussion of all relevant contextual factors is beyond the scope of this chapter, we discuss two exemplar contextual features relevant to individuals’ reaction to research findings: others’ acceptance and implementation of research findings and the structure of the broader environment.

Research in the areas of social identity (Turner & Haslam, 2001), social influence (Cialdini & Trost, 1998), and cognitive development (Luria, 1976; Vygotsky, 1978) provide evidence that cognition and behavior are partially a function of social context. Cialdini (2009) asserts that a key way in which we become persuaded is “the principle of social proof,” that is, we determine what is correct by finding out what others think is correct—and this principle is most powerful when the “others” from whom we take the lead are just like us. The idea of opinion leaders—individuals who influence others’ attitudes and behaviors informally and with relative frequency (Rogers, 2003)—as important agents in change and the diffusion of innovations aligns with this principle. Opinion leaders’ power comes not through their formal position or status, but rather is earned by virtue of their competence, social accessibility, or other characteristics (Rogers, 2003). Within the EBMed movement, opinion leaders have been found to be effective promoters of evidence-based practice (Doumit, Gattellari, Grimshaw, & O’Brien, 2009).

The success of EBMed has been attributed in part to the fact that it was professionally led early on: driven from the bottom up by physicians and other healthcare professionals rather than managers or policy administrators (Dopson et al., 2003). This fact helped limit resistance to adhering to research-based guidelines. For example, Locock and colleagues (Locock, Chambers, Surrender, Dopson, & Gabbay, 1999, as cited in Dopson et al., 2003) interviewed healthcare

professionals in evaluating a national clinical effectiveness initiative to improve application of evidence. Their research validated the power of peer influence. One medical director noted: “What makes me change—it’s not scientific, but when I know what my peers are doing. We meet, we talk, we look at publications” (p. 322). A general practitioner observed: “If the information is easily available, some people will change. When sufficient numbers of informed people make changes in their practice then peer pressure will make the rest change” (p. 322). Thus, the endorsement of peers and influential others can be an important factor in the uptake of research evidence.

However, opinion leaders can also contribute to resistance (Dopson, Fitzgerald, Ferlie, Gabbay, & Locock, 2002; Locock, Dopson, Chambers, & Gabbay, 2001). In Locock and colleagues’ (Locock et al., 2001) evaluation of the national clinical effectiveness initiative just referenced, they found that the presence of opinion leaders who were ambivalent, resistant, or actively hostile tempered the level of positive influence that more enthusiastic opinion leaders could exert. Again attesting to the powerful influence of others, one project manager noted of influential clinicians: “You don’t have to be actively hostile to cause trouble—you can cause a lot of problems just by being neutral” (Locock et al., 2001, p. 754). It can be difficult to try to follow research evidence when others around you do not. To return to the spine fusion controversy, Groopman (2002) tells of one physician who tried to be conservative, as the research suggested, and recommended against fusion surgery for back pain unless it was absolutely necessary. He eventually discovered that nearly all of the patients he turned away went to other physicians who then agreed to do the surgery. In time, the physician just gave in—if the patients were going to get surgery anyway, he might as well be the one to do it.

However, even if there seems to be a consensus regarding some evidence-based practice among one professional group in a setting, lack of acceptance by other professional groups may slow the adoption of the practice. Ferlie, Fitzgerald, Wood, and Hawkins (2005) conducted two qualitative studies in the UK in which they traced the adoption of health care practice innovations (e.g., use of heparin to prevent postsurgical bloodclots after orthopedic surgery, a new service delivery system for the care of women in childbirth). Their results showed that social and cognitive boundaries between different professions slowed the spread of the innovation. The authors argue that professional communities of practice develop *within* rather than *across* disciplines, with these communities “sealing themselves off” even from neighboring communities. For example, in the study of the use of heparin post-surgery, tension existed between the orthopedic and vascular surgeons’ communities of practice (in spite of both sharing a broader identity as surgeons). Strong scientific evidence supported this practice and vascular surgeons endorsed the practice as a safe way to prevent bloodclots. Although orthopedic surgery did not have the same research base, it was resistant to using research knowledge acquired in the vascular and general surgery fields, viewing it as not directly applicable. The various professional groups also displayed different cultures, agendas, and concerns. In the study of the new service delivery system for women in childbirth, the authors observed different definitions of risk and of what constituted both effective care and sufficient evidence among obstetricians, midwives, and social advocacy groups. Thus, the level of support (or lack thereof) among others is one contextual feature that may play a significant role in practitioners’ reactions to and implementation of research evidence.

At a higher level of analysis, another important contextual feature is the structure of the surrounding environment. Authors writing about successful change management invariably

discuss the potential for the environment to facilitate or inhibit change. For example, Kotter (1996) discusses barriers related to structure and systems as some of the biggest obstacles to successful change. As we mentioned previously, Heath and Heath (2010) note that what appears to be a people problem is sometimes a situation problem. We mistake the source of resistance due to our tendency to attribute individuals' behavior to internal rather than external causes (i.e., fundamental attribution error; Ross, 1977). However, individuals may resist research findings, not because they do not believe them, but because the environment does not facilitate successful uptake of the research findings.

An illustrative and inspiring example can be seen in the town of Albert Lea, Minnesota. Although we step away from our focus on practitioners for a moment in sharing this example, we would argue that the lesson is still applicable. Dan Buettner (2008) is author of *The Blue Zones: Lessons for Living Longer from the People Who've Lived the Longest*. Buettner—an author, explorer, and endurance bicyclist, among other things—collaborated with physicians and academics at the University of Minnesota's National Institute on Aging as well as other scientific experts to investigate four specific regions where populations were reaching age 100 at extraordinarily high rates. Their mission was to study the lifestyle behaviors that were contributing to these individuals' long lives. They identified common healthy behaviors related to diet (e.g., dine on plants; stop eating when 80% full), physical activity (e.g., find ways to move naturally), social networks (e.g., make family a high priority), and purpose (e.g., live your passion, participate in spiritual activities).

The Blue Zones organization and its team of scientists partnered with AARP and the United Health Foundation to effect a community transformation; Albert Lea, Minnesota served as the prototype community. The goal? “For the people of Albert Lea to adopt these healthy

habits so naturally, so painlessly, they wouldn't even realize how radically they were changing their lives" (Blue Zones, 2010). Numerous structural and environmental changes were made. For example, the city laid new sidewalks connecting neighborhoods with schools and shopping centers; restaurants changed their menus to offer more healthy choices; schools stopped selling candy for fundraisers and sold wreaths instead; volunteers planted 70 community gardens; numerous workshops were offered on how to pursue talents and passions; the idea of "walking schoolbuses" to escort kids to school on foot was introduced (Blue Zones, 2010; Willett & Underwood, 2010). Over 25% of the population participated.

The results speak to the power of a facilitative environment (and likely the positive influence of others, as we just discussed). Participants lost an average of 3 pounds and increased life expectancy by an average of 3.2 years; employers reported a 21% drop in absenteeism; city employees showed a 49% decrease in health care costs (falling for the first time in a decade); kids walked the last mile to school every day with parents and volunteers using the "walking schoolbus" system (Blue Zones, 2010; Willett & Underwood, 2010).

Willett and Underwood (2010) note that "diet and exercise programs routinely fail not for lack of willpower, but because the society in which we live favors unhealthy behaviors" (p. 42). The Blue Zones project in Albert Lea attempted to alter that society. Heath and Heath (2010) would describe the process in Albert Lea as "tweaking the environment"—essentially "making the right behaviors a little bit easier and the wrong behaviors a little bit harder" (p. 183).<sup>2</sup> The lessons from Albert Lea also apply to evidence-based practice. What looks like resistance to the substance of research findings may instead be an indication of the difficulty of the environment in which they must be implemented. Commonly cited barriers to the use of evidence-based research findings include limited access or difficulty accessing the best evidence and guidelines,

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<sup>2</sup> Thaler and Sunstein (2009) would call it a "nudge."

as well as a lack of time to search for, appraise, and discuss implications of evidence (e.g., Haynes & Haines, 1998; McColl, Smith, White, & Field, 1998; Straus & McAlister, 2000). These are contextual barriers that can potentially be minimized by environmental adjustments. Thus, consistent with those who have noted the significance of contextualization in research (e.g., Bamberger, 2008; Johns, 2001, 2006; Rousseau & Fried, 2001), we note the importance of context in practitioners' reaction to and adoption of research.

#### Potential Solutions to Advance Evidence-Based Management

To this point, we have discussed multiple potential sources of practitioner resistance to research findings. We began with a broad source of resistance to research—distrust of scientists, statistics, and special interests—that would seem to create challenges regardless of the research content. We then presented general types of research findings that practitioners may find difficult to believe or accept: findings that are perceived as threatening, contradictory to personal experience, require change, or are unsupported by context. Consistent with traditional advice in the practice world to “never bring up a problem if you cannot offer a solution,” we now turn to a discussion of potential solutions with respect to EBMgt. Given predictable resistance to evidence, what might be done to promote EBMgt more effectively? Below we present potential solutions to address these sources of practitioner resistance, although of course this is not a comprehensive list [for other solutions to increase practitioners' awareness of, belief in, and implementation of research findings, see Rynes (in press)]. For an overview of the solutions presented, see Table 1.

(Insert Table 1 about here)

*Build Trustful Relationships between Academics and Practitioners*

One broad source of resistance is practitioners' distrust of academics and scientists themselves. Thus, before we can begin to persuade practitioners to believe our research conclusions and to practice in an evidence-based way, we need to become more trustworthy in their eyes. In the classic *On Rhetoric*, Aristotle (1991) delineated three means of persuasion: *logos*, or appealing to the reason of the audience using logical argument; *ethos*, or emphasizing the credibility of the speaker/writer; and *pathos*, or awakening the emotions of the audience. As others (Bartunek, 2007; Van de Ven, 2007) have pointed out, academics tend to rely almost exclusively on logical argument to the exclusion of *ethos* and *pathos*. Of the three means of persuasion, however, Aristotle regarded *ethos* to be the most important, and becoming more trustworthy in the eyes of practitioners gets directly at the *ethos* aspect of persuasion. Aristotle (1991) conceptualized *ethos* as having three dimensions: intelligence (i.e., knowledge, expertise), character, and goodwill. Once again, academics would seem to concentrate on the first dimension—demonstrating their clear knowledge and expertise on relevant topics—as opposed to the other dimensions. Building trustful relationships with practitioners would help to solidify the dimensions of character and goodwill.

Trust is an integral part of relationships (Pratt & Dirks, 2007), particularly high-quality, positive relationships (i.e., those that are emotionally expressive, resilient, and generative in terms of resources, growth, etc.; Ragins & Dutton, 2007). However, it is difficult to build trust if a relationship does not exist in the first place. In her analysis of the research-practice gap in management, Bartunek (2007) suggested that it is critical to build social relationships between academics and practitioners in order to narrow the gap (see also March, 2005). Her suggestion aligns nicely with our discussion of social identities and the “us-against-them” dynamics they can create (Turner & Haslam, 2001), since individualized relationships are one way in which

such intergroup bias can be reduced. The *deategorization* perspective (Brewer & Miller, 1984; Gaertner et al., 2000) proposes that intergroup bias can be lessened to the extent that group membership becomes less salient. A key means to reduce group salience is for members of each group to have personalized interactions with one another—in essence, to get to know one another as individuals rather than as members of “the other” group. Pettigrew (1998) cautions, however, that short-term interaction will be minimally effective. There must be sufficient time to allow for close interaction such that individuals begin a process of self-disclosure and friendships form.

### *Experience the World of Practitioners*

As stated above, *ethos* consists of the components of intelligence, character, and goodwill of the speaker/writer (Aristotle, 1991). This latter component, goodwill, relates to the intention of the communicator toward his or her audience—whether audience members perceive that the communicator is concerned with them, understands them, and has their interests at heart (McCroskey & Teven, 1999). Thus, one way to enhance goodwill would be to demonstrate a genuine interest in understanding practitioners and their work lives. A specific way to accomplish this may be to invest time in experiencing the world of practitioners.

The first author of this chapter spent 10 years in Human Resources Management in the retail, hospitality, and pharmaceutical industries prior to beginning her Ph.D. For most of her career, she functioned as a generalist, in which she was assigned to particular business units to help them achieve their strategic and operational objectives through effective management of human resources. Human resources generalists, like academics, also cannot succeed by *logos* alone. Throughout her career, and particularly at the beginning of an assignment to a new client group, the author would spend significant time working alongside members of her client group. Over the course of her Human Resources career, she has waited on retail customers on the sales

floor, stocked shelves, cleaned hotel rooms, seated restaurant guests, garnished plates and washed dishes in restaurant kitchens, participated in “ride-alongs” with pharmaceutical sales representatives, and sat in on many managerial meetings that she would not normally attend. She always considered these efforts to be time extremely well spent. The employees and managers appreciated her efforts to learn about their roles and the challenges inherent in them. It also was an effective way to build rapport with individuals, and emphasized the value of the skills and talents that everyone contributes to the organization. (The first author learned she is virtually incompetent in forming hospital corners when making hotel room beds or changing the register tape in a cash register—facts that seemed to serve not only as a source of great amusement to the employees, but also as a sort of “social glue” in her relationships with them going forward). In sum, the first author found that taking the time to experience the world of her client groups allowed her to demonstrate genuine interest, which in turn helped her become more effective in her Human Resources role. In short, she enhanced *ethos*.

A similar endeavor might be extremely useful for academics. Although some academics have an intimate understanding of the practice world through previous work experience or extensive consulting, many do not. And while such an endeavor might not seem to contribute directly to academics’ research and teaching responsibilities, we propose that it would make those efforts more relevant. In a recent analysis of the “implications for practice” sections of journal articles, Bartunek and Rynes (2010) noted that one concern of academics with respect to these sections was their lack of comfort in writing them; as one academic commented, “Unless I’m engaged in the field, what do I say?” (p. 109).

This comment could apply to more than simply “implications for practice” sections. Unless academics are engaged in the field, how will they understand the topics most relevant and

the challenges most vexing to practitioners? How will they appropriately contextualize their research? How will they link their results to practice? How will they effectively teach current and future practitioners in the classroom? How will they help practitioners to apply evidence-based principles in their organizations? How will they address practitioners' concerns about their ability to do this?

Although reading results of practitioner surveys or hearing an Executive MBA student tell a "practice" story in your classroom allows some insight into the world of practitioners, we would argue that it is not necessarily the same depth of insight one can experience firsthand (witness the revelations CEOs get from working in entry-level jobs for one week in their own organization in the new television series "Undercover Boss"). Vermuelen (2007) advocates for a "second loop" of communication that focuses on relevance and engages practitioners directly (in contrast to the first loop of communication that is focused on rigor and contained within the Academy). He argues that what you can learn from sitting in your office is limited: "This is what I see as the first element of the second loop: regular, direct interaction with practitioners intended to enrich understanding of my research subject. My own way of doing this is to conduct interviews and write teaching cases, although I am sure there are other and perhaps better ways. At this stage, I listen rather than talk" (Vermuelen, 2007, p. 757). In whatever manner individual academics may choose to do it, taking the time to actually experience the world of practitioners can demonstrate goodwill (enhancing *ethos*), build individualized relationships (reducing intergroup bias), and perhaps create an opportunity for practitioners and academics to work together to facilitate EBMgt.

*Help Practitioners Understand and Think Critically about Research Methods and Statistics*

We presented information about practitioners' distrust of statistics and the scientific method as well as sponsorship and special interests. Helping practitioners to understand and think critically about research methods and statistics can, to some extent, address both issues. A practitioner who understands how to critically evaluate research and its resulting claims can apply these skills to all research and claims, including those that may be biased as a result of sponsorship and special interests. Indeed, developing these skills is vital. Crettaz von Roten (2006) points out that "we live in a statistics-rich society" (p. 244), with statistics permeating many areas of our lives, including health, politics, and work. With respect to critical thinking, Rousseau and McCarthy (2007) refer to this as "perhaps the most crucial capability required in EBMgt" (p. 87).

Rynes (in press) discusses one clear opportunity for academics to facilitate research and statistical understanding as well as critical thinking: make use of our dual role as teachers to help students become more informed consumers of research (e.g., Burke & Rau, 2010; Rousseau & McCarthy, 2007; Trank & Rynes, 2003). Burke and Rau (2010) suggest that such an effort must go beyond stand-alone business statistics or research methods courses to infuse learning objectives related to research skills across all courses. Recognizing the need to "sell" this idea to students and relevant stakeholders, they also suggest that instructors explicitly make a connection between students' research training, skills, and knowledge and their employability in the workplace (Jenkins & Zetter, 2003), presumably so that students can then effectively "sell" this to employers.

Ideas are available to assist instructors in teaching research and statistical concepts, from Aguinis & Branstetter's (2007) theory-based and empirically-supported approach to teaching sampling distribution of the mean to Corner's (2002) presentation of a model for teaching

research design with applicable exercises. Rynes (in press) suggests the use of popular press books such as *Super Crunchers* (Ayres, 2008) or *Innumeracy* (Paulos, 2001) in conjunction with more formal statistical references in order to better contextualize and motivate the study of statistics. These specific ideas can be supplemented with general tips garnered from other instructors' experience.

For example, Bain (2004) finds that the best college teachers work together with their students on issues and problems that are authentic—that seem important to students and mirror what the students might encounter as professionals in the workplace. In the course of tackling these problems, students are asked not simply to listen and remember, but rather to “understand, apply, analyze, synthesize, and evaluate evidence and conclusions” (p. 115). Bain (2004) contrasts this approach with the “plug and chug” approach—memorizing formulae and sticking numbers in equations—that many instructors emphasize and that students then use to make it through mathematical and statistical courses; subsequently, these students are unable to apply the material they have learned to a real-world context.

Markham (1991) offers advice based on teaching research methods within his introductory sociology course for 14 years. He notes that “ideas about variables, hypotheses, and representativeness of samples...represent a completely new way of thinking for the majority of students. A five-minute explanation of what a variable is, with two or three examples, will leave all but the most talented befuddled” (p. 468).<sup>3</sup> Thus, he encourages devoting a significant portion of the course to teaching about research methods, integrating frequent methodological topics with substantive discussions, taking it slow, and using a few extended examples of

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<sup>3</sup> If you have not taught research methods, you may find it difficult to believe students would have trouble understanding the concept of “variable,” a very basic concept in research. Your skepticism would illustrate the “curse of knowledge,” the idea that once we know something, we cannot imagine not knowing it. In addition, we often struggle in sharing our knowledge with others, because the “curse of knowledge” creates difficulty in taking their perspective and re-creating their state of mind (Heath & Heath, 2006; Heath & Staudenmayer, 2000)

research studies rather than a great many in passing, among other ideas. Another important notion, given that we are training future business executives rather than professional statisticians, is to teach students to recognize when a situation or issue requires statistical knowledge that is outside of their technical expertise and to access experts accordingly (Wild, 1994). Then again, Wild (1994) remarks that many statistical consultants find that their most important skills are those such as asking the right questions, causing others to confront their own assumptions, and problem-recognition—in other words, statistical thinking more so than technical statistical knowledge.

The classroom is certainly one way to effect a change in practitioners' ability to think critically and use research effectively. However, not every practitioner will find his or her way into a classroom to develop these skills. Thus, another strategy is to “tweak the environment” (Heath & Heath, 2010), much as Albert Lea, Minnesota did to encourage healthier behavior on the part of its citizens. Remember, “tweaking the environment is about making the right behaviors a little bit easier and the wrong behaviors a little bit harder” (Heath & Heath, 2010, p. 183). It is true that some practitioners may not understand statistics and research at a very high level, but the environment in which they operate can be modified to facilitate appropriate use in spite of this.

For example, Ayres (2008) discusses the practice within medicine of “grading” studies—assigning to each study a “Level of Evidence” designation. According to the “grading system” developed by the Oxford Centre for Evidence Based Medicine (2009), systematic reviews of randomized clinical trials are the highest form of evidence (Level 1a), while expert opinion without explicit critical appraisal fares the worst (Level 5). Such a system—Ayres (2008) characterizes it as perhaps “one of the most important impacts of the evidence-based medicine

movement” (p. 102)—allows physicians and other healthcare professionals who access the studies to quickly discern their quality, regardless of their personal skill level with research methodology or statistics. In another example, the National Council on Public Polls has published a guide for journalists “20 Questions a Journalist Should Ask about Poll Results” (Gawiser & Witt, 2005) to help educate journalists on the appropriate use of public opinion polls. Each question is followed by a brief discussion of issues to consider and what the journalists should be looking for to distinguish a well-conducted scientific poll from a poorly-conducted or unscientific one. The guide includes such basic questions as: Who paid for the poll and why was it done? How many people were interviewed for the survey? How were those people chosen? (Note that the first question allows the journalist to assess vested interests of the sponsors, a source of distrust for the public). The guide also includes perhaps less obvious questions: Who should have been interviewed and was not? In what order were the questions asked? (Rosenstiel, 2005). This guide is a tool that has made the right behavior—reporting information from only valid and reliable polls in the media—just a little bit easier for journalists. Thus, academics can also help practitioners from outside the classroom. They can provide similar tools, checklists, and decision supports to facilitate practitioner critical thinking and use of high-quality research evidence.

### *Learn How to Tell a Good Story*

We discussed previously the importance of narrative in the human experience (Landau, 1984). People simply prefer stories to statistics (Kida, 2006). Heath and Heath (2008) argue that stories are a necessary component to making ideas “stick,” that is, ensuring they are understood, remembered, and impactful in terms of changing an audience’s attitudes or behavior. They maintain that stories are powerful because they provide both simulation (knowledge about how

to act) and inspiration (motivation to act). Simulation comes from a story's ability to provide context for the abstract. As the authors explain, stories put "knowledge into a framework that is more lifelike, more true to our day-to-day existence" (p. 214).

Stories inspire, often through three basic plots: *Challenge* plot, in which a protagonist overcomes a challenge and succeeds; *Connection* plot, in which a character develops a relationship that bridges a gap (e.g., racial, religious, demographic or otherwise); and *Creativity* plot, in which a character makes a mental breakthrough or solves a problem in an innovative way. The substantive content of our field—dealing with people and relationships in organizations, management challenges and problems—would seem to naturally lend itself to these frameworks. Note that the knowledge is *in* the story—that is, the story still contains the core message you are trying to communicate, whether that involves a research-based management principle or the wisdom of adopting EBMgt. The core message is just packaged in such a way that individuals are able to understand, remember, and act on it.

With respect to the Aristotelian framework (i.e., *logos*, *pathos*, *ethos*) referenced earlier, stories are particularly effective in fulfilling the function of the *pathos* element of persuasive rhetoric—appealing to the emotions, values, and imagination of the audience. Bartunek (2007) notes that in her conversations with practitioners about what would help management research have a greater impact on practice, practitioners invariably brought up the importance of emotion. They discussed the value of research that "has emotional components, includes narrative, and offers readers the possibility of seeing themselves in the situation described" (p. 1326). In a paper examining the EBMed movement in light of the Aristotelian framework, Van de Ven and Schomaker (2002) argue that EBMed advocates must "understand human emotions so as to better appreciate the beliefs and experiences of others" (p. 91). They note that emphasis on

*pathos* is more important the greater the divergence in values, beliefs, and experiences of the various stakeholders of EBMed (e.g., researchers, healthcare professionals, patients). Given our earlier discussion about the distinct cultures of academics and practitioners, *pathos* is likely to be particularly important in the EBMgt movement as well.

Other change management work echoes the *pathos* element of persuasion. Heath and Heath (2010) argue that, for change to happen, we must appeal to both mind and heart. Kotter and Cohen (2002) observe that “the core of the matter is always about changing the behavior of people, and behavior change happens in highly successful situations mostly by speaking to people’s feelings” (p. x of preface). It is instructive that Kotter, after publishing his well-known, logos-dominated eight-stage change process in *Leading Change*, followed up with *The Heart of Change* (Kotter & Cohen, 2002) which emphasized emotion (“see, feel, change”) rather than logic (“analyze, think, change”). This shift in emphasis was based on large numbers of interviews in which the authors “collected stories that could help people more deeply understand the eight-step formula” (p. x of preface). Illustrative of our earlier point, the knowledge (eight-stage change process) is still there, just packaged in a more impactful manner.

### *Expand your Toolkit*

Academics’ facilitation of EBMgt will require adjustment not only in terms of how research is packaged for practitioners, but also in the nature and breadth of the research that the package contains. Addressing practitioner challenges, which are likely to be multi-functional or multi-faceted, will require the use of evidence from different bodies or areas of knowledge. Academics need to be able to package research that addresses organizational issues as they are construed by practitioners; that is, as general problems that need to be solved (e.g., low employee

morale, high employee accident rate) rather than as problems labeled by research stream or functional area.

A fitting metaphor is that of Lévi-Strauss' *bricoleur* (1966), or one who engages in *bricolage*. The French word *bricolage* means "to use whatever resources and repertoire one has to perform whatever task one faces" (Weick, 1993, p. 352). Weick (1993) and Thayer (1988) have previously characterized organizational actors as bricoleurs who improvise to make creative use of available people, ideas, and resources. Indeed, the challenges that practitioners face in their work often require such improvisation. Schön (1983) described the "changing character of the situations of practice—the complexity, uncertainty, instability, uniqueness, and value conflicts which are increasingly perceived as central to the world of professional practice" (p. 14). He also, however, described a crisis of confidence in the professions—a question as to whether professional knowledge is adequate for such situations—and noted that professionals who have thought about the adequacy of professional knowledge tend to conclude that it is "mismatched" (p. 14) to the complexity of the situation. Academics functioning as bricoleurs in the context of EBMgt will need to bring whatever research-based resources are available in order to support practitioners in the complex and ever-changing challenges that they face. Successful bricolage requires "intimate knowledge of resources, careful observation, trust in one's intuition, listening, and confidence that any enacted structure can be self-correcting if one's ego is not invested too heavily in it" (Weick, 1993, p. 353). It is to be expected that successful bricolage in this context will require research from multiple disciplines, perspectives, and methodological approaches in order to "match" the complexity and messiness of the real world.

The breadth required to function as bricoleurs may take academics outside their comfort zone, since studies of management and business researchers show a lack of multidisciplinary or

interdisciplinary focus. For example, Agarwal and Hoetker (2007) examined management research over a 25-year period in terms of its relationship with the related disciplines of economics, psychology, and sociology. They noticed a striking negative trend over time in the probability of multiple disciplines being represented in the same research article. The authors conclude that “when management researchers do draw on related disciplines, we seem to do so one discipline at a time” (p. 1317). Biehl, Kim, and Wade (2006) confirm a similar trend on a broader scale. In their study of multiple academic disciplines (e.g., Management, Finance, Operations), they find that “most business academics tend to publish in distinct and mostly non-overlapping disciplines. Akin to Agarwal and Hoetker (2007), Biehl and colleagues (2006) note that “the disciplines’ solitude has become more pronounced over time and is counter-intuitive” (p. 368) given the emphasis on increasing interdisciplinary research. Both sets of authors express concern about the implications of their results and recommend more interdisciplinary efforts. Agarwal and Hoetker (2007) point out that “such combinations would help address a major critique of management research and education: that it no longer relates to real business problems” (p. 1319). Their calls echo Boyer’s (1990) appeal two decades ago for a *scholarship of integration*, whereby scholars give meaning to isolated facts, “putting them into perspective...making connections across disciplines, placing the specialties in larger context, illuminating data in a revealing way, often educating nonspecialists, too” (p. 18).

Thus, just as practitioners already function as bricoleurs (Thayer, 1988; Weick, 1993), so must academics do so in order to facilitate practitioners’ use of evidence in practice. However, in line with Latham’s (2007) advice to “become bilingual” (p. 1029) and communicate in a language practitioners understand, we do not recommend advertising your “bricoleur” status. As one colleague of ours joked about this chapter, “Maybe practitioners would like academics more

if they didn't use words like bricolage!" In the practice world, a comparable metaphor might be the idea of expanding one's "toolkit." Like bricoleurs, good practitioners are constantly broadening their repertoire of strategies or tactics for managing and solving problems, even if they do not necessarily have an immediate application. McGrath (2007) points out that a management tool refers to a "framework, practice, or concept that managers use when trying to achieve some result" (p. 1373), and goes on to reassure her academic readers that "a management tool—although the term might make some academics shudder—is at heart the expression of a theory" (pp. 1373-1374). So whether academics "become bricoleurs" or "expand their toolkits," such an evolution will be necessary to effectively support EBMgt.

*Frame EBMgt as a Means to Alleviate Threats and Anxiety*

We discussed earlier that threatening or anxiety-provoking research findings will pose a challenge for EBMgt. Indeed, individuals will tend to focus on potentially negative implications of research findings and EBMgt, as research supports the idea that individuals display a negativity bias (Rozin & Royzman, 2001; Kahneman & Tversky, 1979). Baumeister, Bratslavsky, Finkenauer, and Vohs (2001) review a broad range of psychological phenomena—from close relationships and emotions to information processing and memory—and conclude that the principle that "bad is stronger than good" is consistently supported.

One way to combat individuals' tendency to focus on how research and EBMgt threaten them may be to encourage their focus on how evidence-based practice can also *alleviate* threat. For example, evidence-based practice provides legitimacy and makes actions more defensible to various stakeholders (Rousseau, 2006). Freidson (1970, 1986) argues that clinical expertise and autonomy have been an important source of power for medical clinicians. He notes that the clinician grows in time to trust his or her own firsthand experience and comes "to rely on the

authority of his own senses, independently of the general authority of tradition or science” (Freidson, 1970, p. 170). As Pope (2003) summarizes, however, “there is certain vulnerability in this position at a time when politicians, payers, and the public demand accountability from the professions and medical work is increasingly the subject of external scrutiny. A reliance on tacit, nebulous knowledge means that one cannot use explicit, formally specified knowledge to defend work practices” (Pope, 2003, p. 277). This same assessment could be made of the present-day business world. In the wake of the recent “Great Recession” and its controversial causes and effects—from Wall Street’s bundling of subprime mortgages into risky mortgage-backed securities to federal bailout of companies and industries pronounced “too big to fail”—external scrutiny and demand for accountability are heightened. Indeed, Freidson (1970) points out that a challenge for the expert is “to assure the public that what expertise it does possess will be exercised evenhandedly, with an adequate degree of competence and in the public interest” (p. 338). The use of evidence-based practice can support practitioners in making this assurance.

Faigman and Monahan’s (2005) discussion of the Supreme Court’s 1993 decision in *Daubert v. Merrell Dow Pharmaceuticals, Inc.* echoes the importance of scientifically-defensible practice. They interpret the *Daubert* decision as an assertion that “law must join the scientific age” (p. 635) and note that it “unequivocally endorses ‘empirically validated treatments’ and ‘evidence-based practices’” (p. 656). Judges are now tasked to serve as gatekeepers of evidence, assuring that any evidence that enters into their courtroom is both reliable and valid. Faigman and Monahan (2005) remark, “Fields that operate by consensus rather than through data collection should be expected to have difficulty passing muster” (p. 636). Thus, for practitioners under increased scrutiny by stakeholders or defending themselves in court, the use of EBMgt should assuage threat and anxiety.

We also discussed how practitioners may perceive the use of research in practice as a threat to their judgment and autonomy, which many practitioners view as their source of power and control (Freidson, 1970, 1986; Pope, 2003). However, we would encourage practitioners to think differently about their source of power. Individuals and departments gain power and influence in organizations to the extent that they are able to reduce uncertainty (e.g., Crozier, 1964; Salancik & Pfeffer, 1977; Salancik, Pfeffer, & Kelly, 1978), particularly if they reduce uncertainty in areas critical to the organization's success and alternative means to reduce the uncertainty are not readily available (Hinings, Hickson, Pennings, & Schneck, 1974). The use of research evidence in practice should enhance managers' ability to reduce uncertainty.

For example, imagine that you are the head of the sales organization in your company. Sales revenues are clearly critical to the company and you are responsible for achieving the company's sales goals. Many factors affect sales results, but a critical component is your sales team. How can you reduce the uncertainty associated with their achievement of performance outcomes and, ultimately, your organization's sales targets? Empirical research offers numerous strategies: select salespeople who are extraverted and conscientious (Vinchur, Schippmann, Switzer, & Roth, 1998); educate your salespeople on how to effectively influence and persuade others (Cialdini, 2009; Petty & Cacioppo, 1996); motivate your salespeople using specific and challenging goals (Latham, 2009b).

While these strategies target the individual, research can also provide equally useful strategies at the group or organizational level. For example, research can guide you in designing a structure that facilitates your strategy (Donaldson, 2009) or building a culture of continuous learning to sustain organizational performance (Beer, 2009). And to reinforce our earlier point of the necessity of academics functioning as bricoleurs, it is doubtful that the challenge of

meeting sales targets in this scenario is just a “selection issue” or just a “goal setting problem.” Management research at the individual, group, and organizational levels will likely be relevant, as will research in the disciplines of Marketing as well as potentially Finance and Operations. In short, evidence-based practice may contribute to practitioners’ power and control by providing them the tools to reduce uncertainty and giving them the best chance of achieving the results for which they are held accountable.

### *Use What We Know about Effective Change Management*

As we discussed, people have a strong affinity for the status quo (Samuelson & Zeckhauser, 1988); unless the incentive to change is compelling, they will tend to persist with what they are currently doing. However, we have a plethora of research and evidence about how to make the incentive to change compelling and to effectively facilitate change. We referred earlier to Kotter’s (1996) eight-stage process for successful change. More specifically, he advises the importance of: (1) establishing a sense of urgency by highlighting present and potential crises and opportunities, (2) creating a powerful coalition of individuals who support the change and can persuade others to do so, (3) developing a vision and strategy, (4) communicating the change vision using every vehicle possible, (5), empowering others to act on the vision by changing the environment and culture to facilitate change, (6) generating short-term wins to build momentum for continued change, (7) consolidating gains and continuing to modify unsupportive contextual features so as to produce more change, and (8) institutionalizing the new approaches by connecting the new behaviors to organizational success. Heath and Heath (2010) discuss similar concepts in their research-based guide to successful change. They articulate specific strategies to connect with people’s heads (their rational mind) and hearts (their emotional mind) and to alter their environments in order to facilitate change.

Both Ayres (2008) and Heath and Heath (2010) share an inspiring story that illustrates several of these concepts within the context of EBMed. It is the story of Don Berwick, the physician and President and CEO of the Institute for Healthcare Improvement whose quote led our chapter, and the 100,000 Lives Campaign. Two events precipitated Berwick's crusade for change: His organization produced a report documenting the pervasiveness of preventable medical errors in the U.S. healthcare system; he then witnessed the process inefficiencies of healthcare (and the potential for errors) firsthand when his wife became ill with a rare autoimmune disorder. In 2004, Berwick launched the 100,000 Lives Campaign. In a speech to a large group of hospital administrators, he set out an ambitious goal: to save 100,000 lives by June 14, 2006 at 9:00 a.m. (18 months from that day). He challenged hospitals to do this by implementing six changes in care to prevent medical errors, and thus, avoidable deaths. Berwick chose the six basic changes—procedures related, for example, to managing patients on ventilators or those with central-line catheters—through analyses of research evidence. For instance, one procedure instructed healthcare professionals to elevate patients' heads and clean their mouths regularly while they are on ventilators in order to prevent lung infections.

Berwick did several things during his campaign that made use of what we know about change management. Clearly he established a sense of urgency and highlighted an opportunity for the hospitals. His organization's report estimated that 98,000 people died each year due to preventable medical errors; however, 25,000 lives would be saved if all hospitals implemented his six recommendations. He appealed to individuals' hearts by having loved ones of patients killed by medical errors participate in his talks. Limiting the campaign to six specific changes was a way to “shrink the change,” to use Heath and Heath's (2010) terminology. Large change

efforts—such as the evolution to evidence-based practice—can be overwhelming; changing six specific procedures was doable and more likely to result in Kotter’s (1996) “short-term wins.”

He also ensured an environment supportive of the change. Hospital CEOs needed only to sign a one-page form to join the campaign (and Berwick used peer pressure as one strategy to get hospitals to enroll); the hospital then received support from Berwick’s organization in the form of research, step-by-step instruction guides, and training. His organization structured opportunities for hospital leaders to talk with one another about challenges and lessons learned, and paired hospitals further along the implementation curve with those just joining the campaign. And in the end, Berwick was able to successfully connect the new behaviors with organizational achievement. More than 3,000 hospitals participated in the campaign (representing approximately 75% of U.S. hospital beds) and in the course of 18 months, prevented an estimated 122,300 deaths.<sup>4</sup> Ayres (2008) characterizes this effort as a “huge victory for evidence-based medicine” (p. 94).

We tell this story not just because it is exciting, but also because it should stimulate us to think about how to apply what we know about effective change management to our EBMgt efforts. Some of our current efforts already reflect such principles. For example, the overarching purpose of the Evidence-Based Management Collaborative (n.d.) is “to design the architecture and support practices for on-line access to best evidence summarized in ways practitioners and educators can readily use”—in other words, to modify the environment to facilitate the change. This Handbook represents an effort to further communicate a vision of EBMgt, as well as strategies to achieve that vision. But other features of effective change

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<sup>4</sup> Ayres (2008) notes that participating hospitals provided to Berwick’s team eighteen months of mortality data prior to joining the campaign as well as monthly updates of number of deaths during the campaign. He acknowledges that a decrease in deaths at one hospital may be just plain luck, but “when the before-and-after results of 3,000 hospitals are crunched, it’s possible to come to a much more accurate assessment of the aggregate impact” (p. 93).

management are not so clearly recognizable. What is the inspirational equivalent in management of saving 100,000 lives in medicine? We need to figure this out so that EBMgt efforts appeal to emotions and values as well as minds. Additionally, the overall message of EBMgt—the best available scientific evidence should inform everything you do!—would likely seem overwhelming to even the most enthusiastic practitioner. What can we do to “shrink the change?” Berwick started with six procedures to prevent medical errors. Can we focus our efforts on a small subsection of organizational decisions and practices to make the process more manageable and generate short-term wins? In short, we must ensure we turn to our own evidence in order to facilitate the practice of EBMgt most effectively.

*Provide a Social “Nudge” toward Evidence-Based Management*

We have discussed the importance of context in both the adoption of and implementation of research findings. Although an unsupportive context can contribute to resistance, a context supportive of EBMgt may contribute to its uptake. As Gladwell (2002) observes, “We are more than just sensitive to changes in context. We’re exquisitely sensitive to them” (p. 140). Thaler and Sunstein (2009) use this idea to advocate for the *nudge*. Essentially, a *nudge* is a contextual feature that gently pushes people toward the best decision without restricting their freedom of choice. An illustration of this idea is provided by organizations that have moved to automatic enrollment as the default in their defined-contribution retirement plans (as opposed to a default of non-enrollment). This means that employees are enrolled in the retirement plan unless they take action to opt out (i.e., complete a form stating that they do not wish to participate). Because of individuals’ tendency toward inertia (Samuelson & Zeckhauser, 1988), the default option can be a powerful nudge. Indeed, automatic enrollment in defined-contribution plans has been found

to be an extremely effective way to boost individuals' savings rates (Choi, Laibson, Madrian, & Metrick, 2002, 2004; Madrian & Shea, 2001).

Consistent with our earlier discussion on opinion leaders (Rogers, 2003) and the principle of social proof (Cialdini, 2009), Thaler and Sunstein (2009) argue that one of the best ways to nudge is via social influence because “Humans are easily nudged by other Humans” (p. 55). They present several ways to nudge via social influence, including providing information about what others are doing, using the power of peer pressure, and priming individuals (i.e., asking them about their intentions, which then encourages them to act in accordance with their stated intentions). Thus, one effective way to nudge managers toward evidence-based practice will be to show them other managers who practice in an evidence-based way.

Latham (2009a) applies this principle in his book that presents six key lessons of management, all research-based and practice-tested. The most important chapter of the book from a “nudge” perspective, however, may be Chapter Seven. In this chapter, Latham (2009a) presents two case studies of evidence-based managers in action. Not only does this chapter accommodate individuals' love of stories, but it provides information about what other managers are doing—in this case, using evidence-based practices with successful results. In a live version of this strategy, Rousseau and McCarthy (2007) note that they bring local executives who practice EBMgt into their classrooms. Scaled-up and expanded versions of Latham's (2009a) and Rousseau and McCarthy's (2007) strategies would become social nudges.

Given that the EBMgt movement is in its early stages, it is tempting to focus on the problem (particularly given our “bad is stronger than good” bias; Baumeister et al., 2001); indeed, the gap between management research findings and management practice looms large (Hambrick, 1994; Johns, 1993; Pfeffer & Sutton, 2000). In addition, Rousseau and McCarthy (2007) note

that the use of peer pressure may be difficult in EBMgt as compared to EBMed due to the lack of a formal body of shared knowledge among managers. However, Heath and Heath (2010) would encourage a focus on the “bright spots.” In other words, concentrate on what is working and discover how that success can be scaled up. Latham (2009a) found two managers effectively practicing EBMgt. Rousseau and McCarthy (2007) are able to find local evidence-based managers for their classrooms. Advocates of EBMgt need to find others—as many as exist—and publicize their existence in order to be able to nudge via social influence.

### Conclusion

The movement toward EBMgt is in its early stages and as Rousseau and McCarthy (2007) observed, the practice of EBMgt is still hypothetical at this point. But for EBMgt advocates, it is an exciting prospect. The possibility that research and practice could be closely intertwined is a heady one, and a vision some academics (e.g., Latham, 2009a; Pfeffer & Sutton, 2000, 2006a, 2006b; Rousseau, 2006; Rousseau & McCarthy, 2007; Rynes, 2007 and in press) and some practitioners (e.g., Cohen, 2007; Saari, 2007) have worked toward and continue to work to bring to fruition. If EBMgt were to become the norm, we might actually be able to answer Hambrick’s (1994) infamous question, “What if the Academy actually mattered?” Certainly it is hoped that, similar to the *British Medical Journal*’s (Dickersin et al., 2007) characterization of EBMed, decades from now we will be able to acknowledge EBMgt as one of our most important management milestones.

As we have presented here, however, there will be resistance. Both history (e.g., Johns, 1993; Rogers, 2003) and our examination of EBMed in this chapter strongly suggest that this is to be expected. But if we would like our research to be relevant, then we must face the resistance and address it. Marian Wright Edelman, the well-known children’s advocate and

founder and President of the Children's Defense Fund said, "If you don't like the way the world is, you change it. You have an obligation to change it. You just do it one step at a time" (Traver, 1987, p. 27). There are steps each of us can take to address resistance and to aid the use of research in practice. You just need to start with one: befriend a practitioner, add a story to that journal submission you're writing, or do some reading completely outside your field to expand your toolkit. In this instance, we do agree with one part of Bruce Charlton's opening quote—the time is ripe.

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Table 1. Proposed Solutions to Address Sources of Practitioner Resistance

<b>Sources of Practitioner Resistance</b>	<b>Potential Solutions</b>
<ul style="list-style-type: none"> <li>❖ Distrust of scientists, statistics, and special interests</li> <li>❖ Threatening or anxiety-provoking findings</li> <li>❖ Findings contradictory to personal experience</li> <li>❖ Findings that require change</li> <li>❖ Findings unsupported by context</li> </ul>	<ul style="list-style-type: none"> <li>❖ Build trustful relationships between academics and practitioners</li> <li>❖ Experience the world of practitioners</li> <li>❖ Help practitioners understand and think critically about research methods and statistics</li> <li>❖ Learn how to tell a good story</li> <li>❖ Expand your toolkit</li> <li>❖ Frame EBMgt as a means to alleviate threat and anxiety</li> <li>❖ Use what we know about effective change management</li> <li>❖ Provide a social “nudge” toward EBMgt</li> </ul>