ResearchGate

See discussions, stats, and author profiles for this publication at: https://www.researchgate.net/publication/282272813

The Use of the Evidence from the Behavioral Sciences in the Organizational Decision-Making Process

Article · September 2015

CITATION
1

READS
387

1 author:

Bogdan Minjina
Center of Psychosociology, Bucharest, Romania
13 PUBLICATIONS **3** CITATIONS

SEE PROFILE

All content following this page was uploaded by Bogdan Minjina on 29 September 2015.

The user has requested enhancement of the downloaded file.

Management Dynamics in the Knowledge Economy
Vol.3 (2015) no.3, pp.381-408; www.managementdynamics.ro
ISSN 2392-8042 (online) © Faculty of Management (NUPSPA)

The Use of the Evidence from the Behavioral Sciences in the Organizational Decision-Making Process

Bogdan MÎNJINĂ
Psychosociology Center
Ministry of Internal Affairs
47 Maria Ghiculeasa St., sector 2, Bucharest
bmanjina@yahoo.com

Abstract. *The important managerial decision-making and the development of policies, strategies, internal normative acts and procedures must be solid grounded for efficient achieving of their objectives. To this end, the evidence-based approach uses various types of evidence, a leading role having those scientific, and the critical thinking. The evidence from behavioral sciences is especially important when the decisions objectives involve behavioral elements. They also help to ensure the rationality of any decision-making process. The concern for the use of behavioral sciences research in the decision-making preceded the occurrence of evidence-based approach. The increased knowledge fund of organizations, the access to the best practices and to the relevant scientific research findings represent only the initial stages of the evidence-based approach implementation and functioning. The ensuring of their effective use calls for special skills training among staff, the creation of tools and organizational mechanisms and of a facilitating organizational culture. This paper argues the need to integrate two approaches that promote the decision-making based on scientific evidence, the evidence-based approach and the use of behavioral and social sciences in the decision-making, to potentiate the contribution of the behavioral sciences to the increasing of the decision-making efficiency. The efforts made in this paper had overall objective to prepare and facilitate the use of research evidence provided by behavioral sciences in the organizational decision-making process by presenting the main concepts and knowledge in the field and by proposing an outline procedure specifically developed.*

Keywords: *evidence-based decision-making, evidence-based management, evidence-based policy-making, behavioral sciences.*

Introduction

At the end of the last century a new trend of thinking emerged in medicine, initiated by Canadian physicians David Sacket and Gordon Guyyat, which promote "decision-making in healthcare based on the latest and best knowledge on what really works" (Pfeffer & Sutton, 2006). Rousseau and McCarthy (2007) states that in the last 25 years scientific evidence became

essential for effective practice in various fields: medicine, education, policing and psychology. Other areas in which this trend was spread are: criminal justice, social work, public policies, management, and advertising.

The evidence is an objective fact, rigorously obtained, which is used to support a conclusion. Examples of evidence are the information produced by the integrated monitoring and assessment systems, the scientific research findings, the knowledge acquired through professional experience and information on best practices. Rousseau (2006) believes that the most important type of evidence is achieved through scientific research, which he calls the "Big E Evidence". The scientific research provides empirical evidence or knowledge which is objective, reliable and valid. Other types of evidence is called by Rousseau (2006, p.260) "little e evidence", which is local or organization specific, specifically "data systematically gathered in a particular setting to inform local decisions".

The evidence-based approach initially targeted the everyday professional practice and subsequently was spread to other areas, like: management, important decisions-making, policies and strategies developing. All these applications of the evidence-based approach involve the decisions-making at various levels. The efforts for the implementation of the evidence-based approach in organizations aim to ensure organization efficiency in the achievement of objectives and in the resources management.

An independent approach which promoted the use of the behavioral and social sciences in decision-making process appeared before evidence-based approach, in 1960s, in the USA.

The bringing together and the synthesis of the two approaches' concepts and knowledge will probable enhance the exploitation degree of the behavioral and social sciences evidence for the enhancement of decision-making processes' quality in organizations.

Objectives

To help prepare and facilitate the full use of evidence from behavioral and social sciences in organizational decision-making process, which is the overall objective of this paper, the present paper aims to achieve the following specific objectives:

1. The presentation and the summarization of the main concepts related to the evidence-based approach and to the approach regarding the use of behavioral and social sciences in the decision-making process.
2. The identification of the elements and of the steps needed to enhance the behavioral sciences research findings use in the organizational decision-making processes.
3. The development of an outline procedure for the use of behavioral sciences evidence in the organizational decision-making process.

Methods

For achievement of the aforementioned objectives was tried to identify the relevant scientific literature based on the literature review method. To this end was made a search on Internet through Google search engine using the keywords or combinations of their parts: evidence-based decision-making, evidence-based management, evidence-based policy-making, evidence-based practice, behavioral sciences, use/utilization of behavioral sciences, use/utilization of social sciences, quality/strength evaluation of scientific evidence. Also, to identify the relevant research in the references of the previous identified articles was made the manual search.

The evidence-based approach and the approach regarding the use of behavioral sciences in decision-making process – the need for their integration

The managerial decision-making process can be perturbed by several factors, such as knowledge achieved through personal experience, insights, observations, knowledge achieved through trial and error, traditions, customs, habits, trendy concepts, rumors, outdated knowledge, opinions, beliefs, preferences, rhetoric elements, logical fallacies, biases, heuristics, assumptions, lobby of individuals or groups. In these situations there is a high risk of the erroneous or non-optimal decisions-making.

Rousseau (2006) notes the existence of a gap between research and practice in management. One year later, Rousseau and McCarthy (2007, p.84) note that "contemporary managers and management educators make limited use of the vast behavioral science evidence base relevant to effective organizational practice". Factors that may explain the gap between research and practice in the management listed by Rousseau (2006) are: the managers don't know the scientific evidence; the managers' loss of control fear; few organizations are doing their own management research; the management is not a profession; the personal experience dominates the job

tasks' approach by manager; the management's decisions often involve other people and many require compromise, political actions and responses to conflicting incentives; the scientific method is less appreciated; the uniqueness paradox encountered mainly in private organizations interfere with the principle of the transfer of the research findings in different settings; the absence of the management research databases. Rousseau (2006, p.262) believes that the professors "must accept a large measure of blame" for the mentioned gap because they "typically do not educate managers to know or use scientific evidence".

The evidence-based management involves "the managerial decisions and organizational practices informed by the best available scientific evidence" (Rousseau & McCarthy, 2007, p.84). As in medicine and education, the judgments of this management type involve the consideration of the managerial decisions' circumstances and of the ethical issues (idem). Rousseau (2012a) specifies three drivers of the evidence-based management that provides unprecedented opportunities to reconsider the fundamentals of the organizations' management: the development after World War II of hundreds of well-supported evidence-based principles relevant to the decisions and to the organizational practices, based on the large number of studies in the social sciences and management; the existence of a broad access to the scientific knowledge through the Internet; the existence of widespread concerns related to improving the quality of the managerial decisions, due to increased awareness of their consequences.

The evidence-based management is also applicable to the organizations' macro areas such as organization theory and strategy management. In this case the focus is on the complex, multi-level and unique problems specific to these levels (Madhavan & Mahoney, 2011). The specific contexts of macro areas decision, which are marked by uncertainty, conflict and ambiguity, increase the need for this management type (idem).

The decision-making is one of the most important activities of managers, because it influences the results of managed structure and affects its employees' morale and welfare. The decisions play a central role "in the daily functioning and welfare of any organization and any manager within them" (Yates & Potworowski, 2012, p.717). Rousseau (as cited in Yates & Potworowski, 2012, p.718) argues that "the decision-making is at the heart of evidence-based management". Evidence-based decision-making requires decision-making informed "as much as possible by evidence, research, and sound information" (Maxim, Garis & Plecass, 2013, p.3).

Evidence-based policy-making "helps people make well informed decisions about policies, programmes and projects by putting the best available evidence at the heart of policy development and implementation" (Davies, 1999, as cited in Segone, 2008, p.27).

Evidence-based practice involves "(the) decision-making through the conscious, explicit and judicious use of evidence from multiple sources … to increase the likelihood of a favorable outcome", which involves several steps: asking ("translating a practical issue or problem into an answerable question"), acquiring ("systematically searching for and retrieving the evidence"), appraising ("critically judging the trustworthiness and relevance of the evidence"), aggregating ("weighing and pulling together the evidence"), applying ("incorporating the evidence into the decision-making process"), and assessing ("evaluating the outcome of the decision taken") (Barends, Rousseau & Briner, 2014, p.2). Rousseau (2006, pp.259-260) presents the following characteristics of this type of practice: "learning about cause-effect connections in professional practices; isolating the variations that measurably affect desired outcomes; creating a culture of evidence-based decision making and research participation; using information-sharing communities to reduce overuse, underuse, and misuse of specific practices; building decision supports to promote practices the evidence validates, along with techniques and artifacts that make the decision easier to execute or perform (e.g., checklists, protocols, or standing orders); having individual, organizational, and institutional factors promote access to knowledge and its use".

Independently of the evidence-based approach, since the mid-20th century the use of the behavioral and social sciences in the decision-making process was explicitly promoted. In the USA, the social sciences research designed to support the policy-making was publicly funded by the US National Science Foundation since the 1960s (Prewitt, Schwandt & Straf, 2012). The social sciences share "their analytic focus on the behavior, attitudes, beliefs, and practices of people and their organizations, communities, and institutions" (idem, p.11). Dror (1969) wrote a work intended to examine the use of behavioral sciences, of which are listed psychology, sociology anthropology and political sciences, in the public policy field. He tried to identify the changes needed to enhance use of behavioral sciences in order to develop better public policies. Behavioural Insights Team, the world's first government behavioral insights team within the UK Cabinet Office since 2010, launched the term behavioral insights to bring together ideas from a range of inter-related academic disciplines (behavioral economics, psychology, and social anthropology) which try to understand "how individuals take decisions in practice and how they are likely to respond to

options". The team argues that these insights enable it "to design policies or interventions that can encourage, support and enable people to make better choices for themselves and society". It developed several works that addressed in more detail how to apply behavioral insights to policy in the following areas: reduction of fraud, error and debt; behavior change and energy use; consumer empowerment to make better choices and get better deals; new incentives for ecological behavior. The punctual examples of behavioral intervention designated and executed by the team and their results presented on its website are: "automatically enrolling individuals on to pension schemes has increased saving rates for those employed by large firms in the UK from 61 to 83%; informing people who failed to pay their tax that most other people had already paid increased payment rates by over 5 percentage points; encouraging jobseekers to actively commit to undertaking job search activities increased their chance of finding a new job; prompting people to join the Organ Donor Register using reciprocity messages ('if you needed an organ, would you take one?') ads 100000 people to the register in one year".

Other fields where behavioral sciences have provided support to the development of policies address challenges such as crime, obesity, environmental sustainability (Dolan et al., 2010), improving health care, improving national security and public safety, safer road traffic (Prewitt & Hauser, 2013).

Prewitt et al. (2012, p.3) argue that "the evidence-based policy and practice, focused on improving the understanding of what works, has influenced the production of scientific knowledge", but "it has made little contribution to understanding the use of that knowledge". In the same work it is mentioned that according to some views the issue of use is deemed to be outside the scope of evidence-based policy because it involves political and value considerations.

The need for the integration of the two approaches by bringing together their specific concepts and knowledge and their synthesis is evident in practical terms. The integration of each approach's contributions can multiply the use of behavioral and social sciences in the organizational decision-making processes. The concepts and the knowledge from the approach regarding the use of behavioral science for policy-making can be adapted and applied to the development, monitoring and improvement of the types of decisions from lower social levels (medium and large organizations) regarding internal normative acts, policies, strategies, procedures and important decisions. The behavioral insights can by

identified not only at the societal level addressed by the use of behavioral and social sciences in policy-making process, but also to lower social levels, like organizations and their structures. So, specific organizational problems, like the issues from human resources (e.g., training, motivation, carrier development, counterproductive behaviors and discipline, deontology etc), job performance, classified information protection, personal data protection and occupational safety and health, can be more efficient addressed.

The concepts and the knowledge of evidence-based approach, like those regarding principles for evidence-informed managerial practice, evidence summaries, quality/strength evaluation of evidence and the importance of critical thinking in decision-making process, can easily be adapted and applied to various types of decision-making supported by the use of behavioral and social sciences scientific evidence.

The organizational fields for use of behavioral sciences evidence

The decisions-making, the development, the implementation, the monitoring and the improving of the internal regulations, the procedures, the policies and the strategies constitute an important field for the use of the behavioral sciences' evidence in the organizational decision-making process.

Van Bavel, Herrmann, Esposito, and Proestakis (2013) argue that in the policy field it is very important to understand how the people are likely to behave (and think or feel) in the context that the limited effectiveness of many policies can be explained by their grounding on the tacit unrealistic assumption that people behave rationally (make choices that lead to the best outcome for them). People sometimes take irrational decisions that are against their interests (eat too much, smoke, get heavily into debt, save too little) (Van Bavel et al., 2013). One of the explanations for such irrational decisions is the custom use by people of system 1 of thinking (fast, automatic, habitual, stereotypical, unconscious), preferred by them because it requires little or no effort. The understanding of the human behavior requires proper reality checks, which involve the policy grounding on evidence, not on assumptions (idem).

Behavioral sciences can be applied to policy-making whenever there is a behavioral element to their level to help the development of new policies, to suggest improvements to existing ones or to provide ex post explanations of why the target group of a policy reacted in a certain way (idem). The same holds true in organizations when developing internal regulations, procedures, strategies and make important decisions.

Van Bavel et al. (2013, p.6) believe that there is a behavioral element to a policy in the following situations:
- "when behavior change is the main objective of the policy";
- "when people's behavioral responses affects the effectiveness of a certain policy, even if the aim of the policy itself may not be to change behavior";
- "in the policy-making process itself", as policy-makers are vulnerable to biases, heuristics and other factors of influence.

Prewitt et al. (2012, p.12) argues that the social sciences can fulfill two roles in policy field: "to accurately describe human behavior and social conditions, including their causes and consequences, and, when policies are implemented to change those behaviors and conditions, to assess the consequences"; "to focus their formidable array of methods and theories on understanding how social and natural scientific knowledge is used as evidence in the policy process".
Since the human resources management involves employee's behavior understanding and managing another important field for the use of behavioral science evidence is the decisions-making in the human resource management.

Terpstra and Limpaphayom (2012) specify a number of surveys that revealed the gap between research findings and practice in human resources made in the USA (Rynes, Brown, & Colbert, 2002; Rynes, Giluk & Brown, 2007; Terpstra & Rozell, 1993), Netherlands (Sanders, van Riemsdijk, & Groen, 2008) and in United Kingdom (Guest, 2007).

Rynes et al. (2002, pp.95-96) present seven misconceptions of HR managers participants at their research which are contrary to the HR research findings: "conscientiousness is a better predictor of employee performance than intelligence; companies that screen job applicants for values have higher performance than those that screen for intelligence; integrity tests don't work well in practice because so many people lie on them; integrity tests have adverse impact on racial minorities; encouraging employees to participate is more effective for improving organizational performance than setting performance goals; most errors in performance appraisal can be eliminated by providing training that describes the kinds of errors managers tend to make and suggesting ways to avoiding them; if employers are asked how important pay is to them, they are likely to overestimate its to importance."

Rousseau and Barends (2011, p.222) present five statements on human resource management issues that usually are wrongly considered true by managers: "combining managerial judgment with validated test results is optimal for selecting successful new employees; incompetent people benefit more from feedback than highly competent people; task conflict improves work group performance while relational conflict harms it; being intelligent is a disadvantage for performing low-skilled jobs; integrity tests do not work because people lie on them."

On the basis of the best scientific evidence relating to the employee turnover, Allen, Bryant and Vardaman (2010) have tried to dismantle employee turnover myths and thought that they have succeeded in this endeavor. The five untrue myths are: "all turnover is the same, and it is all bad; people quit because of pay; people quit because they are dissatisfied with their jobs; there is little managers can do to directly influence turnover decisions; a simple one-size-fits-all retention strategy is most effective" (Allen et al., 2010, p.49).

The gap between practice and science in the human resource management cannot be accepted if, as Rousseau (2012b, p.187) claims, it is considered that the "organizational behavior (science) is arguably one of the most developed bodies of scientific knowledge relevant to management practice".

The organizations that use better sources of information on human resources (based on academic research evidence) should acquire high quality knowledge and information on the effectiveness of various human resources management practices and the superior knowledge, in turn, should lead to the adoption and the implementation of sound practices in the human resources management that will increase the individual and organizational performance (Terpstra & Limpaphayom, 2012).

Educating managers to evidence-based practice offers several promises: the improvement of the managerial decision-making and the achievement of better organizational outputs; the possible reduction of the ineffective management practices' use and the contribution to the spread of the effective approaches; the possible development of a substantive expertise for well-informed managers throughout their careers; possible joint efforts of the researchers, the trainers and the practitioners to improve both the scientific knowledge and the individual and collective learning (Rousseau & McCarthy, 2007). A number of elements are required in the evidence-based teaching: "focus on principles where the science is clear; develop decision awareness in professional practice; diagnose underlying factors related to decisions; contextualize knowledge related to evidence use; develop

evidence-based decision supports; prepare to access new evidence" (idem, pp.85-89).

The decision-making and the everyday professional practice are overlapping to a large extent in the case of the managers because an important part of their practice involves the decision-making. The evidence from behavioral sciences is useful whenever there are behavioral elements involved in this activity.

The scientific products that can be used in decision-making

Generally, primary research uses the directly collected data by the researcher from the research participants. Also, analysis and interpretation of raw data collected by another researcher is a form of primary research.

Secondary research or desk research involves summarizing, collation and/or synthesis of the indirectly achieved results, of primary research already carried out.

From a practical standpoint is first recommended the carrying out of the secondary research to identify and evaluate the primary research conducted on a topic of interest. If there is insufficient primary research on that topic, the findings are unclear or cannot be transferred to the particular topic of interest it is necessary to carry out a primary research.

Primary research

Van Bavel et al. (2013) identified four types of primary behavioral studies. These are shown in the following table.

Table 1. The four types of primary behavioral studies and some of their characteristics (adapted from Van Bavel et al., 2013, p.18)

Types of primary research	Pros	Cons	Minimum time required
Experiments	- can establish the causality (not just correlation) - can provide statistically significant results using relatively small samples - the essential findings can be applied in other contexts	- the samples' representativeness for a population cannot be ensured - the laboratory is an unrealistic and artificial setting	6 months
Randomized	- can establish the causality	- very expensive to run	12 months

controlled trials	(not just the correlation) - allow for observations in natural settings	at the level of a vast territory (and to replicate for the results validation) - the findings from one location are not generalizable to another	
Surveys	- the representativeness for a large population is feasible - relatively cost-efficient	- the respondents' answers to the questions are limited by default options - the respondents' answers may not be sincere - collect only the data on the self-reported behavior - it cannot establish the causality, just the correlation	4 months
Qualitative research	- provides richer and more nuanced data about behavior - often takes place in realistic settings - the participants are free to express themselves, with limited intervention of the researcher	- generally, the collected data are not representative for the larger population - usually have small samples due to financial and time costs involved	4 months

The elements based on which the decision on the type of study useful for the policy initiatives is made, presented by the authors mentioned above, are: the issue to be studied, the time available for study, and the degree to which findings on a non-representative sample can be generalized to the entire population.

Secondary research

The systematic review is a review of the literature that focuses on a research question and attempts to identify, evaluate, select and synthesize all high quality primary research evidence relevant to the respective question. The meta-analysis is the result of applying a systematic approach that takes data from several primary empirical researches and integrates them using the statistical analysis.

The resources for HR practitioners provided in collaboration by the professional organizations SIOP and SHRM are examples of resources designed to support the use in workplace daily practice of the knowledge from industrial-organizational psychology and from other disciplines that address human resources into management practices.

Center of Evidence-Based Management (CEBMa) is a nonprofit organization dedicated to the promotion of the evidence-based practice in the management practice. In order to improve evidence-based management decision-making, CEBMa developed a freely accessible online database with evidence summaries that includes systematic reviews, meta-analyzes, rapid evidence assessments and critically appraised topics.

Rousseau (2012b) argues that the principles are the primary knowledge products of the organizational behavior research, which contributes to guide the evidence-informed practice for the organizing and managing of work. These are results of the secondary research. According to the author aforementioned principles: "represent general truths about the way the world works"(p.203); are obtained based on the massive amount of data accumulated and integrated; every principle summarizes a "regularity manifest in organizations and on the part of their members" (p.203); most are forms of declarative knowledge (what is) and less are forms of procedural knowledge (how to do). Rousseau (2012b, pp.204-209) summarizes some of these principles to illustrate the relevance of organizational behavior science to evidence-based management practice in three fields: decision-making ("human decision makers are limited in the amount of information they can pay attention to at one time and in their capacity to think about and process information fully; having too much choice tends to keep people from making any decision at all; develop and use a few standard but adaptable procedures or tools to improve the success of organizational decisions"); hiring talents ("unstructured interviews are poor predictors of job performance; structured interviews using well-designed job-related questions can be good predictors of job performance; general mental ability is the single best predictor of individual productivity and other job performance indicators; hiring people who are conscientious and emotionally stable is typically a better decision than hiring agreeable people who try to get along with others"); motivating people ("setting specific, challenging goals improves performance as high as .90; accurate feedback generally increases both performance and learning; performance feedback aids learning when given intermittently rather than constantly, to allow learners to reflect on their learning; money does motivate people under certain conditions, in particular, pay for

performance can increase the particular type of performance targeted if money is important to the performer; incentive pay increases individual performance in tasks that are not cognitively challenging; pay for individual performance doesn't work very well when employees have a lot to learn before performing at a desired level or when employees are highly interdependent; offering rewards that create a compelling future, such as development opportunities, engender greater commitment to the organization than short-term rewards; job satisfaction is an important predictor of life satisfaction in general and mental challenge is a key cause of job satisfaction; managers need to cultivate power or influence beyond the authority that comes with their position; top managers who set a vision for their organization typically outperform executives who don't").

The conclusions drawn after analyzing the secondary research with respect to a research question must afterwards be analyzed in terms of external validity, the transferability of the research results to the particular situation of interest for manager.

Elements and demarches for the use of scientific evidence in organizational decision-making process

Crime and Justice Institute from the USA (2009) points out that the effective transition to the evidence-based supervision and service provision require significant organizational change and development processes that involve: the acquisition of new knowledge and skills, the adjustment of the organization's infrastructure to support new ways to do the activities, the rethinking of the organization mission and values and the transformation of the organizational culture.

The mission, the vision and the values of the organization that facilitates the evidence-based decision-making

Oster (2011) clearly addresses the issues related to the mission, the vision and the values of the organization that facilitates the evidence-based practice in the healthcare. These considerations can be easily adapted to other fields of the evidence-based approach use.

A mission statement of an organization is a statement of its core purpose, its reason for being, that has a stable character over time. To establish a culture of evidence-based practice the organization leaders' involvement is needed in the development of the mission statement (Oster, 2011). Oster (2011) believes that the organization's mission statement must address the

following issues: the lifelong learning necessary for the evidence-based practice and the spirit of inquiry among the staff; the work environment that demands and supports the staff's accountability for the practice and for the decision-making; the goal to improve the service outcomes through the evidence-based decision-making.

The organization's vision statement defines its desired future state in terms of its fundamental objectives (Oster, 2011). A vision statement for the evidence-based practice may include the increase of the staff's ability to provide evidence-based services, the increase of the staff's involvement in research or the facilitation of the research within organization (idem).

The values represent the principles for the behavior in organization shared by the personnel, which guides the behavior of the organization members. The values that characterize an evidence-based organizational culture may include respect, integrity and excellence (idem).

The organizational culture that facilitates the evidence-based decision making

The organizational culture comprises patterns of beliefs, values and practices, which are differentiated among them inclusively through criteria as the degrees of coherence, sharing, centrality and stability (Potworowski & Green, 2012).

The organizational culture that facilitates the evidence-based decision-making is a prerequisite for its effective implementation. Potworowski and Green (2012) argue that evidence-based management is itself a pattern of core and peripheral beliefs, values and practices. The two authors describe the three components of that pattern as follows:
- the core practice of this type of management is the decisions-making, "which consists broadly of the acquisition, interpretation, and implementation of evidence into practice" (p.631);
- the core values of the evidence-based management consist of "enacting three principles of justification: effectiveness, reliability and transparency" (p.631);
- the core beliefs of this type of management are made up by how the above values are best enacted. Evidence-based management is based on the belief that "the four own sources of information (the expertise and the judgment of the practitioner, the evidence related to the local context, the critical evaluation of the best available research evidence and the perspectives of persons who may be affected by the decision) are essential for the process,

as well as on more specific beliefs about the value, strengths, and weaknesses of each source" (p.631). Also, this type of management is based on the belief "that the integrity of the process requires that it be conducted conscientiously, judiciously, and explicitly" (p.631).

The knowledge of the elements involved in the evidence-based approach

Rousseau and Barends (2011, pp.222-223) argue that the evidence-based human resource management "means making decisions, promoting practices and advising the organization's leadership through the conscientious combination of four sources of information":
- the best available evidence (that are, in general, the scientific research findings published, peer-reviewed, and that are characterized by the highest levels of validity and reliability);
- the organizational facts, metrics and assessments which are reliable and valid (the consideration of the situation facts in order to identify the research findings likely to be useful);
- the reflection and the judgment of the practitioner ("careful analysis of the situation based on critical thinking, supported by a decision framework that calls attention to assumptions, known facts and goals, can lead to more accurate assessment of the problem and interpretation of facts", p.225);
- the ethical evaluation of the decisions impact on affected stakeholders (to reduce the unintended consequences on them).

The above considerations also are applicable on the evidence-based approach as a whole.

Elements related to the development of the skill to evaluate the scientific evidence

The scientific research as evidence producer

The science is an organized body of knowledge that uses the scientific method for their production. The scientific method is a method through which are developed and tested theories about how are related the observable facts and events. Scientific knowledge is "based on controlled observations, large samples sizes (N), validated measures, statistical controls and systematically tested and accumulated understandings of how the world works (i.e., theory)" (Rousseau, 2012c, p.24).

The scientific method has a number of strengths, such as objectivity, possibility of control and possibility of replication. Another strong point of the scientific method consists of the fact that there is a widely accepted set

of rules for assessing the level of certainty about the correctness of the conclusions from a research (Sherman et al., 1998).

Also, the scientific method has a number of limitations, including those Sherman et al. (1998) specifies:
- the provisional nature of the scientific knowledge – the scientific knowledge becomes continually more refined and therefore no conclusion is permanent.
- the generalizations are uncertain – the science has relatively clear rules about how to test cause-effect relationships in a particular study, a concept known as internal validity. The rules are much less clear, especially in the social sciences regarding the degree of the findings' generalization (to other people, locations and moments in time), a concept known as external validity. The tests that have a reasonable level of internal validity provide some evidence for the external validity, but the external validity testing involves continuous testing, namely the replication.

Other potential problems of the scientific research are: the information overload (a very large number of research on some specific topics), the researchers' subjectivity (determined by cultural or affective factors), the conflict of interest on the level of researchers and/or funders (that occurs when there is interest to achieve specific research outcomes) and the limited knowledge of the practical issues from the topics addressed of the academics who carrying out most of the published research.

The quality/strength evaluation of the scientific evidence

The evaluation of scientific evidence implies the evaluation of its quality/strength and evaluation of its relevance regarding the specific decision's objectives. The most of the literature addressed the evaluation of research evidence quality/strength. Regarding relevance of evidence it is firstly important the consideration of the two sources of information identified by Rousseau and Barends (2011): the context of the decision problem, which implies careful analysis of the situation, and the organizational facts, metrics and assessments.

Rousseau (2012b) distinguishes between two types of scientific evidence in the organizational behavior field: science-oriented evidence and practice-oriented evidence. Criteria for the evaluation of the science-oriented evidence are more articulated than the criteria for the evaluation of the practice-oriented research (Rousseau, 2012b).

Science-oriented research aims interpretation and understanding (idem). In the field of organizational behavior these objectives are achieved by appealing to a large body of studies when assessing the validity of a particular finding's validity, because no single study is enough to establish a scientific fact (idem). In this case the general standard for evaluating any claims regarding evidence is the secondary research. In conducting a systematic review of science-oriented studies, the indicators of evidence quality evaluated, according to that Rousseau (2012b, pp.195-197), are: "construct validity: is the purported phenomenon real?; internal validity: do the observed effects or relationships indicate causality?; external validity: how widespread is the effect? why does it hold sometimes and not others?"

Practice-oriented research aims "to identify what works (or doesn't) in real-life settings and learn which circumstances affect how those practices work" (Rousseau, 2012b, p.198). Both scholars and practitioners conduct practice-oriented research, which is geared towards the particular problems and settings of interest for practitioners (idem). In this type of study scholars study "how practitioners approach the decisions they make and actions they take" (p.198), and practitioners study the impact of an organization policy or program, often in the form of pilot testing or evaluation studies (idem). Rousseau (2012b, pp.199-202) presents the following key criteria for evaluating practice-oriented evidence: "Detailed analysis: What are the conditions of practice?; Real-world applicability: Are the outcome variables relevant to practice?; Effect size: How strong is the effect or relationship?".

The quality/strength evaluation of the primary research evidence

The evaluation of the experimental or quasi-experimental research can be done according to the criteria proposed by Cook and Campbell (1979) in the following areas: internal validity, construct validity, external validity and statistical validity. Sherman and collaborators have developed the Maryland scientific methods scale in 1997 to summarize the criteria proposed by Cook and Campbell (1979). Using this scale can be evaluated the internal validity of any study regarding the evaluation of the crime prevention interventions on a scale from 1 (worst) to 5 (strongest).

Kmet, Lee, and Cook (2004) developed a checklist for assessing the quality of the quantitative studies with 14 criteria and a checklist for assessing the qualitative studies with 10 criteria.

Squires et al. (2013) present a protocol for advanced psychometric assessment of surveys based on standards for educational and

psychological testing that addresses the data mapping, the acceptability, the reliability and the validity.

The quality/strength evaluation of the secondary research

PRISMA is one of the models for the assessment of secondary research, proposed in medicine field by an international group in 2009. It focuses on the ways in which the authors can ensure the transparent and complete reporting of the systematic reviews and of the meta-analyzes and requires the verification of 27 items related to title, abstract, methods, results, discussion and funding.

The integration of scientific evidence

The professionals who integrated the science in their work continuously ask: "What is the strength of evidence to support that (policy/approach/decision)?" (Thigpen, Beauclair, Keiser, & Banks, 2011). There were several attempts to integrate the evidence related to certain topics. Some of these are summarized below.

Sherman and Gottfredson (1997) classified the crime prevention programs based on effectiveness in four categories: works, doesn't work, promising and unknown. The methodological rigor was one main criterion used for the development of this classification and was judged on seven dimensions: the sample's size, the existence of the comparison group(s), the use of control variables to account for initial group differences, the measurement of variables, the control of the attrition effects, the post-treatment measurement period and the use of statistical significance tests.

Bogue et al. (2004) identified a gradient of support by the available research findings for each principle associated with reduced recidivism with five values (gold, silver, bronze, iron, dirt), that were established on the basis of quality, extensiveness and/or methodology of the studies (Thigpen et al., 2011).

Research standards proposed by the National Institute of Corrections from the USA (2010) places the various practices from the field of correctional intervention in one of four categories (what works, what doesn't work, what's promising, what's not clear) on the basis of three criteria: methodology, replication and sample size (idem).

Evidence-based policing matrix, developed by Lum, Koper, and Telep (2010), is a tool that evaluates the effectiveness of the policing strategies in terms of the available scientific evidence. It classifies all experimental and quasi-experimental research on policing and reducing crime characterized by at least a moderate level of methodological rigor according to three criteria (nature of the target, whether the strategy is proactive or reactive, specificity or generality of the strategy).

Elements related to the development of the decision-makers' critical thinking skills

The critical thinking, that has active skepticism as a defining feature, is a key competence for the evidence-based approach. It is the tool that initiates the applied research and by means of which the practical implications of the scientific evidence are evaluated. Also, through the critical thinking can be evaluated the thinking process as well as its conclusion. It is a tool for improving the decision-makers' thinking process because it allows the identification and the neutralization of the elements that can distort the rational decision-making process, like logical fallacies, cognitive biases and heuristics.

An argument is a collection of statements, one of which is the conclusion and others are the premises. Logical fallacies are common errors in reasoning that undermine the logic of an argument or explanation. Maxim et al. (2013) presents several typical logical fallacies that may appear in arguments formulation: the appeal to authority (the grounding of an argument on credibility of source that formulates it), personal or ad hominem arguments (the discrediting of an argument by attacking the person who formulates it), irrelevant information or other techniques used to distract from the argument (red herrings), the sufficient issues to address a problem but not necessarily solutions (pink herrings), the circular arguments (of the type A causes B because B is the result of A), the appeal to popularity and the appeal to the natural character.

In the arguments which conclude that one thing causes another can appear causal fallacies, like: post hoc (because one thing follows another, it is held to cause the other); the joint effect (a purported cause and effect are both the effects of a joint cause); the insignificant cause (the purported cause is insignificant compared to others); the wrong direction (the direction between cause and effect is reversed); the complex cause (the cause identified is only part of the entire cause) (Downes, 1995). Maxim et al. (2013) addresses the false belief that the association (correlation) between elements or phenomena would imply the causal relationship between them.

They presents the terms of Hume for the existence of a causal relationship: the cause and the effect must be related; the cause must appear before the effect; there is not a third factor that determines the appearance of cause and effect.

An explanation is a form of reasoning which attempts to answer the question "why?" (Downes, 1996). Fallacies that occur in explanations are: the subverted support (the phenomenon being explained doesn't exist), non-support (evidence for the phenomenon being explained is biased), untestability (the theory which explains cannot be tested), limited scope (the theory which explains can only explain one thing), limited depth (the theory which explains does not appeal to underlying causes) (idem). Maxim et al. (2013) argue that to prove a hypothesis or a theory as correct it is not enough to gather the sufficient evidence. To prove a theory an explanation consistent with at least the bulk of the available evidence (stage of research called justification) needs to be found. Then secondary tests must be performed to see if the explanation is supported (stage of research called falsification) (Maxim et al., 2013).

Kahneman and Tversky proposed in early 1970s the concept of cognitive bias. This is a "systematic error in judgment and decision-making common to all human beings which can be due to cognitive limitations, motivational factors, and/or adaptations to natural environments" (Wilke & Mata, 2012, p.531). Kahneman, Lovallo, and Sibony (2011) argue that it is almost impossible that a person identifies cognitive biases in his/her own thinking. Among the cognitive biases which can appear in decision-making process: the confirmation bias, the anchoring bias, the availability bias, the overconfidence bias, the optimistic bias, the saliency bias, the self-interested biases**,** the conformity bias. A related concept with cognitive bias is heuristics, "judgment or decision-making mechanism or cognitive shortcut that relies on little information and modest cognitive resources" (Wilke & Mata, 2012, p.531). An example of heuristic that often disrupt decision-making process is the affect heuristic (the influence of the current emotion on the decision).

Kahneman (2011) distinguishes between two ways of thinking: system 1 - intuitive, fast, automated, performed without or with little effort, stereotyped, emotional, subconscious, commonly used; system 2 - slow, voluntary, involving effort, more logical, conscious, more rarely used. Both the bias and the heuristic are more prone to occur in the system 1of thinking than in the system 2 of thinking.

Kahneman et al. (2011) argue the need to implement quality control for the important and recurring decisions due to the extremely low possibility of a person of getting aware about the biases that arise in his thinking process. They believe that, generally, a person's cognitive biases can only be identified by others. Considering the previous mentioned issue, Kahneman et al. (2011) developed a checklist for the identification of cognitive biases that occur in the team decision-making. It contains 12 questions grouped into three categories: "questions the decision makers should ask themselves, questions they should use to challenge the people proposing a course of action, and questions aimed at evaluating the proposal."

The training of the researchers to write research briefs for use in the decision-making process

Decision makers rarely have a sound scientific background. They also have a limited time available for the decision-making. Therefore, it is very important to facilitate their task to evaluate the available scientific evidence, which can be performed including by the way of evidence presentation.

Directorate General for Research of European Commission - Socio-economic sciences and humanities (2010) developed a model for the presentation format of research evidence that can be used in the development of EU policies – policy brief, that includes five parts (introduction, evidence and analysis, policy implications and recommendations, research parameters, project identity). It must provide policy relevant findings in the most convincing possible terms, without overestimating or underestimating their importance. To ensure the relevance of research findings to a particular policy is emphasized the need that the persons involved in the research project to be familiar with the targeted policy issue and to keep it continuously in focus. The development of skills to edit such briefs is very important to facilitate decision-making process and to convince decision-makers regarding the research findings usefulness.

An outline procedure for the use of behavioral sciences products in the decision-making process

Among the useful tools to support decision-making processes in organizations are those proposed by Kahneman et al. (2011) and Yates and Potworowski (2012). The cardinal decision issue perspective of Yates and Potworowski (2012) can be applied in the most decision-making processes that have a significant impact on an organization. The instrument proposed by the two authors assumes that the "decision successes and failures can be

traced to particulars of how and how effectively the decision maker resolved one or more of the cardinal decision issues" (p.747). Yates and Potworowski (2012, p.770) argue that cardinal issue 6 (judgment) "is at the core of most calls for evidence-based practice of all kinds" and points out that to support this position advocates of evidence-based management practice presents many situations in which managers routinely take actions based on judgments about the effectiveness at odds with scientific data. Judgment definition adopted by the aforementioned authors is "an opinion as to what was, is, or will be some decision-significant state of the world" (p.726), of Yates and Chen (2009).

The rational decision-making model have the next steps: identifying a problem or opportunity, gathering the information, analyzing the situation, developing the options, evaluating the alternatives, selecting a preferred alternative, and acting on the decision. The evidence is extremely useful in evaluating the alternatives step.

To design an algorithm for use of behavioral science evidence in decision-making in any context, both in important managerial decisions case and in the case of other decisions such as those involved in developing strategies and policies, it is useful to focus only on the common issues of the two cases. Based on all aspects presented in this paper it has been designed a specific outline procedure for this purpose. The steps of this procedure are the next:
1. The identification of decision's objectives.
2. The determination of behavioral elements related to decision. If these do not exist, it is not necessary to conduct behavioral research, and the procedure will be continued from step 12.
3. The estimation of the added value that behavioral science evidence can bring in the specific decision-making process. If it is significant then is passed to the next step, if not the procedure will be continued from step 12.
4. The precise definition of the research objectives and of the research questions.
5. The review of primary behavioral scientific evidence - secondary research carrying out (involve the strength/quality assessment of the available scientific evidence and the integration of evidence in relation to the specific decision objectives). If the scientific evidence review is exhaustive, provides the necessary and sufficient elements to the decision-making process and the evidence is transferable to achieve the decision objectives then it is not necessary to carry out a primary behavioral research and the procedure will be continued from step 9. If the review of existing scientific evidence is not exhaustive and does not provide the

elements previously mentioned, the primary behavioral research will be carried out and will be taken all the steps that follow.
6. The choosing of the suited primary research type.
7. The developing of research methodology.
8. The carrying out of the primary research.
9. The writing and the presentation of research findings in a format useful to decision-makers (the writing and the presentation of a research brief).
10. The use of research findings in the decision-making process if the decision-makers appreciate that they are valid, reliable and relevant to the decision objectives (help them to choose a decision alternative). The reasons for using or not of these findings in the decision-making process and how are specified.
11. The provisional decision-making (choosing a provisional decision alternative).
12. The quality control of the decision-making process.
13. The final decision-making (choosing final decision alternative).
14. The implementation of the decision.
15. The assessment of results achieved through the implementation of the decision.

Difficulties associated with the implementation and functioning of evidence-based approach in organizations

Based on the results of a survey conducted on a sample of nurses by Melnick et al. in 2012, Wallis (2012) reveals that the most frequently cited barriers to evidence-based practice are the lack of time and the organizational culture, whose essence is captured by the phrase "that's the way we've always done it here". To sustain the evidence-based practice “a context and a support system under which EBP efforts can be sustained” are required (Wallis, 2012, p.15). The nurse leaders need to realize the fact that change takes time, so “a one- or two-day workshop isn't likely to cause sustainable change”, and place enough EBP mentors “at the bedside who can work hand in hand with clinicians to help them learn these (required) skills and implement them consistently” (idem, p.15).

Also, the functioning itself of evidence-based practice involves specific difficulties. Thigpen et al. (2011) consider that to be evidence-based is easier said than done because:
- to be aware of the emergence of new studies can be challenging, because currently there is no single source to which professionals can turn to learn the results of new research.
- new research once identified, its understanding, the assessment of its empirical power and the knowledge of the extent to which support or

contradict previous research findings and bring new knowledge in the field can be difficult, particularly for those who do not have research staff.
- the implementation of new learned aspects in policies or practices can also be difficult.
- to collect data and information to determine if the expected results appeared within is necessary to allocate substantial human and financial resources.

Barends et al. (2014, pp.12-14) list the common misconceptions about the evidence-based management that constitutes a major barrier in its uptake and implementation: "evidence-based practice ignores the practitioner's professional experience; evidence-based practice is all about numbers and statistics; managers need to make decisions quickly and don't have time for evidence-based practice; each organization is unique, so the usefulness of scientific evidence is limited; if you do not have high-quality evidence, you cannot do anything; good-quality evidence gives you the answer to the problem". Barends et al. (2014, p.12) argue that "in most cases they reflect a narrow or limited understanding of the principles of evidence-based practice".

The knowledge and the skills training like those addressed in this paper, and the systematization and the standardization of the decision-making by using a procedure help to overcome many of the difficulties related to the functioning of evidence-based approach.

Conclusions

This paper had as general objective to prepare and facilitate the implementation of the behavioral sciences evidence-based decision-making. The human behavior is the main focus of an important part of management, human resource management, and an important element that must be taken into account in the design, the implementation, the monitoring and the improvement of various policies and organizational strategies, the internal normative acts, the procedures, and in the important decisions-making. Its rationality assumption has led to many failures at their level.

The organizational fields in which the behavioral sciences evidence can be used suggest the importance of the behavioral evidence use in organizations. The existence of different types of behavioral sciences' products increases their possibility to be applied in a wide array of organizational decision problems. The elements and the demarches to use

scientific evidence during organizational decision-making process addressed in this paper were: the organization's mission, vision and values that facilitates the evidence-based approach, the organizational culture that facilitates this approach, elements related to the development of the skill to evaluate the scientific evidence, elements related to the development of the critical thinking skills of the decision-makers, the training of the researchers to write research briefs for use in the decision-making process, difficulties associated with the implementation and functioning of evidence-based approach in organizations. It was proposed an outline procedure for the use of behavioral sciences' evidence in the organizational decision-making process that contribute to the implementation of the principle of Larrik (2009, as cited in Rousseau, 2012b, p.205), "develop and use a few standard but adaptable procedures or tools to improve the success of organizational decisions", which Rousseau (2012b) considers one of the principles provided by the organizational behavior science relevant to the practice of evidence-based management.

This paper proposes new insights into the current state of research regarding the use of the behavioral sciences in the organizational decision-making and promotes the integration of the concepts and knowledge from the evidence-based approach and from the use of behavioral and social sciences research in decision-making approach which have developed separately, as bringing together and synthesis of the two approaches knowledge, concepts and contributions can multiply practical value of the behavioral and social sciences use in the organizational decision-making processes. Also, it sheds light on the elements and steps needed for implementing and functioning in practice of this integrative approach.

The practical objectives of this paper were to provide the knowledge, the concepts and the guidelines for practical tools to fully use the behavioral sciences' evidence in the organizational decision-making process.

One possible limitation of this paper is that it is based only on literature review not on systematic literature review, but this is often done on empirical research. Another limitation, from a practical standpoint, is that the outline procedure proposed has not been pilot tested, but it was not one of the objectives of this paper and must be the topic of another research because of its complexity and practical importance. This is actually an implication for a future research.

References

Allen, D.G., Bryant, P.C., and Vardaman, J.M. (2010). Retaining Talent: Replacing misconceptions with evidence-based strategies. *Academy of Management Perspectives*, 24(2), 48-64.

Barends, E., Rousseau, D.M., and Briner, R.B. (2014). *Evidence-based management. The basic principles*. Amsterdam: Centre for Evidence-Based Management. Retrieved from http://www.cebma.org/wp-content/uploads/Evidence-Based-Practice-The-Basic-Principles.pdf.

The Behavioural Insights Team (n.d.). *What are behavioural insights?*. Retrieved from http://www.behaviouralinsights.co.uk/about-us.

Crime and Justice Institute at Community Resources for Justice (2009). *Implementing Evidence-Based Policy and Practice in Community Corrections* (2nd ed.). Washington, DC: National Institute of Corrections.

Directorate General for Research of European Comission - Socio-economic Sciences and Humanities (2010). *Communicating research for evidence-based Policymaking - A practical guide for researchers in socio-economic sciences and humanities*. Retrieved from http://ec.europa.eu/research/social-sciences/pdf/guide-communicating-research_en.pdf.

Dolan, P., Hallsworth, M., Halpern, D., King, D., and Vlaev, I. (2010). *MINDSPACE: Influencing behaviour through public policy*. London: Institute for Government and Cabinet Office.

Downes, S. (1995). *Causal fallacies*. Retrieved from http://onegoodmove.org/fallacy/causal.htm.

Downes, S. (1996). *Fallacies of explanation*. Retrieved from http://onegoodmove.org/fallacy/explan_index.htm.

Dror, Y. (1969). *A general systems approach to uses of behavioral sciences for better policymaking*. Retrieved from http://www.rand.org/content/dam/rand/pubs/papers/2008/P4156.pdf.

Kahneman, D. (2011). *Thinking, Fast and Slow*. New York: Farrar, Strauss, Giroux.

Kahneman, D., Lovallo, D., and Sibony, O (2011). The Big Idea: Before You Make That Big Decision. *Harvard Business Review*, 89(6), 50-60.

Kmet, L.M., Lee, R.C., and Cook, L. (2004). *Standard quality assessment criteria for evaluating primary research papers from a variety of fields.* Alberta: Alberta Heritage Foundation for Medical Research.

Lum, C., Koper, C.S., and Telep, C.W. (2010). Evidence-Based Policing Matrix. *Journal of Experimental Criminology*, 7(1), 3-26.

Madhavan, R., and Mahoney, J. T. (2011). *Evidence–Based Management in "Macro" Areas: The Case of Strategic Management*. Retrieved from http://www.business.illinois. edu /Working_Papers/papers/11–0105.pdf.

Maxim, P.S., Garis, L., and Plecass, D. (2013). *The right decision. Evidence-based decision making for fire service professionals*. Retrieved from http://www.surrey.ca/files/therightdecision.pdf.

Prewitt, K., Schwandt, T.A., and Straf, M.L. (2012). *Using Science as Evidence in Public Policy*. Washington, DC: The National Academies Press.

Oster, C.A. (2011). Guiding principles for evidence-based practice. In J. Houser and K. Oman (Eds.), *Evidence based practice: An implementation guide for healthcare organizations* (pp.83-109). Sudbury, MA: Jones and Bartlett.

Pfeffer, J., and Sutton, R.I. (2006). Evidence based-management. *Harvard Business Review*, 84(1), 62-74.

Potworowski, G., and Green, L.A. (2012). Culture and evidence-based management. In D.M. Rousseau (Ed.). *Handbook of evidence-based management: Companies, classrooms, and research* (pp.272–292). New York: Oxford University Press.

Prewitt, K., and Hauser, R. (2013). Applying the Social and Behavioral Sciences to Policy and Practice. *Issues in Science and Technology*, 29(3), 53-57.

Rousseau, D.M. (2012a). *The Oxford handbook of evidence–based management*. Oxford: Oxford University Press.

Rousseau, D.M. (2012b). Organizational Behavior's Contributions to Evidence-Based Management. In D.M. Rousseau (Ed.). *The Oxford handbook of evidence–based management* (pp.185-240). Oxford: Oxford University Press.

Rousseau, D.M. (2012c). Envisioning Evidence-Based Management. In D.M. Rousseau (Ed.). *The Oxford handbook of evidence–based management* (pp.185-240). Oxford: Oxford University Press.

Rousseau, D.M., and Mccarthy, S. (2007). Educating Managers from an Evidence-Based Perspective. *Academy of Management Learning & Education*, 6(1), 84–101.

Rousseau, D.M. (2006). Is there such a thing as "evidence based management"?**.** *Academy of Management Review*, 31(2), 256–269.

Rousseau, D.M., and Barends, E. (2011). Becoming an evidence-based HR practitioner. *Human Resource Management Journal*, 21(3), 221–235.

Rynes, S.L., Brown, K.G., and Colbert, A.E. (2002). Seven common misconceptions about human resources practices: Research findings versus practitioner beliefs*. Academy of Management Executive*, 16(3), 92–102.

Sherman, L.W., and Gottfredson, D. (1997). Appendix: research methods. In L.W. Sherman, D.C., Gottfredson, D.L., MacKenzie, J., Eck, P., Reuter, and S.D., Bushway (Eds.), *Preventing Crime: What Works, What Doesn't, What's Promising*. Retrieved from https://www.ncjrs.gov/works/appendix.htm.

Segone, M. (2008). Evidence-based policy making and the role of monitoring and evaluation within the new aid environment. In M. Segone (Ed.). *Bridging the gap - The role of monitoring and evaluation in evidence-based policy making*. Retrieved from http://www.unicef.org/ceecis/evidence_based_policy_making.pdf.

Sherman, L.W., Gottfredson, D.C., MacKenzie, D.L., Eck, J., Reuter, P., and Bushway, S.D. (1998). *Preventing Crime: What Works, What Doesn't, What's Promising*. Retrieved from https://www.ncjrs.gov/pdffiles/171676.PDF.

Squires, J.E., Hayduk, L., Hutchinson, A.H., Cranley, L.A., Gierl, M., Cummings, G.G. et al. (2013). *A Protocol for Advanced Psychometric Assessment of Surveys. Nursing Research and Practice*, 2013. Retrieved from http://www.hindawi.com/journals/nrp/2013/156782/.

Terpstra, E., and Limpaphayom, W. (2012). Using evidence-based human resource practices for global competitiveness. *International Journal of Business and Management,* 7(12), 107-113.

Thigpen, M.L., Beauclair, T.J., Keiser, G.M., and Banks, C. (2011). *Evidence-Based Policy, Practice, and Decision-making. Implications for Paroling Authorities*. Retrieved from https://s3.amazonaws.com/static.nicic.gov/Library/024198.pdf.

Van Bavel, R., Herrmann, B., Esposito, G., and Proestakis, A. (2013). *Applying Behavioural Sciences to EU Policy-making*. Luxembourg: Publications Office of the European Union.

Yates, J.F., and Potworowski, G.A. (2012). Evidence-Based Decision Management. In D.M. Rousseau (Ed.). *The Oxford handbook of evidence–based management* (pp.716-790). Oxford: Oxford University Press.

Wallis, L. (2012). Barriers to implementing evidence-based practice remain high for U.S. nurses: getting past "we've always done it this way" is crucial. *American Journal of Nursing*, 112(12), 15.

Wilke, A., and Mata, R. (2012). Cognitive bias. In V.S. Ramachandran (Ed.), *Encyclopedia of human behavior*: *Vol. 1. A-D* (2nd ed.) (pp.531-535). London: Academic Press.

View publication stats