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Evidence-based management in practice: measuring the use of four core sources of evidence

Frank Bezzina and Vincent Cassar
Department of Business and Enterprise Management, University of Malta, Msida, Malta, and

Denise M. Rousseau
Heinz College and Tepper School of Business, Carnegie Mellon University, Pittsburgh, Pennsylvania, USA

Abstract

Purpose – This purpose of this empirical study is to develop and validate the Evidence-Based Management Source Utilisation Scale (EBM-SUS), a measure that captures the extent to which decision-makers draw on four core sources of evidence – scientific research, organisational data, professional expertise and stakeholder influence. The scale reflects both the use of individual sources (first-order factors) and an aggregated measure of overall utilisation (higher-order factor).

Design/methodology/approach – Two studies were conducted with leaders from the Maltese public service (voluntary participation). Study 1 ($n = 202$) used exploratory factor analysis to uncover the scales' underlying factor structure. Study 2 ($n = 227$) used confirmatory factor analysis (CFA) to validate the measurement model and to examine relationships with two theoretically related constructs: risk aversion and conscientious decision-making.

Findings – The EBM-SUS measures demonstrated robust psychometric properties. All items loaded as expected on their respective constructs, and the higher-order factor effectively captured the shared variance among the four sources, supporting convergent and discriminant validity. Concurrent validity was also established through significant associations with conscientious decision-making and risk aversion, aligning with theoretical expectations in the EBM literature.

Originality/value – This study introduces a validated instrument for assessing the utilisation of four core sources of evidence in decision-making. It enables future research on evidence use by decision-makers, opening up research on evidence-based decision-making and deepening inquiry into decision-making practices in organisational contexts.

Keywords Evidence-based practice, Scale development, Psychometric testing, Risk aversion, Conscientious decision-making, Public administration

Paper type Research paper

Introduction

Although research has advanced the understanding and highlighted the importance of evidence-based management (hereafter EBM) (Rousseau, 2020), few studies have examined the utilisation of evidence sources in decision-making. Existing measures offer only partial

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insights. For instance, Jepsen and Rousseau (2022) developed a scale that captures subordinates' perceptions of their managers' use of evidence in decision-making, while Guo *et al.* (2017) examined the self-reported frequency of source use among healthcare administrators. Other studies have focused narrowly, such as the perceived actionability of research findings (HakemZadeh and Baba, 2016) or the influence of cognitive reflection on evidence use (Criado-Perez *et al.*, 2023). These efforts often concentrate on research evidence alone or general attitudes, rather than capturing the practical use of multiple evidence sources in decision-making. To advance research and practice, refined, source-specific measures are needed (Barends *et al.*, 2014).

EBM is increasingly recognised as vital in organisational management, where it enhances decision-making by integrating four foundational sources of evidence: scientific research, organisational data, professional expertise and stakeholder influence (Briner *et al.*, 2009). Each source contributes uniquely: scientific research provides rigour (Barends and Rousseau, 2018), organisational data ensures contextual relevance (Barends *et al.*, 2014), professional expertise ensures professional and situational insights (Sackett *et al.*, 1996) and stakeholder influence promotes legitimacy and acceptance of decisions (Nutley *et al.*, 2007). Despite their centrality to EBM and organisational management, no validated scale exists in management research that captures the extent of use of all four sources. Most existing EBM measures, particularly those developed in healthcare (e.g. Dusin *et al.*, 2023), prioritise clinical evidence and are not easily transferable to broader organisational management settings.

Our approach addresses this gap. Assessing the extent to which managers draw on each source and collectively can improve transparency, accountability and effectiveness (Pfeffer and Sutton, 2006; Rousseau, 2020). It also supports better alignment of decisions with strategic goals and promotes a culture of continuous learning in complex organisational environments (Briner *et al.*, 2009; Cascio and Boudreau, 2016). By capturing source-specific and overall utilisation, this approach sheds light on how EBM operates across contexts (Martelli and Hayirli, 2018) and how it shapes conscientious decision-making while reducing risks tied to fragmented information (Rousseau, 2020).

This study develops and validates a new EBM Source Utilisation Scale (EBM-SUS) tailored to management. It measures the extent to which managers draw on each of the four EBM sources, both individually and collectively in their decision-making. After testing its factor structure and construct validity, the study examines concurrent validity through relationships with theoretically linked constructs, namely, risk aversion and conscientious decision-making. The goal is to provide a rigorous measure for advancing empirical EBM research and support more evidence-informed organisational practices (Barends and Rousseau, 2018; Reay *et al.*, 2009).

Literature review

Conceptualising EBM

EBM is the practice of "making decisions through the conscientious, explicit, and judicious use of the best available evidence from multiple sources to increase the likelihood of a favourable outcome" (Briner *et al.*, 2009, p. 22). Introduced formally to the management field by Rousseau (2005), EBM has since further developed (Briner *et al.*, 2009; Rousseau and Barends, 2011; Rousseau and Gunia, 2015) to offer a more systematic and organised framework for integrating diverse sources of evidence in pursuit of better decision outcomes.

EBM draws on decision-making behaviour theories to provide more rigorous and practical ways to improve decision quality. Fundamentally, the EBM approach encourages critical thinking and aims to reduce reliance on intuition or biased reasoning by grounding

decisions in the best available evidence (Barends and Rousseau, 2018). This approach helps organisations anticipate challenges, minimise errors and manage risk more effectively, whilst promoting transparent and defensible decisions (Pfeffer and Sutton, 2006).

Yet, despite access to valuable sources of information, decision-makers often face barriers to evidence use, such as time pressure, insufficient skills or organisational norms favouring intuition over analysis (Barends *et al.*, 2017; Cassar *et al.*, 2025). Managers often tend to overlook relevant data (Law and MacDermid, 2008), relying instead on personal experience or assumptions "rather than on evidence-based knowledge or expertise acquired through evidence-grounded applications" (Bezzina *et al.*, 2017, p. 688). Such practices increase the likelihood of flawed assumptions and poor decisions (Kovner and Rundall, 2006; Meckler and Boal, 2020; Tommasi *et al.*, 2023).

Risk perceptions play a pivotal role in how decision problems are framed, which alternatives are considered, and how outcomes are evaluated. These perceptions are not purely rational but are shaped by affective and contextual cues, often leading to systematic biases in judgment under uncertainty (Slovic, 1987; Loewenstein *et al.*, 2001). Moreover, while risk perceptions influence decisions, reasoning styles also shape individual risk propensity (Baer *et al.*, 2021; Tommasi *et al.*, 2023; Williams and Noyes, 2007).

The four sources of evidence

Initially, EBM focused on integrating the best available scientific evidence into managerial decision-making (Rousseau and McCarthy, 2007). Scientific publications were regarded as the sole legitimate source of evidence in EBM, with debates around 'evidence quality' primarily focused on academic rigour (Reay *et al.*, 2009). Other potential sources were largely overlooked. Over time, however, the understanding of EBM broadened. Influenced by developments in evidence-based medicine (Rynes and Bartunek, 2017; Sackett *et al.*, 2000), Barends and Rousseau (2018) outlined four primary sources of evidence: scientific research, organisational data, professional expertise and stakeholder influence.

Scientific research refers to methodologically rigorous, generalisable findings derived from systematic studies. It includes peer-reviewed journal articles, systematic reviews and meta-analyses, academic books and book chapters, and credible research-based reports from governmental or policy institutions. Organisational data encompasses internal performance metrics, financial records, human resource data, customer insights, benchmarking comparisons and compliance reports. Professional expertise relies on the experiential judgement of practitioners and consultants. Finally, stakeholder influence, also termed stakeholder values and concerns, captures input from those affected by decisions, including employees, shareholders, suppliers and clients.

Each source of evidence contributes unique insights but also comes with limitations. Relying on a single source may lead to biased or incomplete decisions. Scientific research findings may lack contextual relevance, timeliness or suffer from replicability issues (Ioannidis, 2005; Paul, 2009). Organisational data can be flawed or misinterpreted (De Rosa and Carrera, 2024). Professional expertise may be biased by heuristics, misconceptions or shaped by idiosyncratic experiences (Martelli and Hayirli, 2018; Saunders and Bezzina, 2015; Tversky and Kahneman, 1974). Stakeholder input may reflect conflicting or short-term concerns (Cairney, 2016; Freeman, 1984).

Because no single source provides a complete picture, EBM calls for the combined use of multiple evidence sources. This reinforces the rationale for developing a robust EBM source utilisation measure that captures how decision-makers draw on the four domains in practice.

Establishing construct validity

To determine whether a scale meaningfully represents the construct it intends to measure, researchers assess construct validity – the extent to which an instrument captures the theoretical concept it is designed to measure (Brown, 2015). This involves confirming the factor structure (i.e. items cluster appropriately under their respective dimension) and evaluating convergent and discriminant validity. Convergent validity is supported when items within a dimension show strong correlations, while discriminant validity ensures that items representing different constructs remain distinct (Hair *et al.*, 2010). Establishing these properties is crucial to confirm the internal consistency and theoretical soundness of the EBM-SUS. Accordingly, the first research question guiding this study is:

RQ1. Do the four dimensions of the EBM-SUS demonstrate adequate construct validity?

Exploring the validity of an aggregated EBM source utilisation scale

The second objective of this study was to determine whether the four first-order EBM source utilisation factors could be represented by a single overarching (higher-order) construct. Such constructs capture the shared variance among related dimensions, enabling a more integrated understanding of complex phenomena (Brown, 2015; Sarstedt *et al.*, 2022). Higher-order constructs are especially valuable in increasingly complex models, benefiting both theory and practice. Advantages include reduced measurement complexity (Hair *et al.*, 2019), greater theoretical clarity through parsimony (Marsh *et al.*, 2007), improved model fit and stability by minimising multicollinearity (Chen *et al.*, 2005) and broader generalisability by capturing the shared essence of distinct dimensions (Marsh *et al.*, 2007). Establishing construct validity at the higher-order level confirms that the aggregated dimension meaningfully represents the combined influence of its components and accounts for their interrelationships.

Accordingly, the second research question of this study is:

RQ2. Does the aggregated dimension (higher-order factor) of the EBM-SUS demonstrate adequate construct validity?

Establishing links with theoretically relevant variables

In light of empirical support for the aggregated dimension of the EBM-SUS, the third objective of this study was to examine the concurrent validity of its measures. This study is grounded in the principles of EBM and decision-making theory. A fundamental theory that has shaped EBM thinking is Bounded Rationality (Simon, 1955, 1997), which posits that organisational decision-making is framed as choices but based on incomplete information, motivating decision-makers to seek out available information to achieve (satisfice) favourable outcomes. Building on this, prospect theory (Kahneman and Tversky, 1979) posits that decision-makers rely on heuristics to evaluate outcomes based on how information is framed (Kahneman, 2003).

Both theories underpin the conceptual basis of EBM; managers are supported to access broader information, systematically appraise it, and construct a more complete representation of the facts relevant to a decision (Barends and Rousseau, 2018; Rousseau, 2006). This entails searching across multiple sources and evaluating their trustworthiness.

In this study, we draw on the concept of conscientious decision-making, defined as style characterised by careful consideration, systematic evaluation and deliberate effort to identify and implement the best possible choice. A term that is conceptually close to conscientious

decision-making is vigilant decision-making (Janis and Mann, 1977). Since vigilance may convey negative connotations such as over-vigilance, anxiety or indecisiveness, we opted for conscientiousness as a more accurate descriptor. EBM promotes diligence by requiring the integration of diverse sources, which we argue fosters conscientious decision-making. Using multiple sources demands cognitive effort and time to process information logically and systematically (HakemZadeh and Rousseau, 2024), particularly in complex and uncertain environments (Warm *et al.*, 2008). We argue that extensive use of diverse sources sharpens decision-makers' attention to potential shortcomings, leading to more conscientious and deliberate choices. Although EBM is widely associated with higher decision quality (Briner *et al.*, 2009; Rousseau, 2020), few empirical studies have directly examined this relationship. Recent work (e.g. Criado-Perez *et al.*, 2023; Jepsen and Rousseau, 2022) supports the idea that engaging with evidence fosters more careful, reflective decision-making. We therefore hypothesise that greater utilisation of EBM sources is positively associated with conscientious decision-making (*H1*).

Risk perception, which refers to how individuals judge the likelihood and impact of uncertain outcomes, also plays a central role in shaping decision strategies (Slovic, 1987). These perceptions are influenced by cognitive, emotional and contextual factors (Loewenstein *et al.*, 2001), particularly relevant in managerial contexts where human errors are costly (Kahneman, 2011). In line with prospect theory, individuals avoid risk when perceiving gains and become more risk-seeking when perceiving losses (Kahneman, 2003). Managers drawing on multiple sources of evidence may become more attuned to uncertainty and adopt a more risk-averse stance (Barends *et al.*, 2014; Milkman *et al.*, 2009; Rousseau, 2018; Sweller, 1988). We therefore hypothesise that greater use of EBM sources is positively associated with risk aversion (*H2*).

Accordingly, the third research question examined in this study is:

RQ3. Does the second-order dimension of the EBM-SUS demonstrate concurrent validity through its relationships with risk aversion and conscientious decision-making?

Context

The context in which EBM is enacted is crucial. As Johns (2018) noted, evidence use is not purely a rational or technical process; it is embedded in institutional norms, stakeholder pressures and organisational culture. This study was conducted among leaders in Malta's public service – a highly structured, unitary administration emphasising accountability, transparency and efficiency, and undergoing reforms to promote evidence-informed decision-making (Bezzina *et al.*, 2021). Public organisations differ from private firms in purpose and accountability, often operating under greater scrutiny and risk aversion (Boyne, 2002; OECD, 2024). Studying evidence use in this context provides insights that are contextually grounded yet broadly applicable and theoretically meaningful for understanding decision-making in organisational settings.

Method

Sampling

This study targeted leaders within the Maltese public service, including individuals in senior headship positions (permanent secretaries, director generals, directors and assistant directors) as well as managerial grades (managers and principals). These positions involve responsibility for policy development, resource allocation, programme implementation, and

strategic and operational decision-making within ministries and government entities. Consequently, respondents were considered appropriate for examining EBM source utilisation in organisational decision contexts. The public sector was selected because it represents a complex decision environment characterised by multiple stakeholders, accountability requirements and increasing emphasis on evidence-informed policy and management, making it a relevant setting for studying evidence-based management behaviours (Bezzina *et al.*, 2021).

This study was conducted in two stages: Stage 1 used exploratory factor analysis (EFA), and Stage 2 employed confirmatory factor analysis (CFA) and SEM. Based on the 10:1 subject-to-item ratio, minimum samples of 120 and 190 were required for EFA and CFA, respectively (Kline, 2015). For SEM, 155 participants were needed, assuming $\alpha = 0.05$, a path coefficient of 0.20, and statistical power of 0.80 (Hair *et al.*, 2019; Kock and Hadaya, 2018). A census-based, voluntary sampling approach was adopted, targeting at least 200 participants per stage. Data collection was facilitated by the Research and Personnel Systems Division within the Maltese Public Service, which distributed an email invitation on behalf of the research team containing a web link to the online questionnaire. The invitation included a cover letter explaining the purpose of the study, assuring confidentiality and anonymity and clarifying technical terminology used in the questionnaire (e.g. systematic reviews, meta-analyses, bibliometric studies) to ensure respondents' understanding. It was stressed that there were no right or wrong answers, and the respondents were encouraged to respond as honestly as possible. This process yielded 429 complete responses across the two stages (202 in January 2025; 227 in February 2025).

Most respondents were female (54.3%), aged 46–55 (30.3%), held a master's degree (42.9%), and occupied managerial grades (58.5%). Ethical approval was obtained from the University of Malta and the Maltese Public Service, and participation was voluntary throughout.

Measures

EBM source utilisation has four dimensions theoretically grounded in the EBM literature. It identifies four primary sources of evidence informing managerial decision-making: (1) scientific research findings, (2) organisational data, (3) professional expertise, and (4) stakeholder influence. These domains are consistently described as the foundational evidence sources underpinning EBM practice (e.g. Barends and Rousseau, 2018). Accordingly, the scale was developed to capture the extent to which leaders utilise each of these evidence sources in decision processes. Each item of the EBM-SUS starts with the prefix, "When making an important decision…". The Scientific Research items are: "I consult scientific research published in reputable, peer-reviewed journals" (SR1); "I search for recent scientific literature (e.g. peer-reviewed journal articles, books, conference papers)" (SR2); "I use published syntheses of empirical research (e.g. bibliometric studies, systematic reviews, meta-analyses)" (SR3). The Organisational Data items are: "I consult evidence gathered and provided by the organisation" (OD1); "I refer to organisational data to identify data patterns and trends" (OD2); and "I use internal data (e.g. financial, operational and HR information) to inform my decisions" (OD3). The Professional Expertise items are: "I consult with professionals (e.g. managers, consultants, and business leaders) for their experience and judgment" (PE1), "I seek guidance from trusted experts with relevant experience to inform my course of action" (PE2) and "I involve subject-matter specialists to gain insights for decision-making" (PE3). The last dimension, Shareholder Influence, consists of: "I integrate the values, beliefs and viewpoints of stakeholders" (SI1), "I take

stakeholder expectations and concerns into account" (SI2), "I consider how the decision will be received by stakeholders, along with its potential ethical consequences" (SI3).

Content validity was assessed using a panel of six subject-matter experts with experience in applying and teaching EBM principles. They evaluated the items in terms of clarity, relevance and representativeness of the intended construct domains. Each item achieved an item-level content validity index (I-CVI) and a scale-level content validity index by universal agreement (S-CVI/UA) of 1, exceeding established thresholds (Polit and Beck, 2006). Items were rated on a five-point scale (1 = never, 5 = always), with higher scores indicating greater evidence source utilisation. Cronbach's alpha coefficients indicated good internal consistency reliability: scientific research (0.85), organisational data (0.79), professional expertise (0.80), stakeholder influence (0.83) and overall scale (0.86). Test-retest reliability ($n = 24$, two-week interval) showed strong temporal stability: $r = 0.71$–0.82 across subscales and 0.74 for the total scale (all p-values < 0.001).

Risk Aversion was measured using three items from Meertens and Lion (2008). An example item is: "When taking an important decision, I prefer to avoid risks." Respondents rated on a five-point scale (1 = strongly disagree, 5 = strongly agree), and higher scores indicated greater risk aversion. Cronbach's alpha was 0.81.

Conscientious Decision-Making was measured using four items from Mann *et al.* (1997). An example item is: "When making an important decision, I take a lot of care before choosing." Respondents rated on a five-point scale (1 = strongly disagree, 5 = strongly agree), and higher scores reflected more conscientious decision-making. Cronbach's alpha was 0.90.

Data analysis procedure

To address *RQ1*, EFA was conducted on Data Set 1 ($n = 202$) using SPSS (Version 29) with maximum likelihood estimation and Direct Oblimin rotation. Factor retention decisions were guided by the Kaiser criterion, scree plot examination and parallel analysis based on randomly generated data. Factor loadings were evaluated using Hair *et al.*'s (2010) guidelines. CFA (Model I) was then performed on Data Set 2 ($n = 227$) in AMOS (Version 29) to validate the four first-order dimensions of EBM source utilisation. Model fit was assessed using Hu and Bentler's (1999) criteria: the normed chi-square ($\chi^2/df \leq 3$), the confirmatory fit index (CFI ≥ 0.90) and the root mean square error of approximation (RMSEA ≤ 0.06). Where needed, modification indices above 20 were addressed, and model improvements were confirmed via Chi-square difference tests. Convergent validity was assessed using composite reliability (CR ≥ 0.70) and average variance extracted (AVE ≥ 0.50), and discriminant validity via maximum shared variance (MSV < AVE) and the heterotrait-monotrait ratio (HTMT < 0.85) (Cheung *et al.*, 2024).

For *RQ2*, CFA Model II tested a higher-order EBM source utilisation factor alongside risk aversion and conscientious decision-making to assess validity within a broader nomological network (Hair *et al.*, 2019). For second-order constructs, the HTMT ratio is not computed as they are not directly linked to observed items, and acceptable rather than optimal fit indices are deemed sufficient for establishing convergent/discriminant validity (Hair *et al.*, 2019; Hu and Bentler, 1999).

For *RQ3*, concurrent validity was examined through correlations between the second-order factor of EBM source utilisation and theoretically related constructs of risk aversion and conscientious decision-making. Effect sizes were interpreted using Cohen's (1988) benchmarks: small ≈ 0.10, medium ≈ 0.30 and large ≥ 0.50.

Results

Construct validity of the first-order dimensions of the EBM-SUS

EFA assumptions were satisfied: the Kaiser–Meyer–Olkin statistic was 0.84, and Bartlett's test of sphericity was significant (χ^2 = 1020.13, df = 66, p < 0.001), indicating sampling adequacy and factorability (Hair *et al.*, 2010). Factor retention decisions were guided by multiple criteria. The Kaiser criterion suggested four factors with eigenvalues greater than 1, accounting for 75.3% of the variance. Parallel analysis yielded three eigenvalues exceeding those generated from random data (4.86 > 1.41; 1.68 > 1.30; 1.24 > 1.21), whereas the fourth eigenvalue fell slightly below the corresponding random value (1.04 < 1.14). However, inspection of the scree plot indicated a clear inflexion after the fourth factor (see Figure 1), and the four-factor solution was theoretically consistent with the established evidence-based management literature.

Given the strong theoretical basis for four evidence sources in the EBM literature and the clear interpretability of the four-factor structure, the four-factor solution was retained. The pattern matrix (Table 1) showed a stable structure, with all items loading strongly on their respective factors (≥0.60) and no significant cross-loadings (≥0.30). The factors were labelled organisational data, stakeholder influence, professional expertise and scientific research.

CFA Model 1 (see Figure 2) produced a significant χ^2 statistic (χ^2 =79.95, df = 48, p < 0.01). Despite this, fit indices supported excellent model fit (χ^2/df = 1.67, CFI = 0.97, RMSEA = 0.05). No substantial modification indices suggesting theoretically meaningful correlated errors or cross-loadings were observed. Figure 1 shows that all standardised loadings were strong (ranging from 0.69 to 0.86) and there were no inter-factor correlations that exceeded 0.85 (Kline, 2015).

We then obtained convergent and discriminatory measures (see Table 2).

Table 2 (CFA Model I) shows that all CRs and AVEs for the four-factor first-order CFA model exceeded 0.70 and 0.50, respectively, indicating strong reliability and convergent validity. Discriminant validity was confirmed as AVEs exceeded MSVs, the square roots of AVEs were larger than inter-construct correlations, and HTMT ratios were below 0.85 (Cheung *et al.*, 2024).

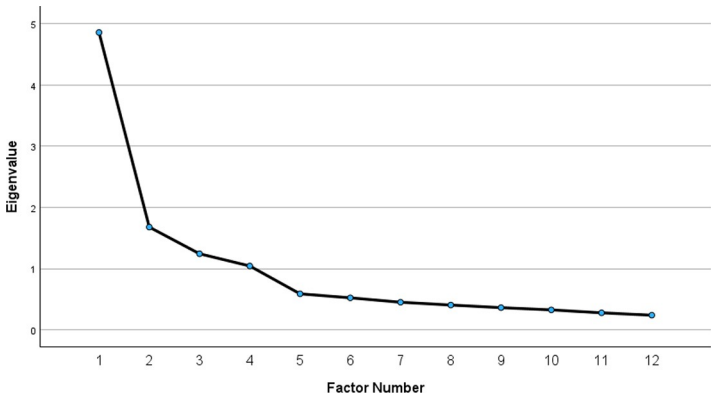

Figure 1. Scree plot
Source: Authors' own work

Table 1. The pattern matrix

	Factors[a]			
Item	1	2	3	4
SR1				0.80
SR2				0.75
SR3				0.74
OD1	0.91			
OD2	0.80			
OD3	0.70			
PE1			0.88	
PE2			0.74	
PE3			0.66	
SI1		0.81		
SI2		0.62		
SI3		0.83		
Eigenvalue	4.93	1.79	1.25	1.08
% Variance	41.05	14.89	10.37	8.97

Note(s): [a]Extraction: maximum likelihood estimation; rotation method: Promax with Kaiser normalisation
Source(s): Authors' own work

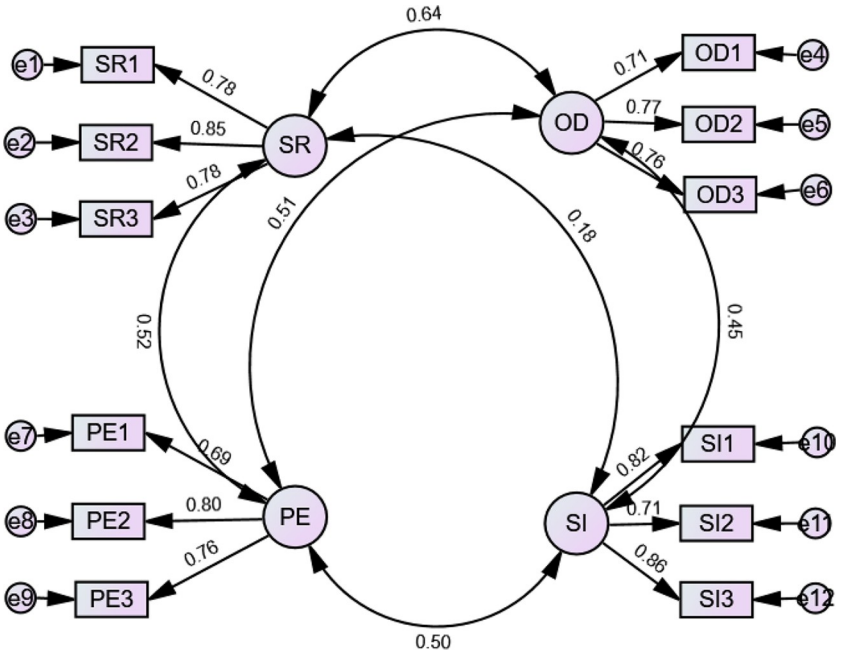

Figure 2. First-order CFA with the four core sources of evidence
Source: Authors' own work

Table 2. Descriptive statistics and convergent/discriminant validity indices for CFA model I and CFA model II measures

Construct	M (SD)	CR	AVE	MSV	SI	PE	OD	SR
CFA model I								
SI	4.09 (0.64)	0.84	0.64	0.25	**0.80**	*0.50*	*0.45*	*0.18*
PE	4.06 (0.61)	0.79	0.56	0.27	0.50	**0.75**	*0.51*	*0.52*
OD	3.70 (0.68)	0.79	0.55	0.40	0.48	0.51	**0.74**	*0.64*
SR	3.24 (0.86)	0.85	0.65	0.40	0.18	0.47	0.63	**0.81**
CFA model II								
	M (SD)	CR	AVE	MSV	EBM-SU		RA	CDM
EBM-SU	3.77 (0.51)	0.86	0.61	0.48	**0.78**		*0.34*	*0.69*
RA	3.49 (0.75)	0.82	0.60	0.16			**0.77**	*0.39*
sCDM	4.29 (0.53)	0.83	0.54	0.48				**0.74**

Note(s): The square roots of the AVEs are shown in bold, inter-construct correlations are shown in italics, and HTMT ratios for CFA Model 1 are shown underlined
Source(s): Authors' own work

Construct validity of the second-order dimension of the EBM-SUS

CFA Model 2 (see Figure 3) provided an adequate fit to the data (χ^2 =332.11, df = 146, $p < 0.01$; χ^2/df = 2.28, CFI = 0.90, RMSEA = 0.07). The second-order factor of EBM source utilisation showed substantial loadings on its four first-order dimensions, which ranged from 0.64 for scientific research to 0.84 for stakeholder influence. This indicated strong support for the proposed hierarchical structure (Kline, 2015). Subsequently, we assessed convergent and discriminant validity.

Table 2 (CFA Model 2) shows that all CRs exceeded 0.70, all AVEs exceeded 0.50, each AVE exceeded its MSV, and the square root of each AVE surpassed its highest inter-construct correlation (Cheung *et al.*, 2024). This indicated that EBM source utilisation, risk aversion and conscientious decision-making demonstrated adequate convergent and discriminant validity.

Concurrent validity of the EBM-SUS

Table 2 (CFA Model 2) shows EBM source utilisation was strongly correlated with conscientious decision-making (r = 0.69) and moderately with risk aversion (r = 0.34), reflecting large and medium effect sizes (Cohen, 1988). These results support *H1* and *H2* and confirm the concurrent validity of the aggregated EBM source utilisation construct.

Discussion

Summary of key findings and link to the literature

EBM holds promise as a framework to capture the dynamics related to the decision-making process (Baba and HakemZadeh, 2012). For this initial step to occur, it is necessary to develop measures that underpin its attributes (Martelli and Hayirli, 2018).

The first objective of this study was to develop and validate a new scale for measuring EBM source utilisation. Using a sample of Maltese public service leaders, the study demonstrated temporal stability, internal consistency reliability, content validity and construct validity for the four EBM source utilisation measures, addressing a gap in the EBM literature where no standardised tool existed.

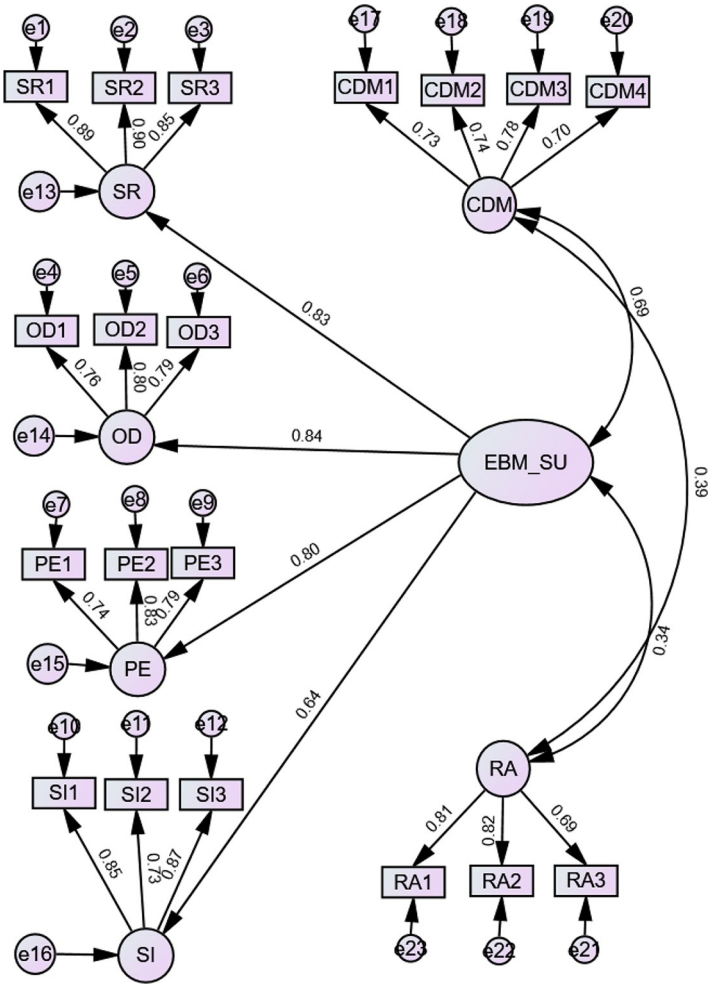

Figure 3. CFA with second-order factor of EBM source utilisation and theoretically related constructs
Source: Authors' own work

The second objective of this study was to evaluate the aggregated, higher-order dimension of EBM source utilisation. The second-order factor showed reliability and validity comparable to the first-order solution, retaining psychometric robustness while providing a more parsimonious and conceptually integrated representation (Chen *et al.*, 2005; Hair *et al.*, 2019; Marsh *et al.*, 2007; Sarstedt *et al.*, 2022). This suggests that decision-making is perceived as a unified process encompassing multiple evidence sources (Rousseau, 2018).

The third objective examined how the aggregated EBM source utilisation measures related to theoretically relevant variables. EBM source utilisation was positively associated with risk aversion, suggesting that engaging multiple evidence sources supports a more cautious, risk-aware

decision-making approach (Barends *et al.*, 2014; Milkman *et al.*, 2009; Sweller, 1988; Rousseau, 2018). It was also positively related to conscientious decision-making, indicating that drawing on diverse evidence sources promotes careful, thorough and diligent decision processes (Briner *et al.*, 2009; Criado-Perez *et al.*, 2023; Jepsen and Rousseau, 2022; Rousseau, 2020). These findings highlight that EBM source utilisation not only provides informational input but may also influence decision behaviour through psychological mechanisms, supporting more systematic, deliberate and well-considered choices.

Overall, these findings support the validity of the EBM-SUS and highlight its theoretical contribution and applicability across organisational contexts.

Theoretical and practical implications

The EBM-SUS addresses a key gap in the EBM literature by providing a standardised, psychometrically robust measure of leaders' use of multiple sources of evidence. This study operationalises EBM source utilisation as a multidimensional construct comprising scientific research, organisational data, professional expertise and stakeholder influence, and validates a higher-order structure. This advances conceptual clarity in the EBM domain and enables more precise empirical investigation of evidence-informed decision-making processes (Hair *et al.*, 2019; Sarstedt *et al.*, 2022). Importantly, the scale allows the assessment of both overall evidence use and the relative contribution of each source. The availability of a validated measure also facilitates theory development by allowing future research to examine antecedents, mechanisms and outcomes of evidence utilisation across organisational contexts.

Practically, the EBM-SUS can support organisations in benchmarking evidence use, identify development needs and design targeted leadership training interventions. The observed associations with lower risk aversion and greater conscientious decision-making suggest that fostering engagement with multiple evidence sources can support more careful, forward-looking decisions and embed cultures of inquiry, learning and accountability (Head, 2016). The scale also enables ongoing monitoring of EBM practices, informing strategic and cultural reforms, particularly in resource-constrained settings like Malta, and aligns with international public sector efforts to enhance transparency, effectiveness and evidence-informed governance (Bezzina *et al.*, 2021; OECD, 2017).

Limitations and future studies

This study has some limitations. First, the EBM-SUS relies on self-reported use of evidence sources, which may be subject to social desirability bias or inaccuracies. Second, the scale measures only the extent of evidence source utilisation, without capturing the quality, appropriateness or effectiveness of how the evidence is used in decision-making. Third, the sample comprised decision-makers from the Maltese public service; while this enhances internal validity and contextual relevance, it may limit generalisability to other sectors, cultures or countries. However, due to the EU shared public service structures and policies (Clifton and Díaz-Fuentes, 2010), the findings may extend beyond Malta. Finally, although causality was not a focus, the validation used cross-sectional data, limiting understanding of how evidence use might change over time.

Future research could triangulate self-report measures with behavioural indicators, document analyses or multi-source assessments, and explore diverse organisational contexts. It could also evaluate the quality of evidence appraisal and utilisation, investigate potential mediating or causal mechanisms linking EBM source utilisation with decision-related outcomes, and employ longitudinal or experimental designs to better capture the dynamics of EBM source utilisation and its relationships with decision-making behaviours. Such work would advance both theory and practice.

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Corresponding author

Frank Bezzina can be contacted at: frank.bezzina@um.edu.mt