Journal of Vocational Behavior 118 (2020) 103377

Contents lists available at ScienceDirect

Journal of Vocational Behavior

journal homepage: www.elsevier.com/locate/jvb

Literature searches in systematic reviews and meta-analyses: A review, evaluation, and recommendations

Michael B. Harari[a,*], Heather R. Parola[b], Christopher J. Hartwell[c], Amy Riegelman[d]

[a] Florida Atlantic University, United States of America
[b] University of Evansville, United States of America
[c] Utah State University, United States of America
[d] University of Minnesota, United States of America

ARTICLE INFO

Keywords:
Meta-analysis
Systematic reviews
Literature searches

ABSTRACT

The search strategy used in systematic reviews is an important consideration, as the comprehensiveness and representativeness of studies identified influences the quality of conclusions derived from the review. Despite the importance of this step, little in the way of best practice recommendations exist. In an effort to inform future reviews, we report the results of two studies. In Study 1, we outline a series of recommendations for designing comprehensive systematic literature searches. We review the search strategies used in 152 recent systematic reviews published in top applied psychology (including organizational psychology, counseling psychology, and management) journals and evaluate them against these criteria. In Study 2, we build on the findings of our review, carrying out an original meta-analysis, which we use as an opportunity to empirically demonstrate effects of database selection and inclusion of a complementary search protocol on search outcomes. Our results suggest that database selection could have a large effect on conclusions from reviews. Implications and recommendations for carrying out comprehensive literature reviews are described.

Systematic literature reviews, whether quantitative or qualitative, are important tools for drawing conclusions from large bodies of research, enabling advancement of scientific theory and evidence-based practice. Both types of reviews have been essential for advancing the organizational psychology and counseling psychology literatures. Indeed, leading journals in these areas, such as the *Journal of Vocational Behavior*, regularly publish both quantitative (Harari, Manapragada, & Viswesvaran, 2017; Kim, Kim, & Lee, 2019; Rudolph, Lavigne, & Zacher, 2017; Sheu et al., 2018; Zhang, Xu, Jin, & Ford, 2018) and qualitative (Su, 2018; Woods, Wille, Wu, Lievens, & De Fruyt, 2018; Yang, Niven, & Johnson, 2018) reviews.

In order to review a body of literature, one must first identify relevant studies for inclusion using a systematic and reproducible strategy. The search strategy is often recognized as a crucial part of systematic reviews. For example, according to Kepes, McDaniel, Brannick, and Banks (2013), "Search strategies, including the literature review […], are among the most important aspects of a meta-analytic review" (p. 123). Over the years, great advancement has taken place with respect to methodological considerations associated with carrying out systematic reviews and meta-analyses. For example, improvements have been made with respect to methods for correcting for statistical artifacts and methods for detecting publication bias (Kepes et al., 2013; Kepes, Banks, McDaniel, & Whetzel, 2012; Schmidt & Hunter, 2015; Wiernik & Dahlke, 2019).

* Corresponding author.
E-mail addresses: mharari@fau.edu (M.B. Harari), hf52@evansville.edu (H.R. Parola), chriss.hartwell@usu.edu (C.J. Hartwell), aspringe@umn.edu (A. Riegelman).

https://doi.org/10.1016/j.jvb.2020.103377
Received 29 January 2019; Received in revised form 2 December 2019; Accepted 11 January 2020
Available online 16 January 2020
0001-8791/

However, despite the importance of the search strategy, there has been no effort to generate best practice recommendations for developing and implementing a systematic literature search protocol in the organizational psychology, counseling psychology, and management literature. Emphasis in terms of generating best practice recommendations has dealt with analytical considerations versus the systematic review itself (e.g., Geyskens, Krishnan, Steenkamp, & Cunha, 2009). Yet, a comprehensive systematic review is absolutely crucial for generating valid conclusions from the data (Kepes et al., 2013). Although the importance of a well-crafted search protocol has become well accepted in other literatures, such as health science (e.g., Lefebvre, Manheimer, & Glanville, 2008), the same emphasis has not been reflected at present in the applied psychological sciences. Where recommendations do exist with respect to carrying out systematic reviews, they deal with reporting of the search protocol vs. best practices concerning how the search might be carried out (Appelbaum et al., 2018). Note that clear and accurate reporting of one's search protocol remains a critical component of publishing a systematic review (and, in fact, it is not clear how well systematic reviews in applied psychology stack up against these recommendations). However, it is also critical that the search itself be well conducted. Thus, the goal of the present study is to help to move the field towards best practice recommendations for literature search strategies for systematic reviews and meta-analyses.

At the outset, we note that our goal is not to produce dogmatic rules to which authors must adhere in order to carry out their literature search. Such concrete guidelines are undesirable and, regardless, unattainable as each review is unique and reviewers must decide what search strategy is best given the particular characteristics of the literature under review. However, in crafting a search strategy, it is useful to understand what a high-quality literature search looks like, including what approaches are recommended, how they could be most productively implemented, caveats to consider, and how many different approaches might be used in conjunction. Such information helps reviewers to understand what search options are “on the table” when crafting their searches and provides insights that both journal editors and journal reviewers can use when evaluating literature reviews.

With this in mind, the present manuscript reports the results of two studies. In Study 1, drawing on prior work and the collective expertise of the authors, we outline recommendations for carrying out systematic literature reviews. As already noted, since all reviews are unique, reviewers will have to consider how to craft a search protocol that is maximally effective for their particular literature under review. The goal of our recommendations is to highlight general characteristics that speak to a high-quality review; they should serve as a starting point or minimum expectations versus the end goal. After outlining these criteria, we carry out a systematic review of systematic reviews published in our field's top journals, allowing us to evaluate the quality of the literature search in published reviews. Further, given that systematic reviews are intended to be reproducible, drawing from the work of Rios, Ihlenfeldt, Dosedel, and Riegelman (2019), we assess the transparency with which the search protocol is reported as well.

Because database searches in particular tend to be the most common method used to identify studies for a review, we identify the most common databases searched in the systematic reviews evaluated in Study 1. Subsequently, in Study 2, we provide a detailed assessment of these commonly searched electronic databases. In particular, we carry out an original meta-analysis, identifying studies using these various databases. This allows us to provide an empirical evaluation of these various databases (i.e., in terms of their comprehensiveness) and demonstrate the importance of comprehensive searches by evaluating the effect of database selection on conclusions from the review. We also evaluate how including a complementary search strategy (i.e., forward search) affects conclusions. Taken as a whole, the work reported here fills an important gap in the literature by providing important insights to authors when crafting their search strategies and to journal editors and reviewers when evaluating the comprehensiveness of search protocols, further moving the field towards best practice recommendations for systematic literatures searches.

1. Study 1

1.1. Study identification methods

Various search methods can be used in an effort to identify relevant studies for a given review, including database searches, forwards searches, and manual searching individual journals, all of which have different benefits and applications. In reviewing best practices of conducting and reporting a search strategy, various guidelines can be accessed including the PRISMA (Preferred Reporting in Systematic Reviews and Meta-Analysis; Mohrer et al., 2009) Statement and relevant extensions (www.prisma-statement.org), as well as individual articles from various disciplines (e.g. Lefebvre et al., 2008; Rios et al., 2019). Here, we review the known best practices of search strategies, and provide insight on how well recent review articles published in top applied psychology and management journals followed these practices.

First, keyword searches of electronic databases, whether just searching one database or searching several, tend to be the most common search strategy used in a variety of literatures. There are two important implications of keyword searches in databases: (1) keywords chosen and (2) database selection. These two decisions are linked, and best practice suggests that reviewers use peer review in making these decisions, most often through consultation with a librarian (Koffel, 2015). Other methods, such as Peer Review of Electronic Search Strategies (PRESS), a guideline for evaluating search strategies (McGowan et al., 2016), have emerged as useful tools in selecting keywords and designing keyword strings. This is particularly important in light of the rise of designing keyword strings using wildcard, truncation symbols, or Boolean operators. These search terms can alleviate some concerns of different terminology forms, which can further broaden the search, but it is important to note that the language and symbols used to represent these functions can vary by database (Othman & Nor Sahlawaty, 2004).

In terms of database selection, the specific database chosen can have important implications on the search breadth. Databases such as PsycINFO and ERIC are discipline specific, providing more narrow or targeted results. Because different databases return studies from different journals and disciplines, multiple databases should be searched to improve search results and provide greater

Table 1
Summary of study identification methods.

Method	Description	Frequency	Target literature
Database search	Keyword search of electronic databases (e.g., PsycINFO, Google Scholar, ABI/Inform).	151 (99.34%)	Indexed
Backward search	Search references of other studies (e.g., prior reviews, studies identified for inclusion in the review).	94 (61.84%)	Indexed
Manual search	Manual review of articles published in particular journals.	50 (32.89%)	Indexed
Conference programs	Searching through programs of relevant conferences (e.g., Academy of Management, Society for Industrial and Organizational Psychology).	48 (31.58%)	Non-indexed
Personal correspondence	Contacting researchers and practitioners who do work in the area to request unpublished studies or datasets.	40 (26.32%)	Non-indexed
Forward search	Identifying studies that cited a prior identified study (for example, important reviews or conceptual work, early empirical investigations, studies that have been already identified for review).	33 (21.71%)	Indexed
Announcements	Posting calls for unpublished studies on listservs of relevant Academic societies.	33 (21.71%)	Non-indexed
Websites	Searching particular websites where reports or white papers might be shared.	3 (1.97%)	Non-indexed
Online database archives	Search for raw data in database archives that might include variables of interest.	1 (0.66%)	Non-indexed

depth of the search.

Second, although database searches tend to be the most used study identification method, a variety of other *complementary* strategies exist that can be incorporated in conjunction with a database search to help to ensure comprehensive coverage of a research literature. We report and define the most frequently used complementary strategies in Table 1. Complementary searches are important as they can help identify studies that the primary database search did not, such as studies that may have been missed due to differences in terminology while using the same scale and underlying construct. These complementary strategies, such as backward searching other reviews or forward searching early work, can be delineated based upon whether the method targets indexed vs. non-indexed studies. As reviewed in Ferguson and Brannick (2012), indexed studies are those that are available through library databases and are thus more readily available to reviewers. Conversely, non-indexed studies are those that are considered "grey" literature (i.e. ephemeral, studies not published by a traditional publisher, early versions such as preprints). Non-indexed studies are not available through library subscriptions and require personal correspondence with authors or other means to obtain (e.g., conference papers, raw datasets, etc.). Additionally, non-indexed studies have not yet or never will be indexed and therefore are more difficult to discover and access than those that are indexed. If the goal is to gain a greater depth of the search, then using multiple types of complementary searches can provide access to both indexed and non-indexed studies that were not located through the initial database search.

Third, search parameters, along with reporting those parameters, are important to consider. These include (a) the specific databases searched, (b) date ranges for the review, (c) the specific search terms used, (d) Boolean phrases used in the search, (e) what the language exclusion criteria were, and (f) geographic regions considered (Moher et al., 2009). We report and define these characteristics in Table 2. Importantly, the limitations placed on date, time, search words, geography, and language can ultimately impact the range of articles returned in the search. Again, consulting with a librarian or engaging in an expert peer review can ensure the most appropriate search parameters are completed for the subject of the search (Koffel, 2015). Moreover, it is important for authors to effectively report these search criteria in order to increase the transparency and replicability of the search.

Having outlined the characteristics that speak to minimum criteria for a quality review (both in terms of comprehensiveness and replicability), we carry out a systematic review of systematic reviews. Our goals are two-fold. First, to evaluate the extent to which existing reviews in the field meet the outlined criteria. Second, to understand and report on characteristics of search strategies, such as common databases searched.

Table 2
Characteristics of reviewed systematic reviews.

Database search information	Operational definition	% Yes
Two or more databases	Reported at least two different databases used	85.43%
Databases included	Reported databases that were used	99.34%
Date ranges for databases	Reported a range of dates for the database search	42.11%
Peer review		
Librarian Involved	Reported the involvement of a librarian in the design or implementation of the search strategy	0.66%
Search variables		
Search terms included	Reported a full list of search terms	56.58%
Boolean phrases included	Reported the use of Boolean terms used in search	24.34%
Language limits	Reported which languages were searched or excluded	16.45%
Geography limits	Reported geographical limits of the search	1.97%
Complementary search strategies		
Indexed	Studies that are available through library databases	77.63%
Non-indexed	Studies are unavailable through library subscriptions and require personal correspondence with authors or other means to obtain	49.34%

2. Method

Two authors independently manually reviewed studies published in the following six top applied psychology and management journals: Academy of Management Journal, Journal of Applied Psychology, Journal of Management, Journal of Vocational Behavior, Organizational Behavior and Human Decision Processes, and Personnel Psychology. Each author downloaded review articles and screened them to determine if the literature search followed a systematic protocol (versus selective reviews where authors did not outline an explicit study identification strategy; Grant & Booth, 2009). The authors coded the strategies used to identify articles (e.g., keyword searches of databases, backward searching, manual review of journals, etc.) and, in terms of databases, also coded the specific databases searched. The authors also evaluated the extent to which search protocols conformed to the recommendations outlined earlier. This search was carried out in 2018. In order to capture five full years of reviews, the authors searched from 2013 to 2017. However, for comprehensiveness, they also searched through articles in the 2018 issues available thus far and early view articles. A total of 152 reviews were included in the database.

Consistent with our expectations, tailored search strategies of databases were the most common approach to identifying relevant studies. This approach was used in all but one identified review. We thus split our review of search protocols into two: (1) database searches and (2) complementary (i.e., non-database) strategies. To provide greater detail, we delineate further between search strategies as a function of the targeted literature: indexed vs. non-indexed (Ferguson & Brannick, 2012).

3. Results

The study identification methods identified in our review, as well as a description, their frequency of use across these 152 reviews, and the target literature (in terms of indexed vs. non-indexed studies) is reported in Table 1. The study identification procedures are listed in order from most frequently to least frequently used across the articles included in our review.

As can be seen by reviewing the data presented in Table 1, searching electronic databases is a nearly universal method of study identification across our sample of systematic reviews. Investigators identified studies using this procedure in all but one analyzed review (99.34%). Investigators reported the use of a wide number of databases. In fact, a total of 57 databases were reported. However, further inspection revealed that, in a few instances, authors reported interfaces searched (e.g., ProQuest, Web of Science) rather than the databases searched through those interfaces, making the exact number of databases searched ambiguous.

Among those studies that reported the specific databases searched (versus those that included interfaces without specifying the databases searched within said interfaces), on average, three databases were searched (M = 3.05). The median and modal number of databases searched was also 3. In terms of the range of databases searched, the minimum was 1, while the maximum was 10.

To provide a more detailed assessment of identified databases, we select the most common using the following, conservative rule-of-thumb: we selected those databases that were used in at least 5% of review articles that incorporated database searching. These databases are listed in alphabetical order in Table 3, followed by the percentage of reviews that used this database as part of their search strategy. Although all databases reported in Table 3 are commonly used, we would caution readers against searching these databases for study identification merely due to the fact that they are frequently used. The decision to search a particular database should be based upon its coverage of the relevant literature. However, this list can serve as one source for identifying databases that might be relevant for a particular review.

As reported in Table 3, searching PsycINFO (63.33%), Google Scholar (38.67%), ProQuest Dissertations and Theses (30.67%), and ABI/Inform (29.33%) was particularly common. Other databases, such as Social Sciences Research Network (6.00%), Social Sciences

Table 3
Comparison of usage and yields of commonly used databases and a forward search.

		Original meta-analysis						
			Publication status		Country		Methodology	
Database	Frequency in published reviews	Overall Yield	Published	Unpublished	US	Non-US	CS/SS	MW/MS
ABI/Inform	29.33%	53.70%	70.00%	33.33%	53.57%	54.55%	50.00%	61.11%
Business Source Complete	14.00%	35.19%	60.00%	4.17%	35.71%	40.91%	36.11%	33.33%
Business Source Premier	16.00%	35.19%	60.00%	4.17%	35.71%	40.91%	36.11%	33.33%
Dissertation Abstracts	10.67%	–	–	–	–	–	–	–
Emerald	5.33%	14.81%	26.67%	0.00%	3.57%	27.27%	16.67%	11.11%
ERIC	8.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Google Scholar	38.67%	98.15%	96.67%	100.00%	96.43%	100%	100.00%	94.44%
JSTOR	18.00%	7.41%	13.33%	0.00%	14.29%	0.00%	5.56%	11.11%
ProQuest Dissertations & Theses	30.67%	31.48%	0.00%	70.83%	50.00%	0.00%	27.78%	38.89%
PsycINFO	63.33%	61.11%	53.33%	70.83%	78.57%	36.36%	50.00%	83.33%
ScienceDirect	12.00%	3.70%	6.67%	0.00%	0.00%	9.09%	0.00%	11.11%
Social Sciences Citation Index	6.67%	25.93%	46.67%	0.00%	32.14%	22.73%	16.67%	44.44%
Social Sciences Research Network	6.00%	1.85%	3.33%	0.00%	0.00%	4.55%	0.00%	5.56%
Forward Search	–	25.93%	46.67%	0.00%	35.71%	18.18%	16.67%	44.44%

Note. US = United States. CS/SS = Cross-Sectional/Self-Report, MW/MS = Multi-Wave/Multi-Source.

Citation Index (6.67%), and ERIC (8.00%), were searched much less frequently, though still frequently enough to emerge among the most common databases used in identified reviews. We also noted two publisher databases were included among our list of the most common databases: Emerald and ScienceDirect (Elsevier). Although including such databases along with many other more comprehensive databases does not hurt, if a review relied too heavily on publisher databases, it would substantially limit the breadth of the literature reviewed. We would generally suggest that reviewers avoid searching such databases and opt for those that search across (e.g., Social Sciences Citation Index) vs. within one publisher.

As reported in Table 1, although database searches are most common, they are not the only approach used to identify studies, nor should they be. Eight other approaches emerged in our review, listed in order of frequency. On average, the reviews included in our database used two complementary search strategies (M = 1.99). The median value was also 2, while the modal number of complementary strategies used was 1. Of the 152 studies included in our database, 29 (19.08%) didn't incorporate any complementary strategies, 35 (23.02%) used one, 29 (19.08%) used two, 34 (22.37%) used three, and 25 (16.44%) used four or more. The minimum number of complementary search strategies used was zero with a maximum of six.

Among the complementary search strategies identified, backward searching (i.e., searching through references of other articles) was the only one to be used in more than half of reviews (61.84%). Backward searches primarily target the indexed literature (to the extent that unpublished research would be unlikely to be cited in already published work, though non-indexed, unpublished research can be returned in some instances). Other approaches that primarily target indexed studies include manual searches of relevant journals (32.89%) and forward searching (i.e., identify studies that cited a particular article) classic or otherwise well-cited articles (21.71%). Note that forward searching requires the use of electronic databases, and thus the points raised in the relevant section above are relevant to this method.

Our review also brought to light a number of methods that are used to primarily target the non-indexed or “grey” literature. Searching through conference programs was the most frequently used method in our sample of reviews (32.89%). Personal correspondence (e.g., with researchers who are known to carry out work in the area being reviewed) and announcements (e.g., Listserv postings) were also used to identify non-indexed studies with reasonable frequency (26.32% and 21.71% for personal correspondence and announcements, respectively). We also observed the use of two other methods for identifying non-indexed studies that were much less frequently used. This involved searching online websites, such as government and industry sites, where data points (e.g., raw data, white papers) might be shared (1.97%) and searching for raw data available in online database archives (0.66%). Reviewers can consider searching these sources where appropriate.

Table 2 reports our evaluation of how evaluated published reviews align with our minimum expectations for a high-quality literature search. Among the 151 studies that searched databases, 85.43% reported searching at least two databases. Thus, approximately 15% of reviews captured here were deficient in this regard. In terms of reporting the actual databases searched, all studies but one (99.34%) met this expectation. Less than half of the reviews (42.11%) indicated the date ranges for their database searches. In terms of librarian peer review of search protocols, this was extremely rare (0.66%) and represents an opportunity to improve the quality of reviews carried out in our field in the future.

The extent to which other parameters of the search were reported varied considerably. A full list of search terms were reported in only just over half of reviewed articles (56.58%). Boolean phrases used were rarely reported (24.34%), as were language (16.45%) and geographic limits (1.97%). Finally, a majority of studies (77.63%) incorporated a complementary search strategy that targeted the indexed literature (as noted earlier, this tended to be backward searching), still leaving a large percentage of reviews (22.37%) that relied upon database searches as the only way to capture indexed work. Further, most reviews failed to make an effort to capture any non-indexed studies, as only 49.34% of reviews included a search strategy targeting non-indexed research (as noted earlier, this tended to be searching conference programs).

4. Discussion

Our review revealed a number of strengths of the search strategies used in systematic reviews in our field. Many reviews searched large numbers of databases and used a wide variety of complementary strategies that target both indexed and non-indexed studies. However, we also observed that many reviews failed to meet the expectations of high-quality reviews and there is considerable opportunity to improve upon study identification. The greatest opportunities appear to come from (a) consulting with librarians when crafting search strategies, (b) incorporating complementary search strategies that target non-indexed studies, and (c) reporting the search protocol more transparently following existing guidelines (Moher et al., 2009).

5. Study 2

In order to further evaluate the comprehensiveness of the particular databases reported in Table 3 for applied psychology literature reviews and to simulate the effect that database selection can have on conclusions from a review, we carried out an original meta-analysis of the proactive personality-turnover intentions literature. This allowed us to evaluate the yields of particular popular databases (in terms of the percentage of relevant studies returned by each particular database overall and along particular study characteristics), empirically demonstrate the effect of literature search strategies on results of a systematic review, and empirically demonstrate the effect of including a complementary search strategy (i.e., forward search).

6. Method and results

We searched for articles that contained "proactive personality" (following Fuller Jr & Marler, 2009) and any of the following: "turnover intention*," "intent to turnover," "quit intention*," "intent to quit," "intent to remain," or "remain intention*." The search was carried out in 2018 using all databases reported in Table 3, except for Dissertation Abstracts, which has since been merged with ProQuest Dissertations and Theses. We placed no restrictions on geographic limits in our search. All returned studies were downloaded for review unless, based on a reading of the title and abstract, we could determine that the study (a) did not report primary quantitative data (i.e., qualitative, literature review, editorial), (b) was from an irrelevant discipline (e.g., history, mathematics), (c) was written in a language other than English, or (d) was not available through the university library, interlibrary loan, or made public by the authors online. To illustrate the impact of including a complementary search strategy, we used Social Science Citation Index to forward search Bateman and Crant (1993) - the article that both (a) explicated the proactive personality construct and (b) provided a validated measure.

In terms of our database search, a total of 1766 studies were advanced to full-text screening. Among these studies, we excluded (a) 151 that did not report any primary quantitative data (e.g., meta-analyses, qualitative, etc.), (b) 1559 that did not capture either proactive personality, turnover intentions, or both, (c) two studies that were reported in a language other than English, and (d) one study that was carried out at the team-level of analysis. Thus, 53 studies remained. Note, however, that not all of these studies (a) were based on unique data and (b) reported correlations. Our meta-analysis includes only those studies that reported original data and correlations between proactive personality and turnover intentions (where multiple studies were reported using the same data, we coded from the study with the largest sample size or, if equal, that which was published first). However, our analysis dealing with the yield of each database (i.e., proportion of total studies identified by that database) includes studies that (a) did not report correlations or (b) were based on overlapping data. This is because, from the perspective of the reviewer, what is critical is that all studies are identified. Indeed, a study must be identified for potential inclusion in a review before it could be determined that a correlation is reported or that the data are unique.

Our forward search was carried out subsequently, based on recommendations from the Editorial Team. This search was carried out in 2019, but we constrained results to 2018 to be comparable to our database search. This search is reported in a PRISMA flow diagram in an online Appendix. The forward search captured eleven relevant studies, one of which was not identified in our database search.

Table 3 reports the yield ratios associated with each of the databases included in our review. As can be seen in Table 3, yields vary considerably across databases. ERIC returned no relevant studies; however, this is not surprising considering that ERIC is an education database and our topic is not relevant to education. Social Sciences Research Network also had a particularly poor yield (1.85%). It is also worth noting that the two published databases searched (i.e., Emerald, ScienceDirect) also had poor yields. This was to be expected as they search journals associated with only one publisher and are therefore less comprehensive.

Some databases had particularly favorable yields. Most notably, Google Scholar identified 98.15% of all relevant studies - all studies but the single unique one identified in our forward search. Although we do not think it's appropriate to recommend particular databases, as database selection should be selected based upon characteristics of the literature under review, it does appear that including Google Scholar as part of a search protocol can facilitate comprehensive study identification. However, this has to be weighed against the cons associated with this database, reviewed in the Discussion section.

Further, and perhaps owing to the fact that the literature reviewed here dealt with an I-O Psychology/HR-OB topic, both PsycINFO (62.26%) and ABI/Inform (54.72%) had impressive yields. Business Source Complete (35.85%), Business Source Premier (35.85%), ProQuest Dissertations & Theses (32.08%), and Social Sciences Citation Index (26.42%) also performed favorably. Although the yield associated with the forward search was a bit lower (25.93%), it was valuable in that it returned a study that wasn't captured in our database search, further instantiating the value of including approaches complementary to database searches. To help readers to understand the overlap in studies identified between each pair of databases, we report in an online Appendix the percentage of common studies identified by each pair of databases (i.e., the number of studies identified by both databases divided by the total number of studies identified between the two databases).

We also computed yield ratios by study characteristics, allowing us to evaluate each databases yield as a function of (a) publication status (i.e., published vs. unpublished), (b) country of data collection (i.e., US vs. Non-US), and (c) methodology (i.e., cross-sectional/single-source vs. multi-wave/multi-source). Several databases identified only published studies. Those included Business Source Complete, Business Source Premier, Emerald, JSTOR, ScienceDirect, Social Sciences Citation Index, and Social Sciences Research Network. Conversely, as would be expected, ProQuest Dissertations & Theses returned only unpublished studies. Both ABI/Inform and PsycINFO had sizeable yields for both types of studies and, having identified all but one study included in the review, Google Scholar had the largest yield for both published (96.67%) and unpublished (100.00%) studies.

In terms of country of data collection, in most cases, databases were no more likely to return studies carried out in the US vs. non-US. However, ProQuest Dissertations & Theses did not return any non-US studies, while PsycINFO had a much better yield for US (78.57%) vs. non-US (36.36%) studies; though the yield was nonetheless reasonably high for both. Finally, in terms of methodology, we observed little in the way of meaningful differences between cross-sectional/self-report (CS/SR) and multi-wave/multi-source (MW/MS) studies. Social Sciences Citation Index and the forward search returned a larger proportion of relevant MW/MS studies (44.44%) vs. CS/SS studies (16.67%). Otherwise, the figures were relatively close. In short, these analyses suggest that the proportion of potentially relevant studies that one is likely to identify and, to a lesser degree, the characteristics of those studies, can be affected by one's selection of databases. The next question concerns the extent to which the conclusions of a review will be affected by database selection. For this, we turn to the results of our original meta-analysis of the $k = 35$ studies that reported proactive personality-turnover intention correlations using non-redundant data.

The meta-analysis was carried out using the R package PsychMeta (Dahlke & Wiernik, 2018). The results are reported in Table 4. We first report the results of our meta-analysis including all $k = 35$ studies. We then report results by database, demonstrating what the results

Table 4
Results of proactive personality-turnover intention meta-analysis moderated by database and forward search.

Database	*k*	*N*	r	SDr	SDres	ρ	SDrc	SDρ	95% CI	80% CV
Overall	35	18,072	−0.01	0.14	0.13	−0.01	0.16	0.15	[−0.07, 0.04]	[−0.21, 0.19]
ABI Inform	20	5124	−0.11	0.12	0.11	−0.14	0.15	0.13	[−0.21, −0.07]	[−0.31, 0.03]
Business Source Complete	13	3149	−0.13	0.10	0.08	−0.15	0.12	0.10	[−0.23, −0.08]	[−0.28, −0.02]
Business Source Premier	13	3149	−0.13	0.10	0.08	−0.15	0.12	0.10	[−0.23, −0.08]	[−0.28, −0.02]
Emerald	3	579	−0.11	0.18	0.17	−0.13	0.22	0.20	[−0.68, 0.42]	[−0.51, 0.25]
ERIC	0	–	–	–	–	–	–	–	[—, —]	[—, —]
Google Scholar	34	17,976	−0.01	0.14	0.13	−0.01	0.16	0.15	[−0.07, 0.05]	[−0.21, 0.19]
JSTOR	4	1003	−0.10	0.04	0.00	−0.12	0.05	0.00	[−0.19, −0.04]	[−0.12, −0.12]
ProQuest Dissertations and Theses	15	4050	−0.02	0.24	0.23	−0.02	0.29	0.28	[−0.18, 0.14]	[−0.40, 0.35]
PsycINFO	28	7153	−0.05	0.19	0.18	−0.06	0.23	0.22	[−0.15, 0.03]	[−0.35, 0.22]
ScienceDirect	2	446	−0.03	0.06	0.00	−0.04	0.08	0.00	[−0.72, 0.64]	[−0.04, −0.04]
Social Sciences Citation Index	13	3233	−0.10	0.09	0.06	−0.12	0.11	0.07	[−0.18, −0.06]	[−0.22, −0.02]
Social Sciences Research Network	1	671	−0.13	–	–	−0.16	–	–	[—, —]	[—, —]
Forward Search	13	2658	−0.10	0.10	0.07	−0.11	0.12	0.08	[−0.19, −0.04]	[−0.23, −0.00]

Note: k = number of studies contributing to meta-analysis; N = total sample size; $\bar{r}$ = mean observed correlation; SD_r = observed standard deviation of r; SD_{res} = residual standard deviation of r; $\bar{\rho}$ = mean true-score correlation; SD_{r_c} = observed standard deviation of corrected correlations (r_c); SD_ρ = residual standard deviation of ρ; CI = confidence interval around $\bar{\rho}$; CV = credibility interval around $\bar{\rho}$. Correlations corrected using artifact distributions.

of the meta-analysis would have been if only that database was searched. Although meta-analysis provides rich information concerning parameters of effect size distributions (Schmidt & Hunter, 2015; Wiernik, Kostal, Wilmot, Dilchert, & Ones, 2017), we emphasize point estimates here and their 95% confidence intervals. We do this because (a) we carried out this meta-analysis for purposes of illustration vs. substantive interest in the effect being study (nonetheless, full output is reported for interested readers) and (b) although full information is valuable, when results of meta-analyses are interpreted in future work, point estimates of population correlations are predominantly interpreted, thus this is perhaps the most important parameter to study for our purposes (DeSimone, Köhler, & Schoen, 2018).

As can be seen in Table 4, proactive personality and turnover intentions were unrelated (ρ = −0.01; 95% CI = −0.21 to 0.19), sharing an effect size of virtually zero with 95% confidence intervals that overlap with zero. This same conclusion (i.e., a null effect based on both the point estimate and 95% confidence intervals) is engendered when evaluating results obtained from Google Scholar, ProQuest Dissertations & Theses, PsycINFO, and ScienceDirect. However, for the remaining databases and the forward search, effect sizes were much larger in magnitude, exceeding the magnitude of over 20% of correlations reported in HR and OB literatures (Paterson, Harms, Steel, & Crede, 2016). The largest effect size observed was −0.16 (for the single study identified by Social Sciences Research Network), followed by −0.15 (for Business Source Complete and Business Source Premier). Further, in six instances, the 95% confidence intervals did not overlap with zero. Thus, when evaluating a non-comprehensive set of studies, reviewers in these five instances would have come to the incorrect conclusion that proactive personality and turnover intentions shared a statistically non-zero relationship that was large enough in magnitude to be practically significant, whereas a better estimate is −0.01, a non-significant and non-practically meaningful value. A forest plot depicting these results graphically is provided in an online Appendix.

7. Discussion

Results of Study 2 illustrated the importance of crafting a search for a systematic review following existing best practice recommendations, as highlighted earlier. Indeed, we observed that database selection and the broader search strategy can have a vast effect on conclusions from reviews. This underscores the need to both carefully select databases, include sampling of a wide number of databases, and include a wide variety of complementary search strategies (at a minimum, one that captures the indexed literature and another that captures the non-indexed literature).

8. General discussion

Despite the recognized importance of the literature search process in literature reviews in the applied psychological sciences (Kepes et al., 2013), and the vast attention given to the topic in other literatures (e.g., Lefebvre et al., 2008), little evidence existed concerning (a) adherence to minimum criteria for a comprehensive and reproducible search, (b) the implications of a deficient search, and (c) the comparative yields of various widely used databases to carry out systematic reviews in the organizational psychology literature. We addressed these issues in the present studies. Building on various trends uncovered in our review, we offer the following points and consideration related to crafting a search for a systematic review and summarize our recommendations in Table 5.

In terms of quality of the search itself, because different databases return studies from different journals and disciplines, multiple databases should be searched vs. only one. Also in terms of the quality of the search, in order to help to ensure that the most appropriate databases are selected and that the most appropriate search terms are chosen, peer review is recommended, generally in the form of consultation with a librarian (Koffel, 2015).

Further, our findings revealed that two publisher databases were used frequently in the systematic reviews included in our review. Publisher databases search journals that are specific to particular publishers, in this case, Emerald and Elsevier (ScienceDirect). As

Table 5
Summary of literature search recommendations.

Databases

Recommendation 1: Search at least two databases, but possibly many more. Select those that are most relevant to the topic at hand. When a review is interdisciplinary, a larger number of databases should be searched to allow for studies from each discipline to be identified.

Recommendation 2: Consult with a librarian to help to select the most appropriate databases.

Recommendation 3: When searching multiple databases through a particular platform (e.g., Web of Science, ProQuest), indicate not only the platform used, but the databases searched through the platform as well.

Recommendation 4: Report all database search information and search variables (see Table 2).

Complementary Strategies – Indexed Studies

Recommendation 1: When carrying out a manual search, (a) list journals searched, (b) justify their selection and (c) clearly specify the protocol used to determine which studies would be selected for further review.

Recommendation 2: Incorporate backward citation searching to identify articles that might have been missed in the keyword search. This could include searching references of studies identified in a keyword search or searching through the references of prior reviews.

Recommendation 3: When carrying out a backward search, provide enough detail to allow for reproducibility. Indicating that references from published studies were "scanned," for example, is insufficient. Clearly specify what criteria reviewers were looking for when evaluating references in other studies, as well as which studies were reviewed and why.

Recommendation 4: Consider forward searching classic, well-cited papers. Tools such as Web of Science, Scopus, and Google Scholar could be used to streamline this process (Bakkalbasi et al., 2006).

Alternate Strategies – Non-Indexed Studies

Recommendation 1: Make an effort to identify studies from non-indexed sources by manually searching conference programs or by contacting experts directly or via listservs correspondence.

Recommendation 2: Searching non-academic websites and database archives can be considered if it is justified by the content area under review. Authors could search or browse dedicated grey literature repositories such as OSF Preprints (osf.io/preprints) and Open Grey (opengrey.eu). These efforts will ideally improve comprehensiveness of the review as the published literature tends to prioritize positive results whereas grey literature could expose null or negative findings.

expected, these publisher databases tended to perform poorly; they both had very low yields. In general, reviewers should consider avoiding such databases unless (a) there is a compelling reason to include them or (b) they are used in conjunction with a wide variety of other databases. If reviewers make the decision to only search a minimum number of databases, such publisher databases should not be included in most cases.

Additionally, although Google Scholar returned the largest proportion of identified articles among all databases and the forward search, there are important limitations worth noting. Performing a complex search in Google Scholar is challenging due to several reasons including the 256 character limit for search terms, lack of precision regarding which bibliographic fields are being searched (i.e., not able to limit to abstract field or author provided keywords), and Google Scholar's lack of transparent ranking algorithm. It is important that search strategies are transparently reported and reproducible according to the date when the searches were performed, and since Google Scholar's ranking algorithm is not public, this is challenging. Unless one is performing a very precise known item search, Google Scholar search result totals are not precise; this means that the total number of search results is often an estimated number ending in zero (e.g., "About 1,960,000 results"). Of that total, the searcher is limited to only the first 1000 results in which the order could vary from others performing the search. This makes a search in Google Scholar not reproducible.

It is becoming more and more common for researchers to use evidence synthesis methods in order to address cross-national issues (e.g., Allen, French, Dumani, & Shockley, 2015; Harari, Herst, Parola, & Carmona, 2016; Shockley et al., 2017). With this in mind, it is useful to consider that some popular databases (namely PsycINFO), had better yields for studies carried out inside vs. outside of the United States (however, this finding should be couched within the general limitation that our original meta-analysis considered only one relationship and it is not clear how generalizable this finding would be. This issue is discussed in greater detail in the Limitations section). We do not wish to dissuade the use of PsycINFO; we merely suggest that databases with broader international coverage can be used as complements.

One benefit of PsycINFO and many other subject specific databases (e.g., ERIC, MEDLINE) is article-level assignment of subject headings and the ability to navigate the controlled vocabulary in a database thesaurus. Searchers could identify which subject headings best match a given topic and where such subject headings exist within broader and narrower headings. Subject headings could be "exploded" to be inclusive of narrower subject headings.

Alternatively, databases and grey literature repositories with international content could be targeted. Choosing such databases would depend largely on the scope of the question as many international platforms are specific to different regions, languages, and subjects. Examples include China Knowledge Resource Integrated Database, Korean Studies Information Service System, Sabinet for Southern African research, EThOS (a national thesis service of the United Kingdom) Theses Canada, Australian Policy Online, VHL Regional Portal (relational database in Latin America) and NORART (regional database in Norway).

Another important point to consider is that electronic database searches, while the corner stone of virtually all meta-analytic and systematic review efforts, is certainly not – and should not be – the only approach used. Reliance on database searches alone can constrain the comprehensiveness of the search, as reviewers are only capturing studies that (a) are indexed, (b) are published in journals that are included in searched databases, and (c) include the search terms queried by the authors. We modeled the effect of a forward search, but it is likely that results would have been quite different if we chose another complementary search strategy. Indeed, there is no reason to believe that a review wouldn't benefit by combining as many different approaches as possible. Further, since the database and forward search captured indexed studies, had we included a search strategy that captured the non-indexed literature, with likely little exception, all identified studies would have been unique from those that were obtained via our database

search. Therefore, we recommend that a minimum expectation for a comprehensive literature search is that at least two complementary search strategies be used: one that captures indexed studies and one that captures non-indexed studies.

Earlier in the paper, we outlined characteristics that speak to reporting transparency and reproducibility. In carrying out our review, we identified additional issues. For example, when backward searching, authors would frequently note that they "scanned" references of included studies. This is not reproducible; it is not often made clear which articles had their references sections reviewed and specifically what criteria authors applied when screening said references. Thus, in addition to making general recommendations concerning the value in using alternate search strategies, we also hope to move the field towards more transparent practices when they are being used.

To help to address this issue, when crafting a review, authors should familiarize themselves with the PRISMA Statement and relevant extensions (www.prisma-statement.org). The PRISMA Checklist includes various items related to the search strategy, and the layout of the checklist is in Introduction – Method – Results – and – Discussion (IMRaD) format. For example, the checklist indicates that in the methods section (M), authors should report all information sources (e.g., bibliographic platforms) as well as the electronic search strategy for one database. Likewise, the new PRISMA-Search (PRISMA-S) Extension (https://osf.io/sfc38/) focuses on search strategy reporting standards. PRISMA-S is currently available as a draft. The PRISMA extensions are useful resources for outlining a structure that, if followed, would result in developing a reproducible search strategy and communicating the strategy in a clear manner.

Additionally search strategies could be peer reviewed, and one document that could help facilitate this work is PRESS, a guideline for evaluating search strategies (McGowan et al., 2016). Components include but are not limited to the correct use of Boolean and proximity operators as well as the use of spelling variants (e.g., labour v. labor).

In addition to the minimum acceptable criteria for carrying out and reporting a systematic review discussed in Study 1 (see also Table 2), Table 5 reports a summary of recommendations that build on our observations from Study 1. It was made clear in our review that database searches were not reported transparently in a large number of reviews and also that complementary search strategies (particularly those targeting the non-indexed literature) were not incorporated into many reviews. Many reviewers might be unfamiliar with the use of many complementary strategies. Further, although not directly assessed in our review, we observed a number of areas where complementary search strategies were not transparently reported. Thus, Table 5 summarizes recommendations that can be followed when carrying out database searches and complementary search strategies to help to promote identification of relevant studies and transparent reporting allowing for reproducibility.

In addition to the insights gleaned from our review, there are general trends in the systematic review discipline that are only recently becoming more frequently used in the applied psychological sciences and organizational sciences. Scholars in these areas should be familiar with these developments. In particular, registering a search protocol is a common practice in some disciplines, especially in the health sciences. Pre-registration of a search protocol is thought to help to prevent HARKing (Hypothesizing After Results are Known). Further, simply maintaining awareness of pre-registered protocols and reviewing registered search strategies periodically will help those conducting systematic reviews to stay current on new strategies that emerge over time. Indeed, the 9 strategies identified here are likely not and will not necessarily remain the only ones, or even the predominant ones. For example, as posting of preprints becomes more common, searching preprint repositories might emerge as a useful strategy for targeting non-indexed studies. Those interested in better understanding the pre-registration process can consult the Open Science Framework (http://osf.io).

8.1. Limitations and future directions

Readers should be sure to not over-generalize our findings, particularly those related to our original meta-analysis, as we are dealing with one specific literature. However, our results are informative in depicting the great variety of yields across databases and help to underscore why a comprehensive search, including the use of many databases and incorporating additional strategies (such as backward searches, discussed next), is so important.

Further, our review of systematic reviews included only recent studies from a handful of journals. Although we think that our findings are likely informative to a range of disciplines in the applied and organizational sciences, additional work would be needed to better understand the generalizability. For example, our findings might be unlikely to generalize to macro-level organizational sciences topic areas or areas of applied psychology that do not deal with the workplace. Further, the journals reviewed were heavily tilted towards organizational psychology vs. counseling psychology and we advocate for more work to be done related to the latter discipline. Thus, although our findings can still be informative for these areas, more work is needed.

For purposes of carrying out our original meta-analysis, we only included articles that were published in English. However, as brought to our attention by the Editor, this is an outdated practice, given the availability of accurate automatic translation software. Thus, we wish to clarify that, when screening articles for inclusion in a systematic review, language should not be included as an inclusion criterion (unless done for particular, substantive reasons).

8.2. Conclusion

Our work advanced systematic review and meta-analysis methodology in the applied psychological and organizational sciences by focusing on a centrally important, but often neglected characteristic – the literature search. By evaluating the quality of published systematic reviews in top applied psychology journals, we identified a number of areas whereby the comprehensiveness and reproducibility of searches can be improved. We also presented evidence suggesting that, when a search is insufficiently comprehensive, findings from a meta-analysis can be substantially skewed, underscoring the importance of our work. Thus, the research reported herein has important implications for systematic reviews and the ability to draw conclusions from large bodies of literature.

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jvb.2020.103377.

References[1]

*Allen, D. G., Weeks, K. P., & Moffitt, K. R. (2005). Turnover intentions and voluntary turnover: The moderating roles of self-monitoring, locus of control, proactive personality, and risk aversion. *Journal of Applied Psychology, 90*(5), 980–990.

Allen, T. D., French, K. A., Dumani, S., & Shockley, K. M. (2015). Meta-analysis of work–family conflict mean differences: Does national context matter? *Journal of Vocational Behavior, 90*, 90–100.

*Andrews, M. C., Kacmar, K. M., & Valle, M. (2016). Surface acting as a mediator between personality and attitudes. *Journal of Managerial Psychology, 31*(8), 1265–1279.

Appelbaum, M., Cooper, H., Kline, R. B., Mayo-Wilson, E., Nezu, A. M., & Rao, S. M. (2018). Journal article reporting standards for quantitative research in psychology: The APA publications and communications board task force report. *American Psychologist, 73*(1), 3.

Bakkalbasi, N., Bauer, K., Glover, J., & Wang, L. (2006). Three options for citation tracking: Google Scholar, Scopus and Web of Science. *Biomedical Digital Libraries, 3*(1), 7.

Bateman, T. S., & Crant, J. M. (1993). The proactive component of organizational behavior: A measure and correlates. *Journal of Organizational Behavior, 14*(2), 103–118.

*Bolino, A. V. (2009). *An investigation of proactivity, adjustment, and intra -assignment: Turnover intentions among expatriates.* Doctoral dissertationUniversity of South Carolina.

*Borst, R. T., Kruyen, P. M., & Lako, C. J. (2017). Exploring the job demands–resources model of work engagement in government: Bringing in a psychological perspective. *Review of Public Personnel Administration,* 372–397 0734371X17729870.

*Bravo, R., Matute, J., & Pina, J. M. (2017). Corporate identity management and employees' responses. *Journal of Strategic Marketing, 25*(1), 1–13.

*Brown, C. G. (2016). *Leader approachability: What is it, what is it good for, and who needs it?* Doctoral dissertationThe University of Tulsa.

*Burke, R. J., Fiksenbaum, L., El-Kot, G., Koyuncu, M., & Jing, W. (2011). Potential antecedents and consequences of work-family conflict: A three country study. *Creating balance?* (pp. 101–119). Berlin, Heidelberg: Springer.

*Burke, R. J., Koyuncu, M., & Fiksenbaum, L. (2007). Career priority patterns among managerial and professional women in Turkey: Benefits of putting career first? *Women in Management Review, 22*(5), 405–417.

*Burke, R. J., Koyuncu, M., & Fiksenbaum, L. (2008a). Workaholism types among Turkish physicians: Potential antecedents and consequences. *Europe's Journal of Psychology, 4*(3).

*Burke, R. J., Koyuncu, M., & Fiksenbaum, L. (2008b). Work experiences, satisfactions and psychological well-being of female and male managers in the hospitality sector in Turkey. *Equal Opportunities International, 27*(6), 505–518.

*Burke, R. J., Koyuncu, M., & Fiksenbaum, L. (2009). Gender differences in work experiences, satisfactions and wellbeing among physicians in Turkey. *Gender in Management: An International Journal, 24*(2), 70–91.

*Burke, R. J., Ng, E. S. W., & Fiksenbaum, L. (2009). Virtues, work satisfactions and psychological wellbeing among nurses. *International Journal of Workplace Health Management, 2*(3), 202–219.

*Che, X. (2012). *An exploratory study of reception of organizational citizenship behaviors and work related outcomes: It is good for your co-workers.* Doctoral dissertationUniversity of South Florida.

*Choi, Y. (2014). *Newcomer socialization: The roles of social networks.* Doctoral dissertationUniversity of Minnesota.

*Chung-Yan, G. A., & Butler, A. M. (2011). Proactive personality in the context of job complexity. *Canadian Journal of Behavioural Science-Revue Canadienne Des Sciences Du Comportement, 43*(4), 279–286.

Dahlke, J. A., & Wiernik, B. M. (2018). Psychmeta: An R package for psychometric meta-analysis. *Applied Psychological Measurement,* 415–416 0146621618795933.

DeSimone, J. A., Köhler, T., & Schoen, J. L. (2018). If it were only that easy: The use of meta-analytic research by organizational scholars. *Organizational Research Methods,* 867–891 1094428118756743.

Ferguson, C. J., & Brannick, M. T. (2012). Publication bias in psychological science: Prevalence, methods for identifying and controlling, and implications for the use of meta-analyses. *Psychological Methods, 17*(1), 120.

*Fiksenbaum, L., Koyuncu, M., & Burke, R. J. (2010). Virtues, work experiences and psychological well-being among managerial women in a Turkish bank. *Equality, Diversity and Inclusion: An International Journal, 29*(2), 199–212.

*Finkelstein, L. M., Kulas, J. T., & Dages, K. D. (2003). Age differences in proactive newcomer socialization strategies in two populations. *Journal of Business and Psychology, 17*(4), 473.

*Follmer, E. (2016). *What we do to fit in: Personality, coping, and person-environment fit.* Doctoral dissertationThe University of Iowa.

*Ford, K. K. (2011). *An evaluation of moderating influences of employee proactive personality: Empowerment and political skill.* Doctoral dissertationPortland State Univesity.

Fuller, B., Jr., & Marler, L. E. (2009). Change driven by nature: A meta-analytic review of the proactive personality literature. *Journal of Vocational Behavior, 75*(3), 329–345.

Geyskens, I., Krishnan, R., Steenkamp, J. B. E., & Cunha, P. V. (2009). A review and evaluation of meta-analysis practices in management research. *Journal of Management, 35*(2), 393–419.

Grant, M. J., & Booth, A. (2009). A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Information & Libraries Journal, 26*(2), 91–108.

Harari, M. B., Herst, D. E., Parola, H. R., & Carmona, B. P. (2016). Organizational correlates of public service motivation: A meta-analysis of two decades of empirical research. *Journal of Public Administration Research and Theory, 27*(1), 68–84.

Harari, M. B., Manapragada, A., & Viswesvaran, C. (2017). Who thinks they're a big fish in a small pond and why does it matter? A meta-analysis of perceived overqualification. *Journal of Vocational Behavior, 102*, 28–47.

*Hester, A. J., Moore, J. E., & Yager, S. E. (2014). The role of voice in retention of IT workers: Paving the higher road. *2014 47th Hawaii international conference on system sciences* (pp. 3980–3992). IEEE.

*Johnson, M. E. (2015). *An analysis of proactive personality in U.S. Air Force Academy cadets: A mixed methods study.* Doctoral dissertationUniversity of Colorado at Colorado Springs.

*Joo, B.-K., Hahn, H. J., & Peterson, S. L. (2015). Turnover intention: The effects of core self-evaluations, proactive personality, perceived organizational support, developmental feedback, and job complexity. *Human Resource Development International, 18*(2), 116–130.

*Joo, B.-K., Hann, H., J., & Peterson, S. (2014). *Turnover intention: The effects of core self-evaluations, proactive personality, perceived organizational support, developmental feedback, and job complexity.* (Unpublished report).

*Kane, L. M. (2014). *Telework and organizational citizenship behaviors: The underexplored roles of social identity and professional isolation.* Doctoral dissertationCity University of New York.

Kepes, S., Banks, G. C., McDaniel, M., & Whetzel, D. L. (2012). Publication bias in the organizational sciences. *Organizational Research Methods, 15*(4), 624–662.

Kepes, S., McDaniel, M. A., Brannick, M. T., & Banks, G. C. (2013). Meta-analytic reviews in the organizational sciences: Two meta-analytic schools on the way to MARS (the Meta-Analytic Reporting Standards). *Journal of Business and Psychology, 28*(2), 123–143.

Kim, J. G., Kim, H. J., & Lee, K. H. (2019). Understanding behavioral job search self-efficacy through the social cognitive lens: A meta-analytic review. *Journal of Vocational Behavior, 112*, 17–34.

Koffel, J. B. (2015). Use of recommended search strategies in systematic reviews and the impact of librarian involvement: A cross-sectional survey of recent authors.

[1] References marked with an asterisk (*) were included in the original meta-analysis.

PLoS One, 10(5), e0125931.
*Koyuncu, M., Burke, R. J., & Fiksenbaum, L. (2008). Virtues, work experiencesw, satisfactions and well-being among physicians in Turkey. *The Journal of Industrial Relations and Human Resources, 10*(3), 54–73.
Lefebvre, C., Manheimer, E., & Glanville, J. (2008). Searching for studies. *Cochrane book series*. (pp. 95–150).
*Loi, R., Liu, Y., Lam, L. W., & Xu, A. J. (2016). Buffering emotional job demands: The interplay between proactive personality and team potency. *Journal of Vocational Behavior, 95–96*, 128–137.
McGowan, J., Sampson, M., Salzwedel, D. M., Cogo, E., Foerster, V., & Lefebvre, C. (2016). PRESS peer review of electronic search strategies: 2015 guideline statement. *Journal of Clinical Epidemiology, 75*, 40–46.
Mohrer, D., Liberati, A., Tetzlaff, J., Altman, D. G., & PRISMA Group (2009). Preferred Reporting Items for SystematicReviews and Meta-Analyses: the PRISMA Statement. *Annals of Internal Medicine, 151*(4), 264–269.
*Moore, J. E., Hester, A. J., & Yager, S. E. (2016). Paving the higher road: The role of voice in the retention of IT workers. *Data Base for Advances in Information Systems, 47*(1), 8–28.
Othman, R., & Nor Sahlawaty, H. (2004). Retrieval features for online databases: Common, unique, and expected. *Online Information Review, 28*(3), 200–210.
Paterson, T. A., Harms, P. D., Steel, P., & Credé, M. (2016). An assessment of the magnitude of effect sizes: Evidence from 30 years of meta-analysis in management. *Journal of Leadership & Organizational Studies, 23*(1), 66–81.
*Prabhu, V. P. (2007). *Understanding the effect of proactive personality on job related outcomes in an organizational change setting.* Doctoral dissertationAuburn University.
*Prabhu, V. P. (2013a). Proactive personality and career future: Testing a conceptual model and exploring potential mediators and moderators. *American Journal of Management, 13*(1), 11–31.
*Prabhu, V. P. (2013b). Retaining your proactive employees: An empirical model with evidence form Israel. *In 2013 Proceedings of the Southwest Academy of Management* (pp. 114–131). .
*Prabhu, V. P. (2013c). Proactive personality and intent to remain with an organization: Understanding factors affecting retention of Israeli employees. *Journal of Management Policy and Practice, 14*(4), 11–25.
*Prabhu, V. P. (2016). Proactive personality and organizational change: Factors affecting retention. *Journal of Organizational Psychology, 16*(1), 11–23.
Rios, J. A., Ihlenfeldt, S. D., Dosedel, M., & Riegelman, A. (2019). A Topical and Methodological Systematic Review of Meta-Analyses Published in the Educational Measurement Literature. *Educational Measurement: Issues and Practice*.
*Ristig, K. (2004). Antecedents and consequences of trust within organizations. *Doctoral dissertation*. Louisiana Tech University.
*Roberts, M. L. (2004). *Personality and work situational predictors of exit, voice, loyalty, and neglect: An interactionist perspective.* Master thesisUniversity of Tennessee.
Rudolph, C. W., Lavigne, K. N., & Zacher, H. (2017). Career adaptability: A meta-analysis of relationships with measures of adaptivity, adapting resources, and adaptation results. *Journal of Vocational Behavior, 98*, 17–34.
Schmidt, F. L., & Hunter, J. E. (2015). *Methods of meta-analysis: Correcting error and bias in research findings.* Sage publications.
Sheu, H. B., Lent, R. W., Miller, M. J., Penn, L. T., Cusick, M. E., & Truong, N. N. (2018). Sources of self-efficacy and outcome expectations in science, technology, engineering, and mathematics domains: A meta-analysis. *Journal of Vocational Behavior, 109*, 118–136.
Shockley, K. M., Douek, J., Smith, C. R., Peter, P. Y., Dumani, S., & French, K. A. (2017). Cross-cultural work and family research: A review of the literature. *Journal of Vocational Behavior, 101*(1–20).
*Slatten, L. A., Carson, K. D., Baker, D. S., & Carson, P. P. (2013). An expansion of the beneficial outcomes associated with the proactive employee. *Journal of Behavioral and Applied Management, 14*(3), 162–172.
*Smothers, J. E. J. (2012). Reinventing the wheel: Examining the antecedents, moderators, and outcomes of the innovation process. *Doctoral dissertation*. The University of Mississippi.
Su, R. (2018). The three faces of interests: An integrative review of interest research in vocational, organizational, and educational psychology. *Journal of Vocational Behavior* (In Press).
*Timmerman, P. D. (2008). *The impact of individual resiliency and leader trustworthiness on employees' voluntary turnover intentions.* Doctoral dissertationThe University of Nebraska – Lincoln.
*Trifiletti, E., Capozza, D., Pasin, A., & Falvo, R. (2009). A validation of the proactive personality scale. *TPM-Testing, Psychometrics, Methodology in Applied Psychology, 16*(2), 77–93.
*Vandenberghe, C., & Ok, A. B. (2013). Career commitment, proactive personality, and work outcomes: A cross-lagged study. *Career Development International, 18*(7), 652–672.
*Walker, W. J. (2009). *Predicting two types of proactive socialization tactics: The roles of context, experience, and age.* Doctoral dissertationGeorgia Institute of Technology.
*Wanberg, C. R., Kammeyer-Mueller, J., & Marchese, M. (2006). Mentor and protégé predictors and outcomes of mentoring in a formal mentoring program. *Journal of Vocational Behavior, 69*(3), 410–423.
*Wang, M. O., Zhan, Y., McCune, E., & Truxillo, D. (2011). Understanding newcomers' adaptability and work-related outcomes: Testing the mediating roles of perceived P-E fit variables. *Personnel Psychology, 64*(1), 163–189.
*Wang, Y. H., Hu, C., Hurst, C. S., & Yang, C. C. (2014). Antecedents and outcomes of career plateaus: The roles of mentoring others and proactive personality. *Journal of Vocational Behavior, 85*(3), 319–328.
*Wawoe, K. W. (2010). *Proactive personality: The advantages and disadvantages of an entrepreneurial disposition in the financial industry.* Doctoral dissertationVrije Universiteit.
Wiernik, B. M., & Dahlke, J. A. (2019). Obtaining unbiased results in meta-analysis: The importance of correcting for statistical artefacts. *Advances in Methods and Practices in Psychological Science* (In Press).
Wiernik, B. M., Kostal, J. W., Wilmot, M. P., Dilchert, S., & Ones, D. S. (2017). Empirical benchmarks for interpreting effect size variability in meta-analysis. *Industrial and Organizational Psychology, 10*(3), 472–479.
*Woo, S. E., & Allen, D. G. (2014). Toward an inductive theory of stayers and seekers in the organization. *Journal of Business and Psychology, 29*(4), 683–703.
Woods, S. A., Wille, B., Wu, C. H., Lievens, F., & De Fruyt, F. (2018). The influence of work on personality trait development: The demands-affordances TrAnsactional (DATA) model, an integrative review, and research agenda. *Journal of Vocational Behavior, 110*, 258–271.
*Yang, J., Gong, Y., & Huo, Y. (2011). Proactive personality, social capital, helping, and turnover intentions. *Journal of Managerial Psychology, 26*(8), 739–760.
Yang, W. N., Niven, K., & Johnson, S. (2018). Career plateau: A review of 40 years of research. *Journal of Vocational Behavior, 26*, 739–760.
*Young, R. L. (2011). *Engagement: Defining and measuring the construct.* Doctoral dissertationFlorida Institute of Technology.
Zhang, Y., Xu, S., Jin, J., & Ford, M. T. (2018). The within and cross domain effects of work-family enrichment: A meta-analysis. *Journal of Vocational Behavior, 104*, 210–227.
*Zhang, Z. (2008). *In the eyes of the follower: Cognitive and affective antecedents of transformational leadership perception and individual outcomes.* Doctoral dissertationUniversity of Minnesota.