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A quantitative and qualitative review of what meta-analyses have contributed to our understanding of human resource management

Shani Pindek [a,*], Stacey R. Kessler [b], Paul E. Spector [a]

[a] University of South Florida, United States
[b] Montclair State University, United States

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ABSTRACT

In this paper we review the contribution that researchers have made to the field of human resource management (HRM) using the method of meta-analysis. First, we summarized results of a content analysis of the most frequently studied HRM topics and topic combinations found in 407 papers published in the major HRM peer-reviewed outlets. Specifically, we found that the most frequently studied topics were performance, attitudes, diversity/demographics, personality, withdrawal, and job characteristics. Second, we used the ISI Thomson Web of Science database to conduct a citation analysis of the 100 most impactful meta-analytic HRM papers. Among the top 10, two focused on justice and two on turnover. Third, we provided a narrative review that noted some important meta-analytic contributions to HRM knowledge. This discussion was organized according to a 2 × 2 framework depicting whether a paper's purpose was to test a theory or was more descriptive/exploratory, and whether a paper's purpose was mainly to cumulate effect sizes or test moderators. This narrative review provided examples that illustrates the breadth of the many contributions made with meta-analysis.

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For the past three decades, the method of meta-analysis has been a major research tool in the field of human resource management (HRM). This method allows for the quantitative combination of results across samples and studies, thereby achieving greater accuracy in the estimation of the magnitude of relationships (Schmidt, 1992). Meta-analysis can be used in an exploratory way as a means of quantitatively summarizing results in an area or can be used in a deductive way to test a priori hypotheses and theories. Recent statistical advances also allow for tests of more complex relationships, such as the detection of moderators.

This paper will utilize both quantitative and qualitative review methods to summarize what we have learned about HRM from meta-analyses over the past three decades. We begin with a content analysis of papers that utilized meta-analysis, published in major HRM journals, to provide a snapshot of HRM content that has been meta-analyzed. This quantitative summary illustrates the frequency with which topics and combinations of topics have been included in meta-analyses. Second, we relied on the Web of Science to provide a citation analysis of the 100 most cited meta-analyses in the leading HRM outlets. Finally, we took a narrative approach to provide notable examples of meta-analyses that provided important insights into HRM, organized by four categories of contribution. Specifically, we categorized contributions into two dimensions examining whether or not they test theories and by whether they only provide estimates of direct relationships or test for moderators as well.

* Corresponding author at: University of South Florida, Psychology Department, PCD 4118, 4202 East Fowler Ave, Tampa, FL 33620, United States.
E-mail address: shanipindek@mail.usf.edu (S. Pindek).

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1. Content analysis of HRM topics that have been meta-analyzed

One way to assess the contribution of meta-analyses to the HRM knowledge base is to consider the frequency with which topics (e.g., job performance) and combinations of topics (e.g., job performance and personality) were examined. Such an analysis provides a global overview of where the field has focused attention and where it has not, at least in terms of meta-analysis. Likely, topics and combinations of topics that have been frequently meta-analyzed are more popular and/or considered to be more important by researchers. Of course, it is possible that there are many topics and combinations that have sufficient primary studies, but have been neglected by meta-analysts. In this section we present results of a content analysis that provides a snapshot of HRM topics that have been meta-analyzed in the major peer-reviewed HRM research outlets. This analysis can be used by researchers attempting to learn how much has been done in each area, as well as the combinations (crossing) of areas.

2. Sample of studies and inclusion criteria

We searched for HRM related meta-analyses in the 14 peer-reviewed journals that we considered the major outlets for HRM research and that publish meta-analyses: Academy of Management Journal (AMJ), Academy of Management Review (AMR), Administrative Science Quarterly (ASQ), Human Relations (HR), Human Resource Management Review (HRMR), International Journal of Selection and Assessment (IJSA), Journal of Applied Psychology (JAP), Journal of Business and psychology (JBP), Journal of Management (JOM), Journal of Occupational and Organizational Psychology (JOOP), Journal of Organizational Behavior (JOB), Organizational Behavior and Human Decision Processes (OBHDP), Personnel Psychology (PPsych), and Psychological Bulletin (PsychBull). We used the PsycInfo database to search for meta-analyses and validity generalization studies published through March 2015. Included were only papers in which a topic area was subject to meta-analysis and discarded methodological papers about the technique itself. As shown in Table 1, our search yielded 1084 hits based on the keywords entered, with 407 of them meeting inclusion criteria (meta-analysis on HRM topic excluding purely macro-level studies). Table 1 lists the number of hits and papers included from each journal. As can be seen, nearly half of the included papers were from Journal of Applied Psychology, with the next closest contributor being Personnel Psychology. Few meta-analyses (under 6) were published in Academy of Management Review, Administrative Science Quarterly, or Human Resource Management Review. The low number of meta-analysis published in HRMR is not a surprise since for many years by policy the journal only published narrative reviews. Although Psychological Bulletin is a major outlet for meta-analyses, we found only 5 on HRM topics.

3. Coding rules and procedure

Each identified paper was examined to see if it met inclusion criteria, and to determine the meta-analyzed variables. We coded the variable content of each meta-analysis, allowing for a meta-analysis to be placed into multiple categories, as long as relevant variables were included in the analyses conducted (we did not include categories of variables that were only discussed in the paper, but not analyzed). For example, if a meta-analysis was centered on the relationship between the antecedents of job satisfaction and personality and the outcome performance, and had the moderator country/culture, it was coded as belonging to all four categories (performance, attitudes, personality and cross-cultural). We used 26 broad categories that in some cases included many variables (i.e., the attitudes category includes variables such as job satisfaction, perceived support, values, and more). These broad categories, while not informing us whether or not a specific topic has been meta-analyzed, do point to areas in our literature that have been studied and analyzed extensively, and areas that have not been as extensively reviewed (as published in the top journals of our field). We chose broad categories because to include specific variables (e.g., pay satisfaction) would have

Table 1
The number of search hits and papers included from each included journal.

Journal	Search hits	Papers included
Journal of Applied Psychology (JAP)	267	180
Personnel Psychology (PPsych)	107	60
Journal of Organizational Behavior (JOB)	32	25
Academy of Management Journal (AMJ)	470	17
Academy of Management Review (AMR)	9	3
Journal of Management (JOM)	56	26
Psychological Bulletin (PsychBull)	11[a]	5
Journal of Business and psychology (JBP)	25	19
Journal of Occupational and Organizational Psychology (JOOP)	32	24
International Journal of Selection and Assessment (IJSA)	31	19
Organizational Behavior and Human Decision Processes (OBHDP)	25	13
Administrative Science Quarterly (ASQ)	2	2
Human Relations (HR)	13	10
Human Resource Management Review (HRMR)	6	4
Total	1084	407

Note. For all journals except AMJ, hits were derived from a PsycINFO search restricted to the specific journal. For AMJ, hits were derived from the AMJ website unless specified differently.

[a] The search was also crossed with the Boolean phrase "'employee' OR 'organization'".

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produced a very long list that would be far too unwieldy to interpret or present. The categories chosen represent an inclusive list of topical areas that are studied within the field of HRM.

Table 2 lists the 26 categories and associated content. In order to keep the tables at a reasonable size, we only included categories that had at least 10 meta-analyses. Excluded topics include: person-organization fit, politics, cooperation, realistic job

Table 2
Variable categories.

Category	Variables included
1. Performance	• Subjective and objective performance indicators • Excludes OCB and CWB
2. Attitudes & values	• Job satisfaction or satisfaction with any area of the job such as satisfaction with coworkers or supervisors (excluding satisfaction with pay which had its own category) • All types of commitment, all types of trust (including employees' trust in the organization/supervisor as well the organization's perceived trust in employees) • Values • Perceived organizational support (POS) along with all types of support including supervisors' support of employees
3. Diversity/demographics	• Includes any focus on biographical differences such as age, gender, and race
4. Personality	• Included the "Big 5 of Personality" as well as other personality variables such as self-efficacy self-esteem. • Trait affect variables are included here.
5. Withdrawal	• Lateness • Absenteeism • Turnover and turnover intentions
6. Job characteristics	• The job characteristics described in the job characteristics model (skill variety, task identity, task significance, autonomy, feedback) • Aspects of the work environment not covered in other categories (e.g., pay is in the compensation category and not included here). • Task stressors such as constraints. • Scheduling, including information about whether/how shifts are scheduled (including flextime).
7. Stress & health	• This included meta-analyses examining stressors and strains. • Variables such as well-being, depression, role ambiguity and role stressors, work pressure, and task repetitiveness were included as well.
8. Job types/sectors	• This variable included the industry and job level within the organization.
9. Ability (cognitive or other)	• All types of abilities including cognitive, physical, and language.
10. Selection and assessment	• Meta-analyses focusing on selection and the utility of selection systems. • Examples included the efficiency of assessment centers, validity generalization, performance appraisal systems, or KSAO's. • Meta-analyses only discussing implications for selection were excluded.
11. Motivation	• This includes all aspects of intrinsic motivation but excludes extrinsic motivation (e.g., pay or bonuses). Also excluded is engagement. • Examples of categories include effort, involvement, goal setting, goal commitment, goal orientation, McClelland's needs theory, job dedication, and growth need strength from JCM
12. Organizational citizenship behaviors (OCB)	• Contextual performance • Interpersonal and organizationally directed OCB
13. Leadership	• Meta-analyses examining leadership styles and behaviors. Examples include transformation and transactional leadership.
14. Training	• Includes training programs as well as transfer of training
15. Counterproductive work behaviors (CWB)	• Interpersonal and organizationally directed CWB • A variety of deviant/harmful behaviors including but not limited to abusive supervision, bullying, and mobbing
16. Groups/teams	• Meta-analyses examining group/team variables including but not limited to group processes and relationships/interactions between team members.
17. Compensation/pay	• Meta-analyses examining employee compensation including employee salary and employee bonuses.
18. Justice	• Meta-analyses examining workplace justice and fairness were included here.
19. Emotions	• Meta-analyses examining a variety of emotions including singular emotions (anger or anxiety), depression, mood, and state affect.
20. Career planning/career management	• Focuses on the planning and management of one's career. • Examples include a focus on promotion (excluding pay/salary) and stage of career • Mentoring
21. Work-family	• This category included all variables related to the intersection of work and family matters. • This included work to family conflict, family to work conflict, everything. • Other variables in this category included "family-related" variables such as marital status and the age of children.
22. Cross-cultural	• Meta-analyses directly examining cross-cultural issues. • Examples include Hofstede's dimensions
23. Climate/culture	• Meta-analyses examining the internal culture or climate of the organization. • Organizational structure and other characteristics (i.e., size)
24. Creativity & learning	• All meta-analyses that explicitly examined creativity or creative behavior. • Innovation • Learning
25. Safety	• Meta-analyses focusing on safety including but not limited to safety climate, safety leadership, safety behaviors/performance, and workplace accidents.
26. Decision making	• Meta-analyses examining how decisions are made.

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preview, job analysis, communication, unions, task/process conflict, power, psychological contract, external environment, technology, interventions, and negotiation.

In addition to coding the topics for each meta-analysis, we coded for the total number of studies (k), minimum k, and total sample size (sum of samples sizes across all studies) for each paper. The median k across all the meta-analyses was 67 and the median total sample size was 16,981. The modal minimum k for reporting a mean correlation was 2, which means that the lowest k appearing in any of the tables in the meta-analyses is typically 2.

We used a sample of 100 papers as a training set so that the two raters could calibrate their coding, and the set of categories could be developed. A small number of papers was coded independently by both raters (the number increased across iterations), and when completed, the responses were compared and discrepancies discussed until consensus was reached. As the categories were developed, and the coders became practiced, the number of discrepancies decreased until near perfect agreement was achieved. The remaining 307 papers were each coded by one of the coders.

4. Results

Table 3 contains a summary of the content analysis of topic and topic combination frequency. Cells on the main diagonal (in bold) represents the number of meta-analyses that included variables from the category noted in that cell's row. Cells below the main diagonal represents the number of meta-analyses that included combinations of variables from both categories in the column and row (the cross tabs).

As seen in Table 3, the most meta-analyzed variable categories from highest to lowest are performance, attitudes, demographics and diversity, personality, withdrawal, job characteristics, stress, job types, selection and ability. Each of these categories appeared in over 50 meta-analyses, representing the most salient and well-studied HRM phenomena. It is important to note though that many of these topics have been studied for the longest time period. Performance, for example, has been the topic of HR research from its very beginning, with early theorists such as Taylor (1914) examining ways to increase employee efficiency. Because topics such as performance have been studied for so long, the number of primary studies that have accumulated is great.

In addition, some combinations of variables have received much attention. For example, there have been 94 meta-analyses that included both attitudes and performance, 45 with ability and performance, 68 with personality and performance, 73 with attitudes and withdrawal, and 63 with attitudes and stress or health. These studies include many of the major known predictors for performance, withdrawal and employee well-being, which are some of the most important HRM outcomes. One important note, however, is that in many, if not most cases, papers did not report complete meta-analytic correlation matrices. Many papers had one or more focal variables (e.g., training outcomes) that were related to a set of predictors (e.g., personality and job type). Whereas correlations were presented between each predictor and each outcome, typically correlations were not reported among the predictors or among the outcomes. Our table does not account for this occurrence (the combination of personality and job

Table 3
A summary of the meta-analyses' content and cross-tabs analysis.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1. Performance	**239**																									
2. Attitudes	94	**168**																								
3. Diversity/demographics	63	55	**122**																							
4. Personality	68	47	31	**109**																						
5. Withdrawal	62	73	33	15	**99**																					
6. Job characteristics	65	54	35	23	35	**98**																				
7. Stress/health	43	63	37	28	37	48	**82**																			
8. Job types	61	23	33	21	19	24	13	**81**																		
9. Ability	45	11	20	31	5	16	7	11	**64**																	
10. Selection/assessment	37	6	17	13	5	11	3	14	24	**63**																
11. Motivation	40	31	13	22	8	24	17	11	9	4	**61**															
12. OCB	41	37	12	24	21	12	15	9	2	2	3	**50**														
13. Leadership	28	31	15	20	10	20	21	8	8	3	13	15	**49**													
14. Training	32	10	12	10	7	10	5	9	11	16	9	2	3	**49**												
15. CWB	26	24	16	20	13	9	16	6	3	4	2	21	7	2	**40**											
16. Groups/teams	29	17	6	5	6	10	6	7	1	1	6	4	5	3	1	**32**										
17. Compensation	22	17	17	9	13	18	11	13	3	5	7	2	6	7	1	2	**31**									
18. Justice	17	25	13	17	12	10	11	2	1	4	3	19	10	2	14	1	3	**29**								
19. Emotions	14	15	12	12	8	11	17	2	3	0	7	9	4	1	6	1	2	8	**27**							
20. Career planning	15	14	11	10	10	6	7	2	5	2	5	2	4	6	1	3	10	0	0	**24**						
21. Work-family	8	16	16	3	6	10	13	5	2	0	4	0	3	2	1	1	5	0	2	5	**21**					
22. Cross-cultural	16	11	5	8	8	6	6	9	5	1	0	6	2	3	1	2	1	2	2	0	2	**20**				
23. Climate	12	16	7	5	6	7	9	3	2	1	5	3	9	3	5	2	2	2	2	1	1	1	**19**			
24. Creativity/learning	7	5	8	8	3	6	6	3	4	1	6	4	4	4	4	2	1	0	4	5	2	1	2	**17**		
25. Safety	5	7	3	6	4	4	5	2	0	0	3	3	4	1	4	2	1	1	0	2	0	0	3	3	**13**	
26. Decision making	4	4	0	1	3	1	0	2	0	1	0	1	0	1	1	3	2	1	0	0	0	0	0	0	0	**10**

Note. Each cell number on the diagonal (in bold) is the number of meta-analyses that included variables from the category on the relevant row/column. Each cell number below the diagonal is the number of meta-analyses that included variables from both categories in the cross between the column and row.

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type would be included in the training outcomes example). Therefore, the frequencies of combinations reported below the diagonal are likely somewhat inflated.

Whereas some combinations of variable categories have been frequently meta-analyzed, other combinations have been neglected. Reasons for lower prevalence of meta-analyses on some topics (or topic combinations) include that some are narrower (e.g., career planning), are of concern to only some types of samples (e.g., creativity may be of less importance for many simple or low scope jobs), are simply newer in our field (e.g., safety), or are just less popular with researchers. Therefore, our report can inform researchers on topics or combinations of topics that likely still warrant meta-analyses or even primary studies.

One example of a topic that might deserve attention from meta-analysts is the relationship between ability and organizational citizenship behavior (OCB), where we found only two meta-analyses in our included journals. This is surprising because ability is a commonly studied predictor of task performance (45 meta-analyses included both categories, as seen in Table 3) and we would expect similar investigations to be conducted with regard to other aspects of performance (i.e., OCB). Even more neglected is the relationship between OCB and work-family, for which there were no meta-analyses in the journals we coded. Because both topics are very well-studied, and there have been hypotheses regarding their relationship (e.g., Bolino & Turnley, 2005; Bragger, Rodriguez-Srednicki, Kutcher, Indovino, & Rosner, 2005), it is surprising that their combination could not be found.

In other cases, relationships received less attention because they are not relevant to one another. For example, there were no meta-analyses on the relationship between selection and work-family, but this is not surprising seeing as family variables typically are not part of the selection process.

5. Impact of specific meta-analyses

Another indicator of the contribution of meta-analyses to the field is the frequency with which they have been cited in the literature. To address the citation impact of these studies, we consulted the ISI Thomson Web of Science database. We ran the Advanced Search with Source as the journals included in our content analysis. This returned more than 50,000 articles that have been published. We sorted those articles by number of citations, and then using the keyword "meta" we searched from most to least cited, and identified the 100 most cited.

Table 4 contains a list of those meta-analyses, the topic they covered, the year published and two citation indices: total citations and citation per year. The total citations provides an indicator of total impact over the life of each paper. Citations per year controls for the fact that the longer a paper is in existence, the more exposure and opportunity there is for citation. The yearly rate indicates the immediacy and year-to-year impact as opposed to cumulative impact. Although there was a strong correlation between citations and citations/year ($r = 0.81$), the two indices are not identical. For example, the Colquitt, Conlon, Wesson, Porter, and Ng (2001) paper on justice ranked first in citations/year but third in total citations.

As can be seen in the table, the most cited meta-analysis in these 14 journals was Barrick and Mount's (1991) paper on the relationship between personality and job performance. This paper was published at a time when the study of personality had fallen out of favor with the academic community, and contributed significantly to a renewed interest that persists to this day. Also we can see that among the top 10 are two meta-analyses on justice, and two on turnover, reflecting the prominence of these two topics. The remaining papers reflect a broad range of topics, with some topics represented multiple times and others only once. It should also be noted that the citations per year varied considerably as well.

6. Narrative review of significant meta-analysis contributions to HRM

Our content analysis and citation counts provide a broad view of the contribution of meta-analysis to HRM knowledge, but they do not provide specific information regarding how meta-analyses advanced our understanding. Since a comprehensive narrative detailing the contributions of each meta-analysis is not feasible, in this section we will provide some notable examples. We organize our examples according to a 2×2 scheme of whether they are descriptive/exploratory versus theory testing, and whether they focus on bivariate relationships (main effects) or moderator effects. We summarize these four categories in Table 5.

7. Descriptive/exploratory studies

7.1. Validity generalization

One of the earliest uses of meta-analysis was exploring the notion of validity generalization within selection (Schmidt & Hunter, 1977). Widely accepted within the field at the time was that test validity was situation specific, and therefore validation studies needed to be conducted in each new setting. In a meta-analysis following up on their original work, Schmidt and Hunter (1998) reported validity coefficients for various selection procedures, highlighting the strong predictive validity evidence for cognitive ability tests. They demonstrated that the observed variability in test predictive validities was attributable to sampling error, and that failures to find significance in many studies was due to inadequate power with small sample sizes. Their meta-analysis had significant implications for selection procedures used across organizations and also raised the question regarding the differential predictive validity of cognitive ability tests for minority groups (Berry, Clark, & McClure, 2011).

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Table 4
The 100 most cited HRM meta-analyses.

Rank	Author	Topic	Citations	Citations/year
1	Barrick & Mount, 1991	Personality & performance	2262	90
2	Damanpour, 1991	Innovation	1646	66
3	Colquitt et al., 2001	Justice	1399	93
4	Griffeth et al., 2000	Turnover	960	60
5	Lee & Ashforth, 1996	Burnout	896	45
6	Cohen-Charash & Spector, 2001	Justice	875	58
7	Organ & Ryan, 1995	OCB	839	40
8	Judge et al., 2001	Satisfaction & performance	818	54
9	Kristof-Brown et al., 2005	Person-job fit	782	71
10	Gerstner & Day, 1997	LMX	780	41
11	Tett & Meyer, 1993	Turnover	732	32
12	Judge & Bono, 2001	Core self-evaluation	698	47
13	De Dreu & Weingart, 2003	Team conflict	661	51
14	Dirks & Ferrin, 2002	Trust & leadership	654	47
15	Jackson & Schuler, 1985	Role stress	646	21
16	Harter et al., 2002	Satisfaction, engagement, business outcomes	629	45
17	Tett et al., 1991	Personality & performance	616	25
18	Judge et al., 2002	Personality & leadership	598	43
19	Fried & Ferris, 1987	Job characteristics model	516	18
20	LePine et al., 2002	OCB	509	36
21	Colquitt et al., 2000	Training motivation	496	31
22	Judge et al., 2002	Personality & job satisfaction	486	35
23	Ones et al., 1993	Integrity tests	486	21
24	Cotton & Tuttle, 1986	Turnover	474	16
25	Harris & Schaubroeck, 1988	Performance ratings by source	453	16
26	Ng et al., 2005	Career success	443	40
27	McKee-Ryan et al., 2005	Unemployment & well-being	422	38
28	Mabe & West, 1982	Self-evaluation of ability	417	12
29	Eagly et al., 2003	Leadership & gender	368	28
30	Spector, 1986	Perceived control	361	12
31	Combs et al., 2006	High performance work practices	359	36
32	Kuhberger, 1998	Training & risky decisions	343	19
33	Lord et al., 1986	Personality & leadership	339	11
34	Miller & Monge, 1986	Participation, satisfaction, productivity	337	11
35	Judge & Ilies, 2002	Personality & performance motivation	332	24
36	Humphrey et al., 2007	Motivation & work design	322	36
37	Colquitt et al., 2007	Trust, risk taking, job performance	322	36
38	Allen et al., 2004	Mentoring	316	26
39	Schmitt et al., 1985	Study characteristics	309	10
40	Podsakoff et al., 2009	OCB	306	44
41	Harrison et al., 2006	Job attitudes	306	31
42	Fisher & Gitelson, 1983	Role conflict & ambiguity	304	9
43	Podsakoff et al., 2007	Challenge-hindrance stressors	290	32
44	Gully et al., 2002	Teams	289	21
45	Dalal, 2005	CWB & OCB	288	26
46	Berry et al., 2007	CWB	285	32
47	Payne et al., 2007	Goal orientation	276	31
48	McDaniel et al., 1994	Interview	276	13
49	Gaugler et al., 1987	Assessment center	275	9
50	Zhao et al., 2007	Psychological contract	272	30
51	Bono & Judge, 2004	Personality & leadership	270	23
52	Thoresen et al., 2002	Job attitudes	270	19
53	Kanfer et al., 2001	Job search	265	18
54	Bowling & Beehr, 2006	Harassment	263	26
55	Parker et al., 2003	Climate	263	20
56	Dalton et al., 1999	Directors & financial performance	260	15
57	Hom et al., 1992	Turnover	250	10
58	Ford et al., 2007	Work family conflict & satisfaction	249	28
59	Illies et al., 2007	LMX & OCB	249	28
60	Webber & Donahue, 2001	Group diversity	249	17
61	Tosi et al., 2000	CEO pay	249	16
62	Loher et al., 1985	Job characteristics & job satisfaction	249	8
63	Riketta, 2002	Commitment & performance	248	18
64	Richman et al., 1999	Social desirability distortion	245	14
65	Bhaskar-Shrinivas et al., 2005	International adjustment	244	22
66	Mento et al., 1987	Goal setting & performance	244	8
67	Sparks et al., 1997	Work hours & health	242	13
68	Beal et al., 2003	Group cohesion & performance	235	18
69	Waldman & Avolio, 1986	Age & performance	233	8

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Table 4 *(continued)*

Rank	Author	Topic	Citations	Citations/year
70	Stewart, 2006	Team performance	231	23
71	Halbesleben, 2006	Social support & burnout	223	22
72	Crawford et al., 2010	Engagement & burnout	218	36
73	Bell, 2007	Team performance	215	24
74	Arthur et al., 2003	Training	210	16
75	Baltes et al., 1999	Work schedule	210	12
76	Kish-Gephart et al., 2010	Unethical decisions	208	35
77	Bauer et al., 2007	Organizational socialization	207	23
78	Tubbs, 1986	Goal setting	207	7
79	Geyskens, 2006	Transaction cost theory	206	21
80	Quinones et al., 1995	Work experience & performance	206	10
81	Hershcovis et al., 2007	Workplace aggression	204	23
82	Wood et al., 1987	Goal setting	204	7
83	Guzzo et al., 1985	Intervention & productivity	203	7
84	Alliger et al., 1997	Training	201	11
85	Coopoer-Hakim & Viswesvaran, 2005	Commitment	200	18
86	Joseph & Newman, 2010	Emotional intelligence	200	33
87	Christian et al., 2009	Safety	199	28
88	Hausknecht et al., 2004	Applicant reactions to selection	197	16
89	Kraiger & Ford, 1985	Race & performance ratings	196	6
90	Joshi & Roh, 2009	Team diversity	194	28
91	Petty et al., 1984	Satisfaction & performance	193	6
92	Horwitz et al., 2007	Team diversity	192	21
93	Carsten & Spector, 1987	Turnover	192	7
94	Lee et al., 2000	Commitment	189	12
95	Wanous et al., 1992	Newcomer met expectations	185	8
96	LePine et al., 2005	Teams	184	17
97	Stewart & Roth, 2001	Risk propensity	184	12
98	Bommer et al., 1995	Performance measurement	184	9
99	Chapman et al., 2005	Applicant attraction	183	17
100	Chiaburu et al., 2008	Coworker effects	180	23

7.2. Personality and performance

As seen in Table 3, there have been 68 meta-analyses that contained personality traits and role/task performance in the journals we coded. Included in this tally is the most frequently cited meta-analysis (Barrick & Mount, 1991). In Table 6, we summarized the uncorrected estimates of the relationships between each of the Big Five traits (Digman & Takemoto-Chock, 1981) and performance, which were estimated in a number of meta-analyses (11 that had at least three of the five traits were included in the table). We also provide the number of samples and combined sample sizes. The table is sorted by the number of samples for the conscientiousness-performance relationship (typically, the biggest number of samples compared to the other personality traits). As can be seen, the first three meta-analyses included a general criterion of job performance and had a large number of samples (35 or bigger) and combined sample size (over 5000). These three meta-analyses were published about a decade apart, and therefore, it is likely that the more recent meta-analysis included additional primary studies. Despite that, their estimations are very similar: for conscientiousness between 0.13 and 0.15, for emotional stability between 0.04 and 0.09, for extraversion between 0.06 and 0.07, for agreeableness between 0.04 and 0.08, and for openness to experience between −0.02 and 0.04. This makes conscientiousness the most notable personality predictor of performance. These numbers are also very close to the estimations found in the second-order meta-analysis conducted by Barrick and colleagues (Barrick, Mount, & Judge, 2001). We can therefore assume with greater certainty that these estimates, achieved via meta-analysis of many primary studies, are stable estimates. In the other meta-analyses reported in Table 6 there were fewer samples included (often under 20), and there was

Table 5
Examples reviewed.

	No moderator	Moderator
Descriptive/exploratory	1. Validity generalization 2. Personality-task performance 3. OCB-task performance 4. Job satisfaction-job performance	1. CWB-OCB 2. Gender as a moderator 3. Job type/sector as a moderator
Testing a theory	1. Job characteristics model 2. Expectancy theory 3. Leadership theories 4. Job demands-resource model 5. Extrinsic and intrinsic motivation	1. Job characteristics model moderated by growth need strength 2. Satisfaction-turnover moderated by unemployment rates

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Table 6
Relationships between Big-five personality traits and performance in published meta-analyses.

Source	Criterion	Conscientiousness			Emotional stability			Extraversion			Agreeableness			Openness to experience		
		r	k	N	r	k	N	r	k	N	r	k	N	r	k	N
Shaffer & Postlethwaite (2012)	Job performance	0.15	113	19,625	0.09	86	13,634	0.07	90	14,637	0.08	94	15,257	0.03	82	13,372
Barrick and Mount, 1991	Job proficiency	0.13	92	12,893	0.04	87	11,635	0.06	89	12,396	0.04	80	11,526	−0.02	55	9454
Hurtz & Donovan (2000)	Job performance	0.14	45	8083	0.09	37	5671	0.06	39	6453	0.07	40	6447	0.04	35	5525
Zhao et al. (2010)	Entrepreneurial performance	0.15	24	3193	0.14	29	4446	0.08	9	1476	0.04	4	931	0.15	15	2461
Salgado (1997)	Supervisor rated job performance	0.10	18	2241	0.08	22	2799	0.06	22	2799	0	19	2574	0	11	1629
Oh et al. (2011)	Overall job performance	0.28	17	2171	0.15	16	1872	0.19	14	1735	0.21	16	2074	0.18	14	1735
Vinchur et al. (1998)	Sales performance	0.17	15	1774	−0.07	14	2157	0.12	18	2629	−0.02	12	918	0.03	6	951
Bell (2007)	Team performance	0.24	11	606	0.05	6	433	0.12	9	653	0.14	10	574	0.16	6	402
Joseph et al. (2015)	Self-rated job performance	0.25	8	2621	0.22	8	2621	0.19	8	2621	–	–	–	–	–	–
Tett et al. (1991)	Job performance	0.12	7	450	0.15	10	900	0.10	15	2302	0.22	4	280	0.18	10	1304
Meriac et al. (2008)	Job performance	0.24	2	128	0.10	2	106	0.24	3	174	0.10	1	60	−0.02	1	60

considerably more variance in correlation estimates among them. This suggests that in our field (and with our typical samples), when a meta-analysis includes at least 20 samples, the estimates of mean correlations can be considered relatively stable.

7.3. Task performance and OCB

The relationship between task performance and OCB, (behavior that goes beyond core assigned tasks Organ, 1988) has received much attention. Although distinct from task performance, OCB is strongly related to it, as indicated by numerous meta-analytic findings (Conway, 1999; Hoffman, Blair, Meriac, & Woehr, 2007; Podsakoff, Whiting, Podsakoff, & Blume, 2009) with an average correlation of approximately 0.50 across more than 70 samples (Podsakoff et al., 2009). Despite the strong relationship between these two types of performance, OCB and task performances have differential relationships with attitudinal constructs, most notably with job satisfaction. More specifically, Hoffman et al. (2007) found that the OCB-job satisfaction relationship was stronger than the job performance-job satisfaction relationship. Moreover, they found incremental validity for OCB over task performance in predicting job satisfaction. These meta-analyses helped inform the nomological network of these highly studied variables.

7.4. Job satisfaction and job performance

There has been a great deal of interest in whether employees' job satisfaction relates to their job performance, or in other words, whether happy employees are also good employees. Four meta-analyses have addressed this question, with their authors reaching diverging conclusions. In one of the earliest meta-analyses in the HR field, Vroom (1964) cumulated results of 20 studies that reported correlations between job satisfaction and job performance, finding a median r of 0.14. Vroom (1964) concluded that the magnitude of relationship was of no practical or theoretical importance. Similarly, two decades later, Iaffaldano and Muchinsky (1985) reported an almost identical mean correlation of 0.15 estimated from 217 primary studies. Their conclusions mirrored Vroom's, suggesting that the job satisfaction-performance connection was largely "illusory" (p. 270). On the other hand, two other meta-analyses found somewhat larger relationships and reached the opposite conclusion regarding the job satisfaction-job performance link. First, published one year prior to Iaffaldano and Muchinsky's (1985) meta-analysis, Petty, McGee, and Cavender (1984) reported a mean correlation of 0.23, concluding that the magnitude of this positive relationship was "impressive" (p. 719) considering range restriction in the performance variable that likely attenuated the observed correlations. Almost two decades after that Judge, Thoresen, Bono, and Patton (2001) revisited the job satisfaction-job performance question, finding a mean correlation of 0.18, which disattenuated for unreliability increased to 0.30. Their conclusion was that there is a moderately strong relationship between job satisfaction and job performance.

Despite differences in methods and conclusions, perhaps the bottom line is whether meta-analysis has settled this issue. One indication that perhaps it has, at least for most people, can be found by looking at the citations to these papers. We used the ISI Thomson Web of Science database to see how much each of the later three meta-analyses were cited. We did not look at Vroom (1964) because it is a book and the database does not provide the same analytical tools for books. In the past five years (2011–2015), we found that there were far more citations for the two papers that concluded there was a significant connection (539 total with 426 for Judge et al., 2001 and 113 for Petty et al., 1984). Iaffaldano and Muchinsky (1985) were cited only 77 times. Thus it seems that most people are accepting that there is at least a modest relationship between job satisfaction and job performance and that the meta-analyses have helped settle this issue.

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8. Tests of theory

Using meta-analyses of primary studies to test theories (Cucina & McDaniel, in press) is beneficial in several ways. The obvious advantage is the larger combined sample size and number of samples, resulting in more stable correlation estimates. Another advantage is that meta-analytic procedures combine samples of employees across different organizations and/or occupations. This increases the generalizability of findings, contributing to the development of theory that is applicable to a wider population of employees. Furthermore, when theories or models include a large number of variables, many primary studies will only include parts of the model and a meta-analysis can be used to combine results pertaining to different parts of the model.

8.1. Job characteristics model

As our first example, we use one of the most influential theories/models in the HRM field: the Job Characteristics Model (JCM). According to the JCM, enriched or complex jobs (indicated by skill variety, task identity, task significance, autonomy, and feedback) are likely to produce increased job satisfaction, motivation, and work performance, and reduce absenteeism (Hackman & Oldham, 1975, 1976). These relationships were hypothesized to be mediated by three psychological states: experienced meaningfulness, experienced responsibility for outcomes, and knowledge of the results of the work, and there were additional hypothesized moderators. There have been numerous primary studies testing aspects of the JCM, most of them using the Job Diagnostic Survey (JDS - Hackman & Oldham, 1974), a self-report questionnaire. An early meta-analysis (Fried & Ferris, 1987) examined the validity of the JCM by combining correlations from 76 studies (though each path in the model had a smaller number of samples, ranging from 3 to 22). Their analysis revealed modest support for the JCM, with some aspects of the model supported (for example, the relationships between job characteristics and employee behavioral outcomes), while other aspects were not supported (for example, the mediating role of psychological states on the relationship between job characteristics and job performance). The JCM meta-analysis serves as an example of how meta-analyses can be used to test the validity of a model in a way that primary studies would be hard-pressed to do.

8.2. Expectancy theory

One of the most prominent motivation theories that received meta-analytic support was expectancy theory (Vroom, 1964) that suggests employees' work motivation is a combination of three elements: belief in the ability to perform well (expectancy), likelihood that performing well will lead to rewards (instrumentality), and the personal value of those rewards (valence). In their meta-analysis of 77 expectancy theory studies, Van Eerde and Thierry (1996) showed that the combined components (expectancy, instrumentality, and valence) predicted performance, effort, intention to apply for a job or quit a current job, and preference for a job. Furthermore, the mean size of correlations was larger for preference and intentions (motivational constructs) than for performance, which is predicted by the theory.

8.3. Leadership theories

Meta-analysis has been used to test prominent leadership theories. For example, two meta-analyses provided support for some, but not all of Fiedler's (1978) contingency theory predictions (Peters, Hartke, & Pohlmann, 1985; Strube & Garcia, 1981). Specifically, support was found for the main thrust of the theory that leaders' performance would be a joint function of an individual difference variable (least preferred coworker) and a situational variable (situational control). More complete support was found for the leader-member exchange (LMX) theory (Dansereau, Graen, & Haga, 1975), highlighting the importance of the relationship between leaders and followers. That is, in their meta-analysis of 79 studies, Gerstner and Day (1997) showed that high quality leader-follower relationships were associated with lower experienced stress, better job satisfaction, and higher commitment.

8.4. Job demands-resource (JD-R) model

Not only can meta-analysis be used to test theory, but it can also aid in refining existing theory. Moreover, given the larger sample size and variety of settings represented, a meta-analysis can provide more generalizable evidence for such a refinement. One example is Crawford, LePine, and Rich's (2010) meta-analysis on the job demands-resource model (JD-R; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). According to the JD-R, job resources constitute functional aspects of the work environment that enable an employee to achieve his/her goals while job demands refer to aspects of the job requiring sustained effort that drains employees. Job resources then act as motivators for employees while job demands can lead to burnout. Noting that primary studies revealed inconsistent findings, Crawford et al. (2010) meta-analytically tested this theory, concluding that job demands should be divided into challenges and hindrances. In other words, previous conceptualizations of the theory were overly parsimonious.

8.5. Extrinsic and intrinsic motivation

Our last example for a meta-analysis of an effect size is the case of motivation, where the relationship between extrinsic and intrinsic motivation has been researched extensively, with at least 10 meta-analyses conducted (for review, see Cerasoli, Nicklin, &

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Ford, 2014). This research is aimed at testing the undermining effect (based on the Cognitive Evaluation Theory; Deci, 1971) which refers to a negative effect that external incentives have on an initially internally enjoyable task, thus reducing the intrinsic motivation (Deci & Ryan, 1985) for that task. In some of these meta-analyses, the combined effects of extrinsic and intrinsic motivation on performance were also examined. The more recent analyses were done with greater combined sample size (over 200,000 in Cerasoli et al., 2014), indicating this question is still relevant and well researched.

9. Moderators in descriptive/exploratory studies

An important use of meta-analysis is to show whether or not moderators might serve as an explanation for observed results. Sometimes this is done in an attempt to develop and refine theory while other times this is done merely to explore relationships in greater depth. Some meta-analyses attempted to explain differences in results across studies by methodological features of studies, whereas others looked at potential effects of sample characteristics. In the current section, we review moderator relationships examined within a descriptive or exploratory nature. Following this examination, we will review how the detection of moderators can be used to advance theoretical knowledge.

9.1. The relationship between CWB and OCB

An important example of a methodological moderator analysis is Dalal (2005) who used meta-analysis to explain why the correlation between counterproductive work behavior or CWB (behavior that harms organizations and stakeholders; Spector & Fox, 2005) and OCB varied across studies. Although most studies found a strong negative correlation, some primary studies found small and even positive relationships between these seemingly incompatible variables. Dalal (2005) showed that there were three features of study methodology that were associated with the magnitude of correlation: whether scales contained antithetical items (an item of one form of behavior that represents the absence of the other form, such as absence as a form of CWB and lack of absence as a form of OCB), whether the item format was agreement or frequency, and whether ratings were self or supervisor-reported. Studies using scales that contained antithetical items, agreement frequency, and supervisor ratings had much larger CWB-OCB correlations than studies that did the opposite. Thus these three methodological features of studies explained in large part variability in results across studies.

9.2. Gender

Gender differences in correlations have also been address using meta-analysis. One example is a meta-analysis by Jiang, Liu, McKay, Lee, and Mitchell (2012) that found that the relationship between job-embeddedness (forces that keep employees stuck or unable to leave their jobs) and turnover was stronger for samples that were disproportionately female. Another example is Ng, Eby, Sorensen, and Feldman (2005) who found that gender was a significant moderator in the relationships between age and job attitudes. For most job attitudes (satisfaction with promotion, role overload, depersonalization, trust in organization, and job insecurity), samples that had more men also had weaker relationships. In contrast, the age–satisfaction with supervisor relationship was stronger for samples that contained more women.

Although these and other meta-analyses have shown that there are gender differences, there is an important levels issue that limits conclusions. Finding, for example, that samples with higher proportions of men have larger correlations that samples with lower proportions of men does not allow one to conclude that the relationships are stronger for men than women at the individual level. This is because sample characteristics represent features of people at the group level and not the individual level. In addition gender and other characteristics of the samples are confounded, that is, samples with large proportions of men likely represent different kinds of jobs than samples with larger proportions of women (e.g., engineering versus nursing).

9.3. Job types/sector

The moderating role of job types have also been examined since the magnitude of some relationships seems to differ as a function of the job. For example, in a meta-analysis of the relationship between leadership styles and leader effectiveness measures, Lowe, Kroeck, and Sivasubramaniam (1996) found, to their surprise, that these relationships were stronger in the public sector than in the private sector. Similarly, another meta-analysis examining the relationship between job-embeddedness and turnover intentions found a stronger relationship in public sector organizations as compared with private sector organizations (Jiang et al., 2012).

Looking at more specific types of organizations, meta-analytic findings indicate that self-reported sexual harassment levels of women were significantly lower in academic samples than in military samples (Ilies, Hauserman, Schwochau, & Stibal, 2003). Finally, in their impactful meta-analysis, Barrick and Mount (1991) found that the relationships between certain personality traits and performance were moderated by occupational groups. For example, extraversion was a valid predictor for managers and for sales associates. For both of these occupations, interaction with others is a vital part of the job, and thus individuals high on extraversion would more likely be effective in their jobs. This trait would be potentially less important in other jobs such as secretaries, accountants, production workers, or engineers.

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10. Tests of moderator propositions in theories

Many theories include moderator variables that can serve a variety of roles, including specifying boundary conditions for a phenomenon. This can be done by cumulating results of multiple moderator tests, or by introducing a moderator variable, either internal (e.g., characteristic of a sample) or external (e.g., unemployment rate as in the example below), that is associated with each study to be cumulated.

10.1. Job characteristics model moderated by growth need strength

An important component of the previously mentioned job characteristics model (Hackman & Oldham, 1976) is the moderating role of growth need strength (GNS), or the extent to which an individual values opportunities for personal growth in life including the job. There were a number of primary studies that tested this moderator, allowing for a meta-analysis that cumulated their results. In 1985, two meta-analyses were published, both of which found evidence for the moderator effect (Loher, Noe, Moeller, & Fitzgerald, 1985; Spector, 1985), thus settling a controversy in the literature at the time about whether or not the moderator proposition was correct.

10.2. Satisfaction-turnover moderated by unemployment rates

The Muchinsky and Morrow (1980) turnover model hypothesizes that unemployment rates in a given timeframe would moderate the satisfaction-turnover relationship. Specifically, when unemployment rates are low and employees have easy mobility, dissatisfied individuals are likely to quit, thus producing a satisfaction-turnover relationship. During periods of high unemployment and limited mobility, dissatisfied individuals would be trapped in their jobs, thus attenuating the satisfaction-turnover relationship. Carsten and Spector (1987) examined this question meta-analytically by determining where and when each of 39 primary studies was conducted, and then looking up the unemployment rate at the corresponding place and time. They found support for the Muchinsky and Morrow (1980) model in that unemployment rate was found to moderate the satisfaction-turnover correlation.

11. Concluding remarks

Meta-analysis has become a major methodological tool for HRM research. Our literature review revealed that this method was used only sporadically prior to the 1980s, and in fact using the key word "meta-analysis" did not yield any hits prior to the 1980s, as earlier uses of the method did not frame it as such (e.g., Schmidt & Hunter, 1977 referred to validity generalization). Since the method came into general use, the number of meta-analyses published in journals we reviewed has been on the rise. Counting in 5 year blocks since 1981, there have been 20 in 1981–1985, 49 in 1986–1990, 39 in 1991–1995, 45 in 1996–2000, 70 in 2001–2005, 93 in 2006–2010, and 90 in 2011–2015 (4.5 years block).

As our review showed, there are some topics and combinations of topics that have received a great deal of meta-analytic attention. Others have not, either because there are insufficient numbers of primary studies, or because no one has thought to do them. Thus there is still a need for researchers to address heretofore meta-analytically unexplored territory. Our citation analysis provides a global view of which individual meta-analyses and which topics have had the biggest impact, at least among other researchers. Of course, such an analysis does not necessarily reflect impact outside of the research community, but such impact is more difficult to determine let alone quantify. Perhaps the most notable example is Schmidt and Hunter's (1977, 1998) work on validity generalization that at least in the U.S. has had tremendous impact on legal practices in employee selection.

Our narrative review was intended to both highlight the types of contributions that have been made through meta-analysis and note some important contributions by individual meta-analytic papers. Meta-analysis has been a valuable tool in summarizing the literature by providing an estimate of relationship strength, as well as indicating the extent to which there is variance among studies of the same variables. They have also proven useful in explaining the reasons for such variability. Finally, meta-analysis can be an important tool in the validation of theories and testing of models. This is particularly important when theory tests are not all consistent, and where meta-analysis can combine results across many studies, thus providing more power to determine significance, and stable estimates of effect size.

The acceptance of meta-analysis as a major methodological tool has helped advance the field of HRM in significant ways. Although it is not our purpose to critique meta-analysis as a method, we note that, as with all of our methods, there are limitations in the use of the method that must be considered. As we documented earlier with the job satisfaction-performance meta-analyses, different researchers can come to dissimilar conclusions based on the methodological decisions and practices they chose. This argues for the desirability of meta-analysis replication, as we should not consider an issue settled based solely on results of a single meta-analysis. A convergence of results across multiple meta-analyses of the same variables by independent groups of researchers should add confidence to conclusions.

In conclusion, for more than 30 years HRM researchers have made good use of the meta-analysis method to add to our understanding of many important issues in the field. It seems likely that this method will continue to be widely utilized in the future as it is useful in answering a variety of important HRM research questions.

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