TRUECONOMICS[1]: A META-ANALYSIS OF JOB, TEAM AND ORGANIZATIONAL PERFORMANCE

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Abstract

Doing a meta-analysis in social science confronts us with the difficulty to cumulate paradigm-driven research. The carefully gathered meta-analytic data may be biased when mostly paradigm confirming results are getting published. And, indeed, fields that have the highest proportion of significant claims may be the least reliable (Fanelli, 2010). Particularly in highly competitive research environments and fields such as the management field, effect sizes may be overestimated (Fanelli & Ioannidis, 2013). By investigating a very high number of empirical estimates, meta-analyses may increase the informative value of empirical research filtering or analyzing the amount of bias in the literature. The more estimates a meta-analysis has, the more accurate becomes the algorithm to correct for any biases (Stanley & Jarrell, 1989). Therefore, this study attempts to integrate the major meta-analyses of the management field in order to further increase the number of estimates and their accuracy. With the largest data set so far in management research, this study offers methodological and theoretical implications for the entire field. I ask: *Are the effect sizes of the management field too high? What are robust effect sizes and which variables are actually non-significant?*

[1] The title refers to the famous book called Freakonomics by Steven D. Levitt and Stephen J. Dubner about cheating teachers, bizarre baby names, and crack-selling mama's boys.

Introduction

Transparency, robustness and replicability are the three most important characteristics of a powerful empirical study. With this in mind, meta-analyses have been cleaning up empirical results pushed by the pivotal paper of Stanley and Jarrell in 1989. Since then, the growth of meta-analyses is at an all-time high of 17% yearly (Maer-Net, 2013). Indeed, meta-analyses provide "objectivity" when subjective decisions are replaced by systematic and objective criteria (Kavale, 1995). Meta-analytic methods allow researchers to gain a holistic overview of a research topic. Meta-analyses provide true effect sizes of constructs, which cannot be uncovered by alternative research methods (Shelby & Vaske 2008).

Despite these obvious strengths of meta-analyses or perhaps because of them, meta-analyses have been increasingly criticized often with metaphorical terms such as "Shmeta Analysis" or "mega-Sillness" (Shapiro 1994). Scholars often criticize the quality of the included primary studies, which has been metaphorically described as "garbage in - garbage out" - problem (Borenstein et al. 2009). Here, it is assumed that the overall quality and validity decreases, if many low-quality primary studies are included in the meta-analysis. Therefore, mistakes of the included primary studies can often be difficult to identify and correct afterwards.

Another point of criticism relates to the frequent non-consideration of unpublished studies (File-Drawer Problem or publication bias) (Hunter & Schmidt 1990). A meta-analysis should include all primary data collected for a particular question, in order to make a valid statement when determining an overall effect and to avoid distortions result.

In order to assess the validity of this and related criticism the present research project first of all, qualitatively evaluates the precision of meta-analysis in the management field comparing older and recent meta-analyses. On top, the present research project quantitatively aggregates the present results of the existing meta-analyses in a second order meta-analysis in order to increase the precision of the existing effect sizes.

Methodology and Results

As a first step, I searched all major management data bases with the search term *meta-analy**. Doing so, I generated a dataset of nearly 700 meta-analyses in the management field. Second, I qualitatively investigated the critical decisions that have been made in meta-analytic papers following and comparing the paper of Geyskens and their colleagues (2009) totaling to 85 meta-analyses with 44 meta-analyses that have just been published from 2008 to 2012 (see Table 1) in order to identify any progress regarding the methodological application of meta-analyses in today's science practice.

Table 1 Results of statistical Precision of Meta-analyses

	1980 - 2007		2008 - 2012	
	#	%	#	%
Effect size metric				
Other metrics (e. g. elasticities)	7	8,2	3	6,8
r	73	85,9	38	86,4
d	5	5,9	2	4,5
Fishers Z	0	0,0	1	2,3
Test of homogeneity				
Chi-square test	19	17,1	3	4,8
75 percent rule	11	9,9	3	4,8
Credibility and confidence interval	46	41,4	36	58,1
Q-Test	18	16,2	16	25,8
No homogeneity test	16	14,4	4	6,5
Other	1	0,9	0	0,0
Single method	56	65,9	14	31,8
Multiple method	29	34,1	30	68,2
Moderator analysis				
Subgroup analysis	36	42,4	13	29,5
Regression analysis	26	30,6	21	47,7
Other methods (e. g. cluster analysis)	4	4,7	6	13,6
No moderator analysis	19	22,4	4	9,1
Publication bias				
Comparison of published with unpublished studies	1	1,2	1	2,3
Rosenthal's 'file drawer' analysis	8	9,4	6	13,6
Other bias	3	3,5	4	9,1
No analysis of publication bias	73	85,9	33	75,0
Grafical design				
Forest plot	2	2,35	0	0,00
Funnel plot	2	2,35	1	2,27
No grafical design	81	95,29	43	97,73
Attenuating artifacts				
Measurement error at individual level	0	0,0	1	2,0
Measurement error using empirical artifact distribution	44	39,3	22	43,1
Dichotomization at individual level	5	4,5	5	9,8
Dichotomization using artifact distribution	7	6,3	3	5,9
Range restriction	31	27,7	7	13,7
No information	25	22,3	13	25,5
Correction for interdependet effect sizes				
One best' estimate	33	38,8	12	27,3

No information	52	61,2	32	72,7
Identification of outliers				
Sample size outliers	14	16,5	7	15,9
Effect size outlier	3	3,5	2	4,5
No information	68	80,0	35	79,5
Mean effect size				
Unweighted average	1	1,2	0	0,0
Sampe-size-weighted average	67	78,8	35	79,5
Variance-weighted average	0	0,0	2	4,5
No information	17	20,0	7	15,9

As a result, one can observe a tendency towards a more sophisticated application of the method meta-analysis, particularly when looking at attenuating artifacts and correcting for publication bias.

Regarding my quantitative analysis, I decided to focus my attention on the top three variables of the management field: job, team and organizational performance. After a rigor search and coding procedure following the guidelines of the Maer-Net community (Stanley et al, 2013), I was able to extract 90 meta-studies, and 757 meta-analytic effect sizes for job performance, 31 meta-studies and 185 meta-analytic effect sizes for team performance, and 27 meta-analyses and 42 meta-effect sizes for organizational performance (see Table 2). I am going to explain more details regarding the coding and filtering procedure in a full paper.

Table 2. Overview of Main Dependent Variables in Management

	MA	K	k	N	r	CI		p
Job Performance	90	757	13.419	3.539.026	0.141	0.123	0.158	0.000
Team Performance	31	185	2.836	281.922	0.217	0.179	0.255	0.000
Organizational Performance	27	42	1382	1.999.179	0.175	0.144	0.205	0.000

Note. MA: Number of meta-analytic effect sizes; k: Number of effect sizes on a primary study level; N: cumulated sample size; r: second order effect size; CI: confidence Interval

All extracted effect sizes needed to be standardized with the aim to achieve a data set of pure r correlational coefficients since the r effect size has several advantages over the d effect size (Rosenthal & DiMatteo, 2001). This second order meta-analysis uses a random effect model, since it cannot be assumed that the sample is based on the same population due to the difference of studies, variables and measures (Field, 2001). In Table 3 you can see the preliminary results of the results of the random-effect meta-regression for job, team and organizational performance. The models control for any overlap between the meta-studies, the measurement of the dependent variable and inclusion of un-published studies. On top, all three models cluster and measure the effect of the main variables mentioned in the literature. When looking at these preliminary results, it is striking that organizational performance reveals much lower coefficients than team performance. On top, the data apparently is positively biased by meta-analyses that did not include unpublished studies.

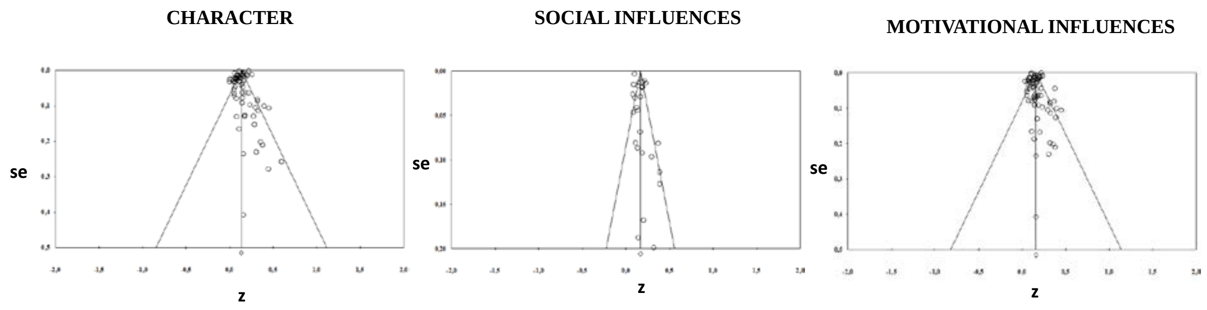
Table 3. Overview of Regression Models of Main Dependent Variables in the Management Field

Job Performance	**b**	**p**	**Team Performance**	**b**	**p**	**Organizational Performance**	**b**	**p**
Constant	*	*	*Constant*	-0.309	0.000	*Constant*	-0.156	0.054
Overlap	0.001	0.380	*Overlap*	0.159	0.267	*Overlap*	-0.125	0.566
Subj Measure	*	*	*Subj Measu*	0.103	0.235	*Non-fin Perf*	0.044	0.237
Only Publ	0.008	0.672	*Only Publ*	0.106	0.038	*Only Publ*	0.121	0.003
Task Perf	*	*	T Development	0.534	0.000	Resources	0.240	0.001
Citizenship Perf	*	*	T Leadership	0.631	0.000	Structure	0.203	0.023
Contraprod Behav	*	*	Transition Proces	0.562	0.000	Strategy	0.165	0.023
Adaptive Perf	*	*	Action Process	0.561	0.000	Governance	0.050	0.464
Sociodemographic	*	*	Relationships	0.543	0.000	Environment	0.260	0.028
Skills	*	*	Confidence	0.668	0.000			
Motivation	*	*	Cohesion	0.517	0.000			
			Character	0.410	0.000			
Adj. R-Squared	*		100%			56.16%		
No. of Observ	757		185			42		
Further single regression tests								
Publication Year	-0.014	0.457	High J Rank	0.101	0.035			
No Artifact Corr.	0.023	0.409	Hedges & Olkin	0.159	0.000			
Fixed Effect	-0.041	0.384	Random Effect	-0.297	0.000			

Note. *=still needs to be calculated for the full paper; b = regression coefficient; CI= Confidence Interval; p = significance value; T=Team; Perf=Performance

Actually, when looking at some exemplary funnel plots of the meta-analytic effect sizes for job performance (see Figure 1), one can see an asymmetric distribution that may indicate a publication bias in the field on a meta-level.

Figure1. Exemplary Funnel Plots of Meta-analytic Effect Sizes of Job Performance Antecedents



Note. se=standard error; z=Fisher's z; each point is a meta-analytic effect size.

Conclusion

Regarding the management field, Fanelli and Ioannidis may have been right with their fear that soft science is biased. In order to overcome this issue, this meta-analysis attempts to clean the existing empirical research by evaluating the present application of meta-analyses in business science and increasing the amount of effect estimates. This way, the present meta-analysis provides not only a status quo how meta-analyses are done in business science, but also a more robust overview of the empirical landscape of the management field. It shows which variables have higher and which variables have lower effect sizes on job, team and organizational performance and, hence, further develops the existing management theory.

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