Testing the Strength of the Iron Cage: A Meta-Analysis of Neo-Institutional Theory

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TESTING THE STRENGTH OF THE IRON CAGE: A META-ANALYSIS OF NEO-INSTITUTIONAL THEORY*

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TESTING THE STRENGTH OF THE IRON CAGE: A META-ANALYSIS OF NEO-INSTITUTIONAL THEORY

Abstract

In this study, we use meta-analytical techniques to quantitatively synthesize and evaluate the sizeable body of empirical work that has been conducted under the banner of neo-institutional theory. We find strong support for the influence of mimetic pressures on organizational isomorphism, but support for the predicted roles of normative and coercive factors is mixed. Similarly, we find that the strategic isomorphism, the homogenous application of corporate policies, tends to translate into symbolic but not substantive performance effects. In combination with additional moderator analyses, these findings suggest new directions for future research.

Over the past three decades, neo-institutional theory has become the dominant approach for explaining how organizations use rationalized formal structures and corresponding policies to adapt to institutionalized prescriptions emanating from their environments. Slowly but surely, the corpus of neo-institutional empirical studies begins to present a serious challenge to earlier work by scholars like Blau (1970), Thompson (1967), and Woodward (1965). These students of organization were schooled in the Weberian tradition, but followed him only partially in that they saw bureaucratization primarily as a rational response to complexity-increasing factors like organizational size and technology. In their work, the spread of bureaucratic structures is explained by pointing at their superior abilities for imposing coordination and control on a complex world.

A response came from Meyer and Rowan (1977), who did not discard the role of rationality in organizational design altogether, but also pointed at an alternative Weberian source of formal structure: the legitimacy of rationalized formal structures and policies. In 'modern' societies, bureaucratic principles are no longer a purely rational response to underlying problems of coordination and control. These principles have become significant institutions unto themselves: sets of prescriptions that are so much seen as definitional characteristics of modern organizations that arrangements lacking these principles are bound to be perceived as incomplete, imperfect, and thus illegitimate. According to Meyer and Rowan, bureaucratic principles are now often mindlessly "enforced by public opinion, by the views of important constituents, by knowledge legitimated through the educational system, by social prestige, by the laws, and by definitions of negligence and prudence used by the courts" (1977: 343), without any realistic assessment of their economic rationality.

A highly influential paper by DiMaggio and Powell (1983) subsequently gave a major impetus to institutional scholarship. At the core of this paper lies the observation that "highly structured organizational fields provide a context in which individual efforts to deal rationally with uncertainty and constraint often lead, in the aggregate, to homogeneity in structure, culture, and output" (p. 147). This observation not only stimulated many new empirical studies; it also 'standardized' them in two important ways. First, increased population-level homogeneity, or isomorphism (cf. Hawley, 1968), quickly became the default dependent variable for neo-institutionalists. Second, DiMaggio and Powell (1983) did not leave the likely antecedents of isomorphism unspecified, but rather stipulated three broad processes through which interorganizational homogeneity could be produced: coercion by powerful actors, mimetism in the face of systemic uncertainty, and normative imbuement by the professions. Soon after the publication of their work, this combination of a compelling dependent variable and intuitively appealing antecedent factors began to show up in the form of research hypotheses in many empirical studies (Mizruchi & Fein, 1999). The upshot of this two-sided standardization process is that the neo-institutional corpus of empirical work is presently more structured than most other subfields in organization studies, which makes it considerably easier to compare and aggregate research findings. An abundance of narrative reviews testifies to this effect (cf. Scott, 1987, 2001; Mizruchi & Fein, 1999; Palmer & Biggart, 2002).

In this light, it is interesting to note that, to the best of our knowledge, no prior attempt has been made to quantitatively synthesize and assess the work on neo-institutionalism with the help of meta-analytical techniques. Such an effort would contribute to the present state of theorizing in a number of ways. First, whereas narrative reviews are important because they organize past research findings and

guide future research efforts, they lack inferential power. In the absence of quantitative integration, it is impossible to come to a full understanding of the relative effect of the various isomorphic processes on the social production of interorganizational homogeneity. Second, both the notion of isomorphism and its antecedent processes defy straightforward operationalization due to their multifaceted nature. A meta-analysis can shed new light on previously unexplored contingency factors by assessing the strength of the proposed relationships at the sub-construct and indicator levels of analysis. Third, strategy scholars have long recognized neo-institutionalism as an important addition to their theoretical repertoires (e.g., Deephouse, 1999). Due to their preoccupation with explaining corporate performance, a significant number of studies is now available for meta-analytical synthesis which test the relationship between the isomorphic enactment of rational myths and organizational success. Significantly, Meyer and Rowan (1977: 352-353) already alluded to the existence and importance of this relationship. Through our meta-analysis, we aim to contribute towards each of these three objectives.

Before proceeding, it must be acknowledged that there is no singular institutional approach to organization studies. No less than three complementary institutional approaches coexist to the present date. First, there is the 'old' institutionalism, closely associated with the work of Selznick (1949, 1957) and focused on how organizations become institutions themselves, in the sense of becoming "infused with value beyond the technical requirements of the task at hand" (Selznick, 1957: 17). The second approach is also known as the 'new' institutionalism, and is mostly concerned with how organizations are influenced by institutionalized rules and environments (for reviews of the difference between the 'old' and 'new' institutionalisms, see: DiMaggio & Powell, 1991; Greenwood &

Hinings, 1996; Selznick, 1996). The third approach recently emerged in response to critics, who have accused the 'new' institutionalists of painting a picture of a Huxleyean *Brave New World* (Hirsch, 1997), in which the only behavioral option open to organizations is complying with prevailing prescriptions. This latest stream recognizes the importance of agency and interest in institutional processes, and seeks to incorporate issues like power, entrepreneurship, and strategic responsiveness in institutional theorizing (see Lawrence & Suddaby, 2006, for a review). Here, we exclusively focus our efforts on providing a quantitative synthesis of the 'new' institutionalism. The other two approaches simply do not lend themselves for a meta-analysis yet, either because the main mode of empirical inquiry has historically been the qualitative case study (the 'old' institutionalism) or because its relative youth has prevented it thus far from producing a sufficient number of quantitative studies to warrant a synthesis ('agency and interest' institutionalism).

NEO-INSTITUTIONAL HYPOTHESES

The central question of neo-institutional theory is straightforward: "What makes organizations so similar?" (DiMaggio & Powell, 1983: 147). Characteristic for neo-institutionalists is that in addressing this question they primarily point at social rather than technical factors. In sharp contrast to neo-classical economic theories and the offspring they spawned in the field of organization studies – such as the resource-based and industry structure views of economic competition – neo-institutionalists do not see organizations as atomistic value-maximizing actors. Rather, they treat them as social acceptance-seeking actors, which are embedded in organizational fields. By the latter concept, neo-institutionalists "mean those organizations that, in the aggregate,

constitute a recognized area of institutional life: key suppliers, resource and product consumers, regulatory agencies, and other organizations that produce similar services or products" (DiMaggio & Powell, 1983: 148).

It should be clear from the onset that the field concept is considerably broader in scope than the related concepts of 'industry' and 'sector,' which occupy a central role in the aforementioned neoclassical economic theories of competition. The virtue of this broader unit of analysis is that it allows for the identification of two distinct sources of isomorphism: competitive and institutional (Fennell, 1980; Meyer, 1979). The former type results from the disciplining force of economic competition. Certain features are likely to diffuse throughout a population of organizations when they make organizations more *efficient*, for example because they help organizations reduce waste or lower transaction costs (cf. Williamson, 1985). The field concept is not strictly necessary for the analysis of competitive isomorphism, as the more confined industry or sector concepts suffice to model it. The latter type of isomorphism, however, results from the rationalized expectations of a much broader group of organizational constituents. Under this conception, features diffuse throughout a population of organizations when they help make organizations more *legitimate*, in the sense of being seen as appropriate or desirable against some preexisting background schema of societal norms, beliefs, and expectations (cf. Suchman, 1995). We need the broader field concept to understand institutional isomorphism, as the narrower industry and sector concepts are not equipped to grasp the consequences of organizations' exposure to non-competitive isomorphic pressures. As stated in the introduction, neo-institutionalists generally consider three such pressures: coercive, mimetic, and normative pressures.

Coercive Pressures.

Coercive isomorphism "results from both formal and informal pressures exerted on organizations by other organizations upon which they are dependent and by cultural expectations in the society within which organizations function" (DiMaggio & Powell, 1983: 150). In empirical work, coercive pressures are typically operationalized in two ways. First, the generic term 'dependence' in the above definition is commonly taken to mean *resource dependence* – organizations' reliance on resources controlled by formally independent others (cf. Pfeffer & Salancik, 1978) – even though the latter concept is considerably narrower in scope. Resource dependencies might lead to isomorphism when resource-controlling parties only make their resources available to parties that have adopted features they deem desirable (Teo, Wei, & Benbasat, 2003; Bridges & Villemez, 1991). Second, the most dominant cultural expectations in modern societies are those supported and upheld by the *legal system* (cf. Weber, 1978), and neo-institutionalists therefore also often operationalize coercive pressure as the imposition of organizational rules and structures through government mandate. Legislation can breed isomorphism when the legislator puts a penalty on organizational deviance from legal rules (Mezias, 1990; Provan, 1987). Both factors are used jointly or in isolation in many empirical studies to test the following hypothesis:

> *Hypothesis 1. The degree of coercive pressure in an organizational field is positively related to the degree of interorganizational homogeneity in that field.*

Mimetic Pressures.

A second potential source of isomorphism is uncertainty, which arises from the use of complex technologies (March & Olsen, 1976), difficult to decipher means-ends relationships (Levitt & March, 1988), ambiguous or contested goals (Thompson, 1967), or symbolic noise emanating from the organizational environment (Meyer & Rowan, 1977). In times of uncertainty, organizations may 'minimize future regret' or 'hedge their bets' by modeling their features after those of selected focal entities in the organizational field. This may happen unintentionally, due to factors like employee transfer and turnover, or deliberately, such as when managers hire consultants to 'benchmark' their performance and business models against those of competitors (DiMaggio & Powell, 1983). In both cases, collective mimicking of a few successful entities in a field will lead to increased homogenization. Haunschild and Miner (1997) have introduced a three-pronged typology of criteria used by mimicking organizations to select their role models. Organizations may imitate practices because they have previously been adopted by a subset of very large or generally successful role models (trait-based imitation), by large numbers of other organizations (frequency-based imitation), or because these practices are believed to have produced positive outcomes for others (outcome-based imitation). We use this typology here because it offers an excellent coverage of the many empirical studies that have appeared on the topic of mimetic isomorphism (cf. Mizruchi & Fein, 1998). Virtually all published studies rely on one or several of these forms of imitation to test the following hypothesis:

Hypothesis 2. The degree of mimetic pressure in an organizational field is positively related to the degree of interorganizational homogeneity in that field.

Normative Pressures.

A third source of isomorphic change derives from the professionalization of organizational fields and is normative in kind. DiMaggio and Powell define professionalization as "the collective struggle of members of an occupation to define the conditions and methods of their work" (1983: 152). Professional norms and prescriptions are often eagerly pursued by organization members, because professional recognition is associated with higher occupational prestige, greater job autonomy, and often better remuneration. The reason that professionalization is associated with homogenization is that professions themselves thrive on the standardization of knowledge, procedures, and outputs (Empson, 2006). DiMaggio and Powell (1983) consider two important routes for the diffusion of professional norms throughout organizational fields. One is through the recruitment of similarly trained and socialized university specialists (Hong & Karlsson, 2004; Mezias, 1990). As these graduates rise through the organizational ranks, they slowly but surely infuse the organization with the professional norms they were taught at their alma maters. Another, much faster route is through the growth and elaboration of professional networks (Geletkanycz & Hambrick, 1997; Lee & Pennings, 2002). As top managers interact with their peers, either directly via structures like board interlocks or indirectly through third-party linking mechanisms like trade associations, they get into direct contact with extant and emerging professional norms. In turn, these derive their

normative force from shared standards of collegiality and appropriateness (Cyert & March, 1963). Both formal education ('credentials') and professional association ('networks') are widely used in empirical studies to test the following hypothesis:

> *Hypothesis 3. The degree of normative pressure in an organizational field is positively related to the degree of interorganizational homogeneity in that field.*

Corporate Performance

Neo-institutional theory is not only used to explain isomorphism. Over the last decade, the theory has increasingly been used by strategic management scholars to explain performance differentials between organizations. In their accounts, organizations that comply with field-level norms can count on positive performance effects when their isomorphic tendencies are interpreted by resource-controlling third parties as credible signs that they are deserving of their support. These efforts by no means stretch the theory beyond its justifiable scope of application. As Meyer and Rowan already pointed out: "Organizations that incorporate societally legitimated rationalized elements in their formal structures maximize their legitimacy and increase their resources and survival capabilities" (1977: 352). In other words, interorganizational isomorphism may yield competitive advantages for focal firms. Two such advantages are commonly identified in the empirical literature. First, isomorphism may allow organizations to gain *symbolic* benefits like public endorsement and better reputation scores (cf. Deephouse, 1996; Staw & Epstein, 2000; Westphal, Gulati, & Shortell, 1997). Even though these benefits are largely

intangible, they are real in terms of their consequences, as they provide organizations with a societal 'license to operate' without which they could not persist. Second, adhering to societally rationalized structures can directly shed *substantive* benefits on organizations such as lower compliance costs and higher stock market evaluations (Fiss & Zajac, 2006; Tuschke & Sanders, 2003; Westphal & Zajac, 1994). Both types of performance indicators are commonly used to test the following hypothesis:

> *Hypothesis 4. The adoption of societally legitimated rationalized elements by focal organizations is positively related to the performance of those organizations.*

EXPLORATORY MODERATOR ANALYSES

We conducted two exploratory moderator analyses in addition to testing the above hypotheses. First, we explored different operationalizations of variables across the various studies included in our meta-analysis. For Hypotheses 1 – 3, we assessed whether differential operationalizations of the independent variables in the individual studies in our meta-analysis resulted in differences in terms of associational strength or even directionality in their relationships with the dependent variables. Thus, for the hypothesized effect of coercive pressures on isomorphism we tested resource dependence versus legislative influence (DiMaggio & Powell, 1983); for differential isomorphic effects amongst mimetic pressures we tested trait-based versus frequency-based versus outcome-based imitation (Haunschild & Miner, 1997); and for differential normative effects we tested credentials versus networks (DiMaggio & Powell, 1983). For Hypothesis 4, we tested whether the predicted relationship was

different in terms of associational strength or directionality for both operationalizations of the dependent variable. We thus tested symbolic versus substantive benefits.

Second, we tested whether the following ten study characteristics had a moderating effect on any of the hypothesized focal relationships: (1) publication status (published versus unpublished), (2) year of publication, (3) publication outlet (*Academy of Management Journal*, *American Sociological Review*, *American Journal of Sociology*, *Administrative Science Quarterly*, or other), (4) study design (cross-sectional versus longitudinal), (5) organization type (private versus public), (6) sector (healthcare, financial services, media, educational services, or other), and (7) home country (US or other). As we had no a-priori intuitions concerning the effect of the moderators on our focal relationships, we offer no directional hypotheses for them.

METHODS

Literature Search

We used four complementary literature retrieval procedures to minimize the odds of "missing a useful paper that lies outside one's regular purview" (White, 1994: 44). To identify appropriate studies (articles, book chapters, dissertations, and working papers), we first examined three computerized databases: ABI/INFORM Global, EconLit, and JSTOR.[1] Second, we conducted manual searches, from 1983 (the year in which DiMaggio and Powell published their influential article) to 2006, of the five journals that yielded most articles during the first step: *Academy of Management Journal*, *Administrative Science Quarterly*, *American Sociological Review*,

Organization Science, and *American Journal of Sociology*. Third, we used a two-way 'snowballing' technique by backward-tracing all references reported in the articles in the initial set, and by forward-tracing all articles that cited the original articles using Google Scholar and ISI Web of Knowledge. As a fourth and final step, we searched for unpublished studies by corresponding with 53 researchers in the area directly and by sending out an e-mail message via OMT-L, an electronic communication medium maintained by the Organization and Management Theory Division of the Academy of Management. This yielded 12 additional responses.

We used two heuristics to determine which studies to include in the meta-analysis (cf. Lipsey & Wilson, 2001). First, a study had to report relationships between isomorphism on the one hand and one or more of the aforementioned operationalizations of coercive pressure, mimetic pressure, normative pressure, and corporate performance on the other. Table 1 summarizes definitions for our core constructs and their common operationalizations. Second, a study had to report sample sizes as well as an outcome statistic (e.g., r, univariate F, t, χ^2) that allows for the computation of a usable effect size (Hunter & Schmidt, 1994; Rosenthal, 1994).

Insert Table 1 about here

We proceeded by reading all articles in the final set and by developing a coding protocol (cf. Lipsey & Wilson, 2001) for extracting data on all relevant variables.[2] Specifically, we collected effect sizes, sample sizes, statistical artifacts, and study characteristics. One of the authors coded the primary studies. The coding

task involved both calculation-based coding (e.g., coding effect sizes, sample sizes, and reliabilities of empirical measures) and judgment-based coding (e.g., assigning specific operationalizations of variables in the primary studies to generic construct categories). All judgment-based codes were rechecked by the other author. Where initial disagreement existed, we used dialogue to reach a joint coding decision.

Data Set

Nonindependence. Stochastic dependencies among effect sizes may influence average effect estimates and their precision (Matt & Cook, 1994). We relied on two separate measures to ensure a reasonable degree of independence amongst the effect sizes in our sample. First, when multiple independent samples were presented in a study, we included correlations from both samples. Second, when multiple correlations for a single relationship were presented which were based on a single sample (as occurs when multiple operationalizations are presented of a single underlying construct), we combined these correlations into a linear composite correlation using formulas provided by Schmidt and Le (2004; also see Hunter & Schmidt, 1990: 457-460). The corresponding reliability scores were calculated using the Mosier formula (Schmidt & Le, 2004; cf. Hunter & Schmidt, 1990: 461).

Outliers and sample. To detect and correct for outliers we followed the Windsorizing approach suggested by Lipsey and Wilson (2001). This procedure is used when "extreme values are believed to be unrepresentative or spurious, but the analyst does not wish to lose the data they represent" (Lipsey and Wilson, 2001: 108). Effect sizes that were more than 2.5 standard deviations removed from the mean correlation for a given hypothesized relationship were brought back to this cut-off

point. In all, 8 effect sizes were recoded. We also checked the robustness of our findings against alternative cutoff points of 2.0 and 3.0 standard deviations, but neither value significantly affected the results of the subsequent meta-analyses. The final data sample consisted of 234 effect sizes from 51 studies, of which 4 were unpublished when we conducted our meta-analysis.

Meta-Analytic Calculations

Every primary study is hampered by imperfections in research methods ('artifacts'). A great advantage of quantitative research synthesis is that it allows us to correct for these artifacts, such that we can maximize the relevance of our estimates to the testing and evaluation of scientific theories (Hunter & Schmidt, 1994). We used Hunter and Schmidt's (2004) approach to correct the retrieved correlation coefficients (*r*'s) for the following artifacts: (1) sampling error, (2) measurement error in the dependent variable, (3) measurement error in the independent variable, (4) dichotomization of a continuous dependent variable, (5) dichotomization of a continuous independent variable, and (6) downward bias in the retrieved correlation coefficient as a measure of the population correction. As information on some of these artifacts was not widely reported, we based our meta-analysis on artifact distributions rather than individually corrected correlation coefficients.

The resulting artifact-corrected meta-analyses yielded the following summary statistics: (1) total number of correlations (k), (2) total sample size (N), (3) the average corrected correlation (mean ρ), (4) the associated standard deviation of the corrected correlations in the population (SD_ρ), (5) the 80% credibility interval around the mean rho ($CrI_{mean\ \rho}$), (6) the 90% confidence interval around the mean rho (CI_{mean}

$_{\rho}$), (7) the true residual variance in the observed correlations after removal of variance due to artifacts (SD_{res}), and (8) and the percentage of variance accounted for by all study artifacts. The distinction in meta-analysis between credibility intervals and confidence intervals is important (Hunter & Schmidt, 2004). The credibility interval refers to the distribution of parameter values, implying that at the chosen level of inclusion 80% of the values of the rho distribution lie in this interval. Credibility values are independent of sampling error, as these have been removed from the estimate of SD_{ρ} Confidence intervals, alternatively, express the likely amount of error in the estimate of mean ρ due to sampling error. At the chosen confidence level, we can be 95% certain that the true mean effect size lies within this interval.

To assess whether all individual correlations reported in our primary studies were drawn from the same population (in which case further moderator analysis would be unnecessary), we relied on Hunter and Schmidt's (1990) 75% rule-of-thumb. The rule states that an additional search for moderators is warranted when less than 75% of the observed variance in correlations is explained by study artifacts. Since the levels of variance accounted for by artifacts are all well below the 75% cut-off point in our analyses, the underlying correlations are apparently drawn from different populations. Further moderator analysis is therefore warranted. To establish the extent to which our findings were influenced by publication bias, we conducted a vote count of the findings of the studies included in our analysis. Publication bias is assumed to be present when published studies report significantly more positive and less insignificant or counter-hypothesized outcomes than unpublished work (Duval & Tweedie, 2000). We found that 60% of all tests in the published studies reported confirmatory results, whereas 6% found counter-hypothesized results. For unpublished studies the percentages were *both* slightly lower at 55% and 4%

respectively. Publication bias thus does not seem to be having a major effect on our findings.

RESULTS

Testing Neo-Institutional Hypotheses

Table 2 presents the summary statistics for our respective meta-analyses. Hypothesis 1 was supported, albeit with an important qualification. The mean ρ of the relationship between coercive pressures and isomorphism was .07 (based on 56 effect sizes) and the 95% confidence interval was small and did not include zero. This implies that the relationship between both constructs is statistically significant. The credibility interval, however, did include zero, which means that the hypothesized effect was not fully generalizable across all primary studies included in the analysis. Further moderator analyses are thus needed to understand the conditions determining the influence of institutional forces. The results further showed that both resource dependence and state influence were significant predictors of isomorphism, as evidenced by their all-positive confidence intervals.

Insert Table 2 about here

Hypothesis 2 was fully supported without further qualifications. The mean ρ of the association between mimetic pressures and isomorphism was .09, the confidence

interval was small and did not include zero, and the credibility interval likewise was all-positive. This implies a statistically significant relationship, which is furthermore generalizable across the set of primary studies included in the analysis. Interestingly, this effect is strongly driven by the effect of frequency-based imitation, as both trait-based imitation and outcome-based imitation evidenced weaker relationships with isomorphism. Also noteworthy is that these results were based on 89 effect sizes, which is the highest number for any of the isomorphic pressures. This suggests prior observations on the disproportionately high degree of attention paid by neo-institutional researchers to mimetic effects (cf. Mizruchi & Fein, 1999).

Hypothesis 3 was supported, but again with an important qualification. The mean ρ between normative pressures and isomorphism was .10 (based on 39 effect sizes), and the confidence interval was reasonably small and all-positive. Thus, the relationship between both constructs is statistically significant. The credibility interval, however, did include zero, implying that our results could not be generalized across all primary studies included in the analysis. Further moderator analysis is necessary to explore why. Interestingly, the results for normative isomorphism appear to be driven somewhat by the normative force of credentials, and only to a lesser extent by network effects. Thus, even though networks allow for faster diffusion of rationalized legitimated practices, the result of formal training and certifications on their adoption appears more profound.

Neo-institutional theory is also worth its salt as a strategic management theory, as is demonstrated by the support for Hypothesis 4. The mean ρ for the relationship between isomorphism and benefits is .23 (based on 50 effect sizes) and the confidence interval does not include zero. Some caution is appropriate, however, since the credibility interval is not all-positive. Additional moderator analysis is called for, as

the overall results are not generalizable across all studies in our sample. Noteworthy is also that the effect of isomorphism on symbolic benefits is greater than its effect of substantive benefits, and that the result for symbolic benefits is also better generalizable than its substantive counterpart.

Moderator Analysis

Both the Hunter and Schmidt (1990) 75% rule-of-thumb and the relatively large credibility intervals around the mean ρ's for our hypothesized relationships suggest that the effect sizes in our sample are heterogeneously distributed, and thus that further moderator analyses are warranted. We rely on a modified weighted least squares (WLS) regression analysis to assess the relationship between effect size and moderator variables (Lipsey & Wilson, 2001). We assume that the variance beyond subject-level sampling error is derived partly from systematic, identifiable factors, and partly from random sources. In this case, so-called mixed effects models are most appropriately applied (Lipsey & Wilson, 2001). Such models act in part like fixed effects models, in that they assume that certain identifiable study characteristics will act as moderator variables, in that they are associated with and will in part account for systematic differences among effect sizes. Unlike fixed effect models, however, they also allow for a random component of residual variance to remain after the systematic part is accounted for.

In the WLS regression, effect sizes are used as the dependent variable, the identified moderators as independent variables, and the inverse variance weights as the weighting variable. Although regular WLS regression analysis tends to fit the model correctly and will provide accurate regression coefficients, betas, and R^2, the

standard errors must be adjusted to be correct and to provide accurate assessments of statistical significance. We made these adjustments using procedures suggested by Lipsey and Wilson (2001). The overall level of heterogeneity in the sample is given by the homogeneity statistic Q. As stated, Q has two components, a component captured by the model (Q_m) and a residual component (Q_r). In the adjusted WLS regression we applied, the random effects variance component is estimated by means of a method of moments-based estimation procedure after the moderator variables have been accounted for. Results for the WLS regressions are presented in Tables 3 and 4.

Insert Tables 3 and 4 about here

We estimated separate models for methodological moderators (publication status, year of publication, publication outlet, and study design) and for substantive moderators (organization type, sector, and home country; see Table 4). Moderator analysis for the relationship between isomorphic pressures and isomorphism showed that year of publication and study design are positively associated with the effect size. The former effect may be indicative of an increasing self-justificatory bias in the literature: as the theory becomes more established over the years, studies that find no support for the theory or even counter-hypothesized effects will become more difficult to publish. The latter effect shows that cross-sectional studies tend to publish greater effect sizes than longitudinal studies. This finding lends credence to emerging notions in the institutional change literature that isomorphic tendencies may represent

episodic rather than continuous aspects of the history of institutional fields (Schneiberg & Clemens, 2006). Organizations may thus come to resemble one another more and more during certain periods, only to diverge again in later periods. Finally, for the methodological model, the component of residual variance, Q_r, is non-significant, suggesting no further presence of moderators.

In the substantive model, all variables except for financial services have a significant moderating effect on the relationship between isomorphic pressures and isomorphism (see Table 4). The fact that the 'private organization' variable negatively moderated the predicted relationship supports the intuitively appealing idea that public organizations are subjected to greater isomorphic pressures, and comply with them more often. Of the sector variables, only 'media' positively moderates the hypothesized relationship. This may point at several factors, including the importance of cognitive legitimacy (Suchman, 1995) for media organizations, the relative ease of mimicking media formats, and the degree of control the state still wishes to exert over media organizations in many nations. Finally, the US variable negative moderated the focal relationship. This is slightly paradoxical, as isomorphic pressures are nowhere studied with greater vigor than in the US, whereas they are de facto stronger in other regions. By and large, this reinforces an existing image of the US as a relatively liberal country amongst the more advanced nations in the world. Finally, for the substantive model, the component of residual variance, Q_r, is non-significant, suggesting no further presence of moderators.

For the hypothesized relationship between isomorphism and performance, no significant moderator variables were identified, neither in the methodological nor in the substantive models. Furthermore, the component of residual variance, Q_r, is non-significant for both models, suggesting no further presence of undetected moderators.

DISCUSSION AND CONCLUSION

Contributions

Since 1983 numerous studies have investigated the relationship between isomorphic pressures and increased homogeneity between organizations and its subsequent effects on efficiency and benefits. This meta-analysis has contributed to neo-institutional literature in a number of ways. First, this is the first-ever quantitative review of more than 50 articles resulting in 234 correlations, allowing for inferences on the above described relationship using a comprehensive model. It showed that there is indeed increased homogeneity due to isomorphic pressures. Second, as indicated by Mizruchi and Fein (1999), we found that mimetic isomorphism is still most commonly used indicator to test homogeneity hypotheses. Moreover, the strength of the relationship between mimetism and isomorphism was greater than that of either coercive or normative pressures. This could be the result of latent publication bias, implying that since these relationships are more often found to be significant, they will also be published more often. It is therefore not surprising that we found the greatest number of effect sizes for this type of isomorphic pressure. Third, as proposed by the literature, increased isomorphism leads to symbolic benefits to be bestowed on the focal organization whereas the hypotheses on substantive benefits received mixed support. This finding supports earlier insights on the importance of isomorphic conformity raised by DiMaggio and Powell (1983) and Meyer and Rowan (1977).

Limitations and Future Research Implications

Like any study, ours has its limitations. First, although we have tried to be comprehensive in our search for articles, we most likely missed out on several studies that somehow went below the radar. Moreover, although several unpublished drafts and working papers are included in our analysis, more are likely to exist. Future meta-analyses of neo-institutional theory could be strengthened by including more unpublished work. Another limitation is that only studies that reported effect sizes of the bivariate relationship between the dependent and independent variable where included. This limited the amount of studies applicable for the research, as most (!) articles did not report a correlation table or only reported correlations amongst the independent variables. This holds particularly true for the sociology journals, even the major ones. This practice, although common, is lamentable as it stands in the way of better research synthesis and the project of cumulative scientific insight more generally. We therefore urge the other major journals in our field to follow the lead of publications like the *Academy of Management Journal*, and make the publication of full correlation tables mandatory.

Conclusion

Neo-institutional theory is well established in the organizational literature and, as our meta-analysis shows, goes empirically supported. Yet, it still struggles with the question as to how universal its applicability really is. Future research is needed on this issue, in order to secure not only a glorious past but also a bright future for neo-institutional theory.

TABLE 1

Definitions of the Neo-Institutional Constructs and Representative Measures

Construct	Definition and measures
Coercive pressures	*Construct definition:* pressures that results from both formal and informal pressures exerted on organizations upon which they are dependent and by cultural expectations in the society in which organizations function (DiMaggio and Powell, 1983). *Representative measures:* see resource dependence and legislative influence
o Resource dependence	*Construct definition:* the extent to which the focal organization depends on constituents in its environment for critical resources (e.g. production input but also legitimacy), that allow these external parties to exercise influence over said focal organization (Pfeffer and Salancik, 1978). *Representative measure:* Teo, Wei and Benbasat (2003) & Bridges and Villemez (1991)
o Legislative Influence	*Construct definition:* imposition of standard operating procedures and legitimated rules and structures through government mandate (DiMaggio and Powell, 1983). *Representative measures:* Mezias (1990) & Provan (1987)
Mimetic pressures	*Construct definition:* the modeling of the focal organizations after other organizations in the field when faced with uncertainty over goals, technologies symbolism etc (DiMaggio and Powell, 1983)\. *Representative measures:* see trait-based, frequency-based and outcome-based imitation.
o Trait-based imitation	*Construct definition:* imitation of practices that have been used by some subset of organizations selected on the basis of organizational characteristics such as perceived successfulness or size (Haunschild and Miner, 1997). *Representative measures:* Kraatz (1998) & Haunschild and Miner (1997).
o Frequency-based imitation	*Construct definition:* imitation of actions that have been taken by large numbers of other organizations (Haunschild and Miner, 1997). *Representative measures:* Kraatz (1998) & Haunschild and Miner (1997)
o Outcome-based imitation	*Construct definition:* imitation of actions that produced positive outcomes for others (Haunschild and Miner, 1997) *Representative measure:* Teo, Wei and Benbasat (2003) Haunschild and Miner (1997).
Normative pressures	*Construct definition:* the collective struggle of members to define the conditions and methods of their work. *Representative measures:* see credentials and networks.
o Credentials	*Construct definition:* professionalization through a cognitive base created through formal education of university specialists (DiMaggio and Powell, 1983). *Representative measures:* Mezias (1990) and Hong and Karlsson (2004).
o Networks	*Construct definition:* growth and elaboration of professional networks that span organizations that allow for new models to diffuse rapidly (DiMaggio and Powell, 1983). *Representative measures:* Geletkanycz and Hambrick (1997) and Lee and Pennings (2002).
Isomorphism	*Construct definition:* a constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions (Hawley as cited in DiMaggio and Powell, 1983). *Representative measures:* D'Aunno, Succi and Alexander (2000) & Lee and Pennings (2002).
Corporate performance	*Construct definition:* the increase in resources, customers, political power and institutional legitimacy due to isomorphism (DiMaggio and Powell, 1983). *Representative measures:* see symbolic benefits and substantive benefits.
o Symbolic benefits	*Construct definition:* the bestowal of symbolic resources such as public endorsement and better reputation scores (Heugens and Lamertz, forthcoming). *Representative measures:* Deephouse (1996) & Deephouse and Carter (2005).
o Substantive benefits	*Construct definition:* possible efficiency and performance benefits accruing from isomorphic adaptation of strategies or structures. *Representative measures:* Geletkanycz and Hambrick (1997) Westphal, Gulati and Shortell (1997).

TABLE 2

Meta-Analytic Results for the Focal Relationships[a]

Predictor	k	N	Mean ρ	SD_ρ	$CrI_{mean\ \rho}$ 80%	$CI_{mean\ \rho}$ 95%	SD_{res}	% Variance accounted for
Coercive pressures to isomorphism	56	92091	.0701	.1795	-.1597 - .2998	.0524 - .0877	.0225	2.7
Coercive pressures to strategic isomorphism	42	31291	.1612	.2556	-.1661 - .4884	.1143 - .2081	.0436	3.3
Coercive pressures to structural isomorphism	14	60809	.0220	.0909	-.0944 - .1383	.0117 - .0322	.0076	2.9
Resource dependence to strategic isomorphism	29	18433	.2117	.2451	-.1021 - .553	.1521 - .3014	.0437	3.5
Resource dependence to structural isomorphism	8	16840	.0020	.1248	-.1578 - .1617	.0009 - .0031	.0143	3.2
State influence to strategic isomorphism	13	12858	.1323	.1805	-.0987 - .3634	.0539 - .2110	.0158	6.9
State Influence to structural isomorphism	6	43960	.0239	.0542	-.0454 - .0932	.0032 - .0447	.0027	4.8
Mimetic processes to isomorphism	89	6393442	.0853	.0369	.0381 - .1325	.0655 - .1052	.0010	4.0
Mimetic processes to strategic isomorphism	82	6363462	.0864	.0419	.0328 - .1400	.0656 - .1073	.0013	3.5
Mimetic processes to structural isomorphism	7	32942	.0901	.1029	-.0415 - .2218	.0077 - .1725	.0096	2.1
Trait-based imitation to strategic isomorphism	28	122288	.0670	.0587	-0081 - .1421	.0300 - .1040	.0021	10.3
Trait-based imitation to structural isomorphism	4	9584	.1880	.1492	-.0030 - .3789	-.0172 - .3931	.0203	1.9
Frequency-based imitation to strategic isomorphism	44	6173877	.0811	.0323	.0398 – 1222	.0607 - .1015	.0009	0.8
Frequency-based imitation to structural isomorphism	1	#	#	#	#	#	#	#
Outcome-based imitation to strategic	10	64335	.0074	.0861	-.0919 - .1285	.0048 -	.0063	2.4

isomorphism						.0318		
Outcome-based imitation to structural isomorphism	2	#	#	#	#	#	#	#
Normative pressures to isomorphism	39	64572	.0960	.1454	-.0901 - .2821	.0681 - .1240	.0151	4.1
Normative pressures to strategic isomorphism	35	40594	.1123	.1946	-.1368 .3613	.0782 - .1463	.0257	3.5
Normative pressures to structural isomorphism	4	23978	.0725	.0831	-.0337 - .1789	-.0119 - .1570	.0063	2.6
Credentials to strategic isomorphism	7	3991	.3118	.2567	-.0168 - .6404	.0913 - .5322	.0553	2.6
Credentials to structural isomorphism	0	#	#	#	#	#	#	#
Networks to strategic isomorphism	28	36603	.0798	.1310	-.0877 - .2472	.0530 - .1066	.0121	6.2
Networks to structural isomorphism	4	23978	.0725	.0831	-.3378 - .1789	-.0120 - .1570	.0063	2.6
Isomorphism to benefits	50	31837	.2327	.2737	-.1176 - .5830	.1514 - .3140	.0444	3.3
Isomorphism to substantive effectiveness	34	26629	.2419	.3049	-.1483 - .6322	.1044 - .3795	.0519	2.3
Isomorphism to symbolic benefits	16	4059	.1847	.0744	.0895 - .2800	.1357 - .2337	.0055	40.3

[a] k = number of data points; N = total sample size; Mean ρ = estimate of the corrected population correlation; SD_{ρ} = estimated standard deviation of the corrected correlations in the population; $CrI_{mean\ \rho}$ 80% = 80% credibility interval for the distribution of parameters values; $CI_{mean\ \rho}$ 95% = 95% confidence interval for mean rho; SD_{res} = residual standard deviation; % Variance accounted for = percentage of observed variance accounted for by statistical artifacts.

TABLE 3

Moderator Analysis Isomorphic Pressures to Isomorphism[a]

Variable	Methodological Model	Substantive Model
AMJ	.0022 (.0479)	
ASQ	.0346 (.0545)	
ASR	-.0150 (.0738)	
AJS	.0809 (.0750)	
PUBYEAR	.0073 (.0037)*	
CROSS	.1065 (.0410)**	
PRIVATE		-.0511 (.0404)**
FINANCIAL		-.0511 (.0363)
CARE		-.1209 (.0508)*
MEDIA		.4173 (.0465)**
EDUCATION		-.1398 (.0465)**
US		-.0855 (.0292)**
R^2	.0720	.2582
Significance	.0379	.0000
Q_{RES}	171.9294	189.7415

[a] * $p < .05$

** $p < .01$

TABLE 4

Moderator Analysis Isomorphism to Performance[a]

Variable	Methodological Model	Substantive Model
AMJ	.0711 (.0788)	
ASQ	-.0730 (.0721)	
PUBYEAR	.0020 (.0057)	
CROSS	.0133 (.0583)	
PRIVATE		.1053 (.0799)
FINANCIAL		-.0126 (.0735)
CARE		-.0230 (.0556)
US		.1771 (.0945)
R^2	.1688	.1063
SIGN	.0675	.2439
Q_{RES}	43.1144	45.8258

[a] * $p < .05$

** $p < .01$

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ENDNOTES

[1] Our searches always included one substantive and one methodological keyword (cf. David & Han, 2004; Geyskens, Steenkamp, and Kumar, 2006). The substantive keywords we used were: 'isomorphism,' 'mimetic isomorphism,' 'coercive isomorphism,' 'normative isomorphism,' 'mimetic processes,' 'normative pressures,' 'institutional theory,' 'rationalization,' 'decoupling,' 'rational myths,' 'substantive effectiveness,' 'symbolic endorsement,' and 'institutional isomorphism.' The methodological keyword we used were: 'data,' 'methodology,' 'correlations,' and 'sample.'

[2] The coding protocol is available from the authors upon request.

[3] References marked with an asterisk indicate studies included in the meta-analyses.

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