METATHEORIZING CITATION*

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This paper reviews a variety of perspectives on citation. It argues that citations have multiple articulations in that they inform our understanding of the socio-cultural, cognitive, and textual aspects of scientific communication. Two metatheoretical frameworks are proposed as a means of negotiating the interpretative differences which characterize the various discourse communities concerned with citation theory and practice.

1. Framing the question

In the section on citation as *explanandum, Leydesdorff* (1998) remarks that "citations are references to another textual element." A simple statement, to be sure, but one which entails a complex question: why does an author provide references to something else? The merit of Leydesdorff's paper is that it demonstrates why this seemingly innocuous question has proved so intractable. He attempts to show why a "grand theory of citation" is impossible given the "constitutionally complex" nature of modern citation. This complexity has stymied would-be theory builders, from sociologists to information scientists, in the process fuelling what *Fish* (1985, p.112) in another context has termed "theory hope." *Leydesdorff*, however, has provided us with a parsimonious framework for analyzing the various dimensions of both citation behavior and citation analysis by separating reflexive practice from reflexive theory. His clarification of the complexity issue may prove to be an important step on the road to forging a *lingua franca* for the patchwork scientometrics community.

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2. Citation behavior

2.1. Ways of seeing

Why do authors cite? The answer, naturally, will depend on the perspective one favors and the degree of granularity required. Three perspectives are considered briefly below: the functionalist, normative and phenomenological. Studies of citation practice typically approach the topic from a single perspective. Intuitively, that makes little sense. Missing from the literature are compelling attempts to achieve discourse synthesis between different investigative communities and worldviews, with the result that the citation field, like many others, for instance sociology (*Turner*, 1989), is characterized by logically connected but non-interacting literature sets (*Swanson*, 1989). In a wide-ranging review of citation studies, *Hemlin* (1996, p.227) observes that the "mixture of results and methods does not lead to a proposal for a theory of citation behavior," while *Hicks* and *Potter* (1991, p.480), adopting a Foucaultian stance, suggest that "the act of citation is a symptom of many ... things." The persistent failure to develop a grand unifying theory of citation serves as Leydesdorff's point of departure towards a metatheoretical formulation.

2.2. Functionalist perspective

A purely functionalist interpretation of why A cites a text (T^I) by B might run as follows: to provide supplementary evidence, to support or refute an hypothesis, to furnish historical context. Of course, what is cited can be as simple as a specific term or as complex as an author's complete *oeuvre* (*Cronin*, 1994). Various schemata and relational operators/qualifiers have been devised to accommodate the spectrum of instrumental reasons for referencing a particular text (or cognitive resource), but none comprehensively answers the question, "Why do authors cite?" Van *Braam* (1991, p. 301) has shown that "giving 'operational' information" is the most important reason for citing "because of the interaction that takes place in the reviewing process between authors, editors and referees." He concludes that citations cannot be dismissed as "private symbols." In similar vein, *Small* (1978) has argued that in the physical (and life) sciences citations are tightly coupled (he speaks of citations as concept symbols) with specific experimental designs, analytic techniques, observable elements and their properties, reaction times, interaction effects, statistical methods and such like. That, of course, is very different from established practices in the social scientific, humanistic and belletristic literatures. And there is an historical dimension which warrants mention:

in seventeenth century science, authentication of experimental practice and results was provided by individuals of gentlemanly stock (*Shapin*, 1994). The mutual trust implicit in this civil process of verification by a third party finds its echo today in the depersonalized practice of citation. Pragmatically speaking, citations bear witness to earlier scientific events and outcomes, and serve a serious rather than a rhetorical or decorative purpose in the narrating of science. *Leydesdorff* would seem to agree in principle for, at the outset, he acknowledges that citations "seem to have specific functions in the research process." His search for a metatheory is thus implicitly grounded in certain assumptions about citation *praxis*.

2.3. Normative perspective

A normative, or domain analytic (*Hjorland*, 1997), interpretation would highlight the rules, tacit or codified, which govern the dispensing of credits (rewards) within the scholarly communication system and its constituent zones. As *Bourdieu* (1991, p.20) notes, "if one wishes to produce discourse successfully within a particular field, one must observe the forms and formalities of that field." This includes matters of etiquette and style, as well as more generalized scholastic *savoir faire*. Typically, these are acquired through an admixture of osmosis, formal and informal mentoring, and the quotidian transmission of cultural precedent from master to apprentice, peer to peer – "the Apostolic succession of apprenticeship" (*Turner*, 1994, p.50). If, like *Brodkey* (1987, p.4), we think of writing as a social (rather than solitary) act, akin to a conversation with "rules for conversing," then citations are the textual equivalent of providing the interactant with socially appropriate cues and reinforcers. This can be taken a step further, with science being viewed "not as an accumulating body of knowledge, but as a conversation" – the narratological approach, *in extremis* (*Czarniawska*, 1997). The ISI's (Institute for Scientific Information's) massive databases are thus the annals of science waiting to be written.

2.4. Phenomenological perspective

But neither the functionalist nor normative explanation fully answers the question, why did A cite T^1 by B? There remains the motivational dimension. Why was T^2 by author C not cited? What motivated A to reference T^1 rather than any other candidate text, whether written by B or another? What social-psychological variables come into play, in the shaping of an author's referencing behavior? And if these are not known (or knowable), how can a putative (and plausible) theory of citation be developed? How,

then, to use the language of economists, are these informational imperfections to be overcome? The Achilles' heel of citation is its residual subjectivity, and this has spurred *MacRoberts* (1997) to challenge the validity of evaluative bibliometrics on the grounds that authors' citation behavior is non-randomly (i.e., systematically) biased. But, as should become apparent, there is no need to throw out the bibliometric baby with the behavioral bath water: as *Grafton* (1997, p.18) observes, "a historical work and its notes can never, in the nature of things, reproduce or cite the full range of evidence they rely on."

2.5. Towards a unitary perspective

These three perspectives are not mutually exclusive: citations have multiple articulations, and citation analysis, as *Leydesdoff* acknowledges, allows for movement "between the cognitive, the textual, and the social dimensions of science ..." For example, A's citing of B's text may provide supporting evidence for A's theory (the citation's perceived intra-textual function), while his formal citing of B's work reflects the scholarly community's expectation that credit will be given to those who have influenced the citing author's thinking. The citation, in that sense, is socially mandated. But the specific reasons for citing B rather than any other author may also be contingent upon a variety of social, structural, cultural, economic, or organizational factors – "the hypothetical causal chain" (*Shadish*, 1989, p.408). Thus, a full understanding of why *A* cites *B* requires a multi-layered explanation and, ideally, thick description of the process – and the politics of the process. Most citation classification schemes, however, suffer from a desire to uniquely pigeonhole authorial purpose or intention, thus downplaying the mix of normative and particularistic factors at work.

2.6. Metaphors

In addition to any overtly instrumental role they play may within a given text, citations can act as signalling or strategizing devices (*Ben-Ari*, 1987) and also as units of potentially convertible symbolic capital in the academic marketplace. The nature of the interaction between these symbolic entities (citations) and related social processes (scholars' information consumptive and communication practices) are not readily apprehensible. Absent a unified theory of citation, a range of metaphors has been used to fill the gap. *Becher* (1989) talks of citation in terms of levying a tax on reusable knowledge; *Cronin* (1981, p.16) uses the image of frozen footprints in the landscape of scholarly achievement; *Hagstrom* (1982) sees citation in the context of gift-giving (the

bestowing of social recognition on one's colleagues in exchange for information). This last interpretation has been roundly dismissed by *Latour* and *Woolgar* (1982, p.38) as having "the aura of a rather contrived fairy tale."

2.7. Shadowlands sociology

Prevailing citation practices are of fairly recent origin, as *Leydesdorff* recognizes, and are a consequence of the progressive professionalization and institutionalization of the scientific enterprise. However, citations are anything but trivial literary inscriptions, or instances of reflexive ritual in the production of stylized texts: the sanctions for failure to cite others' work can be severe and the career costs considerable. Citation has become a structurally embedded component of the primary communication process, and thus deserves to be included in epistemological critiques of science. Cooperation and collaboration are also defining features of the scholarly enterprise, illustrated persuasively in the growth of networking, co-authorship, informal communication and trusted assessorship in recent decades. The nature of the linkages that define disciplinary and social networks in the various sciences are revealed through webs of citations and acknowledgements, systematic analysis of which can lead to the development of a "sociology of the invisible" (*Star*, 1991, pp.81-82). Surprisingly, *Leydesdorff* makes only passing mention of acknowledgements, a closely-related class of textual indicator.

Acknowledgements, though they register essentially personal or behind-the-scenes interactions, gift giving, informal know-how trading between scholars, mentoring (which includes the contributions of "silent scientists" (*Meadows*, 1974, p.182)), do nonetheless exist in the public domain. They feature as meta-textual elements in a majority of scholarly journal articles across most disciplines and fields (*Cronin*, 1995), and provide a revealing window onto trends in collaboration, particularly if used conjointly with other measures of scholarly interdependence and interaction. One might use the term "biographic coupling", playing on the idea of bibliographic coupling, to convey the fact that two authors have been co-acknowledged one or more times in a given corpus of documents.

However, this operationalization of trusted assessorship (*Mullins*, 1973; *Chubin*, 1975) has been largely neglected in the interpretative sociology of science. Unlike citations, acknowledgements have been relegated, historically, to the shadowlands of scholarly production, but the case for their "artful integration", to paraphrase *Suchman* (1996, p.407), into mainstream accounts of science and scholarship is increasingly difficult to resist in the light of the empirical evidence (*Cronin*, 1995; *McCain*, 1991).

Leydesdorff really needs to extend his focus to accommodate other forms of citation – acknowledgements, footnotes, dedications. When measured and mapped, these complementary literary devices take on a significance which transcends the superficially ritualistic roles they perform in the process of literary inscription – *vide Grafton's* (1997) recent account of the history of the footnote and the importance of the "rhetoric of annotation" (p.233) in the literary life of the mind. Carefully aggregated and combined, these formalisms constitute a robust, composite indicator of scholarly interaction, impact and perceived utility.

3. Metatheories

How might the many strands of the citation debate be woven into a coherent whole? In his concluding section, *Leydesdorff* argues that the quest for a grand theory of citation "implies a meta-theoretical question." That being so, two (rather different) approaches are proposed here for consideration. Metatheories, to quote *Vakkari* (1997, p.452), do not "signify substantive theories" and "are not about particular social structures, processes or groupings"; instead they provide a flexible scaffolding or framework within which to think about and explain specific sociological phenomena (*Berger, Wagner* and *Zelditch*, 1989; *Vakkari* and *Kukkanem*, 1997; *Vickery*, 1997). The first candidate involves a recontextualizing of citation practices to accommodate the interplay of the political and the personal in the production and exploitation of symbolic capital: it is recommended that citation behavior be examined in the context of a political and moral economy. The second proposes a structurationally-informed analysis of the citation process, designed to bridge the existing interpretive divide and to articulate the relationship between private acts and public worlds. Both of these metatheoretical approaches are served up here in extremely raw form.

3.1. The moral and political economy of citation

The multi-dimensionality, or multi-contextuality, of citation analysis is captured elegantly in Leydesdorff's two-by-two tables which reveal the "functions of citation relations" at both the micro/disaggregated and macro/aggregated levels. What these tables so clearly show is that a number of socio-professional relations are established (between actors, texts and cognitive resources) when *A* cites *B* cites *C*, etc.. When the unit of analysis is clusters of authors, we are dealing with networks of texts, cognitive resources, and social actors – and networks of networks. The interpretation of these

networks requires an appreciation of the relationships, power structures, alliances, institutional affiliations and bases of prestige which define the moral and political economy of citation.

Bibliometric and sociometric analyses of specialty groups are cantilevered on assumptions about the purpose and integrity of individuals' citation behaviors. The outputs of such studies metastasize into maps of science and information theoretic models of disciplines. Citation analysis makes invisible colleges and virtual communities manifest; it effectively provides an *explanans* for the growth of science and how influence is exercised within and across scientific clusters. In sum, citation analysis has morphed into a tool for narrating and explaining the growth of contemporary science, for calibrating academic performance and for allocating credits and rewards. Despite persistent criticisms relating to construct validity and reliability (e.g., *MacRoberts* and *MacRoberts*, 1989), citation analysis remains, according to the weight of empirical evidence, an efficient means of measuring, if not perceived quality, then perceived usefulness: " ... articles are highly cited if they are useful to a large number of scientists" (*Shadish*, 1989, p.415). The net effect is that citations have become the "most objectified of the indices of symbolic capital" (*Bourdieu*, 1990, p.76), in part as a result of their endorsement by many science policy and research funding agencies. A corollary of this is the growing recognition that market signalling, linked to a publication/citation maximization strategy, whether consciously applied or not, can translate into significant economic gains for the perpetrator (*Cronin*, 1996).

A nagging difficulty has to do with the fact that the process (that which is signified by the act of citation) is divorced from its context once the signifier is subjected to number crunching, a point made tellingly by *Warner* (1990, p.28): " ... the ambiguity of citations in aggregate form can be seen as a special case of the indeterminacy other written signifiers, such as words, can acquire when torn from their discursive context." However, the anti-commodificationists are left to wrestle with the pragmatic realism of *White* (1990, p.91): "When one sees that scores, hundreds, and even thousands of citations have accrued to a work, an author, a set of authors, it is difficult to believe that all of them are suspect. Why not believe that there is a norm in citing – a straightforward acknowledgement of related documents – and that the great majority of citations conform to it?"

How might these contesting viewpoints be accommodated? The moral economy of citation, to appropriate *Silverstone* et al.'s (1992) idea of the moral economy of the household, thus connotes the inherent mutuality of science, with shared expectations of granting credits and acknowledging debts in a transactional system. Transposing their definition of what constitutes a moral economy of the household (p.18), one could say

that authors' citation practices are "defined and informed by a set of cognitions, evaluations and aesthetics, which are themselves defined and informed by the histories, biographies and politics" of the scholarly communication system and that citations are "doubly articulated into public and private culture" (p.15). Indeed, the sense that authors have a collective understanding of the rationale for, and specifics of, citation conjures up the idea of collective mind, conceptualized, in the context of organizational studies, by *Weick* and *Roberts* (1993, p.357) as "a pattern of heedful interrelations of actions in a social system." Citation is predicated on assumptions about socially correct and acceptable practice – distributive justice, in other words. Acknowledging one's intellectual debts and paying credit through bestowal of citations is a means of positioning and patterning oneself *vis a vis* the external community of which one is part.

3.2. Structuration

The problematic relationship between structure and action has been a dominant leitmotif in twentieth century sociology. *Giddens* (1984), to take a notable example, has attempted to bridge the theoretical divide via structuration theory, which, "subsumes two fundamentally antagonistic theoretical positions, that of the structuralist who sees social life as determined by objective social structures and that of the hermeneutical humanists and interactionists who see social life as a product of subjective and intersubjective human activity" (*Macintosh* and *Scapens*, 1990, p.46). In structuration terms, social practices, defined as "the concrete, situated, and routine activities in which people are engaged as they enter, work, play in, and exit a variety of social settings" (*Rosenbaum*, 1996, p.86), are routinely reproduced in social settings by people: social actors in this formulation are individuals – not organizations, collectivities, systems or social structures. And they combine discursive knowledge (which can be articulated) with practical, or tacit, knowledge. Structure, in turn, is defined in terms of the rule sets (techniques or generalizable procedures) and resources (facilities or bases of power) which are invoked and used in the production and reproduction of social systems.

In the literature on citation there exists a comparable ideological cleft between the normative and interpretivist positions (*Cronin*, 1984). Basically, the normative view posits a world in which citation behaviors are rational, universalistic and rule-based. Interpretivists, on the other hand, eschew generalizations and normative accounts of science, privileging instead "the deep personal character of science" (*Mitroff*, 1974, p. 580). The difference could equally well be formulated as objectivists versus subjectivists; or those who are comfortable with the industrialization of citation analysis

and those who dismiss the practice as nothing more than "numerology" (*Jevons*, 1973, p. 45).

Can structuration theory provide a means of bridging the citational cleavage described by *Leydesdorff*? Citation is a well-established social practice rooted in a recognizable social system, that of scholarly communication. Scholars have a mixture of discursive and practical knowledge about citation (the why, how and wherefor) and, in the process of producing and disseminating their publications, routinely draw upon cognitive resources (the ideas, insights and texts of other actors) and rules (which govern the allocation of credits and the distribution of symbolic and material rewards). These rules, following *Giddens*, are thus key in the reproduction of the institutionalized social practice known as citation behavior. Structuration may offer the possibility of carving out a middle ground between naive normativism and extreme relativism.

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