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The Intellectual Link Between Management Research and Popularization Media: A Bibliometric Analysis of the *Harvard Business Review*

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We explore the intellectual link between management research and popularization media. In the "dominant view" of popularization in the sociology of science, the process of popularization is understood as a one-way movement of ideas from the field of science to the general public. Thus, it is seen as unlikely to influence management research. However, more recent research has challenged the assumptions of this view and has offered an alternative perspective, which can be termed the "revised view" of popularization. In this view, interactions between science and popularization media are much more complex, and relevant feedback effects from popularization media to scholarly journals are possible. Against this theoretical background, we investigate the role played by an important example of popularization media in the field of management, the* Harvard Business Review*, in management discourse. Using a bibliometric analysis of 231* Harvard Business Review *articles, we analyze the degree, direction, and type of intellectual influence of the publication. Our findings suggest that this magazine's role differs significantly from the traditional view of popularization. According to our results, the* Harvard Business Review *is not only a widely quoted scientific source, but it also has a significant impact on the scientific discourse in management research.

Popularization journals play an important yet largely unexplored role in the written and spoken debate on management-related topics—the so-called management discourse (Abrahamson & Fairchild, 1999). In the field of general management, publications such as the *Harvard Business Review* and the *Sloan Management Review* pursue the goal of building a "bridge" between business theory and practice. Among the subdisciplinary publications in the field of management, specialized journals such as *Organizational Dynamics*, *HR Magazine*, and *Strategy & Leadership* pursue similar aims, thus "popularizing" these concepts. Popularization journals have much higher circulations than purely scholarly journals and reach a wide practitioner audience (for circulation data, see Cabell's, 2011). At the same time their reputations are ambiguous and their relevance to academic careers is relatively low (Brennan & Ankers, 2004; Cascio, 2008).

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Although many authors have analyzed the impact of leading scholarly journals on the intellectual structure of different management disciplines (e.g., Podsakoff, MacKenzie, Bachrach, & Podsakoff, 2005; Samiee & Chabowski, 2012; Shafique, 2013) what role popularization journals play in the management discourse remains unclear. Little is known about the degree, direction, and type of intellectual influence that exists between the scholarly debate on management and popularization media. For a number of reasons, we have chosen to examine the link between research and popularization in-depth.

First, some management scholars suggest that popularization journals play a key role in bridging the "relevance gap" (e.g., Buckley, Ferris, Bernardin, & Harvey, 1998; Cascio, 2008; Cohen, 2007). These authors adopt a position which in the sociology of science is termed the "dominant view of popularization" (Hilgartner, 1990). According to the dominant view (or the "traditional model") popularization is a straight-forward, unidirectional process. Scientific knowledge that is superior to everyday popular knowledge is transmitted to what is perceived as a passive lay public or professional audience (Whitley, 1985). While there is little reason to dispute the claim that popularization journals in management indeed reach a practitioner's audience (the "downstream side" of popularization (Hilgartner, 1990: 528), the intellectual influence, if any, of scholarly journals on these bridging forms of media (the "upstream side" of popularization: 528) is open to debate.

Second, popularization journals are an important resource for management education (Rousseau, 2006). As such it is possible that they serve as a channel through which scholarly research filters into the field of teaching. On the other hand, it is also possible that popularization media only function as substitutes for scholarly research and in fact contribute to the decoupling of academic research and teaching (Pearce & Huang, 2012).

Third, more recent research in the sociology of science has challenged the assumptions of the dominant view and offers instead a position that can be called the "revised view" of popularization (e.g., Myers, 2003). This view suggests that the interaction between science and popularization media is much more complex than was previously assumed and that there may be relevant feedback effects which move from popularization media to scholarly journals. We analyze whether this revised model applies in the field of management and address the consequences that this might have on the development of the discipline.

We use a bibliometric approach to analyze the intellectual link between management research and popularization media. Tracking the number of citations a particular article receives allows us to measure the degree and direction of intellectual influence and can be an effective tool for studying the structure and dynamics of networks of communication (Moed, 2005; Zuckerman, 1987). Citation-based approaches have become the preferred measure of journal influence because they are based on readily available data and are less susceptible to systematic biases than subjective measures, such as key informants' judgments (Baumgartner & Pieters, 2003; Podsakoff et al., 2005). An article that receives citations in other papers contributes to the exchange of ideas in a particular discourse (Baumgartner & Pieters, 2003). Thus, in general, citation patterns are assumed to be indicative of the flow of knowledge. However, an article may also be cited for reasons that do not reflect acknowledgment or knowledge transfer (Baumgartner & Pieters, 2003; Stremersch, Vernieres, & Verhoef, 2007). Therefore, we also analyze the type of intellectual influence a popularization journal has. In order to differentiate between types of citations, we apply an interpretive coding scheme of citing behavior (Bornmann & Daniel, 2008). In our bibliometric study we use the *Harvard Business Review* (*HBR*) as a case study. The *HBR* is perceived by many authors to be a prototypical popularization medium. According to Rynes, Giluk, and Brown (2007: 990, fn 4) the *HBR* is the "clearest exemplar" of a generalist bridging journal.

THEORETICAL BACKGROUND

Dominant View of Popularization

In recent decades scholars of the sociology of science have analyzed the nature of popularization across different disciplines (e.g., Lewenstein, 1995; Whitley, 1985). These scholars have identified a "traditional" or "dominant" view of science popularization in both the academic and lay discourse (Hilgartner, 1990; Myers, 2003). *Popularization* is traditionally understood to be the "transmission of scientific knowledge from scientists to the lay public for purposes of edification, legitimation and training" (Whitley, 1985: 3), meaning that knowledge flows in one direction, from science to practice. This widespread idea of popularization relies on several as-

sumptions (Myers, 2003: 266; Paul, 2004: 32; Weingart, 1998: 869): First, in this hierarchical sender–receiver model, scholarly research is located at the "upstream side" of the knowledge flow (Hilgartner, 1990). Popularization journals transfer knowledge to the "downstream side" either directly to practitioners or to media outlets, such as newspapers or specialized industry journals that further simplify and diffuse knowledge (Hilgartner, 1990).

Second, scientific knowledge is regarded as superior to popular, non-expert knowledge, and the lay or professional audience to which it is transmitted is perceived as passive (Weingart, 1998: 869; Whitley, 1985). At the same time "the process of popularization is highly selective" (Kidd, 1988: 129), and as a result, only a small fraction of research of a high academic quality gains broader public attention.

Third, in this view, the process of popularization—if properly carried out—does not change the meaning of the original scientific source (Whitley, 1985: 7). However, the language in which this knowledge is conveyed has to be adjusted (through simplification, avoidance of jargon, illustrations, etc.), so that the ideas are made accessible to practitioners or lay audiences.

Many management scholars share the dominant view and refer to popularization in terms of the unidirectional sender–receiver model. In this view, popularization is the key strategy for overcoming a knowledge-transfer problem that stems from the fact that academic journals are not directly accessible to practitioners (e.g., Buckley et al., 1998; Cascio, 2008; Cohen, 2007). The "'semantic swamp' of academic jargon" (Charan, Aines, Ball, Knoepfel, & Lancey, 1979: 505) and many "academic writing conventions" (Kelemen & Bansal, 2002: 98) make it difficult for practitioners to comprehend the implications of scholarly research. Also, the empirical methods emphasized in scholarly journals tend to alienate practitioners. "Because [practitioners] do not understand the mathematics and statistics that characterize most contemporary research, many of the articles published in academic research journals today might as well be written in Greek" (Leisenring & Johnson, 1994: 76). Consequently, academic jargon needs to be "translated in practitioner language" (Kelemen & Bansal, 2002: 97), and researchers have to learn "how to communicate more effectively with practitioners" (Rynes et al., 2007: 1047).

In the dominant view, popularization is an important but low-status task that in and of itself is not popular among scientists for several reasons. First, it is viewed as not contributing directly to the development of genuine knowledge (Hilgartner, 1990: 520). Second, because popularization requires simplification, it presents the risk that the original findings might be distorted (Dunwoody & Ryan, 1985: 29). Third, popularization efforts are directed to an external audience, and therefore, do not feed back into the network of scientific knowledge production (Weingart, 1998). Overall, in this dominant view, scholars' disregard for the process of transferring scientific knowledge from scientists to practitioners is based on the conviction that popularization does not enhance and may in fact even damage academic reputation.

In the field of management studies, there is a widespread view that publishing "popular science" is not an attractive proposition for scientists (e.g., Starkey & Madan, 2001; Kelemen & Bansal, 2002). Popular contributions may increase the prominence of their authors in the media, but will not help them build their academic reputations. According to Cascio (2008: 462), "rewards in academia result largely from publishing in highly rated peer-reviewed journals" and "publishing in bridge or practitioner-oriented journals is viewed pejoratively as 'surrogate consulting.'" In the light of this view, it is not surprising that only a few researchers try to simplify and disseminate their research output in such a way that it can be easily consumed by practitioners. Bettis (1991: 318), for example, bemoans:

> I find it troubling that so-called "practitioner" or "trade" journals are not deemed worthy publication outlets at many schools. This is especially troubling when it seems that so many important and relevant articles dealing with strategic management topics have appeared in the *Harvard Business Review*, *Sloan Management Review*, and *California Management Review* in recent years.

In this view the lack of institutional incentives for popularization measures and their potentially damaging effects on academic reputation explains why the problem of relevance persists in management research (e.g., Wren, Halbesleben, & Buckely, 2007).

Revised View of Popularization

Over the last 3 decades, several sociology of science scholars have criticized the dominant view of

popularization (e.g., Myers, 2003; Paul, 2004; Weingart, 1998). These scholars argue that the dominant view fails to capture the complex and multifaceted nature of popularization and oversimplifies the process through which scientific knowledge interacts with the demands of a lay or practitioner audience. Based on empirical analyses of popularization practices in the social and natural sciences, these scholars have challenged and extended some of the assumptions of the dominant view and have developed a position that can be summarized as the "revised view."

Proponents of the revised view argue that popularizing media play a much more independent and active role than previously assumed and produce knowledge according to their own objectives. "They construct their own reality in the same way as science does" (Weingart, 1998: 870). Thus, popularization media are not restricted to the role of translator, but rather, contextualize scientific knowledge claims into media-specific criteria (e.g., actuality, personalization, or locality). Instead of merely simplifying knowledge, they offer a different type of knowledge.

The revised view of popularization media considers the relationship between science and external audiences in the context of legitimacy. The practice of science depends on its ability to establish legitimacy through external stakeholders in order to receive attention, institutional support, and funding (Paul, 2004). In the years shortly after World War II, the academic status of many social science disciplines was still questioned. This was particularly the case in the field of management. In business schools at that time many faculty positions were filled by experienced practitioners, and management researchers were "not considered by most of the rest of the academic community as serious participants in the world of academic scholarship and intellectual pursuits" (Augier, March, & Sullivan, 2005: 89). In order to develop into a legitimate academic discipline, management had to maintain a distance from popular discourse on management. This changed in the decades after World War II during the successful "scientification" of many social science disciplines. Today, it is not the scientific status of these disciplines, but rather their social usefulness that is the critical factor in their legitimacy (see also Zell, 2001):

> The critical aspect for legitimization is not "trust in science"; public opinion surveys, our survey of press officers, and the hermeneutical media analysis all concur in confirming a high degree of social trust in the institution of science. The factor critical to legitimacy is the sociopolitical relevance of science or science organizations. Adaption to media logic specifically requires the emphasis of non-scientific references in self-representation (Peters, Heinrich, & Jung, 2008: 16).

The revised view of popularization takes into account this change in the environment of academic disciplines. Since popularization measures help to signal social usefulness, the revised view—unlike the dominant view— assumes that these measures are well suited to today's academic reward system.

Moreover, scholars of the sociology of science challenge the idea of a unidirectional, linear knowledge transfer. The revised view instead proposes a reciprocal or even circular relationship between science and popularization media (Myers, 2003; Paul, 2004). Popularization is assumed to feed back into the research process on a number of different levels. On the one hand, popularization influences the degree of scholarly attention certain topics receive. For example, in their empirical study of research articles published in the *New England Journal of Medicine*, Phillips, Kanter, Bednarczyk, and Tastadt (1991) show that articles concerning topics that were covered by the *New York Times* achieved significantly higher visibility and citation frequency in scientific journals than *New England Journal of Medicine*'s articles that were not covered by the newspaper. On the other hand, popular accounts also have an influence on the content of research. In the field of management Barley, Meyer, and Gash (1988) have shown that practitioner outlets can shape the content of science by using linguistic indicators to analyze the discourse on organizational culture between 1975 and 1984. Their results indicate that the influence of the popular management discourse on the academic discourse appears to be greater than the influence of the latter on the former.

HYPOTHESES

Degree and Direction of Influence

To explore the degree, direction, and type of intellectual influence between scholarly management research and popularization media we develop hypotheses through a bibliometric approach. The

dominant view of popularization regards science popularization as a hierarchical process of knowledge flow. If we adopted this view, we would expect a citation pattern that positions a popularization journal between the upstream and downstream sides of the management discourse. Popularization journals are expected to cite high-quality research that is published in leading scholarly management journals that have high impact factors. Although the potential biases of the impact factor have become the subject of much controversy among academics (e.g., Baum, 2011), it is generally assumed that a high impact factor is indicative of high academic quality (Baumgartner & Pieters, 2003). In this view, the leading scholarly journals are located at the upstream side of the management discourse. Knowledge is absorbed by practitioners or cited by lower ranked outlets that further simplify and popularize it, in turn making it further accessible to other disciplines or industries. These lower ranked outlets are located on the downstream side and are expected to have a relatively low impact factor. With regard to citations, we would expect the following relation:

Hypothesis 1: The average impact factor of references listed in popularization articles is higher than the average impact factor of works that cite popularization articles.

Because the dominant view assumes no feedback effects from popularization articles on scholarly journals, scholarly journals should cite popularization journals only rarely. The main flow of intellectual influence points in the opposite direction. The risk that in the process of popularization the "real" meaning of scientific knowledge may be oversimplified is one reason why scientists do not value and do not cite popularization media. This is especially true when "outsiders," such as journalists or consultants, take over the task of popularization (Hilgartner, 1990). Moreover, scientists more frequently cite authors who already enjoy a strong academic reputation (which leads to Merton's well-known 1968 description of the Matthew effect in science). Thus, *if* the *Harvard Business Review* is cited in academic journals, we expect that scientists will refer more often to articles that are authored solely by academics than to articles written by practitioners, as the former are deemed to be of greater value in scientific terms.

Hypothesis 2: Popularization articles that are authored by practitioners are associated with a lower citation frequency in academic journals.

The revised view of popularization expects systematic feedback effects on the network of scientific communication to occur. The more compatible with scientific standards a knowledge claim is, the more "citable" it should be. Thus, the number of the scientific sources and of the references cited in them, as well as the degree to which the references are embedded in the citation network, positively influence potential feedback effects. Accordingly, we propose the following hypotheses:

Hypothesis 3a: The number of references cited in a popularization article is positively related to the article's citation frequency.

Hypothesis 3b: The quality of references cited in a popularization article is positively related to the article's citation frequency in academic journals.

Type of Influence

Proponents of the dominant view assert that popularization measures tend to distort original research. Scientific research not only involves the creation of new knowledge, but also requires the critique of existing knowledge claims. Management scholars dedicated to this pursuit should seek to prevent practitioners from following "managerial fads" or other prescriptions that might have negative organizational consequences. Abrahamson and Eisenmann (2001: 71), for example, see the scholar's task as "debunking management knowledge that is created and disseminated purely for financial profit, at the expense of its truthfulness and utility to varied organizational stakeholders." Thus, *if* academic journals cite popularization media, we expect a critical reference to prescriptive knowledge claims:

Hypothesis 4a: Compared to academic articles, popularization articles are associated with a higher likelihood of being cited in a prescriptive context in the academic discourse.

Hypothesis 4b: Compared to academic articles, popularization articles are associated with a higher likelihood of critical or negational citations in the academic discourse.

Proponents of the revised view assert that popularization articles influence which topics receive attention in academic scholarship. The reason to

cite popularization articles is not only the correction of flawed understandings, but also the creation of an intellectual link to a different type of knowledge from outside of the academic discourse. Popular accounts can serve as gateways for topics of managerial interest and contribute to the framing of a study by highlighting practical relevance and developing implications. Thus, we propose:

Hypothesis 5a: Compared to academic articles, popularization articles tend to be cited more for the purpose of framing an article's topic, particularly in the introduction and the conclusion.

Hypothesis 5b: Compared to academic articles, popularization articles are more often cited in references to management practice or practical concepts.

METHODS

Sample

In order to explore the intellectual link between popularization media and management research, we conducted a bibliometric study using citation data of the *HBR*. We chose the *HBR* as our research subject because the magazine is a central popularization medium in the field of management, and its founding in 1922 can be regarded as a direct response to the seeming lack of immediate practical relevance of academic research to the field of business. The journal has a high circulation among practitioners and enjoys a good reputation among managers (Dunbar, 1983; Rynes et al., 2007: 988). Moreover, it has a long tradition and a very explicit mission to serve as a popularization medium (*HBR*, 2011). Finally, the *HBR* is the most quoted management journal in selected on-line media and business course syllabi (Thelwall & Kousha, 2008).

To test our hypotheses, we collected all articles published in the *HBR* in the years 1990, 1996, and 2002 (H1–H3) and a random selection of articles published in top-tier management journals (based upon 2009 Thomson Reuters' SSCI impact factor) that cite the *HBR* articles in our sample (H4–H5). We chose these *HBR* volumes to ensure that we covered a long observation period (rather than a single temporal snapshot), that the time span between volumes was equal (6 years), and that we could take into account changes in the design and content of articles published.

The *HBR* published 6 issues in 1990, another 6 in 1996, and 12 issues in 2002. The content of each issue is varied and includes feature articles, book reviews, and case studies. Since our purpose is to examine the role of the *HBR* in the citation network of management research, we followed the approach of Rynes and colleagues (2007) and excluded from our sample articles that were shorter than a page in length or that were not of an empirical or theoretical nature (e.g., Letters to the Editor, Books in Review). The application of these criteria resulted in a final sample of 231 articles that were published in the main categories of the three selected volumes of the *HBR*: 84 articles from 1990, 57 from 1996, and 90 from 2002. For each article we gathered bibliographic information, such as article length and number of authors, as well as data on citing and cited references.

From the 6,829 scholarly articles that cited the 231 *HBR* articles between their publication date and November 2009, we randomly selected 100 articles from the *Academy of Management Review*, *Academy of Management Journal*, *Strategic Management Journal*, and *Journal of Management*. These journals have a broad management focus, cover empirical and theoretical work, and enjoy a good reputation among management scholars. We gathered a sample of 100 *HBR* citations from these articles and 100 citations of scholarly articles from the same top-tier management journals that matched the *HBR* reference with respect to the year of publication. If more than one article fulfilled these criteria, we randomly selected one of them. If we could not find an academic article that was published in the same year as an *HBR* piece, we randomly drew an article that was published in either the previous or the following year. In the case of multiple citations of the same reference within a single article, we randomly selected one. Through this procedure we generated a sample of 200 text passages within 100 academic articles that cite 100 *HBR* references and 100 academic references.

In order to test our hypotheses, we collected data on various aspects of the *HBR* articles and conducted a bibliometric study on the basis of citation data using two different research approaches. First, we set out to explore the citation patterns of *HBR* articles to identify the factors that influence the citation frequency of particular articles in the scholarly community. Second, to complement our understanding of citation patterns, we analyzed

the context in which these articles are cited in academic journals.

Measures

In order to analyze the "degree" of intellectual influence, we calculated "citation frequency" as the *dependent variable* given the assumption that the number of citations that a given publication receives reflects that publication's impact on further research and its academic importance. "Citation frequency" was measured as the number of citations that an *HBR* article has received from the point of publication until November 2009 in academic journals listed in the Thomson Reuters' Web of Science (e.g., Stremersch et al., 2007). As *independent* variables, we included the percentage of practitioner authors and the number and relative quality of references cited in a given *HBR* article. To calculate the percentage of practitioner authors, we collected data on their professional backgrounds and calculated the ratio of practitioner authors to total authors. Moreover, we counted the number of articles cited in a given *HBR* article and determined the quality of these references using the average impact factor as of year 2003 of the journals in which the respective works had been published.

We controlled for various article characteristics that we deemed likely to be related to citation frequency. Our *control variables* were article length, number of authors, cover story, number of figures, and publication year (Bornmann & Daniel, 2008; Stremersch et al., 2007; Van Campenhout & Van Caneghem, 2010). We included article length as a control variable because longer articles have more content that can be cited than shorter articles, and this is likely to influence the citation frequency. This variable was operationalized as the number of pages of each *HBR* article (e.g., Bornmann & Daniel, 2008: 47). We included the number of coauthors to control self-citations and the potential effects of the scientific network on the frequency of citations. According to Stremersch et al. (2007: 175), lead articles are more likely to be cited frequently because articles selected as cover pieces are more influential and attract more attention than other articles in a given publication. For that reason, we included a dummy variable set to "one" if the article was published in the *HBR* category "cover story," and "zero" otherwise. We also included the number of figures in an article as a control variable. Graphics can help readers to visualize complex concepts or large amounts of data (Free & Qu, 2011). However, an overabundance of cartoons, pictures, and figures can be perceived as a sign of low scientific quality and thus decrease citation frequency. Finally, we added two year-dummy variables for the years 1990 and 1996, using 2002 as the omitted year. We expect articles with an earlier publication date to have a higher probability of being cited than articles with a later publication date.

In order to analyze the "type" of intellectual influence, we explored the citation context of *HBR* articles in academic journals with respect to the type, valuation, location, and source of knowledge. Therefore, we read and coded the semantic context of 100 *HBR* citations in scholarly journals and 100 citations of scholarly work within the same article. First, we investigated the type of knowledge that could be described either as "descriptive" or "prescriptive." Definitions, descriptions, and explanations used to substantiate arguments or describe empirical findings were assigned to the subcategory "descriptive." If the context referred to a practical recommendation or contained phrases that highlighted its practical relevance, it was coded as "prescriptive." Context that did not fit in either of these categories was coded as "unclear." Accordingly, we generated a dummy variable that takes the value one if the type of knowledge is "prescriptive" and zero if it is "descriptive." Second, we coded the valuation of knowledge either as "critical/negational" or "supportive." If a citation challenged the knowledge of the cited work, criticized it, or offered corrections or a new interpretation, it was coded as "critical/negational" (e.g., Bornman & Daniel, 2008: 45). If the citation confirmed or supported the content of the cited article, the reference was coded as "supportive." Neutral citations that neither criticized nor supported the knowledge of the cited reference were assigned the category "neutral." We created a dummy variable that takes the value of one if the valuation of knowledge is "critical/negational" and zero if it is "supportive." Third, we coded the location of the citation within the article (introduction, body, or conclusion) and created a dummy variable "framing" that takes the value one if the citation is located either in the introduction or conclusion and zero otherwise. Finally, we investigated the source of knowledge that could be described either as "research" or "practice." A reference was coded as "research" if the source cited was a piece of (quasi-) academic research and as "practice" if the source was cited

in the context of business practice, referred to as a (potentially) practically relevant concept, as a tool without a research basis, or served as evidence of how companies operate in the "real world." If the reference did not fit into one these two categories, we assigned the category "unclear." Accordingly, we generated a dummy variable that takes the value of one if the source of knowledge is "practice" and zero if it is "research."

The coding was conducted independently. Interrater reliability was measured by calculating Perreault and Leigh's (1989) reliability index, as this measure takes the number of categories into account. The average reliability index was 0.87 for the different categories. In cases of disagreement, joint discussions led to consensus among the coders. Table 1 displays the frequency distribution of *HBR* and research articles across the different categories.

We used the different variables "prescriptive," "critical/negational," "framing," and "practice" that represent the type, valuation, location, and source of knowledge as *dependent* variables. The *independent* variable is a dummy variable that indicates whether the cited reference is an *HBR* article or an academic journal article. As controls we specified the frequency of the citation of the reference within the academic article, whether it was single citation or combined with other references, whether it was a self-citation, and whether the citation was included in the case of a word-for-word quotation (e.g., Paul, 2004; Judge, Cable, Colbert, & Rynes, 2007).

TABLE 1
Frequencies of Citation Context

	Harvard Business Review	Research article
Type of knowledge		
Prescriptive	43	19
Descriptive	55	69
Unclear	2	12
Sum	100	100
Valuation of knowledge		
Critical/negational	4	2
Supportive	78	78
Neutral	18	20
Sum	100	100
Citation location		
Introduction	16	15
Body	69	78
Conclusion	15	7
Sum	100	100
Source of knowledge		
Practice	18	3
Research	59	87
Unclear	23	10
Sum	100	100

Analysis

The first dependent variable in this study—citation frequency—is positive and discrete. Citation data are counts for which the appropriate statistical techniques are either the Poisson model or the negative binomial model. Both models take into account the special attributes of the distribution of the dependent variable and lead to consistent and unbiased coefficient estimates (e.g., Cameron & Trivedi, 1998; Winkelmann, 2008). To analyze the influence of the independent variables on citation frequency, we applied both regression techniques to estimate the model for our sample. However, a test to detect overdispersion indicated that we needed to reject the Poisson model in favor of the negative binomial model—the most frequently used model in bibliometric analyses (Bornmann, Mutz, Neuhaus, & Daniel, 2008).

We estimated different models predicting citation context. The dependent variables "prescriptive," "critical/negational," "framing," and "practice" are dichotomous. The appropriate statistical technique when using a binary dependent variable is logit regression, which leads to consistent and unbiased coefficient estimates (Greene, 2003). The model parameters are estimated using maximum likelihood estimation (MLE) techniques. The explanatory power of the logit model is assessed using the chi-square statistic derived from the ratio of the log-likelihoods of a full model and a model that includes only a constant term. The goodness of fit can be derived from the pseudo *R*-square as suggested by recent work on the use of limited dependent variable techniques in management research (Wiersema & Bowen, 2009).

RESULTS

Descriptive Results

The impact factor of the *HBR* is relatively high compared to other management journals. In 2007 the impact factor of the *HBR* was 1.32 according to the Web of Science, while the median impact factor of all management journals listed in the SSCI was only 0.96 (Albers, 2009: 355). Typically, an impact factor that is greater than 1.00 is regarded as

high for a periodical (Harnad, 1998: 285). Although top-tier management journals, such as the *Academy of Management Journal*, the *Academy of Management Review*, and the *Strategic Management Journal* have a much higher impact factor, the impact factor of the *HBR* shows that this outlet occupies a relatively central position within the research community.

With respect to the citation data of the 231 articles in our sample, we found a significant difference between the number and impact of citing and cited references. More than half of the articles (59.12%) contain no literature references at all, and only 49 of the 231 *HBR* articles (21.21%) cite academic articles. These references correspond to 157 different sources, so on average, there are 3.20 citations per article in this subsample and an average of 0.69 literature references per article in the entire sample. Thus, we can conclude that explicit references to scientific discussions within *HBR* articles are rather infrequent.

In their turn, the 231 *HBR* articles included in our sample were cited a total of 6,829 times by academic journals between their publication dates and November 2009. The *HBR* articles that were published in 1990 received 3,919 citations, those published in 1996 were cited 2,086 times, and those published in 2002 were cited 824 times. On the basis of our sample, a given *HBR* article was cited an average of 29.56 times by academic journals. These descriptive results illustrate the discrepancy between the numbers of citations *in HBR* articles and *of HBR* articles. More precisely, they show that on average an *HBR* article receives many more citations than the number it contains.

However, a closer look at the citation data reveals that the majority of citations received by *HBR* articles as a whole were received by only a few of the articles in our sample. Of the 4 most-cited articles, "The Core Competence of the Corporation" by Prahalad and Hamel (1990) received 1,735 citations; "What is Strategy" by Porter (1996) was cited 500 times; "Zero Defections: Quality Comes to Services" by Reichheld and Sasser (1990) received 434 citations; and "Reengineering Work: Don't Automate, Obliterate" by Hammer (1990) received 284 citations. Compared to the median of 6.0 citations per article, these numbers are extremely high. Figure 1 depicts the citation frequencies of the 10 most-popular articles in our sample. Of those, 8 articles received more than half of all citations (51.78%). Overall, these results indicate that the image of the *HBR* in management research is shaped by only a small number of articles.

With respect to Hypothesis 1, in which we state that the impact factor of publications *cited* in *HBR* articles is higher than the average impact factor of works that *cite HBR* articles, a mean comparison test shows that the average impact factor of cited references is 0.12, while that of the works that cite *HBR* articles is a much higher 0.86, and that this difference is significant ($t(460) = 8.34$; $p < .01$). The average impact factor of the cited references is surprisingly low. It is significantly lower than the median of the impact factor of all management journals that are listed in the Web of Knowledge database. If we assume that the impact factor measures the scientific quality of a publication, our results indicate that the publications cited in the few *HBR* articles that refer to other works at all (21.21%) tend to be of average or below average scientific quality. In contrast, the works that cite *HBR* articles have a significantly higher impact factor than expected. The citation pattern that emerges shows that the *HBR* transfers knowledge from the downstream to the upstream side—and not vice-versa. Thus, Hypothesis 1 is not confirmed.

Results From Regression Analysis

Means, medians, standard deviations and correlations for the sample of 231 *HBR* articles that we analyze to explore the "degree" of influence of the *HBR* on management research are presented in Table 2.

Table 3 displays the results of the negative binomial regression of the effects that the different variables have on the citation frequency of the 231 HBR articles. Model 1 provides the base model of control variables only. The results indicate that article length, number of authors, number of figures, and the publication year dummy variables are significant and positively associated with citation frequency. We utilize separate models (Models 2, 3, and 4) in Table 3 to test the influence of each of our explanatory variables: practitioner author, number, and impact of references. Model 5 includes all independent variables.[1] As indicated

[1] We also conducted several robustness checks to test whether the regression results were driven by outliers (e.g. we dropped the 10 most frequently cited *HBR* articles). However, the analyses showed that the coefficients have the same sign and significance.

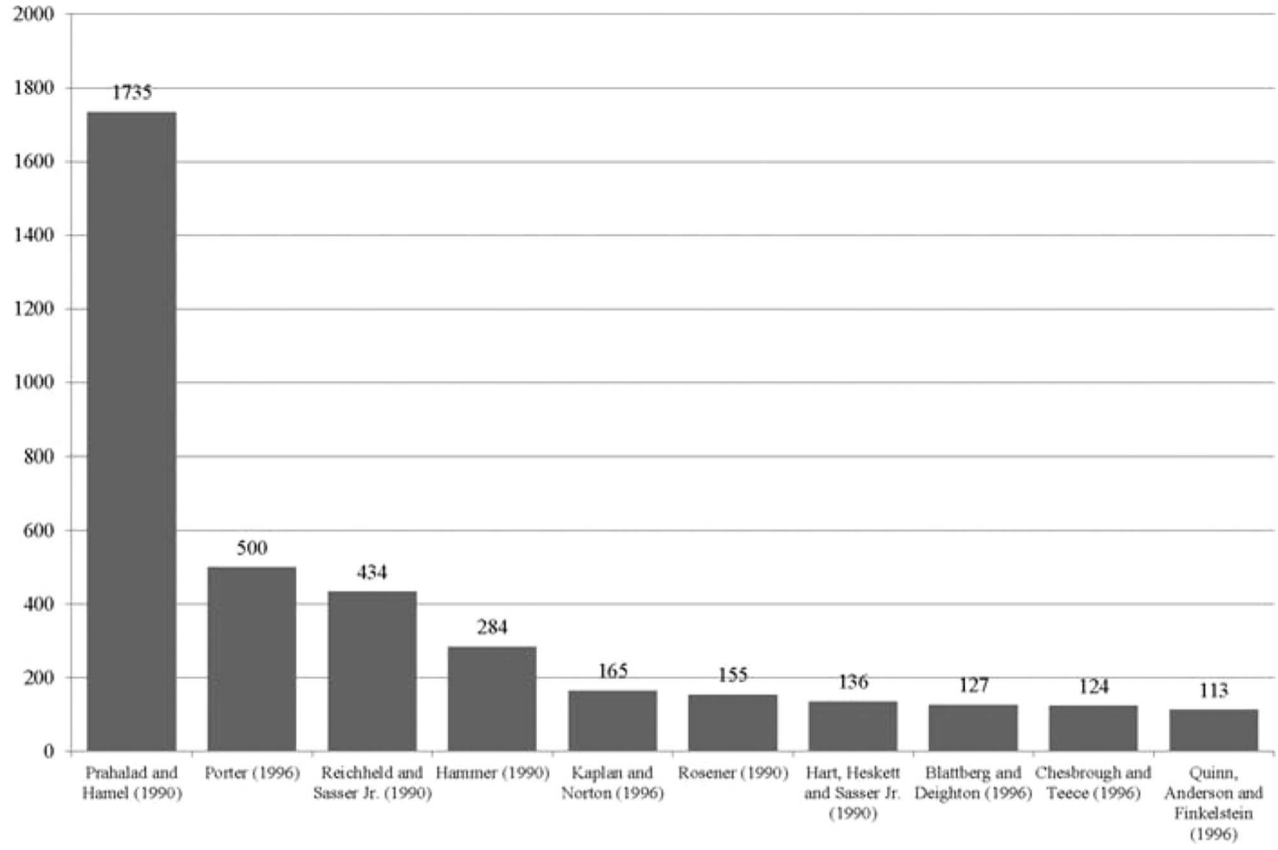

FIGURE 1
Citation Frequency of the 10 Most Popular *Harvard Business Review* Articles in 1990, 1996, 2002

by the likelihood ratio (LR) statistics we report, all models are highly significant ($p < .01$).

Hypothesis 2 proposes that popularization articles that are authored by practitioners are associated with a lower citation frequency in academic journals. The estimated coefficient of "practitioner," in Model 2 of Table 3 is negative indicating that articles authored solely by practitioners have a lower citation frequency. However, the coefficient is only weakly significant ($p < .10$). On that basis Hypothesis 2 is weakly confirmed.

Hypothesis 3a proposes that the number of references cited in an *HBR* article is positively related to its citation frequency in academic journals of

TABLE 2
Analysis of Citation Frequency—Descriptive Statistics and Correlations

	M	*Mdn*	*SD*	1	2	3	4	5	6	7	8	9	10
1 Citation frequency	29.56	6	124.73										
2 Number of references	0.68	0	1.96	0.09									
3 Impact of references	0.12	0	0.42	0.22***	0.38***								
4 Practitioner authors	0.53	0.50	0.03	−0.05	−0.10	−0.01							
5 Article length	8.74	9	3.82	0.16**	0.17***	0.13*	−0.22***						
6 Number of authors	1.53	1	0.74	0.06	−0.06	−0.04	−0.24***	0.09					
7 Cover story	0.03	0	0.16	0.05	0.06	−0.05	−0.07	0.18***	−0.01				
8 Number of figures	1.53	0	2.17	0.17***	0.18***	0.12*	−0.10	0.34***	0.14**	0.11*			
9 Year 1990	0.36	0	0.48	0.10	0.16**	0.03	0.03	0.11	−0.13*	−0.01	0.33***		
10 Year 1996	0.25	0	0.43	0.03	−0.04	−0.03	−0.13**	0.25***	0.05	0.10	0.06	−0.43***	
11 Year 2002	0.39	0	0.49	−0.13**	−0.12*	−0.01	0.09	−0.11*	0.08	−0.08	−0.38***	−0.60***	−0.46***

* $p < .10$, ** $p < .05$, *** $p < .01$.

TABLE 3
Regression Analysis of Citation Frequency (Negative Binomial Model)

	Model 1	Model 2	Model 3	Model 4	Model 5
Independent variables					
Practitioner authors		−0.41* (0.25)			−0.42* (0.24)
Number of references			−0.06 (0.08)		−0.05 (0.07)
Impact of references				0.69*** (0.24)	0.76*** (0.26)
Control variables					
Article length	0.23*** (0.04)	0.23*** (0.04)	0.22*** (0.04)	0.19*** (0.04)	0.19*** (0.04)
Number of authors	0.42** (0.16)	0.38** (0.16)	0.43*** (0.16)	0.41*** (0.15)	0.37** (0.15)
Cover story	0.39 (0.63)	0.40 (0.63)	0.43 (0.63)	0.51 (0.61)	0.56 (0.61)
Number of figures	0.15** (0.07)	0.15** (0.07)	0.15** (0.06)	0.12** (0.06)	0.13** (0.06)
Year 1990	0.79*** (0.27)	0.76*** (0.27)	0.77*** (0.27)	0.88*** (0.27)	0.84*** (0.27)
Year 1996	0.47* (0.28)	0.39 (0.28)	0.50* (0.28)	0.69** (0.27)	0.59** (0.28)
Constant	−0.47 (0.42)	−0.15 (0.46)	−0.42 (0.42)	−0.27 (0.43)	0.01 (0.52)
Log likelihood	−855.30	−853.92	−854.97	−849.82	−847.86
LR statistic	98.43***	101.18***	99.08***	109.38***	113.30***
LR index (pseudo *R*2)	0.05	0.06	0.05	0.06	0.06

Note. $N = 231$. LR = Likelihood ratio. Standard errors in parentheses.
* $p < .10$, ** $p < .05$, *** $p < .01$.

management research, while Hypothesis 3b proposes that the scientific quality of the references cited in an *HBR* article is positively related to that article's citation frequency. The estimated coefficients of Models 3 and 4 in Table 3 imply the following relations: The number of literature sources that an *HBR* article refers to does not have a significant impact on the article's popularity among scientists, as measured by its citation frequency in academic management journals. Consequently, Hypothesis 3a is not supported. The coefficient for the quality of references, on the other hand, is positive and significant ($\beta = 0.69$, $p < .01$). Thus, Hypothesis 3b is supported: The higher the impact factor of the cited references, the higher the number of citations an *HBR* article receives.

To analyze the type of intellectual influence we analyze the context of 100 citations of the *HBR* in comparison with top-tier management journal. Means, medians, standard deviations and correlations for this sample of 200 citations are presented in Table 4.

Table 5 displays the results of the logit regression of the effects that the *HBR* and the control variables have on the citation context of the 100 academic journal articles. The table presents three models with different dependent variables for citation context: "prescriptive" (Model 1), "framing" (Model 2), and "practice" (Model 3). As indicated by the LR statistics, Models 1 and 3 are highly significant.

In Hypothesis 4a, we proposed that popularization articles are associated with a higher likelihood of being cited in a prescriptive context in the academic discourse. As shown in Model 1 in Ta-

TABLE 4
Analysis of Citation Context—Descriptive Statistics and Correlations

	M	*Mdn*	*SD*	1	2	3	4	5	6	7	8
1 Prescriptive	0.32	0	0.47								
2 Critical/negational	0.03	0	0.17	0.13							
3 Framing	0.27	0	0.44	0.02	0.16**						
4 Practice	0.11	0	0.31	0.23***	−0.06	−0.02					
5 *Harvard Business Review*	0.50	0.5	0.50	0.26***	0.06	0.10	0.25***				
6 Citations in article	1.90	1	1.90	−0.02	−0.08	−0.04	−0.08	−0.06			
7 Other references	1.12	0.5	1.87	−0.07	0.018**	0.05	−0.13*	0.09	0.01		
8 Direct quotation	0.04	0	0.18	0.05	−0.03	0.07	0.02	0.03	0.02	−0.11	
9 Publication year	7.79	5	4.52	−0.06	0.01	0.01	−0.05	−0.03	0.06	−0.13*	0.01

* $p < .10$, ** $p < .05$, *** $p < .01$.

TABLE 5
Regression Analysis of Citation Context (Logit Model)

Dependent variables	Model 1 Prescriptive		Model 2 Framing		Model 3 Practice	
Independent variable						
Harvard Business Review	1.08***	(0.33)	0.43	(0.33)	2.21***	(0.66)
Control variables						
No. citations in article	−0.00	(0.09)	−0.06	(0.10)	−0.22	(0.24)
Other references	−0.15	(0.10)	0.07	(0.08)	−0.64*	(0.33)
Direct quotation	0.46	(0.86)	0.83	(0.80)	0.40	(1.41)
Publication year	−0.04	(0.04)	0.01	(0.04)	−0.04	(0.06)
Constant	−0.88**	(0.42)	−1.35***	(0.43)	−2.31***	(0.82)
Log likelihood	−111.32		−113.69		−51.72	
LR statistic	14.14**		3.91		22.88***	
LR index (pseudo R^2)	0.06		0.02		0.18	
N	186		200		167	

Note. LR = Liklihood ratio. Standard errors in parentheses.
*$p < .10$, ** $p < .05$, *** $p < .01$.

ble 5, the *HBR* is significant and positively related to a higher likelihood of being cited in a prescriptive context ($\beta = 1.08$, $p < .01$). Hence, Hypothesis 4a is supported.

Hypothesis 4b proposes that popularization articles are associated with a higher likelihood of a critical/negational citation in the academic discourse. Only 6 of 200 citations were made in a critical/negational context. This is a low value even if we take into account that negational citations are rare in general. According to Bornmann and Daniel's (2008: 67) review of studies on citing behavior in many different disciplines, the percentages for this type of reference range from about 1–15%. Because of the sparseness of our observation (see also Table 1), a regression analysis would not produce robust results. Hence, the hypothesis is not supported. This finding disputes the view that management scholars refer to the *HBR* in order to "debunk" popular recommendations or management techniques with questionable outcomes. However, in the dominant view, there are few other motives for references to the popular discourse.

Hypothesis 5a proposes that popularization articles are associated with a higher likelihood of being cited for the purpose of framing, that is, in the introduction or the conclusion. As shown in Model 2 of Table 5, the *HBR* is not associated with a higher likelihood of being cited in the introduction or conclusion. Thus, Hypothesis 5a is not supported.

As shown in Model 3 in Table 5, the coefficient of the *HBR* is significant and positive ($\beta = 2.21$, $p < .01$), as predicted by Hypothesis 5b. The *HBR* is associated with a higher likelihood of being cited within the context of business practice. However, the results have to be carefully interpreted, that is, only in comparison with academic articles published in the top journals. The absolute numbers paint a different picture. Table 1 shows that the *HBR* is usually cited as a research source and within a supportive context and only rarely with reference to business practice. Only in a few exceptional cases is the *HBR* explicitly marked as a practitioner's source, for example, as experience-based knowledge or as a belief of the business community.

Outlier Analysis

The results still leave the question of the skewed nature of the citations of *HBR* articles, that is, why the image of the *HBR* articles in the academic world is shaped by a few extremely popular articles. For this reason we performed an outlier analysis and took a closer look at Prahalad and Hamel's (1990) article in relation to our research question. This article that is the cornerstone of the globally influential core competence concept (Nicolai, Schulz, & Thomas, 2010) was with 1,735 citations by far the most-frequently cited article in our sample. It can be argued that Prahalad and Hamel's article has significantly shaped the academic image of the *HBR* over the last 20 years.

At first consideration, it seems that Prahalad and Hamel's article is a classic example of popularization. Many management researchers (e.g.,

Starkey & Madan, 2001) think that Prahalad and Hamel's core competence approach popularizes the "resource-based view," which is one of the most important theories of the 1990s in the field of corporate strategy. Wernerfelt, who coined the term "resource-based view" (RBV) in a publication in the *Strategic Management Journal* (*SMJ*) in 1984, is also of this opinion:

> As best I can tell, practicing managers were not aware of the argument on the resource-based view until 1990. That year the *Harvard Business Review* published an article (Prahalad & Hamel, 1990) which presented many of the ideas on a compelling managerial style. [. . .] despite the number of academic papers that had been published on the subject by that time, I believe these authors were single-handedly responsible for the diffusion of the resource-based view into practice (Wernerfelt, 1995: 171).

Like the core competence concept, the RBV also adopts an "inside-out" perspective, that is, the identification and exploitation of valuable resources that are potential sources of competitive advantage. However, whether the two approaches share any further similarities remains open to debate. Although the RBV has strong connections to economic theory, the core competence approach has none (nor does Hamel and Prahalad's more detailed publication on the same topic in 1994). Mintzberg, Ahlstrand, and Lampel (1999) go as far as to assign the two approaches to different schools, while other authors point to explicit differences in the basic assumptions of each approach (Schulze, 1994).

To get a clearer picture of the relationship between the two articles, we conducted a supplementary citation analysis of Wernerfelt (1984) and Prahalad and Hamel (1990). The results are displayed in Figure 2.

The data confirm that Wernerfelt's article (1984) has had a strong influence on management research. While *SMJ* articles that were published in 1984 received on average 29 citations between 1985 and 2003, Wernerfelt's article was cited 634 times by academic articles during the same period. The connection to the core competence concept is visible in the co-citations; however, the data do not indicate a linear popularization process. Prior to 1990, there had not been an intensive debate on the RBV, and Wernerfelt's publication (1984) had been largely ignored. Until 1990, Wernerfelt's article only received one citation per year—less than the 1.2 citations per year received by the average *SMJ* article. Only after 1990 did interest in the RBV article begin to increase. It should be noted that the increase in the citation rates of the Prahalad and Hamel article (1990) preceded the increase in the citation rates of the Wernerfelt article (1984). Another noteworthy point is that in their 1990 article, Prahalad and Hamel do not refer to Wernerfelt's (1984) article. What's more, they do not even recognize the logic of the RBV's argumentation in their own concept: "he [Prahalad] does not see his work as an example of resource-based logic" (personal interview with Prahalad in Barney & Arikan, 2001: 176). For these reasons, the idea that the concept of core competence popularized the RBV did not spread initially. In 1991 there were only 2 co-citations among a total of 10 citations of Wernerfelt's (1984) article. In the following years the number of co-citations consistently increased, reaching its peak in 1999, when half of all articles that referred to Wernerfelt (1984) also cited Prahalad and Hamel (1990).

The association of the RBV with the core competence concept and the perception that it was relevant to management practice grew gradually, increasing acceptance of the core competence concept in the scientific management discourse. Although the anecdotal style of the 1990 article does not conform with academic standards of knowledge production, we did not find any critical/negational citations during our coding procedure of citation contexts (which contained 25 references to Prahalad & Hamel, 1990), but in more than a half of these cases we found an explicit attribution to the resource-based view.

As the above demonstrates, there is no evidence that Prahalad and Hamel's (1990) article popularized the RBV either in terms of content or of citations. Instead, the results suggest that the *HBR* article by Prahalad and Hamel helped establish the RBV as a practical and relevant theory in management research. In this sense our outlier analysis also disconfirms the dominant view and supports the revised view that the *HBR* has a greater impact on the scientific discourse than the other way round.

DISCUSSION

Our study has shown that the scientific basis of *HBR* articles is rather weak but that there are sig-

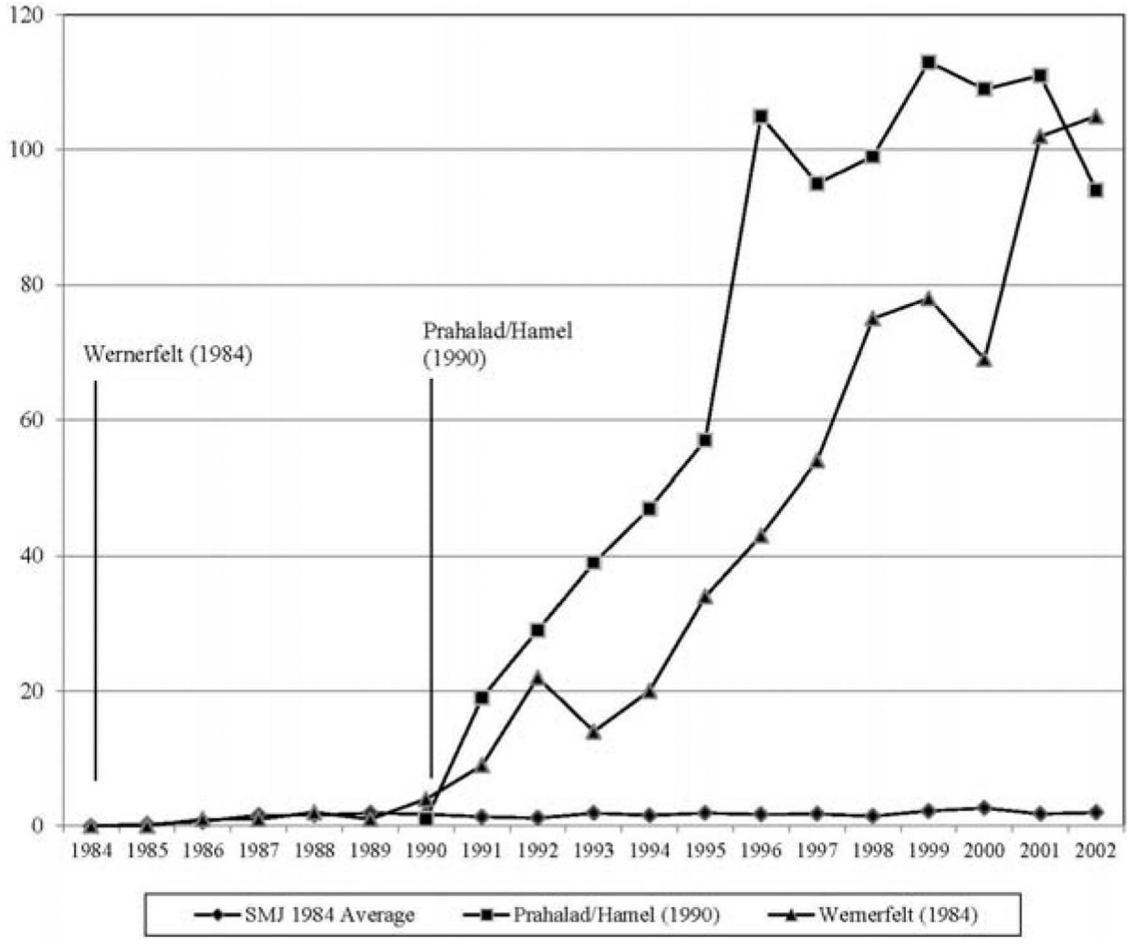

FIGURE 2
Citation Frequency of Wernerfelt (1984) and Prahalad and Hamel (1990) in Comparison With an Average *Strategic Management Journal* Article Published in 1984

nificant feedback effects to the scholarly debate from this popularization journal. A possible explanation for the weak ties between *HBR* articles and the academic realm has to do with citation practice: It is possible that the authors of the articles in our sample left out some scientific references in order to improve readability. This practice, however, contradicts the editorial policy of the *HBR* which states, "We would rather see source notes than not" (HBR, 2011). Moreover, even if it were true, leaving out some scientific references still would not explain why *HBR* authors choose to drop high-quality references in favor of low-impact citations. There are, however, some indications that the academic basis of *HBR* articles is indeed as weak as the data suggest. Since the foundation of the *HBR*, its lack of scholarly references, which reflects the lack of a scientific foundation, has often been criticized. Early on in the *HBR*'s history, several academics voiced the criticism that it not only lacked a good grounding in academic research, but also propagated concepts that often contradicted state-of-the-art scientific findings (Braunstein, 1974). In the 1980s, Dunbar (1983: 183) searched for a "social science that is valid to the scientist and useful to the practitioner" and systematically analyzed the *HBR* using content analysis. Although the *HBR* articles considered did contain many recommendations for business practice, with regard to their scientific foundation, Dunbar came to the following conclusion: "The scientific basis for these general recommendations was not apparent, and the rationalized descriptions of order that characterized many *HBR* articles indicated a belief in administration as an art rather than a science" (Dunbar, 1983: 140).

In a similar study, Rynes and colleagues (2007) analyzed whether the important findings of re-

search in human resources are "translated" into a more accessible form and "transferred" to practitioners by popularization media. The results of their study of three widely read transfer journals—*Human Resource Management*, *HR Magazine*, and the *HBR*—show that such periodicals, in contrast to their own mission statements, hardly ever discuss scientific results; what's more, the topics they do cover are not those considered important among academics: "Our most striking finding is that bridge and practitioner journals have barely covered topics that HR researchers believe to be among their most important findings" (Rynes et al., 2007: 999).

The surprisingly high impact factor of articles that cite the *HBR*, which we observed in our own analysis, confirms earlier evidence that popularization media can gain prominence among management researchers although they only partly conform to the well-established rules of scientific communication (e.g., formal requirements, organized skepticism, theoretical and methodological foundations). For example, Porter's management bestseller *Competitive Strategy* was referenced in approximately half of all articles published in the *Strategic Management Journal* between 1986 and 1990 (Miller & Dess, 1993: 553–554). Moreover, Hambrick (1990: 257) has shown that Porter's book was the most frequently cited management bestseller in management research.

It seems that popularization media are quite popular among academics: " [. . .] academics at the most prestigious schools (e.g. Harvard; Stanford; MIT; UC, Berkeley; the University of Pennsylvania) do not seem reluctant to publish in *HBR* or other university-sponsored publications that are specifically designed to bridge the gaps between research and practice" (Rynes et al., 2007: 1000). This view is also corroborated by surveys among scholars in the field of business policy in the U.S., which indicate that the *HBR* is regarded as fairly prestigious (MacMillan, 1991). Publishing or citing *HBR* articles does not seem to damage these scholars' academic reputations as the dominant view would hold; on the contrary, scientists in the applied discipline of management seem to like the idea of popularization.

In general, references to the *HBR* resemble a typical citation in a scholarly journal. The additional data we collected on the formal context of citations supports this finding. For example, it is a standard citation practice to enumerate citations at the end of a sentence or paragraph in order to give reference to accumulated evidence. This applies no less to the *HBR* than to the academic journals we looked at (mean number of the bracketed sources is 1.28 vs. 0.95, no significant difference). Moreover, where and how often an *HBR* article is cited within a given academic article does not differ significantly from the references to academic journals (1.79 vs. 2.01 times per article). This result is in line with Paul's (2004) study on the role of popularization in the area of chaos theory. The author analyzed how a popular account on this topic fed back into the academic discourse and found similarly that the "majority of the citations are used with no reference to the popular origins of the text" (56) and that the "vast majority of the citations reflect standard citing practices in science" (57).

Overall, our results of the various analyses of the *HBR* we have looked at, including our own, are difficult to reconcile with what sociologists of science call the dominant view of popularization. Our data lend more support to the revised view of popularization insofar as there are significant feedback effects to the scholarly debate from the popularization journal in question. If an *HBR* article is based on high-impact sources, it has particularly high resonance in the academic sphere. However, the type of feedback is different from originally expected. It seems that *HBR* articles do not explicitly serve as "gateways" for practitioners' knowledge to management research. Rather, these articles are referenced like traditional academic sources. The only striking difference between the *HBR* and scholarly journals in this context is that *HBR* articles are more often cited in a prescriptive context. *HBR* articles are cited as if they were scholarly knowledge, but they have a normative bend. This offers a possible explanation for why management academics cite the *HBR* so often in their work. *HBR* articles appear to fulfill—at least rhetorically—the expectation that rigor and relevance are aligned.

Implications

Our findings have several implications for the debate about practical relevance, teaching, and research in management: First, our study raises doubts about the idea that the problem of practical relevance stems from disregard for popularization measures in general and from "bridging journals" in particular. In so doing, it contradicts the widely held view that enhancing the status of "bridging

media" and encouraging management scholars to popularize their work is the key to increasing the practical relevance of management research. The problem seems to have deeper roots. The question is not why popularization is unpopular—as we have seen, it is not—but why an outlet like the *Harvard Business Review* acts in contradiction of its own editorial policy and does not fully exploit the resource "science." Why is the intellectual influence of top-tier scholarly journals on a leading bridging journal so weak? This is not just a technical problem or a problem of translation, but concerns the content of academic research as such. Using the example of the German *ZFO*, another bridging journal, Nicolai, Schulz, and Göbel (2011) showed that both academics and practitioners value practical orientation in a management article. However, their assessments of what is practically relevant are inversely related: The greater the manuscript's practical relevance from an academic's point of view, the less its relevance from a practitioner's point of view, and vice-versa. This suggests that there is a tension between the viewpoints of academics and practitioners. For instance, practitioners might associate relevance with success factors, while scholars find it hard to deliver such factors without compromising scholarly rigor (March & Sutton, 1997). Although articles in top-tier journals regularly highlight the implications of their findings for management practice, this does not seem to be the kind of relevance practitioners are looking for (Crook, Bratton, Street, & Ketchen, 2006; Pearce & Huang, 2012). The above indicates that management researchers should test their own social constructions of relevance critically and identify how relevance is understood from the practitioner's point of view. To date, the latter question has seldom been studied.

Second, our findings lend support to the concern that management education has been drifting apart from academic research. Rousseau (2006: 262) points out:

> Research evidence is not the central focus of study for undergraduate business students, MBAs, or executives in continuing education programs (Trank & Rynes, 2003), where case examples and popular concepts from nonresearch-oriented magazines such as the Harvard Business Review take center stage.

Against the backdrop of our findings there is little reason to believe that popularization journals serve as an indirect medium through which research diffuses into the classroom. Rather, they pose the opposite risk of driving scholarly texts out of management education. Given that business schools today face greater pressures from external stakeholders than in the immediate post-World War II period, it might be tempting for academics to base teaching mainly on popular texts. However, this strategy would result in scholars lagging behind rather than leading other knowledge entrepreneurs, such as consultants (Abrahamson & Fairchild, 2000). An alternative first step could be to strengthen the research-orientation in management education by rediscovering the critical function of science. If management academics teach popular concepts just as uncritically as they cite them, this function may be undervalued. Research-orientation in this sense does not contradict practical relevance. For instance, the critical debate on "management fashions" attracted a great deal of attention not only in the scholarly discourse but also among practitioners (Abrahamson, 1996).

Third, our findings have implications for the citation practices of management scholars. Feedback effects from the popular discourse can enrich the scholarly debate. Sources such as the *HBR* help scholars to relate their research to developments in business practice. Popularization journals can impart to academic research "a feeling for the organism" (Fox Keller, 1983) that is based on practical experience.[2] More circulation of knowledge between scholarly and popular discourses would seem to us to be a healthy development. However, this does not mean that scholars should treat popular accounts as quasi-scientific knowledge, as the current citation practices suggest. Marking popular knowledge claims as another type of knowledge and juxtaposing them to scientific insights seems to be the more promising form of integration.

Limitations

Our empirical study is subject to some limitations. First, we analyzed only one popularization medium, and it is impossible to conclude from this case study alone whether our results for the *HBR* also hold for popularization media in general. The *HBR*'s position in the field of management is special insofar as

[2] We are very grateful to the anonymous reviewer who alerted us to this phrase from Evelyn Fox Keller's work on Barbara McClintock.

many popular management concepts originate from it. Therefore, it would be of particular interest to know whether our findings can be extended to other transfer journals and also to different subdisciplines within the field of management. Although some research has explored the content of practitioner and bridging journals in particular management areas, such as HRM (e.g., Deadrick & Gibson, 2007; Rynes et al., 2007), it would be interesting to know whether such specialized journals also feed back into the academic discourse. Moreover, transfer journals differ in their academic bases and in their presentation of information (Rynes et al., 2007). It would therefore be not only interesting to determine whether our findings extend to other journals, but also to examine the contingent factors influencing these linkages.

Second, our study suffers from classic problems related to citation analysis. One of our assumptions is that article citations represent knowledge flow or intellectual indebtedness. However, articles may also be cited for other reasons. While we have analyzed the citation context in-depth to better understand the underlying motives and to address such concerns, still a matter of debate is where citations represent real knowledge flow and where they are included only for the purposes of having a rhetorical influence on readers (Cozzens, 1989). Further research using surveys or interviews with management researchers may shed light on these issues.

Third, in we focused on the "upstream" side of knowledge. However, popularization also involves the "downstream" side. While the interest of practitioners in the *HBR* is relatively undisputed, we still lack an understanding of whether and how the knowledge transported through popularization media actually influences business practice. Some research, for example, has shown that popular management concepts (including those which have their origins in transfer journals) are widely discussed in business press (Abrahamson & Fairchild, 1999; Spell, 2001). However, we do not yet know whether and how managers and executives apply such ideas and concepts in their daily business work. Moreover, it would be interesting to explore whether the usage of popularization media in classroom teaching differs from direct reading. Answering these questions will require analyses further "downstream."

CONCLUSIONS

The main objective of this study was to shed light on the role of the *HBR* as a well-known popularization medium in management discourse. Our study is among the first to systematically analyze the role of popularization media in the management discourse using a bibliometric research approach. We combine citation-count data with interpretive coding data of citing behavior. In our view, this approach has proven an appropriate method for exploring the intellectual link between management research and popularization media. Our findings suggest that this magazine's role differs significantly from the traditional view of popularization. According to our results, the *HBR* is not only a widely quoted scientific source, but also a significant influence on the scientific discourse in management research.

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