Exposure to intermediaries and the meanings managers hold: Evidence from Manufacturing Best Practices Programs

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August, 2008
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We are grateful to Ruth Aguilera, William Ocasio, Marc Ventresca, Ian Williamson and participants at the 2008 "Challenging Institutions" workshop at the UNSW, for their insightful comments. The statistical analysis in this paper would not have been possible without the tremendous assistance of Phil Eber and Chris Lloyd, or the data generously lent to us by Danny Samson. An earlier version of this paper was published in the proceedings of the Sixty-fifth annual meetings of the Academy of Management, Atlanta GA (2006).

ABSTRACT

We explore how engagement with intermediaries shapes meanings that managers hold. Specifically, we examine variations in the adoption patterns of Manufacturing Best Practice programs, and use this to infer how managers understood the meaning of 'Manufacturing Best Practices.' Sites that engaged with intermediaries adopted a constellation of practices that was more consistent with normative theories than sites that did not, indicating that intermediaries shape meanings within a field. Interestingly, sites that engaged with theorizing agents and communities of practice adopted practices consistent with one normative theory while those who engaged with customers &suppliers adopted practices more consistent with another.

Institutionalization leads particular ideas to become taken-for-granted (Berger & Luckmann, 1967). Consequently, institutionalization leads actors in the fields where those ideas hold sway to change their values and understandings (Parsons, 1951; Swidler, 1986; Weber, 1947). From about the mid-1980's to the mid-1990's, manufacturers in Australia and New Zealand came to take for granted the idea that their viability depended on their adoption of 'best practice' manufacturing techniques (see Rimmer, 1996; and the body of this article). That change, driven by the simultaneous rise of the quality movement and dismantling of local tariff protection, paralleled similar changes around the world. In order to take this idea for granted, Australian and New Zealand manufacturers needed to do more than buy into the overarching idea and decide to adopt a Manufacturing Best Practices program. They also had to make the program real. That is, they had to take up the more specific manufacturing practices and values that together constituted the over-arching category ***Manufacturing Best Practices***,[1] so that it would be reproduced through practice (Barley, 2008; Giddens, 1984) and through discourse among members of the manufacturing field (Phillips, Lawrence, & Hardy, 2004).

The description above points to a gap in neo-institutional research. Prior researchers have studied, extensively, the diffusion and institutionalization of overarching practices like ***Manufacturing Best Practices***. Much less research has focused on how those practices are actually constituted -- how managers put them together. This is an important omission. The meaning of a practice resides just as much, if not more, in the way a social actor understands what it is, as in their appreciation of its existence and appropriateness. Consequently, in this study, we explore how institutional processes shape the ideas and meanings that managers come to accept as constituting a diffusing (and perhaps institutionalizing) practice. Specifically, we focus on the role of intermediaries. Ideas and meanings about practices often move through

[1] As elaborated in the methods section, we define a category as the set of objects that embody a concept.

intermediaries – consultants and other theorizing agents, communities of practice, customers, suppliers, competitors, stock analysts, corporate parents, and the like (DiMaggio & Powell, 1983; Sahlin-Andersson & Engwall, 2002a). We expect that those who are helped in their adoption by intermediaries will differ in their understanding from those who rely instead on the mass media (books, seminars, etc.) for their information (Meyer & Rowan, 1977; Sahlin-Andersson & Engwall, 2002b). We also expect that those differences in understanding will be reflected in adoption behaviour. In particular, given that an over-arching category contains many practices, we expect sites with different understandings of a category like ***Manufacturing Best Practices*** (or TQM, or civil service reform, or M-Form organisation) will have adopted different constellations of practices from within the category (like statistical process control, self-managed teams or machine setup-time reduction). In order to understand what impact intermediaries have, we need to answer two questions. First, which organisations in the field engage with intermediaries? Second, how do intermediaries shape the constellation of practices that organisations adopt, and by inference, the way those organisations understand the diffusing practice?

In this study, we examine the way three types of intermediaries (communities of practice, theorizing agents (consultants, business schools, trade associations), and customers & suppliers) shaped the way manufacturers in Australia and New Zealand adopted their Manufacturing Best Practices programs. We commence by discussing Manufacturing Best Practices programs in Australia and New Zealand. In addition to explaining where Manufacturing Best Practices came from institutionally, we demonstrate that manufacturing in Australia and New Zealand provides an excellent venue for such an examination. It was clearly a field at the time, and Manufacturing Best Practice programs were institutionalizing over the period of study.

When considering our first research question regarding determinants of interaction with intermediaries, we draw on Mintzberg (1983) to note that two major structural groups in organisations are the operating core and the strategic apex. Each of these groups will interact with different parties in the environment (Cohen & Levinthal, 1990) – the operating core with other technical and operating groups and the strategic apex with corporate managers, analysts, and other executives. We argue that high exposure of the strategic apex or the operating core to the environment leads to a high likelihood of engaging with intermediaries.

We address our second research question by examining the effect of the three types of intermediaries on adopters. Prior research has shown that sites rarely adopt advanced manufacturing practices successfully unless a constellation of supporting practices (which we will call capacity practices) is also in place (e.g. MacDuffie, 1995; Wood & de Menezes, 2008). Consequently, we ask how interactions with intermediaries shaped the adoption of both the practices manufacturers adopted to improve manufacturing performance directly ("manufacturing practices") and the practices they adopted to improve their capacity to adopt those manufacturing practices ("capacity practices"). For both classes of practices, we argue that higher exposure to intermediaries will shift adoption behaviour towards normative patterns within the field. In the case of capacity practices, we compare our sites to a normative adoption pattern consistent with models expounded in books and at seminars (i.e. theorizations by 'gurus' and academic researchers). For adoption of manufacturing practices, we compare the pattern of adoption at our sites with a normative pattern we infer was constructed through discourse within the field.

The study makes two main contributions to the neo-institutional literature. First, we find that sites which engage with intermediaries adopt a constellation of practices that are more consistent with normative rationalized myths (Meyer & Rowan, 1977) than those who do not. That provides evidence that constitutive meanings are shaped through engagement with intermediaries. More broadly, this finding suggests that engagement with intermediaries leads to isomorphism, in that the sites all develop measurably similar responses to the change in their environment (Boxenbaum & Jonsson, 2008; DiMaggio & Powell, 1983), as a result of attributing similar meanings to Manufacturing Best Practices. Second, we find that while each type of intermediary shapes adoption behaviors, the different types of intermediaries shape such behaviors in different ways. While the pattern is complex, we conclude that differences in the responses to intermediaries can be explained by differences in the nature of interaction we anticipate that sites had with intermediaries, and the way those would shape differences in the nature of institutional rules. More broadly, the differences are consistent with there being two different logics operating within the field.

These findings are important for institutional theory because they answer Greenwood et al's (2008) call for research which juxtaposes the notion of cognitive maps with Scott's (2008) cognitive pillar. Put differently, one of the ongoing criticisms of institutional research is that it has conflated the idea of institutionalization -- the spread of a set of taken-for-granted assumptions across a field which are then enacted behaviourally -- with the broad diffusion of homogeneous behaviours (such as organisational forms) (Greenwood et al., 2008). In this research, we demonstrate the spread and shaping of a set of ideas by exploiting the fact that organisations do not all adopt the same form.

RESEARCH CONTEXT: MANUFACTURING BEST PRACTICE PROGRAMS

The concept of Manufacturing Best Practices was highly salient across both countries' manufacturing sectors during our study period, and the manufacturing sector was a clearly a "recognized area of institutional life" (DiMaggio & Powell, 1983:64-65) within which institutional processes such as theorization and meaning transmission could be active and influential. Field-level actors including the state, consultants and industry associations were deeply involved in shaping the definition and legitimate status of Manufacturing Best Practices and programs. These programs were widely adopted by manufacturing firms across the two countries. In this section we discuss these processes in more detail.

Manufacturing Best Practice (MBP) programs occupied the same fashion niche (Abrahamson & Fairchild, 1999) as Quality Circles, Total Quality Management and Six Sigma, all of which were products of the focus on manufacturing competitiveness that emerged in Western economies during the 1980s. MBP programs emerged as a response to both perceived limitations of quality management programs that had been inspired by (and copied from) Japanese firms (cf. Hyman & Streeck, 1988; Piore & Sabel, 1984; Venetucci, 1992), and increased competitive pressure on manufacturers driven by the removal of protective trade policies. The best practices conception of manufacturing effectiveness retained the Japanese emphasis on quality and process improvements but also emphasized systematic search and adaptation of "best practices" from "best-in-class" firms anywhere (Hanson & Voss, 1995; Pilkington, 1998; Venetucci, 1992).[2] As we discuss in greater detail in the methods section, key components of MBP programs included improvements in production operations and logistics, participatory management, team-based work, and learning from peer organisations.

Manufacturing Best Practice programs arrived in Australia and New Zealand in the mid-1980s. By that time, manufacturing competitiveness was a highly salient issue in Australia, with

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[2] Although the term "Best Practice" is now quite common and well institutionalized, it only entered the lexicon in the late 1980's. We searched the ABI/Inform database for articles about "Manufacturing Best Practices" , and found that our search term ("Manufacturing" within three words of "Best Practic*") did not appear before 1986. Its use became significantly more prominent about 1991, and its use has been relatively constant (controlling for the number of articles in the database) since about 1996.

several state-sponsored initiatives in place that aimed to restore it (Rimmer, 1996). While the history of Manufacturing Best Practices in New Zealand is not well documented, it appears that a strong focus on manufacturing competitiveness actually arrived there slightly earlier than in Australia (Australian Bureau of Industry Economics, 1990, 1991). The core management ideas and practices that defined Manufacturing Best practices programs in Australia and New Zealand were imported from the USA and Japan. "The transmission agencies were multinational businesses such as ICI, CRA, and Ford, consulting firms like McKinseys and [the] Boston Consulting Group, and management schools including the Australian Graduate School of Management." (Rimmer, 1996: 9) Additionally, Australian industry groups such as the Business Council of Australia (a body of large corporations) and the Australian Manufacturing Council took an active interest in industrial reform and actively pushed the notion of "Best Practice" as being the most appropriate direction for Australian Manufacturers to pursue (e.g. Australian Manufacturing Council, Pappas Carter Evans & Koop, & Telesis, 1990).

In Australia at least, MBP (rather than TQM) was arguably the most prominent response to the manufacturing crisis (Rimmer, 1996). Our own data provide evidence on the adoption of Manufacturing Best Practice programs widely during the late 1980s and early 1990s by Australian and New Zealand manufacturing sites. Figure 1 shows that the adoption pattern of such programs in our sample. It exhibits the classic accelerating pattern which has been associated with widespread diffusion in institutionalized environments (Abrahamson & Fairchild, 1999; Strang & Macy, 2001). Indeed, within our sample, 71% of sites had adopted by early 1994, with adoption being consistently high across all one digit Australian Standard

Industry Classifications.[3] Adoption levels in New Zealand (77%) were somewhat higher than in Australia (70%).

<Figure 1 about here >

Taken together, the active involvement of field-level actors and the widespread adoption of MBP programs suggests that the practice had achieved a reasonably high level of institutionalization when our data were collected in early 1994. This status appears to have been enduring, as Manufacturing Best Practices programs continued rather than exhibiting the classic drop-off of fad-like practices. ABI/Inform searches showed the number of articles on the subject of Manufacturing Best Practices remained consistently high from 1994 to 2002, with over fifty annually. A content analysis of the abstracts of those articles provided no evidence that best practice programs were falling from favour as might happen in a management fad (cf. Abrahamson & Fairchild, 1999). The practice remains in widespread use at the time of this writing.[4]

THEORY DEVELOPMENT

Who uses intermediaries?

Before considering how intermediaries help shape behavior, it is worth considering who engages actively with intermediaries in the first place. Our broad argument, consistent with prior institutional research on embeddedness (Dacin, Ventresca, & Beal, 1999:325-330), is that organizations that are more exposed to institutional processes will feel more pressure to adopt the diffusing practice, and therefore, will be more likely to either activate pre-existing network ties

[3] Adoption rates across one digit ASICs varied from 59% to 81%. Only one of these 12 rates differed statistically from the median (about what chance would predict). New Zealand firms showed similar patterns.

[4] In a convenience sample in January 2005, eight out of 10 alumni of a leading Australian business school, working in manufacturing, indicated that their corporation had an active program in place ($p<0.001$). The other two were clearly familiar with the concept (further details available from authors).

or to seek new relationships in order to resolve that pressure effectively. We argue that exposure to institutional processes can be inferred from structural characteristics of the organization.

More specifically, we expect that different organisations within a single field will be more or less densely embedded in the network pathways that transmit institutionalized meanings. In some cases, differential embeddedness flows directly from structural characteristics. For example, publicly listed companies will have links to analysts and other stakeholders which privately held ones do not, and subsidiaries will have links to corporate parents and sister sites which are not available to freestanding sites. For other dimensions, differential embeddedness can be predicted on the basis of more general understandings about types of organisations. For example, we expect that larger sites in our sample will have had more and denser linkages than smaller firms for many reasons, among them that larger sites would be more likely to have sought or be sought out by consultants and that they were more likely to employ staff specialists who brought or could create linkages. In much the same way, we expect more technologically sophisticated firms in our sample would have been more embedded because they would have been more likely to engage in discourse about the implementation of manufacturing best practices. They have a greater incentive to join communities of practice (Wenger, McDermott, & Snyder, 2002) that engage in those sorts of conversations.

Not only do we expect that these structural variables are indicators of embeddedness, we also expect that the embeddedness itself can usefully be thought of as manifesting itself along multiple dimensions. Different parts of an organization face different parts of the environment (Cohen & Levinthal, 1990), and so may be embedded in different ways. Mintzberg (1983) identifies five fundamental structural groups in an organization, of which two will be critically important in manufacturing organizations: the operating core and the strategic apex. In the case of a manufacturing site, the operating core translates into the operators and engineers, while the strategy apex is equivalent to the senior management team. We expect the operating core to interact with the engineers and operators of other organisations. We expect the strategic apex to interact with other managers, analysts, corporate headquarters, and the like. Consequently, we expect a given organisation's exposure to the environment to vary on two dimensions – one corresponding to the exposure of its managers (the managerial dimension), and the other corresponding to the exposure of the operating core (the operating core dimension). Given that the period of our study was one in which people placed tremendous emphasis on the link between manufacturing and strategy (e.g. Dertouzos, Lester, & Solow, 1989), we expect exposure on either dimension would have been a source of discourse about manufacturing best practices and exposure to intermediaries (see also figures 2 and 3). Consequently, we hypothesize that sites whose managers or operating core are more exposed to institutional processes will be more likely to engage with intermediaries. More specifically:

Sites whose managers are more exposed to relevant institutional processes will be more likely to engage the following intermediaries to help them adopt a Manufacturing Best Practice program:

H1a. Theorizing Agents
H1c. Communities of Practice
H1e. Customers and Suppliers

Sites whose operating core is more exposed to relevant institutional processes will be more likely to engage the following intermediaries to help them adopt a Manufacturing Best Practice program.

H1b. Theorizing Agents
H1d. Communities of Practice
H1f. Customers and Suppliers

< Insert figures 2 and 3 about here >

Having discussed who engages with intermediaries, we now turn to the impact those intermediaries have on behaviour and understanding.

What do intermediaries do?

We build on recent work (e.g. Sahlin-Andersson, 1996; Sahlin-Andersson & Engwall, 2002a) to argue that the managers adopting Manufacturing Best Practice programs were mindful agents. That is, they acted on the basis of theories they held about the nature of the world (Berger & Luckmann, 1967). However, they did not receive those theories full-blown from their environment. Rather, they constructed them themselves. A pivotal role of intermediaries is to help them construct those theories.

More specifically, we build on the interactionist tradition (Barley, 2008; Scott, 2008), to propose that myths (which we define as a coherent set of theories) operate at three loosely-coupled levels. At the top level there is the over-arching rationalized myth (Meyer & Rowan, 1977) that mobilizes the field around an issue. In our case, it is the myth, promulgated by a number of actors, that a necessary, though insufficient, condition for survival was the adoption of Manufacturing Best Practice programs.

At the bottom level are the very local theories managers construct for themselves and use to guide communication and the actually implementation of practices in their organization. In developing those theories, they draw on a variety of sources such as observations of their environments (DiMaggio & Powell, 1983), and of themselves (Weick, 1995), things they were taught about the underlying concept, either through formal education (Quine, 1977) from theorizing agents (DiMaggio, 1988; Greenwood, Suddaby, & Hinings, 2002; Lawrence & Suddaby, 2006; Sahlin-Andersson & Engwall, 2002b) or through discourse more generally (Phillips et al., 2004), metaphorical and metonymical linkages they created between the concept of interest and other concepts (e.g. Lakoff, 1987; Lakoff & Johnson, 1980; Leblebici, Salancik, Copay, & King, 1991), and their goals (Burnett, Medin, Ross, & Blok, 2005; Ratneshwar, Barsalou, Pechmann, & Moore, 2001).

While managers may have local theories, they also must communicate with intermediaries outside their organisation. Consequently, bridging the local and the global myths is an intermediate myth, or set of myths. The focal organization and the intermediaries create it as they interact (Barley, 2008; Scott, 2008). This theory is normative, in that it provides guidance to managers as to how they should act locally. The more intense the interaction between the parties, the more coherent this intermediate myth needs to be. So, for example, we do not necessarily expect to see a high level of coherence between the theories an academic teaches in a short executive course and the myth a manager takes away from that course, because they don't actually have to work together. We do, however, expect to see a high level of coherence between the intermediate-level theories held between a consultant and a long-term client, or between two partners working to solve problems in the supply chain that links them. Because intermediaries of a given class (Theorizers, Customers & Suppliers, Communities of Practice etc.) are structurally equivalent (Burt, 1987), and are embedded in networks that span multiple dyadic relationships, we expect to see coherence across intermediate theories (DiMaggio & Powell, 1983). We focus on the intermediate theory the adopting managers held, and will refer to it as the normative theory constructed through field-level discourse.

There was, however, another normative theory present in the field. As Manufacturing Best Practices diffused, a number of celebrities ('gurus') and academics, in the quality domain and in operations management more generally, prescribed how organizations should implement their programs. That is, they developed their own normative theory, which we will call the normative theory of 'gurus' and academics. In our context, this theory likely diffused primarily through books, videos and seminars, rather than through interpersonal interactions, because very few of the sites in the study employed 'gurus' and academics as consultants.

It is conceivable that for the organizations in the study, these two theories were the same. That is, the theory they constructed through discourse was consistent with the theorizations of the 'gurus' and academics. It is also conceivable that, through various de-coupling mechanisms, such as the decoupling of rhetoric and reality (Zbaracki, 1998), they were quite different.

The effect of intermediaries on practices adopted

As mentioned above, we consider two distinct areas where intermediaries are likely to shape the intermediate-level theories, and in turn influence manager's local theorizing and adoption behavior. First, several authors have found that for productivity-enhancing workplace practices (which we call manufacturing practices) to be implemented effectively, they need to be underlain by a set of more fundamental organizational practices (which we call capacity practices) (see, for example, Wood & de Menezes, 2008 for a review of the sub-set of studies involving high-involvement HRM systems). For example, MacDuffie (1995) found that automobile assembly plants with appropriate governance relations and workplace organization derived much higher benefits from new manufacturing techniques and technologies. In the case of these capacity practices, we test the proposition that exposure to intermediaries led the sites and intermediaries to develop an intermediate-level theory consistent with that advocated by 'gurus' and academics, and therefore to adopt a set of practices consistent with that theory.[5] This leads to the following hypotheses (see figure 2). The first three involve explicit interaction with intermediaries, while the remaining two pick up a combination of those intermediaries whose

[5] We could test four different empirical combinations of type of normative theory and type or practice. The combination we test is, in our opinion, the most illuminating because we expect that changing capacity practices to the form advocated by 'gurus' and academics is the most difficult of the four organizational change problems, while changing manufacturing practices to a discourse-based normative form is the easiest. Consequently, any combination of significant and non-significant results will produce interesting insights.

influence we do not capture directly (e.g. competitors, corporate parents and stock analysts) plus any other variables which correlate with the predictor variables, such as differential exposure to books, seminars, and the mass media:

H2a. Sites that engage theorizing agents will adopt a set of capacity practices that is more consistent with the normative theory of 'gurus' and academics.

H2b. Sites that are members of communities of practice will adopt a set of capacity practices that is more consistent with the normative theory of 'gurus' and academics.

H2c. Sites that actively engage with customers and suppliers will adopt a set of capacity practices that is more consistent with the normative theory of 'gurus' and academics.

H2d. Sites that have high level of exposure of managerial personnel to the institutional field will adopt a set of capacity practices that is more consistent with the normative theory of 'gurus' and academics.

H2e. Sites that have high level of exposure of technical personnel to the institutional field will adopt a set of capacity practices that is more consistent with the normative theory of 'gurus' and academics.

In the case of the manufacturing practices, we postulate, once again, that the managers and intermediaries constructed an intermediate-level theory together. However, this time, rather than testing the proposition that they adopted the normative theory proposed by the 'gurus' and academics, we are able to measure more directly whether they adopted practices consistent with the normative theory they actually constructed. This leads to the following hypotheses (see figure 3). Once again, the first three involve explicit interaction with intermediaries, while the last two pick up a combination of those intermediaries whose influence we do not capture directly (e.g. competitors, corporate parents and stock analysts) and the effect of differential exposure to books, seminars, and the mass media which correlates with these predictor variables:

H3a. Sites that engage theorizing agents will adopt a set of manufacturing practices that is more consistent with the normative theory constructed through field-level discourse.

H3b. Sites that are members of communities of practice will adopt a set of manufacturing practices that is more consistent with the normative theory constructed through field-level discourse.

H3c. Sites that actively engage with customers and suppliers will adopt a set of manufacturing practices that is more consistent with the normative theory constructed through field-level discourse.

H3d. Sites that have high level of exposure of managerial personnel to the institutional field will adopt a set of manufacturing practices that is more consistent with the normative theory constructed through field-level discourse.

H3e. Sites that have high level of exposure of technical personnel to the institutional field will adopt a set of manufacturing practices that is more consistent with the normative theory constructed through field-level discourse.

RESEARCH METHODS

Survey. We obtained data on manufacturing best practices adoption and implementation from a 1994 mail survey of Australian and New Zealand manufacturing firms conducted by the Australian Manufacturing Council (AMC) in conjunction with the Boston Consulting Group, the Australian Bureau of Statistics, and the Manufacturing Advisory Group (New Zealand) (Australian Manufacturing Council, 1994).

The survey has been used in several published studies (Challis, Samson, & Lawson, 2002; Rimmer, 1996; Samson & Ford, 2000; Samson & Terziovski, 1999; Terziovski, Samson, & Dow, 1997). The survey instrument was an extensive review of manufacturing strategy, practices and performance outcomes. The instrument was pilot tested at six sites and revised based on respondent reactions.

In addition to asking whether and when the responding firm embarked on a program aimed specifically at achieving “best practice”, the survey asked about a large number of manufacturing-related practices and technologies, their extent of adoption, and their impact on the firm and its performance. The survey authors judged these practices to be a superset of “best practices” (Samson, personal communication, December 2001).

Sample. The survey instrument was sent to a stratified random sample of the manufacturing sites that were registered with the Australian Bureau of Statistics or Statistics New Zealand and employed more than 20 people in 1993. The sample was stratified within each country using twelve industry codes (ASIC and NZIC) and three size categories (25-49, 50-100, and over 100). The stratification resulted in each cell containing at least 15 respondents.

The survey was mailed to 4,000 manufacturing site managers, 3,000 in Australia and 1,000 in New Zealand. 1289 responses were received within a ten-week period, with response rates of 32% for Australia and 38% for New Zealand. The AMC subsequently conducted a telephone survey of 108 non-respondents, who were asked a subset of questions with high predictive validity for the survey as a whole. No significant response bias was found (Australian Manufacturing Council, 1994). We created dummy variables to account for missing values in our control variables, using the method suggested by Allison (2002). Of the 1289 responding sites, this left 1171 with no missing data and 836 of these (71%) indicated that the firms had adopted a manufacturing best practices program by the time of the survey. We analyze data for the adopting 836 firms.

Dependent variables

There are two dependent variables in the study. The first, *Capacity Practices*, measures the consistency of the practices underlying the Manufacturing Best Practices program with the normative theory advocated by 'gurus' and academics. The second, *Manufacturing Practices*, measures the consistency of the manufacturing improvement practices actually implemented with the normative theory constructed through field-level discourse.

Capacity practices: Hypothesis 2 states, broadly, that interaction with intermediaries will increase the extent to which a given site implements capacity practices consistent with the normative theory espoused by high-profile proponents and analysts of Manufacturing Best Practices ("gurus" and academics). These advocates and analysts espoused a particular ideology of MBP, and therefore a particular preferred value orientation. Capacity practices which were consistent with the ideology were believed to be likely to support the effective implementation of the manufacturing practices, while those which were inconsistent with it would be expected to inhibit implementation, or at best be neutral. We expected, given a broad array of sites, with varying sizes, production technologies, and local contingencies, that there could be significant variation in the capacity practices sites actually implemented. Notwithstanding, if the number of capacity-related practices implemented in an organisation is approximately constant, which is a reasonable assumption given the sorts of practices we are talking about (please see table 2), then the number of capacity practices a site implements consistent with the normative prescriptions is a measure of the proportion of those practices it implements, and therefore, the extent to which the site implements capacity practices consistent with normative understandings. Therefore, we measured the consistency of the capacity practices with the espoused ideology by assembling a broad basket of practices that were consistent with the MBP ideology, and then building a measure of the extent of implementation of these practices at the site.

The first step was to identify values and beliefs that advocates and analysts argued underlay MBP. Unfortunately, no prior analysis was available. However, Detert et. al. (2000) had constructed a comprehensive set of organisational culture dimensions and then specified values and beliefs that underlie TQM along each dimension (see Table 1). For example, one dimension refers to a culture's stance on whether work is best accomplished collaboratively or individually. Since TQM relies on collaboration through internal and external partnerships, Detert et. al. argued that organisations that valued collaborative work highly would find their values aligned well with the values that underlie TQM. While their dimensions arise from an analysis of TQM rather than MBP programs, TQM and related practices appeared to be the core of Manufacturing Best Practice programs during the study period (see below). Consequently, a large part of the adoption decision for an MBP program would likely involve consideration of TQM itself. Furthermore, the same values and beliefs have high face validity as being desirable for the successful implementation of the other core element of MBP – learning best-in-class practices from others. Consequently, using Detert et. al.'s dimensions, values, and beliefs seemed both a valid and reasonable approach.

-- Insert Table 1 about here --

Accordingly, the authors independently identified survey items that reflected on one or more of Detert et. al.'s dimensions for inclusion in a measure of capacity practices. For example, one survey item asked respondents to indicate the degree to which the site had effective top-down and bottom-up communication processes. We selected this item for the scale because it reflected two of Detert's dimensions, one of which is the collaborative vs. individual work dimension mentioned earlier and the other being the organisation's stance regarding control, coordination, and responsibility. A positive response would appear to indicate that organisational members valued collaboration and broad involvement in decision-making as well as the likelihood that members valued shared control (e.g., employees being involved in decision-making) rather than centralized control. In turn, this would indicate the organisation's meanings, values, reward systems, and norms were aligned with the ideas advocated by 'gurus' and academics as underlying TQM.

We identified 34 items as candidates for inclusion in the capacity practices measure. We winnowed these down to 21 items by eliminating any item that either author thought were ambiguous, duplicative, or could be construed as manufacturing practices.[6] The twenty-one items that comprise the capacity practice measure are presented in table 2. No items mapped positively onto some dimensions and negatively onto others. Inter-rater reliability was over 90%, and differences of opinion were resolved by consensus. All eight of Detert et. al.'s dimensions appear to be covered by the final set of 21 items in a reasonably balanced way. Chronbach's α for the 21 items was 0.82, supporting the idea that they represent a coherent group of practices. We constructed the measure used in the analysis by normalizing the 21 component variables, summing them, and then normalizing the summed measure.

-- Insert Table 2 about here --

Manufacturing practices:[7] Hypothesis 3 rests on the broad idea that senior managers in organizations that interacted with intermediaries had a different normative theory of what it meant to adopt a Manufacturing Best Practices program from those that did not. This, in turn, would have led managers in organizations that engaged with intermediaries to attribute different relative value to the component practices that made up their Manufacturing Best Practices

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6 This final criterion is not critical, since we do not use capacity practices to predict manufacturing practices.
7 The first part of this section draws heavily on (citation to be included after blind review process).

program, and hence to select a different mix of practices for adoption. Consequently, the measure of holding a different normative theory is whether they attributed different value to the practices. Consequently, the manufacturing practices variable is a measure of the differential value of the different practices within the field.

To develop this variable, we drew on psychological theories of categorization. Scholars in that domain define a category as the set of objects that are manifestations of a concept (Barsalou, 1992, 1999; McGarty, 1999; Murphy & Medin, 1985; Solomon, Medin, & Lynch, 1999). That is, people use a set of concepts to understand the world, and categories are simply the set of objects that bring those concepts to life. Categorization researchers have found that the members of a given category can be ranked in terms of how well they exemplify the concept underlying the category, and refer to this ranking as the category grading (e.g. Barsalou, 1983, 1987, 1999; Burnett et al., 2005; Kempton, 1981; Lakoff, 1987; Murphy & Medin, 1985; Rosch, 1978). They have found that, as well as exemplifying the underlying concept associated with a category better, the central members of a category (those which are further up the grade) are also more valued (not in an absolute sense, but with respect to the concept of interest). There are psychological and sociological reasons why we expect this to be the case. From a psychological perspective, we expect that people will attribute more value to the more central members of the category because the most central member represents, in some sense, the ideal member of the category. For goal-derived categories, like Manufacturing Best Practices, this is virtually implicit (Barsalou, 1985; Barsalou, 1991). The most central member is the one that is most important for realizing the goal of the category, and therefore is the most valued. From a sociological perspective, we expect the central members of the category will be the most valued because we expect that theorization and institutionalization will lead people to privilege certain social objects (the central members) over others (Strang & Meyer, 1993), and institutionalization will lead people to ascribe value to those objects beyond their technical merit (Selznick, 1957).

As noted in the theory section, we assume that each site adopted MBP on the basis of its senior managers' theories of MBP. Corresponding to that theory will be a grading of the category "Manufacturing Best Practices" which represents the value they attributed to the different component practices. Hypothesis 3 essentially states that those who interact with intermediaries will enact a category grading closer to that implicit in the normative theory constructed through field-level discourse. Our empirical task then was to obtain a measure of the field-level consensus of the category grading. To do so, we selected a group of practices that were clearly identified with Manufacturing Best Practices programs, and asked a group of experts to give us their perception of the way managers graded those component practices.

To select the component practices themselves, we found nineteen practices in the survey which met three criteria: they were incorporated within theorizations of MBP, they were empirically relatively distinct from each other, and we could obtain a relatively unambiguous measure of whether they were adopted. To further verify that adopters considered these practices to be components of a best practices program, we imposed an additional criterion that the practices should be used more frequently by adopters of Manufacturing Best Practices programs. We found, encouragingly, that 18 of the 19 practices met this criterion (using a t-test and $p<0.05$ critical value).[8] We removed three practices based on suggestions from our experts (see below). The 15 remaining component practices are listed in Table 3.

---- Table 3 about here ----

[8] The nineteenth practice had an adoption fraction of 95%, indicating that many organisations had adopted it independently of their Best Practices program.

To measure where each component practice fell on the category gradient, we identified, in December 2001, eight scholars whose research or consulting experience indicated a clear understanding of normative models of Manufacturing Best Practice implementation *as well as* a broad understanding of how the practices were actually used in the mid-1990s. We used these researchers as a nucleus for a snowball sample. Using first and second-order referrals, they helped us add eight more similarly-qualified people. We received five valid responses.[9] Four others declined to participate (primarily because they felt their knowledge base was too narrow), and seven did not respond to our e-mail.

We sent each respondent a list of eighteen practices described above and asked them to indicate "the relative centrality (i.e. closeness to the prototype) of the listed practices to the concept of **manufacturing best practices**, as you believe **decision-makers in manufacturing firms would have understood them** in 1994." (emphasis in original) using five-point Likert scales. For each component practice, we used the mean response across the experts, which we called the *component-practice manufacturing practice score*. That mean response ranged between 3 and 5, providing evidence we had captured practices that ranged from the most central to moderately central. We also asked the experts to comment on the survey items, and, on that basis, eliminated three practices.[10] We then tested that the category grading was a valid measure of the relative value of the practices in five different ways (see appendix).

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[9] We felt fortunate regarding the expertise level of our respondents. For example, we did a count of books published before 2002 (conference proceedings, research monographs, or textbooks) on general management, technology management, or operations management. The publication count was as follows, in descending order: Danny Samson (9 publications); Chris Voss (7); Roger Schmenner (6); Roger Schroeder (3), and Aleda Roth (1).

[10] One respondent informed us that firms with computer-integrated manufacturing were more likely to have adopted best practice programs, rather than the other way around. In the case of production planning and control and warehouse management, another respondent argued that a best practice program will influence how you perform those functions, but not whether you do them. His argument is supported by their very high adoption fractions (99% and 96% respectively) for these practices among adopters of best practices.

The actual dependent variable, *manufacturing practices*, is a site-level variable. It is constructed by taking the average of the *component-practice manufacturing practice scores* for the component practices actually adopted by the site.

Independent variables

Managerial Exposure and **Operating Core Exposure.** We argued above that the strategic apex of the site (essentially the management team) will be exposed to other managers, corporate headquarters, analysts, and the like, while operating core (essentially the operators and engineers) will be exposed to other operations and technical groups. Furthermore, we argued that, in the period of our study, high exposure of either group to institutional processes would be a driver of interaction with intermediaries. To construct measures of these two exposures, we started with four indicators of structural characteristics of the organisation: *Site Size* is the log of the number of full-time permanent employees at the time of the survey. *Public* is a dummy variable indicating that the site is a public company listed on a stock exchange (as opposed to a private company or government corporation). *Owned* is a dummy variable indicating a positive response to the second or third category of an item which asked whether the site was an "independent firm," an "operating unit of a large firm," or a "subsidiary of a parent or holding company." *Technology* is calculated from a section of the survey that asked the extent to which several manufacturing technologies such as CNC machines, robots and materials-working lasers contributed to the firm's competitiveness. Twelve such measures were available. Contribution was assessed using a five-point scale. The technology level was constructed as the mean level across the twelve measures (alpha = 0.80).

Factor analysis of these four indicators showed two distinct factors (i.e. with Eigenvalues > 0 as per Stata Corporation (2007)). We interpreted the first factor as indicative of *Managerial Exposure,* given that *Public, Owned,* and *Size* loaded heavily on it (factor loadings were .68, .71, and .46, respectively), while *Technology* did not (factor loading .16). We interpreted the second factor as indicative of *Operating Core Exposure*, as *Technology* loaded more heavily on it (.37) while the *Public* and *Owned* had negative loadings. *Size* loaded positively on the second factor (.28), though this loading was substantially less than for the first factor**.** The behavior of *Size* is not surprising, given that firm size is plausibly correlated with both types of exposure.

Mediating variables

We argued that higher managerial or operating core exposure to the institutional field will lead to a higher likelihood of an organization engaging with intermediaries. We examine three forms of intermediary explicitly – communities of practice, theorizers, and customers & suppliers – and leave the remainder implicit (see figures 2 and 3). The survey included nine items asking who had been "**valuable** sources of external advice or assistance in helping the site achieve improved business performance based on '**best practice'**" (emphasis in original), and measured responses using a five-item Likert scale. The nine items referred to (i) parents or related companies, (ii) customers or clients, (iii) suppliers, (iv) competitors, (v) international or overseas firms, (vi) other Australian or New Zealand firms, (vii) industry associations, (viii) management consultants, and (ix) universities or business schools.

Theorizers is the linear sum of responses to the last three items (industry associations, management consultants, universities or business schools).

Community of practice is the sum of the fifth and sixth items (international or overseas firms, other Australian or New Zealand firms). We infer that responses to these two items excluded those categories of firms listed explicitly in the other seven parts of the question.

Customers and Suppliers is the sum of the second and third items (customers or clients, suppliers).

Control Variables.

Measures were included to control for characteristics of sites that might influence the dependent variables. In order to separate theorization effects from mimesis effects, we measure the similarity of sets of component practices between sites, using the *Conformity* measure developed by Westphal, Gulati, and Shortell (1997). The dependent variable may vary systematically with to the number of component practices adopted by a site. In cases where the average adoption fraction of practices is substantially above 0.5, the Westphal, Gulati, and Shortell measure is highly correlated with the number of practices adopted (r=0.98 in our case). Therefore, we use it to control for the number of practices adopted also. Involvement of trade unions in MBP implementation could potentially influence adoption behaviour. We control for potential effects with: *# of Unions* is the number of unions reportedly represented at the site, *Unionized* is a dummy variable indicating that the number of unions is greater than or equal to one, and *Bargaining Unit* is a dummy variable indicating whether or not the workplace operated as a single bargaining unit. Because change, and hence implementation of novel practices, is easier in organizations that are growing, *Employee Growth* is the log of the number of full-time permanent employees at the time of the survey divided by the number of such employees two years previously. Although manufacturing across Australia and New Zealand constituted a field, there may have been local differences in behaviour. *Australian site* is a dummy variable indicating that the respondent is physically located in Australia (as opposed to New Zealand). To the extent that local sites were responding to pressure from corporate parents, the location of that parent may have affected the nature of that pressure. Consequently, *European parent, US parent, and Japanese parent* are dummy variables indicating the location of parent corporations of subsidiaries. Finally, to control for variations between industrial sectors, dummy variables were included for 11 of the 12 one-digit ASIC/NZSIC industry codes.

ANALYSIS AND RESULTS

To analyze the data, we conducted two path analyses. The means, standard deviations, and bivariate correlations of all variables used in the analyses, except the industry controls, are presented in Table 4.

< Table 4 about here >

To test our hypotheses, we used the AMOS 6.0 structural equation modeling package, which allows researchers to simultaneously examine a number of dependence relationships. Amos provides both an assessment of the fit of the overall model and tests of the individual proposed relationships (or paths).

The hypothesized models, along with the standardized maximum-likelihood parameter estimates for the main predictors along with the significance levels for the hypothesized models, are depicted in Figures 4 and 5. Each model consisted of two exogenous variables (*Management Exposure* and *Operating Core Exposure*) and three endogenous variables (*Theorizing Agents*, *Community of Practice* and either *Capacity Practices* or *Manufacturing Practices*). The measures of managerial and operating core exposure were built from four indicators, as described above. All control variables were constructed from single indicators and assumed to contain no measurement error. The three endogenous variables (*Theorizing Agents*, *Community of Practice* and either *Capacity Practices* or *Manufacturing Practices*) were constructed from single indicators and assumed to contain measurement error. All models include all control variables, though these are not shown in the figures.

We assessed the overall fit of the two models using the normed fit (NFI), incremental fit (IFI) and comparative fit (CFI) indices. Fit indices above 0.9 indicate acceptable fit (Medsker, Williams, & Holahan, 1994). The fit indices for both models were essentially identical. These tests indicate that our models had adequate fit to the data (NFI=0.91, IFI=0.93, CFI=0.92).

Hypothesis 1 – Users of intermediaries. Hypothesis 1 suggests that sites will be more likely to engage theorizing agents to help them adopt a MBP program if their management (H1a) or their operating core (H1b) is more exposed to institutional processes. Similarly sites will be more likely to actively engage with communities of practice to help them adopt an MBP program if their management (H1c) or their operating core (H1d) is more exposed to relevant institutional processes. Finally, sites will be more likely to actively engage with customers and suppliers to innovate in their management practices if their management (H1e) or their operating core (H1f) is more exposed to institutional processes. Five of the six parts of hypothesis 1 are supported. Sites whose management (path coefficient = 0.099, $p<0.01$)(H1a) or operating core (path coefficient = 0.225, $p<0.001$)(H1b) is more exposed to institutional processes are more likely to engage theorizing agents. (All probabilities are one tailed, and all path coefficients are standardized.) Similarly sites whose management (path coefficient = 0.201, $p<0.001$)(H1c) or operating core (path coefficient = 0.167, $p<0.001$)(H1d) is more exposed to institutional processes are more likely to engage join communities of practice. However, while sites whose operating core is more exposed to institutional processes are more likely to actively engage with customers and suppliers (path coefficient = 0.085, $p<0.01$)(H1f), sites whose management is more exposed to institutional processes are not (path coefficient = -0.044, n.s.)(H1e).

<Figure 4 about here>

Hypothesis 2 – Effect of intermediaries on Capacity Practices. Hypothesis 2 suggests that sites that engage with intermediaries will adopt a set of capacity practices consistent with the normative models espoused by 'gurus' and academic researchers. Only one of the four parts of hypothesis 2 is supported, and the path coefficients for the three paths in the top of the path diagram have the wrong sign. That is, sites that engaged theorizing agents (path coefficient = -0.010, n.s.)(H2a), joined communities of practice (path coefficient = -0.054, n.s.)(H2b), or whose management was more exposed to relevant institutional processes (path coefficient = -0.062 n.s.) (H2d) were not more likely to adopt a set of capacity practices that was more consistent with the normative theory of 'gurus' and academics. Similarly, sites whose operating core was more exposed to institutional processes were not more likely to adopt a set of capacity practices that was more consistent with the normative theory of 'gurus' and academics (path coefficient = 0.043, n.s.)(H2e). However, sites that actively engaged customers & suppliers did adopt a set of capacity practices that was more consistent with the normative theory of 'gurus' and academics (path coefficent = 0.073, $p<0.05$)(H2c).

Hypothesis 3 – Effect of intermediaries on Manufacturing Practices. Hypothesis 3 suggests that sites that engage with intermediaries will adopt a set of manufacturing practices consistent with a normative model constructed through discourse within the field. Two of the five parts of hypothesis 3 are supported (see figure 5). That is, sites that join communities of practice (path coefficient = 0.117, $p<0.001$)(H3b) or whose management is more exposed to relevant institutional processes (path coefficient = 0.150, $p<0.001$)(H3d) adopted a set of manufacturing practices that were more consistent with the normative theory constructed through field-level discourse. However, this was not the case for sites that engaged theorizing agents (path coefficient = 0.033, n.s.)(H3a), or sites whose operating core was more exposed to relevant institutional processes (path coefficient = 0.020, n.s.)(H3e). Finally, sites that engaged actively with customers and suppliers did not adopt a set of manufacturing practices that was more consistent with the normative theory constructed through field-level discourse. In fact, with a two-tailed test, this result would be statistically significant, and we can conclude that adopted a set of manufacturing practices that is less consistent with the normative theory constructed through field-level discourse (path coefficient = -0.090 n.s.).

<Insert Figure 5 about here>

The lack of support for Hypothesis 3a led us to wonder whether theorizing agents played a different role early versus late in the diffusion process. Perhaps, early in the diffusion process, when people knew little about Manufacturing Best Practices, theories about MBP were transmitted along the network pathways, whereas later on, when people took the theories for granted, information travelling along the pathways was about implementation issues. That is, perhaps early adopters engaged theorizing agents to teach them what MBP was (what should we do?), while later adopters engaged them to implement a well-defined program (how should we do it?). To test this idea we exploited a question on the survey, which asked whether the site had embarked on a program aimed specifically at achieving "Best Practice" and if so, when such efforts commenced. Four time periods were provided – before 1985, 1985-1988, 1989-1991, and post-1991 (the survey was mailed in January 1994). We repeated the test of hypothesis 3 using just the first three cohorts. The model had better fit (NFI=0.92, IFI=0.97, CFI=0.94) and the standardized path coefficient on the path from *Theorizers* to *Manufacturing Practices* became statistically significant (path coefficient = 0.115, $p<0.01$). The standardized coefficients on all the other paths were also greater, but did not result in a different statistical outcome.

Robustness checks: To test the robustness of our results, we repeated all analyses with three alternative dependent variables. The first was designed to test the sensitivity of our analysis to our method of determining the category grading. For this, sites scored 1-4 depending on how many of the four most central practices (TQM, Benchmarking, Just-in-time Manufacturing, Machine Setup and Time Reduction) they implemented. The results were generally similar. However, there were some notable differences. In particular, if we use just the four central practices, the path from *Theorizers* to *Manufacturing Practices* becomes statistically significant, indicating that *theorizers* emphasize the central practices. The path from *Operating Core*

Exposure to *Manufacturing Practices* goes from being non-significant to being significant. This suggests that hypothesis 3 was not supported for sites with high *Operating Core Exposure* because they were over-adopting the peripheral practices (essentially those that involve empowering workers or interacting with customers), and not that they were under-adopting the central practices. In the second, we were concerned that the results were being dominated by the adoption, or not, of TQM. So, we removed TQM from the set of practices from which we calculated the *Manufacturing Practices* measure. In this case, the results were essentially unchanged. In the third, we were concerned that results on the path from *Customers & Suppliers* to *Manufacturing Practices* may have been an artifact of there being items related to customers and suppliers within the measure of *Manufacturing Practices*. We conducted this test two ways. In the first, we removed two practices from the measure of *Manufacturing Practices.* The omitted items were number 2 (taking the requirements of customers into account when designing new products and services) and number 12 (working closely with suppliers in product development). In the second, we also removed number 4 (systematically and regularly measuring customer satisfaction). While the effect on this path weakened slightly, it stayed statistically significant (albeit with the wrong sign, as before). All other paths were essentially unchanged. (We did not remove the items from the variable for the main analyses because we thought that it was important to have measures of interaction with customers and suppliers in the evaluation of the other paths.)

In addition, to test the assumption that Australia and New Zealand could be treated as a single field, we repeated the analyses with just the Australian sites. The results were qualitatively unchanged. Analyses are available from the corresponding author.

DISCUSSION AND CONCLUSIONS

This study examined the way intermediaries shaped the adoption behavior of sites, and by inference, their impact on the theories and meanings that managers came to hold as they adopted and implemented a diffusing (and institutionalizing) practice. We asked whether sites were more likely to engage intermediaries when the firm's managers or operating core were more exposed to the relevant institutional processes (H1). We examined whether interaction with intermediaries shaped adoption patterns for two types of practices relevant to Manufacturing Best Practices programs. We asked whether such engagement shaped "capacity" practices (i.e. those practices that support implementation of MBP programs) towards the normative pattern of adoption advocated by 'gurus' and academics (H2), and whether such engagement shaped "manufacturing" practices (practices adopted to improve manufacturing performance directly) towards a form constructed normatively through discourse within the field (H3).

At first blush, the results seem very complex. However, if one examines them in two groups, they become much more straightforward. Consider first the top half of each path diagram, namely the paths through *Theorizers* (H1a, H1b, H2a, H3a) and *Communities of Practice* (H1c, H1d, H2b, H3b), and the direct path from *Managerial Exposure* to either *Capacity Practices* (H2d) or *Manufacturing Practices* (H3d). On this set of paths, sites that are more exposed to institutional processes were more likely to engage with theorizers, communities of practice, and other intermediaries (i.e., H1 is supported). That engagement had two effects. First, there was no discernable relationship between interactions with intermediaries and the sites' *capacity* to adopt manufacturing practices (i.e., H2 is not supported). Second, there was relationship between engagement and the adoption of a set of practices consistent with the normative theory constructed through field-level discourse (i.e., H3 is supported with the caveat that support for the path from *theorizers* to *manufacturing practices* is limited to the first three adopter cohorts). One potential explanation begins by suggesting that capacity practices, in contrast to the manufacturing practices, are much closer to the core assumptions, beliefs and values of the organization (Detert, Schroeder, & Mauriel, 2000). This implies they would be simultaneously much harder to change and much more important for successful program implementation (e.g. Barney, 1997; Deal & Kennedy, 1982). Consequently, it may be that, despite their efforts, intermediaries simply had no differential impact on the core values and assumptions of the sites. More likely in our view, intermediaries viewed the core values and assumptions of the client organization as a constraint that they meddled with at their peril. If this is true and intermediaries were not pushing sites towards a set of capacity practices advocated by 'gurus' and academics, then we would expect, as suggested by the Appendix, and consistent with prior researchers in the context of TQM (Cole, 1999; Easton & Jarrell, 2000; Zbaracki, 1998) that the field-level normative form of manufacturing practice adoption was designed to be implementable within the context of the pre-existing capacity practices of the adopting firms. This explanation is supported by the support for hypothesis 3 along these three paths. In the case of theorizers, we can explain this path through the self-interest of the theorizing agents (c.f. Cole, 1999; Easton & Jarrell, 2000). In the case of communities of practice, it is a likely consequence of the decoupling of rhetoric and reality Zbaracki (1998) discusses.

The second set of results (see the bottom half of each path diagram) is nearly the inverse. Hypothesis 1 is only partially supported, hypothesis 2 is essentially supported, and hypothesis 3 is not supported. That is, while *Operating Core Exposure* is a strong predictor of use of active engagement with *Customers and Suppliers* (H1e), *Managerial Exposure* is not (H1f). Furthermore, the path from *Customers and Suppliers* to *Capacity Practices* (H2c) is statistically significant (and the path from *Operating Core Exposure* to *Capacity Practices* has the correct sign). Finally, the path from *Operating Core Exposure* to *Manufacturing Practices* (H3e) is not statistically significant, and the path from *Customers & Suppliers* (H3c) is not only not statistically significant, but is statistically significant in the opposite direction.

To explain these results, it is worth separating the two bottom-half paths. First, consider the path through *Customers & Suppliers*. This path differs from the paths through *Theorizing Agents* and *Communities of Practice* in four fundamental ways. First, the relationship is pre-existing. Every site in the sample has customers and suppliers. Consequently, to find customers and suppliers valuable sources of help in the adoption of MBP requires the activation or reframing of existing relationships, rather than the construction of new ones, as would be the case with theorizers and communities of practice. This might well explain the lack of support of H1e (from *Managerial Exposure* to *Customers and Suppliers*) and the strong support of H1f (from *Operating Core Exposure* to *Customers and Suppliers*). That is, it is quite conceivable that once the overarching rationalized myth had diffused, the elaboration of this relationship was driven much more by technical than institutional imperatives (Strang & Meyer, 1993), and therefore, much more by the operating core than the strategic apex. In this regard, we should not overlook the role of selection effects (that is, sites with appropriate capacity practices in place fostered relationships with customers and suppliers) and reverse causation (sites with particular constellations of manufacturing practices chose to engage actively with Customers and Suppliers as part of a broad effort to improve manufacturing performance). Notwithstanding, if these relationships were productive, as defined by the rationalized myth, their enactment would have resulted in the strengthening of the statistical relationships. Second, the incentives were different. We expect that the parties were much more invested in actually achieving best practice manufacturing. That is, the focal site could not achieve best practice unless it received high quality inputs from its suppliers. Furthermore, and to a lesser extent, its success depended on the ability of its customers to present excellently manufactured products to the market. Third, this relationship is laden with power. Whereas power was not implicated in relationships with communities of practice, and the focal site held power over theorizing agents, customers held power over the focal site, and the focal site held power over suppliers. Consequently, the organization downstream in the supply chain had the ability to regulate the behavior of those upstream. Finally, the consequences of efforts to achieve MBP were measurable within the context of the relationship. The focal sites could tell if their suppliers' manufacturing performance was increasing, and their customers could tell if theirs was. All four of these differences – qualitatively different relationships, higher incentives for success, regulative capacity, and the ability to measure outcomes -- suggest that the mechanics of adoption along this pathway was completely different from that along the pathways through *theorizers* and *communities of practice*. The consequence is that these sites appear to have been converging on the normative form proposed by 'gurus' and academics, rather than the normative form developed through discourse within the field.

Consider finally the direct path from *Operating Core Exposure* to either *Capacity Practices* (H2e) or *Manufacturing Practices* (H3e). We must be much more speculative about this path because we don't know how much of this effect is due to the intermediaries we are not studying (corporate parents, stock analysts, government agents, etc.), selection effects (sites with high operating core exposure have more appropriate capacity practices before they engage intermediaries), or some other exogenous effect. Notwithstanding, we know that sites with high *Operating Core Exposure* had much more incentive to be excellent manufacturers than those with low *Operating Core Exposure* because the high operating core exposure sites (by construction) had more sophisticated manufacturing operations. This was especially true for sites with low *Managerial Exposure* (i.e. smaller, privately held, single site organizations), because sites with high *Managerial Exposure* may well have high *Operating Core Exposure* simply as a consequence of their scale of operations. We also know, from our robustness checks, that sites on this path tend to over-adopt the peripheral practices, not under-adopt the core ones. That is, they adopted the central practices, and interacted with external parties, and empowered their employees. In combination, this suggests that, like those interacting with the customers and suppliers, the organizations on this path were adopting a set of practices somewhat like the normative form proposed by the 'gurus' and academics.

In combination the results suggest the importance of the intermediate level (Barley, 2008) between the diffusion of the overarching myth (Strang & Meyer, 1993) and its local enactment. The interactions of the various players, and the playing out of their interests and power relations appears to have shaped the way managers in adopting sites came to understand the practice they were adopting, and consequently the way they adopted. That is, the two sets of paths embody different institutional logics (Thornton & Ocasio, 2008). If our interpretation above is correct, then those who engaged with *theorizers* and *communities of practice*, ended up with a set of manufacturing practices that were congruent with their prior capacity practices and that were reinforced through their relationships with the intermediaries (Giddens, 1984), effectively enacting the rationalized myth created through discourse in the field. A likely consequence is that, while the adoption was not ceremonial (Meyer & Rowan, 1977), improvements in manufacturing performance may well have been quite limited. On the two paths in the bottom half of the diagram, again if our interpretation is correct, the manufacturing practices appear to have been, once again, congruent with the capacity practices, and with the relationships and interactions within which they were embedded. However, in this instance, the reinforcement appears to have been a driver of change, moving the players towards the logic associated with the theories proposed by 'gurus' and academics.

These findings suggest two broad contributions to institutional research. First, they are consistent with a model in which institutionalisation has involved the diffusion of both a overarching myth – that to be competitive, the sites must become best practice manufacturers -- and an intermediate-level rationalized myth which was contingent on the types of relationships in which the sites were embedded. By showing the mechanisms by which institutional processes play themselves out through these intermediary relationships, the study shows how organizations can end up looking similar. That is, it demonstrates isomorphism in the context of institutionalization, without implying that organizations copy each other, or even that they end up looking the same (Boxenbaum & Jonsson, 2008; DiMaggio & Powell, 1983; Greenwood et al., 2008). This is true both within the given paths (sites that engaged theorizing agents or communities of practice did not all adopt identical programs) and between paths (sites that engaged customers and suppliers adopted programs that were qualitatively different from those developed by sites that engaged theorizers or communities of practice). That is, this study provides evidence that the actual form of adoption is driven by both the form of the myth that the organization receives and the way that the organization interprets that myth in the context of local contingencies and relationships (see also Beck & Walgenbach, 2005; D'Aunno, Succi, & Alexander, 2000; Dacin, 1997).

Notwithstanding, it is worth noting a qualitatively difference in the nature of the isomorphism between the top and bottom halves of the path diagram. Scott (2008) distinguishes between the constitutive and regulative rules that underlie institutions. Constitutive rules are rules that create the very possibility of certain activities (Scott, 2008:64; Searle, 1995:27). Through the process of institutionalization, they shape the identities of the actors in the field. In this study, we see constitutive rules at work. The manufacturers we studied took on the overarching myth and came to take-for-granted that their identities as manufacturers (not their legitimacy as manufacturers) hinged on their aspiring to best practice. Consequently, they adopted Manufacturing Best Practices programs, and became isomorphic to their environments.

In the paths in the bottom half of the path diagram, we can note the additional importance of regulative rules as drivers of both isomorphism (towards practices consistent with the myth of the "gurus" and academics) and change (away from practices consistent with the myth constructed through field-level discourse). Regulative rules are rules designed to influence antecedently existing activities (Douglas, 1973, 1986; Scott, 2008:64; Searle, 1995:27). For example, in Westphal, Gulati, and Shortell's (1997) study of TQM adoption, the dependent measure was the hospital's score for accreditation. Later adopting hospitals adopted forms of TQM in conformity with earlier adopters. It is not clear that institutionalization had occurred – that hospitals had come to take-for-granted certain rationalized myths about TQM and the form it should take (Berger & Luckmann, 1967). It is clear, however, that there were agents with sufficient power and surveillance capacity to dictate the form of practice that the hospitals should adopt. Under regulative rules, we expect isomorphism to be driven by the surveillance capacity of the powerful regulator, and the recipient organization's need for legitimacy or resources, and to manifest itself as organizations looking the same (Meyer & Rowan, 1977). Rules can, however be regulative and constitutive at the same time (Edelman, 1992; Scott, 2008), as was the case here, and the regulative component (the playing out of power relations through institutional rules) appears to be one of the likely drivers of change on that path.

Second, this study contributes a novel approach to the study of meaning in institutional research. Because of the mind-body problem, researchers must always infer meanings rather than measure them. This is as true for neuroscientists observing synapses firing as it is for ethnographers interpreting gestures and behaviors in the field. Notwithstanding, certain methodologies – particularly discourse analytic and qualitative field methods – are well suited to studying meaning as an open multi-dimensional construct, virtually undifferentiated from culture (e.g. Berger & Luckmann, 1967), and so have been preferred for the study of meaning in institutions (Zilber, 2008). However, some institutional theorists (e.g. Meyer & Rowan, 1977; Selznick, 1957) have conceptualized the role of meaning much more narrowly. These authors are interested in the way institutions shape meanings principally to the extent that they shape perceptions of value. The approach we have developed here exploits the structure of categories to study differences in value. It provides an approach to studying this critical dimension of meaning, which can be used across significant expanses of time and institutional space.

The study has some limitations. Most obviously, the cross-sectional survey data raise a concern about causality claims. However, as noted above, even if selection effects and reverse causation are driving some of our results, it would be very surprising if there was no effect in the hypothesized direction. Furthermore, the correlational results – the idea that different sorts of intermediaries are associated with different sorts of outcomes – are theoretically interesting. Notwithstanding, a study that modeled causation explicitly would clearly be preferable. Relatedly, it is very difficult to operationalize variables like the ones we have modeled here, on a field scale, at the start of a diffusion event. Consequently, there is a place for a qualitative field study, in some emerging area, to validate and further explore the mechanisms we have proposed. Relatedly, although our arguments about the changing role of intermediaries during diffusion are not core to our findings or contribution, it would be valuable to conduct a longitudinal study in which engagement with intermediaries and the practices being adopted were measured contemporaneously. More generally, we believe this study's findings suggest further research studying *how* managers understand and adopt practices can provide useful insight into how institutional processes shape constitutive beliefs that are held across a field.

APPENDIX: VALIDATION OF OUR MEASURE OF MANUFACTURING PRACTICES

The task we set the experts was difficult. It required them to rate the practices neither according to popularity nor according to their beliefs of importance, but rather in terms of how they perceived adopters perceived the practices. Consequently, we tested their responses five ways. First, we noted that they did not order them according to the research findings – some of the practices most likely to produce productivity improvements (e.g. empowering workers (Dertouzos et al., 1989; Waterman, 1994)) were ranked lowest. Second, the modest correlation between the level of conformity associated with the practices adopted by a site and their average centrality, as scored by the experts (the *manufacturing practices* score)(r=0.12, see table 4), indicates they did not rank them in order of popularity.

Third, we examined whether the practice centrality scores attributed by our experts were consistent with our expectations. As noted above, and as has been observed in prior research (e.g. Zbaracki, 1998), managers do not necessarily accord priority to practices in accordance with the normative theorizations of academics. Rather, we must take into account the interaction between these theorizations and other institutional processes and meanings. Factors such as managers' ability to implement the practices and the social processes which mediate delivery of practices to organisations (Munir & Phillips, 2005; Phillips et al., 2004) will shape the category and its structure on the way to implementation.

Intermediaries – consultants, government bodies, communities of practice etc. -- appeared to act as advocates for MBP programs. When asking how these agents might transform the normative model to ensure its diffusion, we postulated that their principal job would be to persuade firms to adopt the category (i.e. to "sell it" to them)(Cole, 2000; Easton & Jarrell, 2000). That, we contended, required two tasks. First, they had to distinguish MBP from prior occupants of the management fashion niche, or they would not be taken seriously. As the above narrative suggests, the two things that clearly differentiated Manufacturing Best Practices were a focus on Total Quality Management combined with systematic exploration of alternative ways of doing things, particularly through benchmarking (Hanson & Voss, 1995; Pilkington, 1998; Venetucci, 1992). Therefore, we expected TQM and Benchmarking to be the central members. Second, these agents were likely to minimize those elements of the normative model which were likely to induce resistance, namely threats to managers' power (Perrow, 1986), and sources of anxiety (Schein, 1992). These are likely to be activities that required managers to engage interactively with customers, suppliers, and production employees.

We constructed a theoretically-derived expectation of centrality for each practice based on its relationship to the need to differentiate and the need to avoid threat or anxiety, as described above. To analyse the relationship between these theoretically-derived measures and the experts' responses, we gave the two differentiating practices (TQM and benchmarking) a ranking of 1, those which involved direct interactions with customers, suppliers and production workers (likely sources of threat or anxiety) a ranking of 3, and all the others a ranking of 2. We then compared this derived centrality measure with the actual practice centrality score responses from our experts. We did so using ordinary-least square regression, with the experts' measure as the dependent variable and the theoretically-derived measure as the independent variable. Given that there is only one independent variable, the results are not tabulated. Even with the small sample size (n=number of practices=15), there was a highly statistically significant relationship between the two variables ($t=4.02$, $p=0.001$). While the theoretically-derived scale is admittedly simplistic, the agreement between it and the expert's responses increased our confidence in the validity of the experts' scores. In particular, it suggests they were sensitive to the processes that led managers to not adopt purely normative models of Manufacturing Best Practices.

Fourth, Rimmer et al. (1996) summarize a set of 42 demonstration projects funded as part of a broader Manufacturing Best Practices demonstration program (published as Caruso & Australian Best Practice Demonstration Program, 1997). They show that the behavior of the demonstration project participants is broadly consistent with our experts' scores and our theoretical model. In particular, the highest adoption rate is for operational improvement efforts (42/42 firms), while the lowest is employee empowerment and change (see Table A.1).[11]

--- Table A.1 about here ---

Finally, we coded our search of the ABI/Inform database (described in footnote 2 above), which we expect to contain principally normative articles about MBP, because articles on the upswing of a diffusion process tend to be exhortations (Abrahamson & Fairchild, 1999). The search yielded 119 abstracts between 1986 and 1995 (see Figure A1). Fifty-three of these talked about program content. We coded all component practices that were mentioned explicitly or implicitly, and whether those practices represented a main idea in the article, or were just mentioned. Our coding produced a list of 28 practices. We found in both instances that these articles strongly emphasized Total Quality Management (quality itself is first-ranked, and the 3rd, 4th, and 5th highest-ranked- items are also components of TQM) with an additional emphasis on benchmarking and the practices to which benchmarking might lead manufacturers. Furthermore, the top 10 items indicated a fairly even spread of activities directed at employees, customers, suppliers, and technology. (Results available from authors).

---- Figure A.1 about here ----

[11] Please note, these are demonstration projects, so we expect levels of implementation of all practices to be significantly above the population averages. Also, we did not include their technology measure because we are using technology as an independent variable in our analysis.

We had two other concerns about the validity of our experts' scores. The first was that they didn't appear to agree with each other consistently. There was high agreement about which practices were central, moderate agreement about which ones were peripheral, and poor agreement in the middle. We discovered this pattern is quite consistent with other studies of category grading (Barsalou, personal communication, 2006). In retrospect, this makes sense, since we were asking the experts to set aside their normative beliefs and put themselves in the shoes of their research subjects and consulting clients. This is not a straightforward task. The second was that our sample was smaller than the norm in psychological research on grading, which is 8-16 respondents (Barsalou, personal communication, 2006).

TABLES

	Organizational culture dimension	TQM value
1	The basis of truth and rationality in the organization	Decision making should rely on factual information and the scientific method
2	The nature of time and time horizon	Improvement requires a long-term orientation and a strategic approach to management.
3	Motivation	Quality problems are caused by poor systems – not the employees. Employees are intrinsically motivated to do quality work if the system supports their efforts
4	Stability versus change/innovation/personal growth	Quality improvement is continuous and neverending. Quality can be improved with existing resources.
5	Orientation to work, task, and coworkers	The main purpose of the organization is to achieve results that its stakeholders consider important. Results are achieved through internal process improvement, prevention of defects, and customer focus.
6	Isolation versus collaboration/cooperation	Cooperation and collaboration (internal and external) are necessary for a successful organization.
7	Control, coordination, and responsibility	A shared vision and shared goals are necessary for organizational success. All employees should be involved in decision making and in supporting the shared vision.
8	Orientation and focus – internal and/or external	An organization should be customer driven. Financial results will follow.

Table 1. Dimensions for optimal TQM adoption
Source: Detert et al., 2000.

	Survey Item
1	We have a comprehensive and structured planning process which regularly sets and reviews short and long-term goals.
2	Relative to our domestic and international competitors, this site has an advantage/disadvantage in the following areas: Our production planning and control.
3	Our human resource plan is clearly focused on the core skills and competencies required to manufacture competitive products
4	We know our external customers' current and future requirements (both in terms of volume and product characteristics).
5	We are attempting too many simultaneous improvement initiatives (reverse coded).
6	Employee education and training expenditure as a percentage of pre-tax average payroll.
7	Our site's manufacturing operations are effectively aligned with the central business mission.
8	We have a written statement of strategy covering all manufacturing operations, which is clearly articulated and agreed to by our Senior Managers.
9	Ideas from production operators are actively used in assisting management.
10	Our occupational health & safety practices are excellent.
11	Employee flexibility, multi-skilling and training are actively used to support improved performance.
12	Which of the following "pay for performance" schemes for production operators have been introduced at your site: None of the above.
13	Relative to our domestic and international competitors, this site has an advantage/disadvantage in the following areas: Our people's abilities and skills.
14	The following are important BARRIERS to achieving improved business performance: Ability to implement change by senior management (reverse coded)
15	The following are important BARRIERS to achieving improved business performance: Ability to implement change by middle management/supervisors (reverse coded)
16	The following are important BARRIERS to achieving improved business performance: Ability to implement change by production operators (reverse coded)
17	These customer requirements are effectively disseminated and understood throughout the workforce.
18	Relative to our domestic and international competitors, this site has an advantage/disadvantage in the following areas: Our supplier relationships.
19	When we develop our plans, policies and objectives, we always incorporate customer requirements, supplier capabilities, and the needs of other stakeholders, including the community.
20	Our site has effective "top-down" and "bottom-up" communication processes.
21	There is a high degree of unity of purpose throughout our site, and we have eliminated barriers between individuals and/or departments.

Table 2. Items making up the Capacity Practices measure

	Practice	Expert Score	Theoretical score	Adoption fraction (%)
1	Benchmarking	4.6	3	60
2	Taking the requirements of customers into account when designing new products and services	4.0	2	91
3	Designing products to match manufacturing and other capabilities	3.6	2	65
4	Systematically and regularly measuring customer satisfaction	3.6	1	65
5	Machine set-up time reduction	4.2	2	87
6	Statistical process control	4.0	2	86
7	Preventative maintenance	4.0	2	96
8	Housekeeping	3.6	2	98
9	Self managed and/or cellular work teams	3.8	1	77
10	Having an organization-wide training and development process including career path planning for all employees	3.4	1	43
11	Regularly and formally measuring employee satisfaction	3.2	1	39
12	Working closely with suppliers in product development	3.6	1	48
13	Total quality management	5.0	3	77
14	Just-in-time	4.8	2	62
15	Manufacturing resource planning (MRP, MRPII)	3.4	2	52
	Number of observations	5		897

Table 3. Components of manufacturing practices: experts' scores, theoretical scores (see appendix), and adoption fraction.

		Mean	*S.D.*	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*	*(13)*	*(14)*	*(15)*	*(16)*
(1)	Mfg Practices	3.97	0.1	1															
(2)	Capacity Practices	0.09	0.43	-.19	1														
(3)	Theorizers	6.49	2.33	.08	.05	1													
(4)	Comm. of Practice	4.76	2.03	.15	.05	.30	1												
(5)	Cust. & Supp.	5.38	1.76	-.04	.13	.18	.31	1											
(6)	Managerial Exposure	0	0.81	.18	.02	.09	.19	-.05	1										
(7)	Ops Core Exposure	0	0.49	.04	.15	.22	.16	.09	-.06	1									
(8)	Conformity	7.79	1.54	.12	.34	.17	.26	.18	.24	.30	1								
(9)	No. of Unions	1.91	1.73	.10	.00	.01	.11	-.05	.46	.20	.09	1							
(10)	Unionized	0.82	0.38	.14	-.04	.04	.09	-.05	.39	.00	.08	.51	1						
(11)	# Bargaining Units	0.55	0.5	.07	.04	.05	.08	.02	.20	.00	.14	.03	.32	1					
(12)	Employee Growth	0.02	0.15	-.05	.05	-.01	-.03	.05	-.16	-.02	-.05	-.23	-.25	-.09	1				
(13)	Australian Site	0.73	0.44	-.02	-.02	.05	-.17	-.16	.09	-.03	-.04	.01	-.02	-.05	-.08	1			
(14)	European Parent	0.13	0.33	.00	.01	-.01	.01	-.04	.23	-.04	.03	.08	.09	.06	-.10	.07	1		
(15)	US Parent	0.07	0.26	.03	.09	.09	.08	.00	.15	.04	.08	.02	.00	.07	.00	.10	-.11	1	
(16)	Japanese Parent	0.03	0.16	.00	.09	-.06	.06	.10	.09	.11	.15	.14	.07	.08	-.05	-.07	-.06	-.04	1

Table 4: Means, Standard Deviations and Bivariate Correlations of variables used in the analysis

Implementation area	Adoption rate
Process improvement	100%
Structure	88%
Strategy	83%
People management	83%
Measurement and control	81%
External relations	76%
Change leadership	74%
Empowerment	33%

Table A.1: Implementation patterns of the 42 participants in the MBP demonstration program (From Rimmer et al. 1996:66)

FIGURES

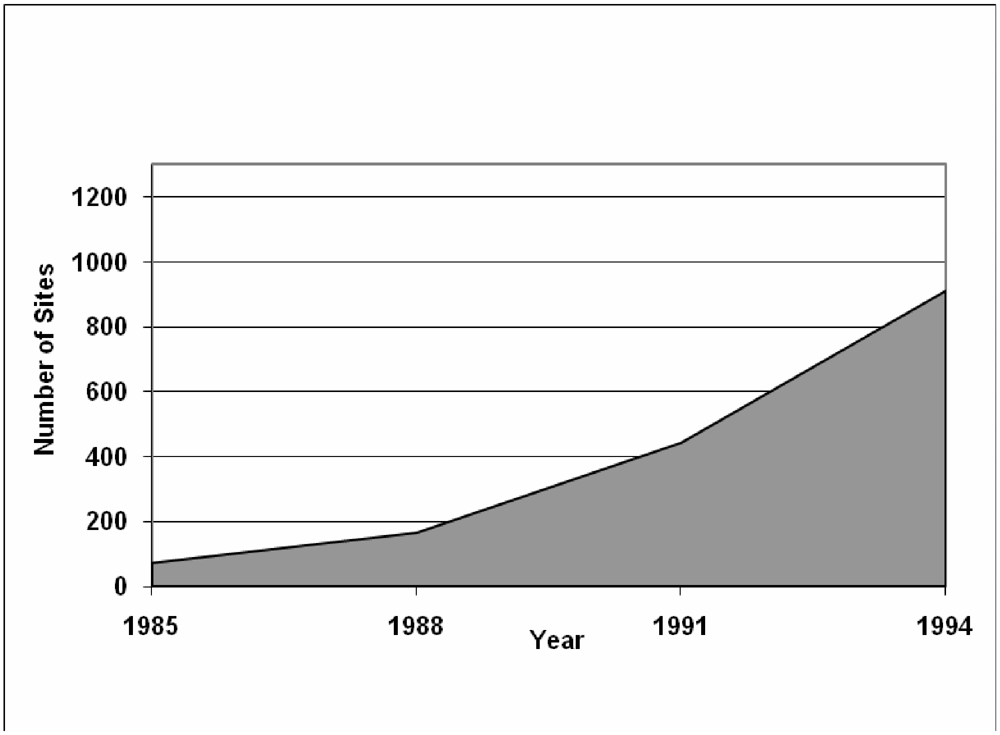


Figure 1: Cumulative adoption of Best Practices initiatives among Australian & New Zealand manufacturing sites (n=1289)

Figure 2: Theoretical model – Capacity practices

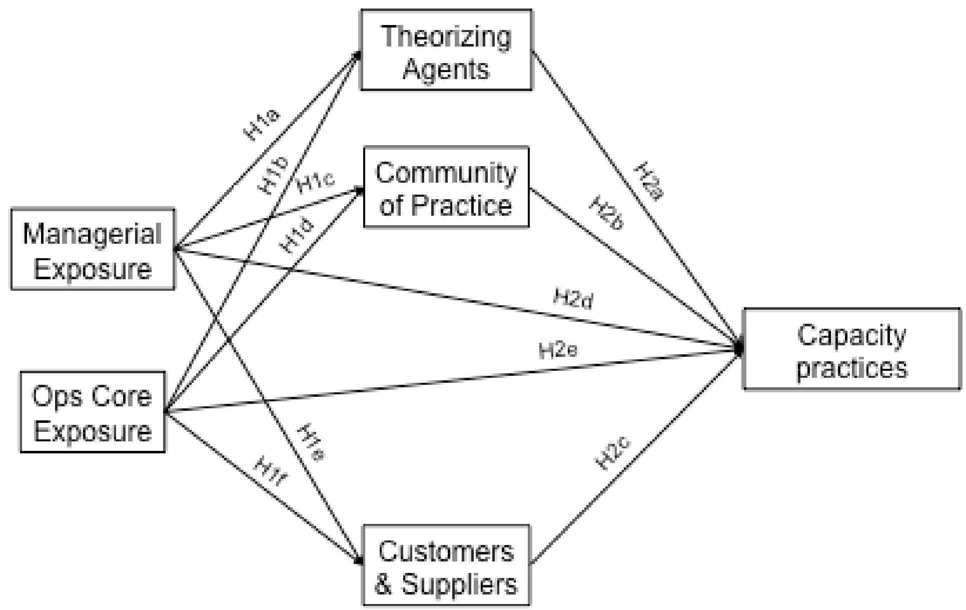


Figure 3: Theoretical model – Manufacturing practices

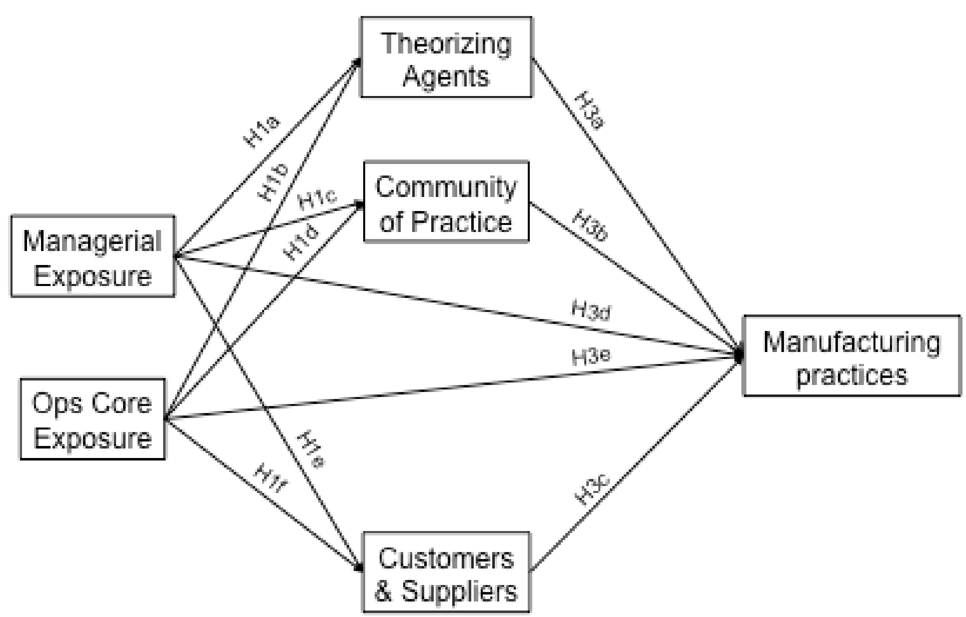
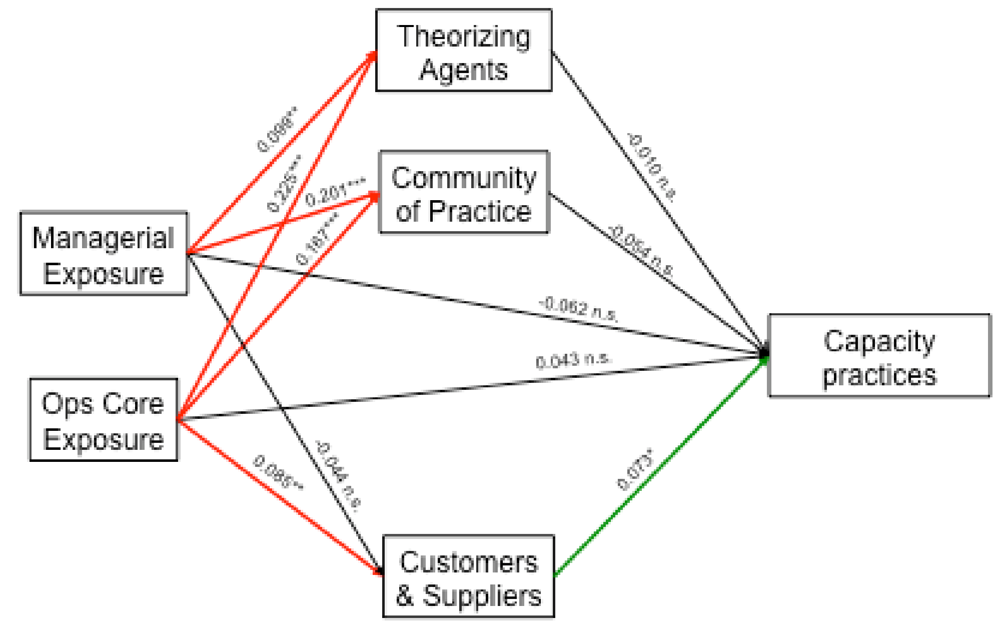
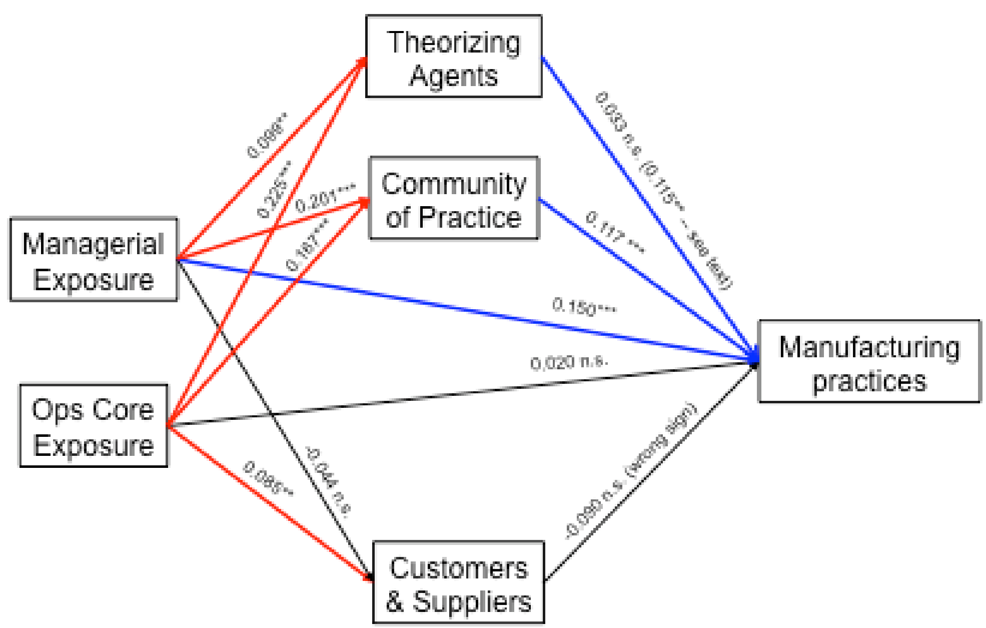


Figure 4: Path analysis – Capacity practices



*** p<0.001, ** p<0.01, * p<0.05 (one-tailed)
Control variables not shown (see text for list)
All weights are standardized

Figure 5: Path analysis – Manufacturing practices



*** p<0.001, ** p<0.01, * p<0.05 (one-tailed)
Control variables not shown (see text for list)
All weights are standardized

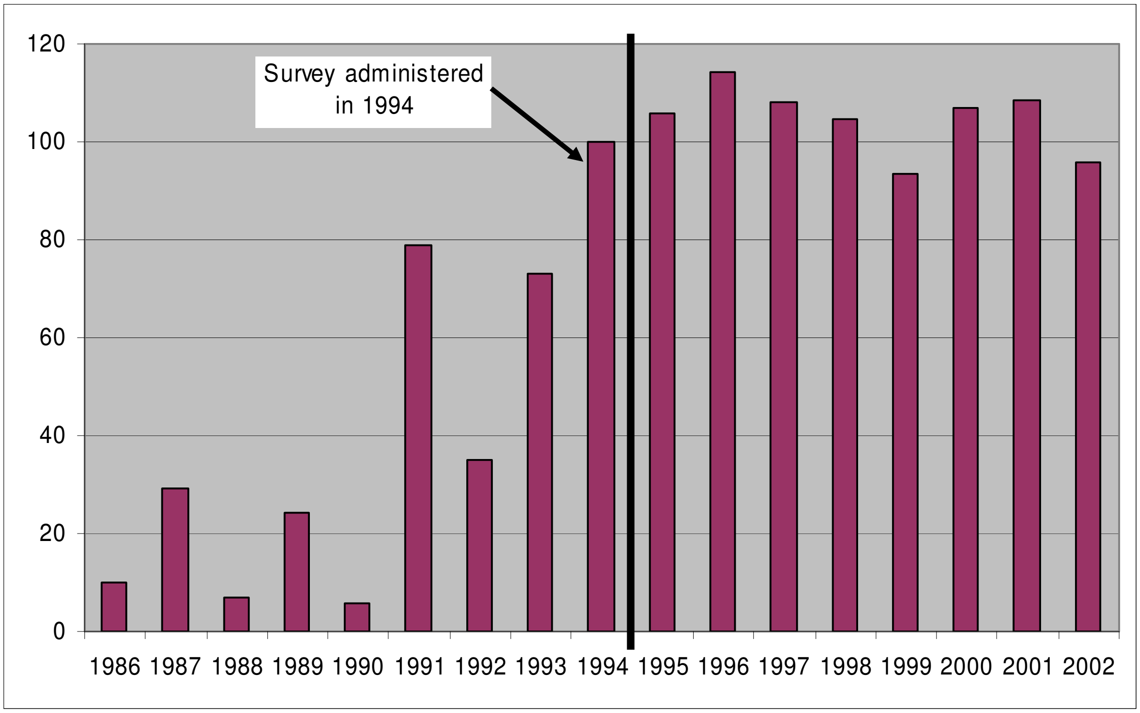


Figure A.1: Index* of Relative Number of Articles about Manufacturing Best Practices from ABI/Inform Search, 1986-2002 (1994=100).

*To construct the index, the number of "hits" in each year was first divided by the total number of articles in the ABI/Inform Database for that year. Based on these values, the 1994 reference year index was set to 100 and the other years' index values were set relative to it. The survey was administered in 1994. We also show index scores for several years after 1994. These later data points suggest MBP did not exhibit a fad-like pattern of rapid increase followed by a subsequent decrease.

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