Mediating Among Scientists: A Mental Model of Expert Practice

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Abstract

Despite the considerable research on mediator behavior, the cognitive structures and processes that presumably guide the strategic and tactical choices of professional mediators are poorly understood. The current study made use of a reflective case study method to explore in considerable detail the strategic thinking of five experienced mediators. The project was conducted at the National Institutes of Health whose Office of the Ombudsman (OO) mediates disputes among the institute's scientists. Eighteen cases were studied. The thinking of the mediators in these cases displayed regularities that are described in terms of the ombuds team's *working mental model* of mediation. The mental model consists of two strongly contrasting intervention scripts: a *deep problem-solving* script (DPS) focused on identifying and addressing latent issues of an interpersonal or systemic kind and a *tactical problem-solving* script (TPS) focusing instead on the issues as presented by the parties. The tactical script was applied in either an *integrative* bargaining mode or a more *distributive* quasi-arbitration approach. The choice of which script to follow in a given case is determined by *first order decision rules* concerning the existence and nature of any latent problems that may be present, and *second order*

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decision rules concerning the parties' capacity to engage in "deep" problem-solving. Despite their very different foci, both DPS and TPS appear to follow the same metascript of problem-solving stages, beginning with an intensive diagnostic phase during which the decision rules are applied and a script "selection" is made. DPS is the preferred intervention mode of team members. Every case began with at least a preliminary effort to search for and address latent causes, and team members expressed dissatisfaction if they could not apply DPS in cases where latent problems were thought to be fueling the conflict. However, ombudsmen used the scripts flexibly and switched to TPS if DPS was unnecessary or impractical. Both scripts produced agreements that were useful to the parties and to the institution's scientific purposes, particularly the fostering of scientific competence. The mental model is heavily shaped by the social context in which the ombudsmen function. Thus, the primacy of DPS in the model appears to be due to the fact that the ombudsmen are "repeat players" in the life of the NIH and therefore in a position to become adept at recognizing the latent sources of its dysfunctional conflicts, are under a strong role mandate as ombudsmen to pay attention to covert patterns of organizational dysfunction, and deal with disputants pressed to address latent issues blocking scientific work.

The prevailing empirical literature on mediation is extremely diverse, focusing on such things as the variables that affect the likelihood that mediation will occur, the effectiveness of mediation in different settings, the strategies and tactics used by mediators and the relationship of mediator behavior to outcomes (Kressel, 2006; Wall, Stark, & Standifer, 2001). This body of research has greatly expanded our understanding of the mediation process, but, with some notable exceptions, it largely neglects how experienced mediators think, particularly in terms of global, "top down" cognition that appears characteristic of expert performance in many other domains (Feltovich, Prietula, & Ericsson, 2006; Ross, Schaffer, & Klein, 2006) and that presumably plays an important role in influencing mediator behavior.

In this article, we report the results of a 3-year collaboration between a research oriented practitioner and a practice oriented researcher to explore and carefully describe the cognitive underpinnings of practice of an experienced group of mediators. The setting for the study was the Ombuds man's Office (OO) at the National Institutes of Health, whose primary mission is to advance the frontiers of biomedical research. For the purpose of understanding how expert mediators think and how their thinking is structured, this setting had several appealing qualities. First, it involved experienced practitioners already inclined to critical self-reflection and eager to improve their

practice through intensive, systematic case study. Second, it offered a unique opportunity to learn about the causes, dynamics, and management of conflict among scientists, a topic that, occasional high profile accounts not withstanding (Kevles, 1998; Watson, 1969), has been very little studied despite the fact that to do their work scientists must collaborate closely.

We begin with an overview of the small, but important, literature on higher-level mediator cognition and the methodological and conceptual perspective that informed our collaboration.

Higher Order Cognition in Mediation

For the practitioner community, top-down thinking about mediation appears to come naturally and underlies many of the debates in the field about the proper role of the mediator. The concept of mediator ''style'' is perhaps the most illustrative example. Mediator style refers to the overarching goals and organizing ideas that are said to be the appropriate basis for intervention. Practitioners talk of ''facilitative,'' ''evaluative,'' and ''transformative'' styles (Bush & Folger, 1994; Kressel, 2006; Riskin, 1996), among others, and there is often a direct or strongly implied message that the style being described is inherently superior to other styles, regardless of context or the nature of the dispute. The empirical evidence for the homogeneity, relative effectiveness, and specific cognitive and behavioral components of these styles is scanty, however (Pruitt, 2006).

Among mediation researchers there is a much smaller, but important, literature on mediator style and the related concept of third-party ''strategy,'' both of which involve a top-down cognitive component. Kolb's (1983) study of ''dealmakers'' and ''orchestrators'' among labor mediators, Silbey and Merry's (1986) ''bargaining'' and ''therapeutic'' styles in family and civil law contexts, and the ''problem-solving'' and ''settlement oriented'' styles in divorce mediation described by Kressel, Frontera, Forlenza, Butler, and Fish (1994) are ethnographic, case-based examples.

A handful of other empirical studies, using more traditional methods, have identified higher order third-party strategic orientations, although typically with nonprofessionals (students, managers) serving as the sources of data. Carnevale's well-known research on strategic choice in mediation has identified four overarching strategic approaches that mediators may take—*integrate, press, compensate,* and *inaction.* The likelihood of each strategy has been found to be a function of the relative strengths of two mediator cognitions—the perceived value of helping the disputants achieve their aspirations and the probability that a mutually acceptable solution can be reached (Carnevale, 1986). The higher order cognitive concepts of ''schema'' or ''frame'' have also been used to study how lay people believe they would intervene in hypothetical everyday conflicts (Sheppard, Blumenfeld-Jones, & Roth, 1989), and a few studies have identified the overarching intervention strategies used by organizational managers (Pinkley, Brittain, Neale, & Northcraft, 1995) or graduate business school students (Karambayya & Brett, 1989) acting as informal third parties in simulated organizational disputes.

Collectively, this research provides evidence that third-party intervention may be studied fruitfully at a higher level than the mere identification of individual tactics, which has been a more dominant research trend (Kressel, 2006; Wall et al., 2001). However, the number of such studies is small and restricted to only a few institutional contexts. It often involves nonprofessionals and, with a few notable exceptions, provides few details on the cognitive structures and processes underlying stylistic or strategic orientations. There is clearly value in expanding research on higher order mediator cognition to other institutional settings and to focusing on the thinking of seasoned professionals.

Conceptual Considerations

Given the paucity of research on the thinking of experienced mediators, we did *not* begin with a set of well-defined hypotheses about higher order cognition. We began instead with a few broad conceptual and methodological assumptions, drawn from our own direct mediation experience (both authors have been practicing mediators for many years) and a close reading of the ethnographic, case-based literature on mediation practice (e.g., Brett, Drieghe, & Shapiro, 1986; Kolb, 1983; Kressel et al., 1994; Silbey & Merry, 1986). We were also influenced by Donald Schon's (1983) seminal work on reflective professional practice and by studies of real-world decision-making involving dynamic, ill-structured problems, with arguably genotypical similarities to the situations faced by mediators (Klein, 1998; Ross et al., 2006).

On the conceptual side, our basic assumptions were that the behavior of seasoned mediators is driven by some form of high-level cognitive organization; that this organization is, to a significant degree, implicit; and that it depends on the capacity to recognize recurring patterns of events, interactions, or situations in their area of practice. Our own direct experiences also suggested strongly that mediator approaches to the role, at least for highly experienced, competent professionals, are bound to be very closely tied to social conditions and will be shaped by those conditions in powerful ways. All mediation is "local." We are not the first to notice this. Kolb's (1983) path-breaking ethnographic study of "dealmakers" and "orchestrators" in labor mediation turns on how the very different social contexts of practice provided by state and federal mediation services can profoundly effect how mediators think and behave. The primary goal of the study was to see if our basic assumptions about mediator cognition were true in this particular setting and, if so, to describe them in some detail.

There was no single concept that was self-evidently best for our purpose of capturing the global, complex, and organized nature of mediator thinking. In social (and clinical) psychology, likely candidates included the terms "schema," "scripts," "frames," and "mental models," all of which have been used fairly loosely and interchangeably (Barone, Maddux, & Snyder, 1997).

Of the various terms from social cognition available to describe the thinking of the National Institutes of Health (NIH) ombudsmen we have chosen the concept of *Working Mental Model.* Borrowing from Barone et al. (1997), a working mental model may be defined as a "symbolic construction representing events, guiding problem-solving,

and changing in response to experience. Working models offer a schematic, a map, a blueprint, a flowchart, an outline, a sketch, a scenario, a script, a plan'' (pp. 105; 117). As Barone et al. note, the concept of the working mental model has been adopted by both cognitive psychologists and clinicians—a propos for our purposes, since mediation is a quasi-clinical activity. It is also a notion that has adaptive meaning: ''*Working* signifies that the model does something (such as directing exploration or enabling simulations) and that they are the current best estimates, continuously being updated by the information sampled'' (p. 106)—also a propos, since this implies that a detailed knowledge of one's working mental model is important for mediators as a means of effective functioning and self-improvement.

Methodological Considerations

Given our interest in elucidating top-down cognitive processes and exploring the role of social context in shaping those cognitions, we decided on a comparative, case-based ethnographic approach. Friedman (2004) has noted the incalculable value of an ethnographic stance for capturing the detailed knowledge about the social and institutional norms of professional negotiators. We also felt strongly that our ethnographic approach should be case-based. Although case study methods have important uses for conflict theorists (Druckman, 2005), with the exception of international negotiations (Zartman, 2005), they have not been especially popular. In a review of a decade of recent research in major empirical journals on conflict and negotiations, case study investigations represented only 4% of reported studies (De Dreu & Carnevale, 2005). Nonetheless, as Zartman (2005) has noted, comparative case studies can be of inestimable value for satisfying the needs of both analysts and practitioners for understanding the components of successful performance. In his evocative words, ''comparative case studies lie at the crossroads of reality and theory; they present their evidence through the eyes of a knowledgeable specialist and test it against the hypothetical constructs of a creative conceptualists'' (Zartman, 2005, p. 3).

The value of the case study method is also supported by the growing research literature on the naturalistic decision-making of experts. There is considerable evidence, for example, that experts tend to think in terms of cases when asked to justify their decisions or actions (Hoffman, 1996). Klein's (1998) influential research program on expert decision-making has been based almost entirely on investigating such case-based stories. The value of case-based methods for elucidating the implicit wisdom of experts is connected to the ''automatic'' nature of expert thinking that makes it hard for experts to articulate what they know in the absence of a concrete stimuli. In addition, as Klein (1998) has pointed out, expert decision-making rests on subtlety of pattern recognition as well as a tendency to react to things that are not happening as well as those that are. Getting experts to talk about cases in a systematic way serves as a useful means of countering these cognitive masking tendencies.

A case-based method was also highly congruent with the pragmatic goals of the NIH team to improve their collective practice. The Ombudsman's Office's traditional weekly case review meetings mixed unstructured descriptions of case histories with requests for

help, expressions of support, suggestions for interventions and the giving of criticism. While that approach built solidarity among the staff it did not produce either a sense that their understanding of the conflict dynamics among scientists was becoming more sophisticated or a clear understanding of why particular interventions succeeded or failed.

In our quest for a practically useful, case-based ethnographic method we adopted an approach developed by Kressel (1997) in his study of divorce mediation. The method, referred to as the *reflective case study method*, is based on Donald Schön's (1983) influential notions of reflective professional practice. Schön argued that the solution to improving professional performance (he did not write specifically of mediation) should involve research that takes as its starting point the vexing and complex realities of professional activity.

> The reflective turn is…a kind of revolution. It turns on its head the problem of constructing an epistemology of practice. It offers as a first order answer to the question, what do practitioners need to know?, reflection on the understandings already built into the skillful actions of everyday practice. Even when the [researcher] wants to help practitioners acquire a new set of skills or insights…his or her primary concern is to discover and help practitioners discover what they already understand and know how to do (Schön, 1991, p. 5).

Kressel's reflective case method, which we describe in detail later, attempts to operationalize Schon's perspective via the structured, systematic debriefing of mediator cases in a supportive, but probing environment. It also has much in common with interview methods that have successfully captured the cognitive activity of other types of experts (Hoffman, Crandall, & Shadbolt, 1998). The reflective case study method had special appeal as a vehicle for studying expert mediation practice because a recognized hallmark of expertise in any domain is a highly developed capacity for metacognition—the capacity to reflect on one's own knowledge and performance. Experts are good at reflective learning (Feltovich et al., 2006) and self-monitoring (Chi, 2006). Second, the capacity to reflect appears to be a product of the developed cognitive structures embodied in the mental models of experts (Feltovich et al., 2006). The reflective case study method should therefore be a good vehicle for elucidating such models.

Method

We describe below the institutional setting in which the research occurred, the characteristics of the 18 cases that were the subject of scrutiny, and the mediation format by which those cases were handled. We conclude with an account of the reflective case study method that governed the collection of data, and describe our approach to data analysis.

The Setting and Project Team

The National Institutes of Health collectively represent one of the world's premiere research institutes. There are roughly 20,000 employees at NIH, and approximately half of them are directly involved in scientific research activities. Of this number about 1,000 are tenured scientists and 3,600 are postdoctoral researchers. The others are support

people, including staff scientists, technicians, veterinarians and animal care assistants, students, and clerical support staff. The NIH Office of the Ombudsman was established in 1998. It provides a range of dispute resolution programs and services for all employees of the NIH. Among these programs is mediational assistance to NIH scientists in conflict with each other in ways that directly impact their scientific collaboration.

The project team consisted of the five members of the Office of the Ombudsman. All of them are seasoned professionals, with a collective average of more than 10 years in mediation and related activities. Two had prior experience in counseling psychology; one in organizational development; one in law; and one in the management of Equal Employment Opportunity (EEO) grievances. The first author did no mediation, but served as the coordinator of the research activities in the role of *reflective facilitator*, an activity described in The Reflective Case Study Method.

Criteria of Case Selection

A number of criteria governed the selection of cases. First, since an important goal of the NIH team was to better comprehend the vicissitudes of scientific collaboration, the dispute had to either involve conflict over the substance or procedures of scientific work or seriously impair the interpersonal or organizational research climate. In the year 2000 such cases represented approximately 15% of the 350 conflicts handled by the OO. By the year 2004 such cases represented 40% of almost 500 cases. The majority of these cases began with a single individual who came to discuss a problematic situation and eventually segued into mediation after discussion with the ombudsman. (The OO offers other forms of assistance besides mediation depending on need and motivation. These include individual coaching, shuttle diplomacy involving no joint sessions, and facilitated workshops on conflict management.)

Second, as noted earlier, case selection was driven to a very significant degree by the desire of the OO staff to improve its collective practice and learn from each other's experiences. Cases were selected not by traditional research criteria (e.g., on a random or "representative" basis) but by such ombudsman practice concerns as needing help, wanting to understand a complex or confusing case better, or the desire to explore an interesting case dynamic. (While there is some reason to believe that many of the 18 cases ultimately selected were more complex than the average mediation case of the OO, the individual ombudsman had a great deal of freedom to suggest which case they wanted to present for reflective study and weren't required to give extensive reasons for their selection.)

Finally, the project also had to be tailored to suit the ethical and professional standards for ombudsman functioning. Foremost among these was the protection of the confidentiality of the disputants.

The Cases and Their Characteristics

Eighteen cases provided the data for this study. Eleven of them were completed cases that had ended within 1–4 weeks of the reflective case discussion; seven were ongoing at the time of reflection. The relatively small number of cases was a function of the

amount of time consumed by each reflective case discussion (4–6 hours was typical) and the need to accommodate to practical exigencies, such as the work demands of a very busy office, the fact that the reflective facilitator was available on average only once a month, and the need to set aside an entire day for case debriefings to minimize facilitator travel time and associated expenses. The time needed to make sense of the large amounts of qualitative data generated by the reflective case method was another factor limiting the size of the sample, a familiar trade-off in research with an ethnographic thrust (Friedman, 2004; Kolb, 1983).

The cases involved five categories of conflict:
(1) *Mentoring conflicts* ($n = 6$). Disputes involving a senior scientist and his or her scientific protégé, usually a postdoctoral fellow (PDF). Typically these conflicts involved either assertions by the junior scientist that the mentor was providing inadequate guidance or support, or claims by the senior member of the dyad that the junior person was disruptive or lacked competence.
(2) *Interpersonal conflicts* ($n = 3$). Dyadic conflicts revolving around serious interpersonal tensions or allegations of inappropriate personal interactions. These cases all involved scientific peers (or near peers) in the earlier stages of their careers (usually PDFs).
(3) *Allegations of uncollegial behavior and possible scientific misconduct* ($n = 3$). Disputes involving allegations of plagiarism, falsification of data, or the violation of the appropriate norms and procedures in the scientific review process.
(4) *Intellectual property disputes* ($n = 3$). Disputes about authorship or ownership and control of intellectual property.
(5) *Organizational conflicts* ($n = 3$). Conflicts about matters of procedure, leadership, data collection, or fair treatment within a research group.

The most common route by which disputes reached the OO was by referral from a lab chief or other administrator to whom the principal disputants reported (50% of the cases). These referrals were in the form of suggestions, rather than coercive "orders," and participation in mediation was always voluntary. Interestingly, in six of these nine cases the referring senior person also eventually became involved in the mediation, often in ways that were useful.

Of the 45 individuals who were most directly involved in these 18 cases, 35% (16) were junior scientists (PDFs or untenured scientists) and 38% were senior scientists (7) or senior scientific managers (10) (lab chiefs, program directors). As these figures would suggest, more than three-quarters of the disputes (14) involved some clear status discrepancy. Fully half of the cases involved at least one postdoctoral fellow. Forty-seven percent of the disputants (21) were women. More than a third of the disputants (38%) were non-U.S. nationals, of which the largest proportions were from Asia (52%) and Eastern Europe (29%).

The Mediation Procedures

Case management may be characterized as *intensive, complex, and caucus driven.* The average case involved nearly 30 hours of intervener time (if we include co-mediators,

translators, and consultants the number would approximate 40–50 person hours per case) and extended over periods of weeks and sometimes months. The intensity of the interventions in these 18 cases is more or less typical because of the relative complexity of the scientific disputes that arrive at the OO's doorstep.

Co-mediation was the most common mediation format, occurring in 11 of the 18 cases (61%). The modal case ($n = 6$) involved 15–25 hours of staff time and five cases involved somewhere between 30 and 60 hours. No case involved fewer than 5 hours. Nine of the cases (56%) involved persons in addition to the principals and seven cases made extensive use of e-mail and telephone contacts in addition to the various face-to-face meetings.

Intervention typically began with caucuses with the principals (or occasionally the referring person) to gather information, formulate a preliminary strategy, and determine who else might be usefully consulted. Joint sessions with the principals (and sometimes others) typically followed the initial round of caucuses. These meetings were devoted to problem-solving and negotiations. A return to caucusing was common at various points, usually to do further problem-solving with the principals in a less tense atmosphere than could be provided in joint sessions or to get further information. Every case save one involved more caucuses than joint sessions. The average ratio of caucuses to joint meetings per case was 3.72.

We did not attempt to sample an equal number of cases for each member of the OO team. Case selection was driven primarily by the criteria noted above and what in hindsight may have been an implicit preference to focus on the most experienced members of the group. Thus, the OO's Director, by far the most seasoned member of the team, is represented in half of the 18 cases either as solo mediator (three cases) or the lead mediator in a co-mediation team (six cases). The two next most experienced ombudsmen figured in seven cases each. (One was a solo mediator in three of her cases and a co-mediator in four; the other was the sole mediator in one of her cases and a co-mediator in six.) The newest members of the group each figured in three cases, always as a co-mediator with one of the more senior members of the team.

The Reflective Case Study Method

The research vehicle was the in-depth reflective case conference. Case conferences occurred once a month and typically covered one or two cases. Each case received from 3 to 6 hours of team discussion, with an average approximating 5 hours per case.

Protocols and Procedures

The reflective case discussions were guided by *a Case Conference Protocol* (CCP), adapted from Kressel (1997). The protocol gave a degree of uniformity to the reflective process from case to case, reminding the team of factors to consider and the importance of keeping the reflective dialog as specific and concrete as possible. The case discussions focused on the team member(s) whose case was being considered. Serving as the reflective facilitator, the first author directed these discussions.

The CCP began with a semi-structured interview of the target team member(s). Interviews were 30–40 minutes in length and were intended to give the team a shared

understanding of the basic facts of the case and the major issues of concern to the mediator(s) whose case was being discussed.

Guided by the CCP, the conference then proceeded to a detailed discussion in five major areas: *Positive dispute characteristics* (characteristics of the dispute that aided productive management of the conflict and eased the task of the mediator); *Negative dispute characteristics* (characteristics that appeared either to fuel destructive conflict or posed serious obstacles to effective intervention); *Positive interventions* (actions or strategies of the mediator that helped reduce tension, moved the parties in productive directions, or had other positive effects); *Negative interventions* (mediator actions or strategies that appeared to have increased tensions, moved the parties in unproductive directions, or had other negative or negligible effects); and *Lessons to be Learned* (e.g., for handling similar cases or improving the procedures of the OO).

Norms of Case Deliberation

Behavioral norms for guiding the reflective dialog were needed lest the pressures for team consensus and cohesiveness interfere significantly with the goals of honest and searching reflection. At the outset of the project the requisite norms were embodied in a written document that was circulated to all team members and discussed in detail. The key injunctions were *to ask open-ended, but focused questions to clarify unarticulated knowledge* (e.g., "What was happening?" "What did you feel or see at that moment?"); *to summarize what others have said in order to insure understanding and slow down the dialog to create "space" for reflection; to challenge others in a firm, but respectful way* (e.g., "Why wouldn't 'x' have been a better intervention here?"), and t*o probe for the concrete meaning of abstract terms* (e.g., if "creating a trusting climate" is offered as one of the effective mediator interventions, ask how trust was created). A central part of the reflective facilitator's role was to have the group observe these norms to the greatest extent possible.

Data Analysis

A quasi-ethnographic approach such as the reflective case study method generates large amounts of verbal data and also involves building theory from observations in a gradual, iterative process as data collection continues (Friedman, 2004). There are no universal procedures for analyzing the data generated by such a process, but structured and frequent efforts at data reduction are necessary. Our approach to data analysis was very similar to that described by other conflict ethnographers (Friedman, 2004; Kolb, 1983).

1. *Immediate summaries of key case themes*. As the team proceeded through each section of the CCP the reflective facilitator dictated the results of the deliberations onto a "reflective summary" audiotape for later transcription. Starting with the sixth case, a second, continuous "rolling tape" was also made of each reflective case conference to capture the complete reflective dialog. During the reflective case discussions the reflective facilitator (RF) made summaries of "key themes." These were fairly low level—e.g., summarizing the thrust of a particular intervention and the mediator's thinking behind it. The team would either endorse the RFs summary or modify or expand it on the tape recording of the case discussion. As soon as possible after each day's work with the OO, the RF would review his notes and reflect on the day's discussions, noting important

phenomena or emerging ideas (e.g., how frustrating it was to team members when they could not address what they felt were important underlying issues and how severe these self-criticisms sometimes seemed).

2. *Detailed analysis of the audio recordings of the reflective case discussions*. As soon as possible, transcripts were made of the audio recordings of the reflective case summary tapes, which typically ran to 15–20 pages. The first author read these carefully and made notes on the answers to all the CCP protocol questions as approved or modified by the team during the case discussion. The complete ''rolling tape'' of each reflective team case discussion was also carefully audited for significant ideas or incidents that had not been summarized in the transcribed summary tape. Each case generated as many as 60–70 thematic or incident-based case notes, organized around intervention strategies and the thinking behind them, case dynamics that were experienced by the team as helpful or problematic, and ''lessons learned'' by the team from each case.

3. *Case summaries*. An 8–10 page *case summary* was written of each case, summarizing the *key phenomenon.* For example, in a given case three or four *intervention strategies* (e.g., ''fact-gathering''; ''strategic reframing''; ''negotiating a separation'') and four or five dispute characteristics (e.g., ''constructive involvement of leadership''; ''avoidant pattern of communication between the parties'') might be summarized. Key themes or ''reminiscences'' with other cases were also noted. As the case summaries accumulated, more and more of these connections became apparent—for example, the large amounts of time spent in many disputes on information gathering before a strategy of intervention was decided upon or how similar the overall intervention strategy in one case was with that in another. These case summaries were circulated to team members for comment. The case summaries also began to inform the debriefing of new cases, and some of the key phenomena from earlier cases (say the intensity of an initial period of diagnostic activity) would stimulate the reflective discussion of a new case—helping to clarify or amplify the thinking behind the phenomenon and its relationship to other aspects of intervention.

4. *Emergence of explanatory concepts.* The end of active data collection was a somewhat arbitrary event, driven primarily by a sense that no unfamiliar and important new phenomena were being uncovered. At this stage, the first author went back closely over the cases to look for further *explanatory concepts* cutting across cases. It became apparent at this stage that the cases could be more or less evenly divided into those in which ''deep'' issues had been addressed and those in which the mediator had hewed more or less to dealing with the issues as presented by the parties. Once this fundamental dichotomy was established it informed the search for other associated regularities and eventually to the embracing of the mental model concept and its component parts, which is at the heart of this article.

Methodological Coda

We are well aware of the methodological trade-offs and compromises that have been made in this investigation. For example, because of the strong norms of confidentiality that characterize ombuds culture and the great sensitivity of many of the cases, it proved impossible to observe or tape-record mediation sessions or contact the parties

directly after the conclusion of a case for their reactions. Beyond the explicit criterion that cases directly impact scientific collaboration in some clear way, we also trusted to the judgment and needs of the OO team to pick cases that were "challenging" in some broadly defined way and therefore likely to generate the kind of insight into practice that was our overarching goal, rather than attempting to impose a more systematic (or random) method of case selection.

Finally, while the CCP and the agreed upon norms of case deliberation imposed a useful order and purpose to case review, the reflective process was deeply interactive. Our approach was, in fact, part ethnography and part action research, of the type Schein (2001) has labeled "clinical research inquiry." Thus, there were occasional departures from the CCP when a case appeared so complex and so frustrating to the ombudsman that a less circumscribed and more spontaneous mode of case debriefing around the key concerns of the CCP seemed necessary to maintain morale and pursue understanding. In addition, early on, the RF began to share his observations with the team about emerging themes concerning intervention strategy or conflict dynamics. Quite naturally, these observations fed into the case reflections of the group and the work of team members, all of whom found their practice affected to some immeasurable degree by their participation in the project.

On the whole, these methodological departures (as seen from a traditional empiricist vantage point) seemed eminently worth making in exchange for the opportunity to have intimate access to the thinking of an enthusiastic group of professionals mediating in a virtually unstudied and important form of social conflict. Every method has its strengths and limitations. In the discussion section we will consider the implications of this fundamental fact for the findings produced by our methodological choice.

Results

The aim of the study was to explore and describe the cognitive underpinnings of mediation practice of the NIH OO. The content and structure of those cognitions are well captured under the heading of the OO *working mental model* of practice. The working mental model of the NIH ombuds team has three core components: (a) two contrasting *scripts of intervention*, (b) *decision rules* that determine which script will predominate in a given case, and (c) an overarching *metascript of problem-solving stages* that each script follows, albeit in distinctive ways. Each of these components of the mental model is described in turn. We begin with an account of the two intervention scripts, which are at the heart of the working mental model, illustrating each script with case examples. We will then proceed to an account of the decision rules that appear to govern script "engagement" and thence to the metascript of problem-solving stages.

1. Approaches to Intervention: *The Deep Problem-Solving and Tactical Scripts*

The concept of *intervention scripts* organizes much of what the NIH ombudsmen had to say as they talked about their efforts to manage the conflict among the scientists in our

18 cases. In half of those cases the ombudsmen's intervention activities and rationale appeared to follow a Deep Problem-Solving (DPS) script; in a third of the cases their activities and thinking conformed to a contrasting Tactical Problem-Solving (TPS) script (three cases could not be clearly classified according to script type).

These contrasting scripts were not a conscious part of the reflective case discussions. Team members rarely spoke of their "models" (scripts, in our terms) of intervention and, on occasion, took issue with suggestions that the case studies might eventually reveal that they did have a consistent model or models. They favored the notion that, other than being informed by the broad goal of being nondirective and neutral facilitators, their work was guided by the idiosyncratic demands of each case. Nonetheless, the case discussions indicate clearly that at an implicit level the OO team has a single, consistent mental model made up of two contrasting intervention scripts from which the ombuds choose, depending on circumstances.

The Deep Problem-Solving Script

This script was characterized by a *primary* interest in identifying and addressing an underlying, latent source of the conflict. Other strategies and intervention challenges (e.g., establishing rapport and deciding whom to invite to sessions) were part of the case discussions, but the conceptual organizing force behind the mediation account was the search for some latent dimension of the conflict and a strategy to manage it. Typically, these "deeper" problems involved such things as dysfunctional patterns of communication, motivational or emotional problems in the mentor–protégé relationship, or problems in organizational leadership, norms, or patterns of interaction. In most instances, once the mediator had helped surface the underlying dysfunction(s), the mediation process turned to helping the parties make the necessary adaptations (e.g., helping them become less avoidant or coercive in their communications or adopt more effective group norms or procedures); in a few cases, surfacing the underlying dysfunction was the major task, with the parties themselves making the necessary changes outside of mediation, perhaps working in concert with relevant organizational leaders and with only an occasional return to mediation.

On the evidence of these 18 cases, DPS appears to be the "default" intervention script preference of the OO. Nearly every case discussion revealed at least a preliminary attempt to "engage" it. If, in the face of important latent problems, the enactment of the DPS script proved untenable and a switch to the alternative TPS script became necessary, team members typically expressed dissatisfaction with their performance and with the parties. The default status of DPS can be explained as a shared orientation that grows out of experience. The omsbudsmen have come to believe that many conflicts reflect organizational dynamics and structural problems as much as they reflect interpersonal dynamics. Since their primary goal is conflict *resolution* rather than dispute *settlement* they are likely to be disappointed when they are unable to address the underlying organizational and structural issues and therefore unable to achieve *resolution* and have to settle for *settlement*.

Although we did not conceptualize this study as an outcome investigation and were precluded by concerns about confidentiality from speaking directly to the parties about

their experience in mediation, the information available suggests that the DPS script was a generally useful intervention. In seven of the nine DPS cases, the immediate result was a mutually acceptable agreement that largely (five cases) or partially (two cases) resolved the parties' presenting concerns. These settlements were, to a significant degree, the result of a successful attack on the latent problems that were fomenting the conflict and blocking the parties' own efforts at resolution. DPS was not, however, a ''magic bullet.'' In four of these successful cases, residual, but important, underlying problems could not be addressed to the satisfaction of the ombuds team and, in at least two instances, seriously dysfunctional individuals who had been ''managed'' during the intervention, subsequently created significant problems that were not amenable to a return to mediation. One case, described in detail later, was by general team consensus, a complete failure. Latent issues were significant but could not be addressed because of the resistance of the leader of the dysfunctional unit to engage with the DPS script that was implicitly proffered.

The example of the DPS script that follows comes from a mentoring conflict, one of two domains where latent cause thinking was most often exemplified (organizational conflict was the other). (In all the case examples in this report we have modified important identifying details to preserve the anonymity of the individuals and units involved while preserving the underlying dynamics of the case and its management.)

***The Avoidant Mentoring Dyad*: An example of the Deep Problem-Solving script**

The dispute involved a demanding, critical mentor and a female PDF whose scientific performance at NIH had been quite poor and gave little sign of improving. As a result, the mentor was determined to terminate her fellowship a year early. The dyad had a highly avoidant communication pattern that was the major focus of the mediation.

The intervention began with a caucus with the Fellow who was protesting the decision of her lab chief to terminate her fellowship position. She worked in a small four-person lab. The only interaction was the regular lab meetings that the lab chief ran in a very structured, demanding style. The Fellow felt put on the spot and terrified. She felt lost in her science and in need of guidance, which she was afraid to ask him for. He would publicly rebuke her at the lab meetings for her failure to ''produce.''

The ombudsman then met alone with the lab chief. He was determined to terminate the Fellow a year early. Toward the end of the session the ombudsman began to query him about his mentoring ''strategy.'' He had none, except to demand that the Fellow give him what he needed.

The lab chief then made a more important admission: He had just received a disappointing performance review that recommended that his lab be downsized. The revelation of this additional latent problem helped the ombudsman formulate a strategic plan for mediation based on the scientific and institutional realities as she understood them: The Fellow was a weak scientific performer and the lab chief was a high profile scientist who was now facing stringent performance pressures. Mediation's most promising and likely goal would be to help the parties negotiate an early termination agreement that would achieve at least some of the Fellow's needs and free the lab chief to replace her with a more capable researcher.

> The ombudsman brought the parties together to negotiate over their respective agendas. Their dysfunctional communication pattern was immediately resurrected. The mentor bullied and the postdoctoral was passive. The ombudsman caucused with the Fellow. She pointed out that her failure to give the lab chief any honest feedback was effectively undermining any chance she had for obtaining her objectives and convinced her to return to the bargaining table in a more assertive spirit.
>
> When the joint session resumed, the ombudsman told the lab chief that the Fellow felt "bulldozed" by him, but determined to speak on her own behalf if he was willing to listen. He agreed, but asked the ombudsman for her opinion: Did she agree with the Fellow that he "was coming on like a bulldozer?" The ombudsman replied: "Yes, I do find you that way—somewhat," to which he replied laughingly, "I've heard that before."

The exchange led to an improved communication flow and the parties were able to negotiate a date for the Fellow's departure (for a point midway between the lab chief's wish and the official expiration of her appointment) and the kinds of assistance he would provide to insure that her article was finished in a timely fashion. On follow-up, both parties reported that good things had happened since mediation ended. The Fellow had become more assertive in making her needs known to the mentor, they were working better as a team, and the Fellow had just secured a nontenure track teaching position at a prestigious university.

In addition to its focus on treating underlying sources of conflict, the DPS script had a number of other salient characteristics, all of which are illustrated in *The Avoidant Mentoring Dyad*. First, in DPS guided interventions the focus on latent causes was pragmatic and carefully circumscribed. Ombudsmen operating in the DPS cognitive mode did not talk of ambitious therapeutic change or the fundamental alteration of dysfunctional relationships. Their concern revolved around latent issues with either a direct link to solving the problem at hand or a palpable indirect tie-in to those problems.

Second, ombudsmen functioning in the DPS mode conveyed a robust self-confidence that they were comfortable and knowing experts about the source of the parties' difficulties and what needed to be done to address them. The implicit assumption underlying the script might be summarized thusly: "Conflict is often caused by real circumstances, events, and dynamics. We, as repeat players at NIH, know how to find out about those realities and how to manage them constructively."

Third, the DPS script was strongly shaped by the scientific culture in which the ombudsmen are embedded. In perhaps one third of the cases, for example, the ombudsman's intervention seemed to be aligned with the actor in the dispute whose agenda was most consistent with the furthering of scientific excellence. In *The Avoidant Mentoring Dyad,* the DPS script led to an ombudsman-orchestrated plan for separating an unproductive young scientist from the rigors of the NIH scientific environment. More often, the institutional commitment to scientific excellence led the ombudsmen to orchestrate the retention at NIH of very capable young researchers by freeing them from mentoring situations that were no longer enhancing their scientific development. This "Autonomy Drama," as it was routinely called, was sufficiently familiar to the ombuds staff that their own role as agents of orchestrating a mutually acceptable separation of the parties was well instantiated in the collective intervention stratagems of the office.

The DPS script was also implicitly promoted by the culture of science that permeates the entire institution. Many cases come to the OO at the behest of high-level scientific administrators who are motivated by their commitment to scientific excellence to take the OO's search for underlying causes seriously and inclined to motivate the parties to do so as well. Indeed it was a shared interest in scientific excellence that sometimes provided the incentive to resolve differences by confronting difficult latent issues.

Finally, the primacy of the DPS script in the mental life of the OO appears to introduce an important tension between the ombudsmen's commitment to neutrality and respect for the parties' autonomy on the one hand and the pressures introduced by being latent cause experts and agents (to some degree) of NIHs scientific mission on the other. Prior to coming to NIH, the Director of the OO was an eloquent spokesman for ombudsman neutrality in its most pristine form (Gadlin & Pino, 1997), but once at NIH he was responsible for promoting the DPS script, with its more ambiguous relationship to neutrality. When this apparent shift was brought to his attention he commented on the "creative tension" between the obligation to neutrality and his sense of being expert about the "real" (latent) problems. "Even when we become fully convinced of the accuracy of our own insights into a particular situation we struggle with questions of how to integrate those insights into our commitment to neutrality and our obligation to honor the self-determination of the people with whom we work. It comes up in every case review."

The Tactical Problem-Solving Script

This script was characterized by a focus on addressing the issues more or less as presented by the parties. "Deeper" issues, when they were identified, were left largely untouched. The level of the parties' participation in the negotiating process varied from relatively passive to highly active, but, as with DPS, the mediator was clearly the leader of the negotiating process. There were two variants of the TPS script: An *integrative* variant (four cases), in which the mediator tried to help the parties resolve their presenting issues on the basis of a mediated negotiation around enhancing mutual interests, and a *distributive* variant (two cases) in which the mediator orchestrated a process of nonbinding arbitration.

As with DPS, the TPS script had its share of success and failure. Four of the six TPS cases resulted in the complete (three cases) or partial settlement of the key issues that had brought the parties to the OO. By definition, latent issues were not addressed directly in any of these TPS cases, usually because of the parties' extreme hostility, lack of trust, or bad faith negotiating attitude. In one case, systemic issues might have been addressable, but the scientific incompetence of one of the parties convinced the mediator to sidestep the DPS approach in favor of a TPS-driven negotiation over the terms by which the underperforming party would be transferred to another unit. Interestingly, in one case (described in detail below), the TPS intervention had an indirect, but highly constructive systemic impact through the ombudsman's access to high-level NIH administrators interested in improving the dynamics between senior and junior scientists within the organization. However, as with DPS, TPS was no panacea. In two of the six cases the result of lengthy effort was no settlement of any kind.

Despite the relatively positive outcomes associated with TPS, there was strongly suggestive evidence that, relatively speaking, it is the mental stepchild of the OO. Nearly all case discussions started out with an account of exploratory attempts to implement DPS and reverted to the TPS script only when that exploratory probe was deemed unsuccessful or unlikely to work. There were no recorded instances where the intervener began with a TPS script and reported a switch to DPS. In four of the six TPS cases the mediator(s) also expressed significant disappointment and self-criticism that they had been unable to engage the parties in addressing important latent issues (i.e., to use the preferred DPS script).

There was also evidence for a hierarchy of script preference: In the mental model of the OO not only is the DPS script preferred over TPS, but within TPS there appeared to be a preference for the integrative script over the distributive variant. We provide below one case example of each type. *Sharing the Intellectual Property* illustrates the integrative version of a TPS script in a straightforward mediation in which, from the mediator's account, no latent causes were identified. *The Authorship Imbroglio* illustrates the distributive variant of TPS and the characteristic ambivalence the ombuds team felt when latent issues could not be addressed.

***Sharing The Intellectual Property*: An example of the Tactical Problem-Solving Script (integrative version)**

The dispute was between three former colleagues who were in conflict over the best ways to protect their respective interests in an algorithm for tracking certain kinds of scientific data. Dr. Inventive had played the primary role in the project. He had recently left NIH to take a prestigious academic job. When he left he had agreed to allow Dr. Concerned and Dr. Colleague to continue to disseminate their joint product. The dispute broke out when Dr. Inventive tried to post an enhancement of the algorithm on the NIH web site. Dr. Concerned, the senior member of the team, had taken this revised version off the web site because NIH regulations dictate that before new products can be posted they must be reviewed and approved by NIH. Dr. Inventive took exception to this. He felt strongly that he should have been consulted before his colleagues took his posting down. Drs. Concerned and Colleague, in turn, were upset with Dr. Inventive for reacting so vehemently.

The ombudsman assigned to the case nominated "helping them sort between their personal anger and the substantive issues" as the first diagnostic issue. Although he described this activity as "very undramatic," the use of a TPS script depended on being assured that important or complex interpersonal or organizational issues were not involved.

Having established that there were no latent issues, the ombudsman-mediator shifted into TPS mode. The first step in that process was to invite in as a co-mediator an expert on intellectual property law, an expertise not represented within the ombuds office. The diagnostic issue was to identify the underlying interests that were informing the parties' positional stances. The ombudsman and his co-mediator spent time with each side trying to ascertain what these were. They then talked privately and at length with each other about what they had learned about the underlying interests of both sides and what this might mean for a possible agreement.

At a culminating joint meeting they presented their understanding to the parties. Their key idea was that the NIH scientists give their former colleague the trademark to their joint intellectual property, since this was the only legally feasible way to give credit to them, which was one of their underlying concerns, and insure dissemination of the algorithm, which was the primary objective of the former NIH scientist. With some minor modifications the recommendations became the basis for the final agreement.

***The Authorship Imbroglio*: An example of the Tactical Problem-Solving Script (distributive version)**

The protagonists were an Asian female PDF, two staff scientists, and the lab chief to whom all three reported. The fellow felt strongly that she should be a co-author on a article that had been written by the two staff scientists and the lab chief.

The intervention began with an intense series of diagnostic caucuses. The fellow's authorship claim was based on her contention that the lab chief had asked her to review the two senior scientists' work and conduct extensive supplementary analyses. These analyses had become part of a revised article and, she felt, fully justified her claim to co-authorship. She also reported intense animosity between her and the two senior people—a climate full of threats, intimidation, and lack of respect.

The ombudsman then met separately with the lab chief, the two staff scientists, and the referring administrator to whom the lab chief reported. The ombudsman came away from these diagnostic meetings feeling that the authorship dispute was almost certainly the product of a deeply disturbed pattern of relating between the fellow and her colleagues in which the lab chief was doubtless playing an important role. However, he also doubted that attempts to address these underlying problems would work because of the intensity of the conflict between the Fellow and her senior colleagues and the unresponsive attitude of the lab chief.

The ombudsman elected to avoid these troubled latent waters and to try instead to mediate an agreement solely on the authorship issue. That effort failed. The parties were too distrustful and angry. Reluctantly, the ombudsman decided to render a nonbinding decision on the authorship matter. With the parties' consent, Dr. J., a distinguished NIH scientist, was invited to the meeting to serve as arbitrator. The meeting lasted for 2 hours and ended with Dr. J. recommending that the fellow be included as a co-author on the contested paper. A day later the ombudsman got an e-mail from the lab chief saying that he and the two senior scientists accepted this recommendation.

During the reflective case dialog on this case the ombudsman and his colleagues expressed decidedly mixed feelings about how the dispute had been managed. From the ombudsman's perspective, the biggest problem was that he had departed from his preferred approach.

> I certainly don't feel that good about this. I think it made sense to give them a recommendation, but in terms of the ability to get on top of the conflict itself among all these people? No. Although we got the authorship issue resolved, the fact is that the lab is going to dissolve. It may be a just resolution but it creates a worse situation in the lab. The part of me that's a mediator feels bad about it; the part of me that's an ombudsman—bringing it to the attention of the appropriate people; knowing that some appropriate steps may be taken—I feel ok about that. But it's not my preferred way of doing things.

Despite these unhappy reflections, at the end of the mediation the ombudsman met with two high ranking administrators to give them feedback, based on his experience on this, and related cases, about needed systemic changes in how PDF are recruited and mentored at the Institute. He felt that this information was well received and was partially responsible for the development at NIH of a mentoring program for senior scientists.

2. Decision Rules: Fitting the Intervention to the Dispute

The reflective record makes abundantly clear that a good deal of ombudsman energy is devoted to the frequently vexing, if implicit, question of whether the DPS or TPS script is a ''best fit'' to the dispute at hand. The record also suggests that making this decision is not idiosyncratic, but rests on a reasonably well-structured set of decision rules. The decision rules are of two types: *First order decision rules* concerning the existence and nature of any latent problems that may be present, and *second order decision rules* concerning the parties' capacity to engage in ''deep'' problem-solving if latent problems have been identified.

First Order Diagnostic Questions

Since the prevailing assumption in the OO is that much interpersonal conflict, and nearly all organizational conflict, is fueled by underlying causes of which the parties are typically unaware, the first order of diagnostic business is to determine whether such conditions exist in a particular dispute. The case deliberations reveal three principal first order diagnostic questions:

1. *Are dysfunctional communication patterns a significant source of the conflict?* Patterns of conflict avoidance or coercion are common in the OO caseload. Two of the six mentoring disputes and all three of the cases of interpersonal hostility involved significant diagnostic activity to ascertain whether or not such disturbed interaction patterns were at play. The activities of the ombudsman in *The Avoidant Mentoring Dyad* discussed earlier are illustrative.

2. *Has a normal process of fostering scientific autonomy been blocked?* Two other mentoring cases represented what the team referred to as ''autonomy dramas.'' Mentoring is a foundational activity in science and one whose vicissitudes are well known in the OO. Like other developmental relationships, the mentoring relationship can occasionally be affected by forces that interfere with the normal trajectory from dependence to healthy separation. These forces include the reluctance of the mentor to ''let go'' of a protégé on whom they have come to rely or the anxiety of the protégé to proceed toward autonomy in a competitive scientific environment. Often these respective motivations are intermingled. The result can be a series of polarized surface conflicts that fail to address the underlying separation ambivalence. It falls to the mediator to help the parties regain the trajectory of separation.[1]

[1]Mediation in other types of developmental conflicts often turns on precisely the same underlying ''separation'' strategy. We include here divorcing conflict (cf. Kressel, 1985) and end of life disputes (Kressel, Kennedy, Lev, Taylor, & Hyman, 2002).

Autonomy Blocked

The case involved a promising young female researcher, Dr. Verity, and her two senior colleagues, Dr. Parameter, her lab chief, and Dr. Parameter's close associate, Dr. Reagent. Dr. Parameter depended very heavily on Dr. Reagent, who was more technically accomplished. Dr. Reagent, in turn, was demanding and rigid, and delegated an inordinate amount of her own work to the young Dr. Verity. The result was a situation in which Dr. Verity could count on little help from Dr. Parameter in her struggles to free herself from what she regarded as Dr. Reagent's unfair demands and unsympathetic attitude. She had therefore made a tentative decision to try to leave their lab, but was uncertain about how to proceed and worried that their anger at her decision might hurt her career.

> The ombudsman helped orchestrate a two-step process of separation between Dr. Verity and her senior colleagues. They first met alone with Dr. Verity to understand her situation and calm her fears. Their knowledge of laboratory culture and the normal transitions in scientific careers helped Dr. Verity see her experience as not unusual. The OO explicitly labeled it for her as "the autonomy drama." They also offered to help her by holding a 3-way mediation session to negotiate the terms of her disengagement from the lab and suggested that she speak with her supportive Branch Chief before that meeting.

At the outset of the joint meeting, one of the ombudsmen found a useful analogy to help the two senior scientists accept the separation: She likened the three scientists to a "choir" that was trying to "harmonize," but in reality they were "soloists" who would be better able to "harmonize" if they were independent! This preamble led to Dr. Verity reading her "declaration of independence": She had high regard for Drs. Parameter and Reagent as scientists and she was relinquishing all intellectual authorship claims on joint projects with Dr. Reagent. The other ombudsman empathized with Dr. Reagent's sense of loss at the rupture with Dr. Verity. With this "obstetric" assist from the OO (and the background support of the branch chief in finding Dr. Verity a new home), the parties agreed to a respectful separation.

3. *Are there major systemic problems?* This was always a relevant diagnostic concern. However, in organizational conflicts an underlying systemic cause was an implicit presumption. In these cases, therefore, intervention began with a diagnostic effort heavily primed by receptivity to systemic information. *Animal Angst* illustrates the approach.

Animal Angst

The request for assistance was motivated by a breakdown in following NIH regulations for the humane treatment of research animals in a large research study. The principal investigator's request for help was based on the misconception that the OO would "fix" the problem by a set of recommendations. The co-mediators felt recommendations might eventually be appropriate but first they wanted to form their own diagnostic understanding.

> There ensued an intensive diagnostic phase involving interviews with nearly every person on the research project. The ombudsmen began with the assumption that the problems might well be attributable to straightforward differences in animal care philosophy between two groups of veterinarians but they were implicitly primed by their mental model to be attentive to discovering more latent systemic problems. After the first round

> of interviews they became more and more inclined to this perspective and increasingly shaped the remaining interviews around hypotheses about specific areas of systemic or structural difficulty that might be causing problems.

Their final conclusion was that the underlying problem was entirely systemic in nature. These problems included absentee leadership and unclear procedures for resolving conflicts over the care of the research animals. The ombudsmen provided systematic feedback to the leadership group about these matters and took the lead in helping the parties address them. The mediation re-involved leadership, clarified role responsibilities, and greatly improved the climate among team members.

Second Order Diagnostic Questions

Although the DPS script was ordinarily engaged if a first order diagnostic question was answered affirmatively, there were second order diagnostic questions that could alter this path. These second order questions had to do primarily with judgments about the parties' motivation and capacity to address the underlying sources of their difficulties as well as with assessments of institutional or "political" reasons that argued more strongly in favor of one script than the other. There were three principal second order questions revealed in the case discussions:

1. *How high is the level of conflict?* The DPS script is unlikely to be viable if tensions are inordinate. *The Authorship Imbroglio* recounted earlier is a case in point. There were other similar examples in which TPS was settled on, however reluctantly, as the script of choice.

2. *Are the parties capable of addressing their respective roles in the conflict?* Even very angry parties may be capable of collaboration under the right circumstances. On the other hand, if one or both parties are incapable of even limited self-examination or if the parties lack any genuine interest in working together, the DPS script is contraindicated. TPS may be unworkable with such parties also, but because it has less ambitious goals it may succeed in a more arid interpersonal climate. *The Refusal to Share Data* provides an illuminating illustration of the shift from the default DPS script to TPS under such circumstances.

The Refusal to Share Data

The dispute involved allegations by a male program director that a female postdoctoral fellow was guilty of plagiarism. Mediation began with a short-lived effort to implement DPS. The ombudsman gave this account of his efforts:

> I made repeated observations about the dynamics of their conflict and the way in which at every point at which they moved toward a cooperative statement one or the other of them would escalate the conflict again, and their refusal to acknowledge any sign of progress by either reiterating a past violation or a re-expression of some kind of anger. And we talked about the possibilities of having modes of interaction where they could just chat. There was not a lot of enthusiasm about that.

Matters came to a head when the ombudsman described to the parties the unspoken, but palpable reality: "I articulated what they were unwilling to articulate directly: that it's clear that they would rather not be working together; that in ideal circumstances, he would be able

to get rid of her and she would be able to leave. No one resisted that at all.'' Given the acknowledged lack of motivation, the ombudsman adopted a TPS-driven strategy of negotiations to help the parties reach agreements that would simply allow them to get through the next year until the Fellow's contract at NIH expired.

3. *In organizational disputes, how receptive is leadership to pursuing systemic change?* In organizational conflicts, proceeding with the preferred DPS script hinges significantly on evaluating leadership's motivation for addressing underlying systemic problems. All three of the organizational cases in the sample illustrate this fundamental point. In two cases, the ombudsmen made a correct assessment that leadership possessed the requisite motivation; in one case the assessment was wrong and the effort to follow a DPS script ended in failure.

As is often the case, failures can be highly instructive. *Managerial Miasma* suggests that the very strong default preference for DPS in the working mental model of the OO, combined with the inherent difficulty of assessing the parties' capacity to participate in such a script, can make it very difficult to apply correctly the decision rules governing script activation.[2]

Managerial Miasma: How receptive is leadership to change?

The dispute occurred in an 18-person research group engaged in a multimillion-dollar study. Dr. Judge, a seasoned administrator with a high profile at NIH, headed the unit. Lately, however, her unit had been beset by strife. Various staff members had been transferred or had left NIH because of unhappiness with their assignments and with Dr. Judge's preemptory managerial style. Dr. Judge's immediate superior referred the case to the OO to work with Dr. Judge and her staff to help address whatever issues and unit problems seemed appropriate.

The major—and fatal—flaw in the intervention was that the co-mediators attempted to address organizational problems despite evidence that Dr. Judge was resistant to such assistance. ''Almost every comment of hers was an attempt to minimize or blunt the impact of the observations that were being made, without being overtly hostile. She didn't listen. She was formulating her response the minute we started to talk. Anything that suggested that she might not be getting all the information about what was going on in her organization was beyond her imagination.''

The manager bolstered her resistance with the use of two organizational consultants. The mediators met with Dr. Judge in their company. One of the ombudsmen gave this sardonic account of the encounter:

> That was a little bit like a scene out of one of the ''Godfather'' movies in terms of the ''muscle''—the administrative equivalent of muscle—sitting around the ''Godmother.'' Their role seemed to be to directly challenge any kind of feedback that we gave that she

[2]Although *Managerial Miasma* is an instructive example of the hazards of diagnostic inference, our reflective discussion of the case also considered another post hoc possibility: In every field there are high risk cases that are worth attempting even though the chances for success are not good. Although this was not the conscious frame that the mediators brought to *Managerial Miasma,* there was enough evidence of important and long-standing systemic problems to justify the mediation effort that was made.

> didn't challenge. It was a situation of going into a session with a strategy that appeared well-worked out, but it didn't work the way we imagined, in part because they never got past the point of seeing the process as something that threatened her authority and ability to lead.
>
> The inability of the mediators to penetrate Dr. Judge's defensiveness was also a function of Dr. Judge's considerable institutional power and the very weak pressure on her to take the process seriously: "Dr. Judge is incredibly skilled at working with scientists in the outside world. She is also a great spokesperson for the Institute. Everybody acknowledges it. But she is a total disaster in running a staff. They [the Institute leadership] wanted to maintain the skill parts and have the managerial things transformed or changed, but they were unwilling to be direct about that."
>
> The mediation eventually came to a grinding halt, leaving the mediators frustrated that many hours of effort had been wasted and that they had raised unfulfilled expectations in the staff that their grievances would be addressed.

Given the inhospitable circumstances, why did the ombudsmen proceed with a DPS-driven strategy? The reflective case discussion suggested several reasons. The primary one is the great appeal to the ombuds staff of latent cause thinking and their history of success with it. In explaining why he overlooked a particularly striking sign of Dr. Judge's lack of interest in exploring organizational problems, the lead mediator remarked: "Probably some kind of narcissism; that if we gathered good enough feedback from people as to what they thought was the problem that she would be open to hearing this and we would win her over." His co-mediator added, "If you are very skilled it is even harder to pull back since you are so used to successfully reframing things for people."

The DPS script was further primed because the Ombuds Office was already involved in the organization under another mediation generated by the federal Equal Employment Opportunity statute. That experience confirmed the theme of organizational dysfunction. "We [didn't] want to reduce this to this one [EEO] case. There is a whole organizational issue here. We have a good opportunity to use the individual case to give organizational feedback. We do that all the time! Typically people are open to working on that. We thought we could generate buy in."

Accurate use of the decision rule about the suitability of the DPS script was also compromised by the inherently ambiguous task of assessing the parties' motivation. Often, when the parties' motivation is unclear or ambivalent, beginning the mediation process helps them realize that their interests might actually be well served by mediation. There are other occasions when the ombudsmen tell the parties that, in their judgment, a situation does not appear to call for mediation but for some other approach (e.g., further managerial action).

But in *Managerial Miasma* the effort to change or understand Dr. Judge's motivation failed. The lead ombudsman noted the dilemma he had in trying to figure out what was responsible for Dr. Judge's lack of engagement. Conversations with her were always "confusing." She would "dispute a lot" but she also always wanted to seem "polite and cooperative." This made it easy to misread her.

Astute script selection also requires mental energy. That energy is often in short supply. The co-mediator in the case, reflecting on why the diagnostic signs about Dr. Judge's antipathy to a DPS approach were missed, commented: ''When you are so busy running from one thing to another you're not stopping to think. We just wanted to get these things scheduled. The calendar pressures are great.'' Another member of the team added, ''Checking things out takes time and energy, which isn't always available. It could be 2½ hours of work to check out a diagnostic hunch!''

A final word about script engagement: While our account highlights the cognitive dimension of script engagement, the primary explicit accompaniment of script selection was not cognitive, but affective. Often this affect was negative. *The Authorship Imbroglio*, summarized earlier, provides a prime illustration. Although the ombudsman agreed that finding a strategic direction (script) was a key accomplishment, he had an amused reaction to hearing the process by which he settled on TPS described in explicit, decision-making terms.

> I'm laughing because the description of what it is and the experience of what it is, is so discrepant one from the other. Its like you're in the water and the water is splashing over you and you're swallowing more and more water; so you're assessing the situation and you're coming to the conclusion: ''Oh yes, I'm about to drown!'' [laughs heartily].
>
> Facilitator: ''Drowning'' in what way?
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> Ombudsman: In anger, in storytelling. The experience was that it was very very hard to process and interpret what was going on. So it was very hard to figure out what makes sense as an attempted intervention. You do what you can to slow down the drowning process.

3. The Metascript of Problem-Solving Stages

The reflective case discussions suggest that the DPS and TPS scripts rest on a shared metascript of distinctive stages of intervention. This metascript imparts a similar broad trajectory to all cases, a surface resemblance that may be one of the reasons why the DPS/TPS distinction was not self-consciously apparent to the OO team. The metascript involves three distinctive stages: a *stage of diagnostic inquiry*, a *stage of interpretive reframing,* and a *working-through stage.* This is an idealized account that overstates the extent to which the three stages are separable in practice. Nonetheless, the three-stage structure captures the approximate thrust of ombuds thinking in nearly all the cases. It was particularly well delineated in its DPS variant in *The Avoidant Mentoring Dyad* and in its TPS form in *Sharing the Intellectual Property* and *Authorship Imbroglio,* all of which have been described earlier.

1. *The Stage of Diagnostic Inquiry.* This initial stage involves sustained information gathering, often via extensive individual interviews (especially in organizational disputes) and relies heavily on increasingly focused question-asking to test emerging ombudsman hypotheses about possible latent causes that may be fueling the conflict. The diagnostic

stage is also concerned with at least a preliminary assessment of whether or not the case is suitable for any kind of mediation and, if so, whether co-mediation would be useful. It is in the diagnostic stage that the decision rules for script activation are most in evidence. Indeed the Stage of Diagnostic Inquiry largely turns on their use and might well be called *The Stage of Script Selection.*

2. *The Stage of Mediator Interpretive Reframing*. The diagnostic phase typically culminates in the mediator developing a sense of the addressable problems; in the second stage he or she communicates this sense to the parties, sometimes explicitly, sometimes by implication. In a TPS script, the mediator proposal concerns possible means to address the positional differences that have brought the parties to mediation with no reference to exploring latent issues.

3. *The Stage of Working-Through.* In this stage the parties are invited to react to the mediator's suggestions. In DPS, the working-through stage involves a mediator-facilitated dialog in which a central element is addressing the underlying problems that the mediator has helped identify. The modification of these sources of the conflict smoothes the way to a relatively straightforward problem-solving effort, sometimes with mediator assistance, sometimes by the parties themselves, working in conjunction with relevant NIH managers with authority to effectuate the necessary arrangements. In TPS, the working-through stage revolves around a more circumscribed exchange of proposals when that is possible. When it is not, a form of nonbinding arbitration may be substituted.

Discussion

Through an intensive study of 18 cases we have crafted an account of the working mental model of a team of five experienced ombudsmen intervening in conflicts among scientists. The working mental model is not an exact cognitive replica of how the OO team engages in the disputes they manage. It is a model of how they think, inferred from structured discussions with them about their cases. (In that sense, it is really a model of a model.) But it is a useful tool that appears to make their work more efficient and, arguably, more effective.

The mental model consists of two strongly contrasting intervention scripts: a ''deep'' problem-solving script focused on identifying and addressing latent issues of an interpersonal or systemic kind and a ''tactical'' script, focusing instead on the issues as presented by the parties. The tactical script is applied in either an integrative bargaining mode or a more distributive quasi-arbitration approach.

The choice of which script to follow in a given case is determined by first order decision rules concerning the existence and nature of any latent problems that may be present, and second order decision rules concerning the parties' capacity to engage in ''deep'' problem-solving (when the mediator feels that latent problems are important). Despite their very different foci, both the deep and tactical scripts appear to follow the same metascript of problem-solving stages, beginning with an intensive diagnostic phase during which the decision rules are applied and a script ''selection'' is made.

The ''deep'' problem-solving script is the preferred intervention mode of team members. However, both scripts are capable of producing agreements that are useful to the parties and to the institution's scientific purposes, particularly the fostering of scientific competence.

Our account of the NIH mental model is not without its drawbacks, of course. It greatly oversimplifies, it does not necessarily correspond to what the work ''feels'' like to the NIH team, it is a post hoc creation, and its relationship to behavior and outcomes is uncertain. We also acknowledge the limitations on generalizability due to the small sample of cases and mediators, as well as to the criteria of case selection—which were driven by the practice motives of the team rather than by methodological rigor—and to the reflective case method itself, which may have encouraged a focus on more challenging or complex cases and therefore have highlighted the primacy of the DPS script. We also have no way of knowing whether the mental model we have described is applied by the OO to the routine workplace disputes they handle that do not involve scientific collaboration. Indeed, this is an interesting empirical question.

The study also leaves unresolved the precise locus of the mental model. We have presented it as a collective product, broadly accepted by all five members of the team and shaped by all of them to some degree. This assertion reflects the spirit of the case discussions, but clearly the mental model is primarily the product of the three most experienced members of the team who conducted the majority of the cases analyzed, and in particular, of the OO's Director, who was involved in fully half of them. In short, it is entirely conceivable, perhaps even likely, that to some unknowable degree, our account of the NIH Ombuds Office working mental model for mediating disputes among scientists is an artifact of our method.

On the other hand, our reflective-ethnographic approach was well suited to the goal of gaining insight into the ''top-down'' cognitive frames that drive expert mediation practice in an important institutional context. We believe that the results may be described by Box's (1979) dictum, ''All models are wrong. Some are useful.'' In that regard, our depiction of the NIH mental model affirms and extends the insights derived from the handful of extant studies that have focused on overarching mediator stylistic or strategic thinking. Our findings also have interesting and important implications for mediation research and training. It is to those matters that we now turn. We begin with a consideration of the impact of institutional and professional contexts on mediator cognition.

The Cognitive Contours of Embedded Mediation Practice

The practitioner literature on mediation is notorious for paying scant attention to the very different social contexts in which mediation is practiced and the importance of those contexts in shaping what it means to perform at an expert level (Pruitt, 2006). In the empirical literature attention has been paid to the impact of particular dispute characteristics and circumstances on mediator behavior (Esser & Marriott, 1995; Kressel & Pruitt, 1989), but the impact of the wider social context has rarely been considered. (Culture is the exception; cf. Wall et al., 2001.) In the current study its impact is pervasive. The NIH team functions in a particular institutional context that its members come to

know well and with which they are highly identified. Their working mental model of mediation reflects this reality in five important ways:

1. *The working mental model is implicit.* The members of the OO team are clearly explicitly aware of *elements* of their working mental model. For example, they can say, when their attention is directed to a specific case instance, that identifying latent sources of destructive conflict is an important element in deciding how to proceed. They know, too, that it is foolhardy to attempt to address such causes when the parties themselves are too angry or too unmotivated to do so. What was not explicitly conscious to them—what, indeed, they denied at the start of our project and for much of its duration—was that these individual elements are part of a larger cognitive structure, consisting of distinctive scripts of intervention and the decision rules that lie behind script engagement. Their knowledge of their mental model is largely tacit. The reflective case method helped them make it explicit. This is entirely consistent with Schön's (1983) distinction between practitioners' ''espoused'' theory versus their (actual) ''theory in action,'' as well as with much empirical research in other domains of real-world expertise. Expertise typically becomes highly ''automated'' over time, and even inaccessible to ordinary reflection (thus, experts frequently refer to their ''intuition''), unless special conditions for retrieval are provided (Hoffman & Lintern, 2006). In the case of our ombuds experts, lack of explicit awareness of their two distinctive scripts may also have received an assist from the shared metascript of intervention stages on which both intervention scripts appear to depend. At least at a superficial level, all cases may ''look'' the same. Some elements of the mental model—for example, the strong inclination to harness the DPS script to the task of freeing promising young scientists from unproductive laboratory situations—may also be difficult for team members to explicitly acknowledge to themselves because they contradict the strong normative pressures from ombuds and Alternative Dispute Resolution culture that, despite considerable research to the contrary, continue to emphasize neutrality and nondirectiveness as the sine qua non of professionalism in the third-party role.[3]

While the implicit nature of the mental model is understandable and even functional for the ombuds, making it explicit, as we have labored to do, has its own advantages. Not the least of these is the ability to train others and to improve one's own performance by greater self-awareness.

2. *The working mental model is complex and differentiated.* The results of a number of studies of formal and informal third-party interveners (Kolb, 1983; Pinkley et al., 1995; Sheppard et al., 1989; Silbey & Merry, 1986) have demonstrated the importance of broadly contrasting cognitive schemata for third-party intervention. Our results significantly extend those findings by providing rich details on the kinds of procedural and substantive complexity that can inform such models when the subjects of study are

[3]While they were not aware of consciously choosing (or having) a script, mediators were keenly in touch with their own emotional discomfort as they struggled to figure out how to proceed. This discomfort may have had useful motivational properties. This speculation is consistent with evidence that, compared to novices, experts may agonize much more over the problems on which they work (Scardamalia & Bereiter, 1991).

seasoned professionals who are given extended and structured opportunities to reveal their thinking. Such richness and detail is entirely consistent with the mental models of experts from other domains of real-world practice that involve ill-structured problems, shifting, ill-defined, or competing goals, action-feedback loops, multiple players, and organizational goals and norms (Endsley, 2006; Ross et al., 2006).

3. *The working mental model revolves around the selection of holistic scripts, not individual tactics.* The empirical literature on mediation has tended to focus more on identifying discrete mediator tactics rather than on holistic, overarching strategies (Esser & Marriott, 1995; Kressel & Pruitt, 1989; Wall et al., 2001). The dynamic element of ombuds thinking, however, is not the discrete tactic but the two contrasting DPS and TPS intervention scripts (and subscripts, within TPS). The team does think tactically, but the tactics are clearly the subordinate unit of cognition. The implicit scripts organize, propel, and give coherence to the conscious choice of tactics. The few other ethnographic studies of mediators lead to a similar conclusion about the primacy of an overarching role or stylistic conception as the ''driver'' of mediator tactical behavior. (Kolb, 1983; Kressel et al., 1994; Silbey & Merry, 1986).

4. *The working mental model involves flexible movement between scripts.* An important issue raised by empirical studies of mediator strategic or stylistic thinking is the degree to which mediators adjust their approach to the circumstances of a conflict or maintain a reflexive preference for a given strategy or style. Evidence exists on both sides of the equation.

There appear to be contexts that are largely determinative of mediator stylistic thinking. For example, Kolb's (1983) federal labor mediators were exclusively ''orchestrators,'' while her state labor mediators were exclusively ''dealmakers.'' The more nondirective orchestrator style was associated with the relatively benign circumstances that exist in private sector labor negotiations—a long history of collective bargaining, the ability of mediators to work with experienced ''pros'' representing labor and management (and from whose ranks most federal mediators come), and a more developed and collegial mediation community. Kolb attributes the unequivocal ''dealmaking'' of the state mediators to a much more inhospitable public sector context—inexperienced parties, ''no strike'' clauses, and little opportunity for mediators to get training or interact with their colleagues.

There also appear to be individuals with such strong personal affinities for one schema, style, or script that contextual variation matters little, if at all. Thus, of the five labor mediators in a study by Shapiro, Drieghe, and Brett (1985), one consistently used the same tactical ''style'' across all of the cases in which he was involved. Kressel et al. (1994) report something similar. In their study of divorce mediation one of the four mediators enacted a style akin to DPS in all cases; another was a consistent fan of a more tactical approach.

There is also evidence that mediators can show strategic or stylistic flexibility. Silbey and Merry (1986) observed mediators moving between the therapeutic and bargaining styles, often within the same session (although they note a tendency for mediators to become more highly identified with one style or the other). In their study of highly experienced labor mediators, Shapiro and her colleagues (1985) reported situational

responsiveness, with mediators choosing among five distinctive tactical styles depending on their initial "take" on the case.

> Our results suggest that early in the conference, the mediators ask themselves, "What can be done in a case like this? What kind of outcome is possible?" …We suggest that mediators consult a repertoire of case patterns they know. Such patterns are probably stored in mediator-technique/mediator-outcome sequences. The mediators' quick cognitive evaluation of the potential outcome of a case thus evokes a set of behaviors that can achieve that outcome. (Shapiro et al., 1985, p. 112)

The current results support this line of reasoning. However, for NIH ombudsmen the decision rules for choosing between scripts do not center narrowly on outcome predictions, but appear to involve a more extensive set of diagnostic considerations. These included the presence or absence of blocked scientific autonomy, communication dysfunction or systemic difficulties of one kind or another, as well as an assessment of the capability of the parties to address such issues if they are present. The narrower script activation criteria of labor mediators presumably reflects the restrictive circumstances of industrial mediation that limit mediators to choosing only between tactical scripts of one kind or another. The wider diagnostic net cast by the NIH mediators reflects local conditions that are more expansive and permit a DPS script as well as a tactical one. This is one illustration of a broader phenomenon illustrated by our findings: The degree to which the NIH mental model is a product of institutional and professional contexts.

5. *The working mental model does not exist in an abstracted intellectual space but is heavily shaped by situation awareness and social context.* The idea that expert thinking is strongly shaped by social, professional, and institutional forces is a staple of the literature on expertise in real-world dynamic environments of the type that mediators must master. In such environments expert performance is closely linked to acute situation awareness (Endsley, 2006) and the recognition of recurring patterns (Klein, 1998).

The central place of situation awareness and pattern recognition in the working mental model of the NIH team is indicated by the intensity and focus of the diagnostic stage of the problem-solving metascript. Because they are repeat players in the conflicts of the NIH, the ombudsmen know where to look and what questions to ask about the interpersonal, systemic, and "cultural" forces that can disrupt scientific collaborations. The first order decision rules in the working mental model capture some of the prototypical dysfunctional conflict patterns that the NIH team has learned to "match" against the case at hand; the second order decision rules reflect their tacit knowledge about the situational factors that will determine how the conflict should be addressed (i.e., whether DPS is the appropriate script and, if so, whether it is a likely to succeed). Had we examined more than 18 cases we might have identified their awareness of other prototypical conflict patterns and situational script triggers.

The most compelling example of the impact of social context in shaping the mental model of the NIH team is the primacy of the DPS script. Although addressing latent cause of conflict is a well-known idea in the practice literature (Moore, 1996) and has made an occasional appearance in studies of informal conflict interveners (Pinkley et al.,

1995; Sheppard et al., 1989), it is rarely in evidence in surveys of mediator role-conceptions (Herman, Hollett, Eaker, & Gale, 2003), in empirical studies of mediator behavior or thinking (Kressel & Pruitt, 1989) or the occasional in-depth accounts of mediators at work (Kolb, 1983; Kolb & Associates, 1994; Wall & Chan-Serafin, 2006; cf. Kressel, 2007, for details on the relative neglect of latent cause mediation models).

Why then is ''deep'' problem-solving so central to the mental model that prevails in the NIH Office of the Ombudsman? The answer would seem to lie with a particularly supportive (and perhaps relatively uncommon) set of social circumstances. The primacy of the DPS script is supported by the fact that the ombudsmen are ''repeat players'' in the life of the NIH and therefore in a position to become adept at recognizing the latent sources of its dysfunctional conflicts and how to address them. As ombudsmen, they are also under a strong role mandate to pay attention to covert patterns of organizational dysfunction (Gadlin, 2000). In addition, three members of the team had training in disciplines that stress the importance of latent dynamics (clinical psychology and organizational consulting). The culture of the OO also provided frequent opportunities to reflect with other team members about case management. Finally, the disputes that the NIH ombudsmen mediate typically involve parties well suited to latent cause thinking by virtue of their scientific training and continuing relationships. The one in-depth study of which we are aware in which an intervention script similar to DPS was identified (Kressel et al., 1994) involved a mediation context with some of these same social parameters (institutional embeddedness, team members with training in latent cause disciplines, time for reflection, and disputants with continuing relationships).

The shaping influence of social context also extended to the circumscribed meaning afforded to ''deep'' problem-solving. Only latent dysfunctions that were *domain relevant* and directly connected to the immediate concerns of the parties were targeted, and then only to the degree necessary. There was also a tendency to use scientific competence as a ''filter'' for intervention. Thus, the NIH mediators focused only on those aspects of the mentor-protégé relationship with immediate bearing on a scientifically relevant task, such as the resumption of a talented junior scientist's movement toward scientific autonomy or the early termination of a PDF not up to the rigorous demands of the NIH scientific environment. It is likely that a defining characteristic of mediator competence in settings that support ''deep'' problem-solving mental models is the capacity to discern relevant latent causes and to parse out those that are less relevant to the solution of the immediate problem while doing so in terms that resonate with the ''cultural'' context in which the mediation is occurring.

Implications for Research and Training

Theory building and practice in any professional field can draw significant inspiration from making explicit the implicit wisdom of expert practitioners. This is Schön's seminal insight, and it is also the perspective underlying the field of expert decision-making in real-world settings (Crandall, Klein, & Hoffman, 2006). It was the broad premise that

informed our collaboration. We sketch below several research and practice implications of our findings.

1. *The need for a robust version of the mental model concept.* The mental model concept has been productive for building research and theory in a variety of areas, including social aggression (Anderson & Huesmann, 2003), team performance (Kozlowski & Ilgen, 2006), and interpersonal intimacy (Bowlby, 1969), but in the study of conflict and mediation, as we have noted, it has been used sparingly and in relatively simplistic terms. A true theory of mediation practice will need to invoke a more complex and differentiated notion of the mental model concept. Our findings suggest that a focus on identifying and describing intervention scripts and the decision rules and procedural metascript that inform script activation are likely to be important components in building such mental models and should be a targeted focus of inquiry. The subjects of study need to be seasoned professionals dealing with cases in their familiar subdomain of mediation practice.

2. *The value of comparative studies organized around core social variables.* Wall et al. (2001) have noted that while there is a large literature categorizing mediator behavior, studies of the determinants of that behavior are sparse. The current findings, in conjunction with related research, suggest that an important degree of order may be brought to the literature on mediator behavior by taking into account the social circumstances in which mediators practice. One should be able to make testable predictions about the social conditions that are likely to produce contrasting mental models of mediation practice. Kolb's (1983) path-breaking ethnographic study of "dealmakers" and "orchestrators" in labor mediation turns on how the very different social contexts of practice provided by state and federal mediation services can profoundly effect how mediators think and behave. In her study the impact of social context was in shaping the kind of tactical intervention script a mediator was likely to have (to use our terminology).

In this study, the effect of social context was on the preference for a latent cause mental intervention script rather than a tactical one. Partly, this was a function of studying third parties who are ombudsmen, a role that orients toward latent cause thinking. This was not the only contextual factor promoting the DPS script, however. Others include mediators who are repeat players in a particular institutional context and who have had training in disciplines with latent cause theories, frequent opportunities for reflective case consultation, and exposure to disputes involving parties with ongoing relationships who are negotiating about multiple tangible and intangible issues. In settings in which all or most of these elements are absent more tactical models are likely to prevail.

3. *The usefulness of a mental models approach for outcome assessment.* The capacity of professional mediators in certain contexts to move flexibly between intervention scripts also has implications for how we conceptualize the relationship between "models" (scripts) of mediation and outcomes. There is a strong inclination to think in terms of pitting one mediation approach against some competing model—e.g., in determining whether one strategic style produces better results than another (e.g., Kressel et al., 1994). In the collective practice of the OO, however, DPS and TPS are not *competing*

intervention scripts, but are used *selectively and in a complementary manner,* depending upon diagnostic signs. Outcome research will have to reckon with such complexity. At least in certain contexts, the relevant unit of comparison may not be this or that script, strategy, or "style" but the degree of mediator sophistication and flexibility in using the mental models available to them.

The results of this study also have implications for practice and training. An important implication for practice is the significant limitation of "one size fits all" arguments about which approach to mediation is "best." Moore (1996) and Pruitt (2006), among others, have noted the futility of such arguments on general conceptual grounds, but in the practitioner community there are still strong debates revolving around the presumed superiority of one approach to mediation over another. The current findings strongly support the "all mediation is local" perspective. Mediating in the shadow of science presents very different cognitive challenges, opportunities, and pressures than mediating in the shadow of the law or in the shadow of labor-management relations. That is why the working mental model of the NIH team, with its robust preference for a latent cause intervention script and the decision rules that support it look so different from the mental models we may infer from accounts of seasoned mediators working in other social contexts (Brett et al., 1986; Kolb, 1983; Touval & Zartman, 1989). Here again, our findings are echoed by research that demonstrates that expertise is highly subdomain specific (Feltovich et al., 2006).[4]

Naturalistic decision-making research has demonstrated the value of using the rich mental models of domain experts in the training of novices (Feltovich et al., 2006; Ross et al., 2006). A training implication of our findings is the importance of dedicated case-based learning. By dedicated case learning we refer to the utilization of cases for instruction that are tailored as closely as possible to the specific social context in which mediators will be expected to work. Beyond the novice phase of professional development, and for all but the most restrictive mediation contexts, training materials need to capture the cognitive elements we have identified as being associated with mature mediation practice. These include multiple scripts, well-articulated diagnostic rules for script selection, responsiveness to prevailing institutional and organizational circumstances (the ubiquitous "shadow" influences), and, in settings that allow it, the capacity to recognize, investigate, and act on latent causes of destructive conflict.

There is, of course, a downside to developed mental models for expert mediation practice and for teaching such models: The problems introduced by chronic script accessibility. We have described the problem in *Managerial Miasma.* Chronically accessible (favored) scripts can produce inaccurate diagnoses and the inappropriate application

[4]A small but telling illustration of this point occurred when an ombudsman who had just begun her work at another scientific institute used the reflective method to debrief one of her cases with the OO team. Although a scientist of many years experience and well-indoctrinated with a generic facilitative, interest-based model of mediation, she was struggling to get her bearings in a classic mentoring dispute. The nature of this dispute and what to do about it were, however, readily apparent to her more experienced NIH colleagues with their differentiated, context specific mental model.

of a script when another script (or no mediation at all) would suit better. This is one reason that reflective practice methods of one kind or another are likely to be extremely helpful for highly experienced professionals whose habitual cognitive predilections may need to be periodically challenged and modified.

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